



TUMACÁCORI

General Management Plan • Environmental Assessment



**Draft General Management Plan / Environmental Assessment
Tumacácori National Historical Park
Arizona**

U.S. Department of the Interior • National Park Service

General Management Plan / Environmental Assessment
Tumacácori National Historical Park
Santa Cruz County, Arizona

In September 1908, a presidential proclamation established Tumacácori National Monument to preserve “the Tumacácori Mission, an ancient Spanish ruin. . . .” The original proclamation established a park area of 9.11 acres. A second proclamation in 1958 enlarged the national monument by 0.15 acre. The National Parks and Recreation Act of 1978 revised the authorized boundary of the national monument, adding 6.37 acres and removing 0.13 acre. In August 1990, Public Law 1001-344 changed the designation of the park from national monument to national historical park by combining the existing monument with two associated Spanish colonial sites south of Mission San José de Tumacácori: Los Santos Ángeles de Guevavi (Guevavi), established in 1691, and San Cayetano de Calabazas (Calabazas), established in 1756. Tumacácori, Guevavi, and Calabazas are commonly referred to as units of Tumacácori National Historical Park. An additional 310.0 acres, including a 1.0-mile stretch of the Santa Cruz River and adjacent riparian area, gallery forest, and mesquite bosque, were added to the national historical park in 2002. Currently, the three units combined total 360 acres.

This document examines three alternatives for managing Tumacácori National Historical Park for the next 15 to 20 years. It also analyzes the impacts of implementing each of the alternatives. Alternative 1 is the “no-action” alternative and provides a baseline for evaluating changes and impacts that could result from the other alternatives. Under alternative 1, the National Park Service would continue to manage Tumacácori National Historical Park for the protection and interpretation of natural and cultural resources as outlined in the 1996 *Tumacácori National Historical Park General Management Plan*.

Under alternative 2, park management would focus on engaging visitors, park neighbors, and partners in the history and outstanding natural and cultural resources found at all three park units. While visitors would be encouraged to spend their time connecting with the three units, visitor activities would be focused on the Tumacácori unit. Park management would focus on the preservation of cultural resources and the restoration of natural resources.

Alternative 3 would focus on the connections of the park to the larger community through the Santa Cruz River and more broadly on how the past connects with the future in the Santa Cruz River valley. The river is the feature that unites the three park units and interconnects the valley’s history, inhabitants, and natural resources. For this reason, visitors would be encouraged to experience other related sites as part of a longer tour of the Santa Cruz River valley.

Alternative 2 is the NPS preferred alternative.

The potential environmental impacts of the alternatives have been identified and assessed. Implementation of alternative 1 would result in long-term, minor to moderate, beneficial impacts to vegetation; long-term, minor, adverse impacts to wildlife; long-term, negligible to minor, adverse impacts to federally listed and candidate species; long-term, negligible to minor, beneficial impacts to archeological resources; long-term, negligible to minor, adverse impacts to historic structures; long-term, negligible, beneficial impacts to cultural landscapes; long-term, negligible to minor, beneficial impacts to visitor use and experience; short-term, negligible, beneficial and long-term, minor, beneficial impacts to the socioeconomic environment; and long-term, moderate, adverse impacts to park operations and facilities.

Implementation of alternative 2 would result in long-term, moderate, beneficial impacts to vegetation; long-term, minor, adverse impacts to wildlife; long-term, negligible to minor, adverse impacts to federally listed and candidate species; permanent, minor, adverse impacts to archeological resources; long-term, negligible to minor, beneficial impacts to historic structures; long-term, negligible to minor, adverse impacts to cultural landscapes; long-term, minor to moderate, beneficial impacts to visitor use and experience; short- and long-term, minor, beneficial impacts to the socioeconomic environment; and long-term, minor, adverse impacts to park operations and facilities.

Implementation of alternative 3 would result in long-term, moderate, beneficial impacts to vegetation; long-term, minor, adverse impacts to wildlife; long-term, negligible to minor, adverse impacts to federally listed and candidate species; permanent, minor, adverse impacts to archeological resources; long-term, negligible to minor, beneficial impacts to historic structures; long-term, negligible to minor, adverse impacts to cultural landscapes; long-term, minor to moderate, beneficial impacts to visitor use and experience; short-term, minor, beneficial impacts and long-term, negligible to minor, beneficial impacts to the socioeconomic environment; and long-term, minor, adverse impacts to park operations and facilities.

This *General Management Plan / Environmental Assessment* has been distributed to other agencies and interested organizations and individuals for their review and comment. The public comment period for this document will last for 45 days.

HOW TO COMMENT ON THIS PLAN

Comments on this *General Management Plan / Environmental Assessment* are welcome and will be accepted during the 45-day public review and comment period. During the comment period, comments may be submitted using one of the methods noted below.

Online:

<http://parkplanning.nps.gov/tuma>

We prefer that readers submit comments online through the park planning website identified above so the comments become incorporated into the National Park Service planning, environment, and public comment system. An electronic public comment form is provided through this website.

Mail:

Tumacácori National Historical Park
General Management Plan
National Park Service
Denver Service Center – P, Erin Flanagan
PO Box 25287
Denver, CO 80225

Hand Delivery:

May be made at park headquarters or at public meetings, which will be announced in the media, following the release of this plan.

Park headquarters location:

Tumacácori National Historical Park
1895 East Frontage Road
Tumacácori, AZ 85640

Before including your address, telephone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

SUMMARY

BACKGROUND

This general management plan is needed to update the management framework for Tumacácori National Historical Park due to the addition of 310 acres to the Tumacácori unit in 2002; these lands are directly associated with the Mission San José de Tumacácori. Resources on the acquired land include the mission orchard and acequia, as well as farmlands and a portion of the Santa Cruz River. The 310 acres were not part of the park in 1996 when the last general management plan was completed; therefore, a new plan is needed to address these lands and the opportunities they present, as well as the new challenges facing the park not considered in the previous general management plan. Management direction is needed on how best to conserve the cultural and natural resources and the evolving/expanding opportunities for interpretation and visitor experience.

Purpose of the Plan

The approved general management plan will be the basic document for managing Tumacácori National Historical Park for the next 15 to 20 years. The purposes of this plan are as follows:

- Confirm the purpose, significance, and mandates of Tumacácori National Historical Park, and identify fundamental resources and values.
 - Clearly define resource conditions and visitor experiences to be achieved in Tumacácori National Historical Park.
 - Provide a framework for park managers to use when making decisions about how to best protect park resources, how to provide quality visitor experiences, how to manage visitor use, and what types of facilities, if any, to develop in or near Tumacácori National Historical Park.
- The purpose of this plan is to also address eight issues identified by the public and National Park Service for Tumacácori National Historical Park. The issues are as follows:
- **Cultural Resource Issue 1:** Mission architecture, archeological sites, and associated features are being impacted by environmental and human-caused factors, including (1) natural weathering and deterioration, (2) damage from animals (e.g., bats, rodents, and birds), (3) inadvertent impacts from visitors, and (4) intentional looting and vandalism.
 - **Cultural Resource Issue 2:** Current management approaches for the three park units, including the recently acquired lands along the Santa Cruz River, do not convey a sense of place or historic context.
 - **Natural Resource Issue 1:** The recently acquired portion of the Santa Cruz River and its associated riparian habitat is being impacted by a number of factors, including cattle that enter through broken fences and trespass on park lands, nonnative plants, water pollution, trespass by all-terrain vehicles on park lands, and other human-caused impacts (e.g., visitor-created trails).
 - **Park Resources and Values Issue 1:** Ongoing or potential changes in

surrounding land uses (especially from residential development) are adversely affecting the overall character of the three park units. Effects include impacts to the park's scenic viewsheds, natural soundscapes, cultural landscape, natural habitats, and visitor experience.

- **Visitor Use and Experience Issue 1:** The park hosts a variety of popular special events that draw large crowds; these events and associated crowds could impact the quality of the experience for some visitors.
- **Visitor Use and Experience Issue 2:** The three park units have the potential to provide a wider range of visitor opportunities (e.g., recreational activities and interpretive programs) than are currently being provided.
- **Community Connections Issue 1:** The park must strive to remain a vibrant part of the surrounding community, and it has the potential to become more relevant to the changing demographics of the area.
- **Park Operations Issue 1:** The park was expanded in 2002, by 310 acres, a 720% increase in total acres that introduced important new resource types into the park with no concurrent increase in staff. The park's small staff faces many pressing demands, including managing visitors, resources, and facilities of three units.

Need for the Plan

This general management plan is needed to update the management framework for the national historical park due to the addition of 310 acres to the Tumacácori unit in 2002; these lands are directly associated with the Mission San José de Tumacácori. The 310 acres were not part of the park in 1996 when

the last general management plan was completed. Therefore, a new plan is needed to address these lands and the opportunities they present, as well as the new challenges facing the park not considered in the previous general management plan.

THE ALTERNATIVES

Alternative 1: Continuation of Current Management

Concept. Alternative 1 is the “no-action” alternative and provides a baseline for evaluating changes and impacts that could result from the other alternatives. Under alternative 1, the National Park Service would continue to manage Tumacácori National Historical Park for the protection and interpretation of natural and cultural resources as outlined in the 1996 Tumacácori National Historical Park General Management Plan.

The lands along the Santa Cruz River were added to the Tumacácori unit in 2002 (six years after the completion of the 1996 general management plan.) Under alternative 1, the park staff would manage these lands according to applicable laws and NPS policies since no other guiding framework exists. Management of these lands would include the restoration of natural resources with available funding and staff. For the timeframe of this plan there would be no major changes in the management directions of the three units from what is now occurring. All facilities, resource programs, and visitor use opportunities would continue as they are. Existing visitor activities would continue in the park under alternative 1. Visitors would continue to have year-round access to the Tumacácori unit and access to the Guevavi and Calabazas units on ranger- or volunteer-guided tours.

Environmental Consequences. Overall, the alternative would have a long-term, minor to moderate, beneficial impact to

vegetation, primarily due to continued restoration activities in the Tumacácori unit. Native vegetation in the Guevavi and Calabazas units would not be affected by the alternative. The alternative would be expected to have a long-term, minor, adverse impact on the park's wildlife, primarily due to the disturbance of some individual animals by people in the Tumacácori unit. No changes to the park's wildlife populations would be expected to occur. Alternative 1 would have a long-term, negligible, adverse impact on the southwestern willow flycatcher and would have a long-term, minor, adverse impact on the yellow-billed cuckoo, primarily due to the disturbance of individual birds by the presence and activities of people in the Tumacácori unit.

Overall alternative 1 would have a long-term, negligible to minor, beneficial impacts to archeological resources, primarily due to continued documentation, preservation, and protection activities in all three units. Alternative 1 would have long-term, negligible to minor, adverse impacts to historic structures primarily due to visitors coming into contact with the fragile adobe and plaster on the structures. Impacts to cultural landscapes would be beneficial, long-term, negligible, site-specific due to continued preservation efforts.

Alternative 1 would result in beneficial impacts to visitor use and experience in all three units of the park. Overall, the impacts would be negligible to minor, long-term, and beneficial due to the continuation of current visitor experiences, the interpretation of cultural resources, and the sponsorship of special events in the park that involve culturally associated groups of people.

For the socioeconomic environment, alternative 1 would result in short-term, negligible, beneficial impacts and ongoing long-term, minor, beneficial impacts as government expenditures and visitor spending enter the local economy.

Impacts to park operations and facilities would be long-term, moderate, and adverse due to continually high demands on the park's limited staff.

Alternative 2: NPS Preferred Alternative

Concept. Under alternative 2, park management would focus on engaging visitors, park neighbors, and partners in the history and outstanding natural and cultural resources found at all three park units. While visitors would be encouraged to spend their time connecting with the three units, visitor activities would be focused on the Tumacácori unit. Park management would focus on the preservation of cultural resources and the restoration of natural resources. Elements of this alternative would support the resilience of the National Park Service to expected impacts from climate change, including winter and spring warming trends, increased potential for forest fires, and shifting plant and animal communities, all of which may affect cultural and natural resources, as well as visitor experience in the park.

The park would provide a greater variety of visitor opportunities that reflect the significance of place, the complex history of the *Pimería Alta* and the connections to the larger mission system, and the importance of natural resources to communities over time. The park would also provide opportunities for visitors to develop personal connections to the park, its resources, and its history through interpretation, special events, education, and outreach. Partnership efforts would focus on integrating the community into the park so they become directly engaged in resource protection, interpretation, and the continuation of cultural demonstrations and special events. Expanded use of partnerships would enable all parties to better leverage resources, allowing for more effective collaborations.

Natural and cultural resource management would be integrated to tell the complete

story of the park (i.e., the broad cultural history of the park including the tribal and other perspectives with links to natural resources and cultural preservation). Interpretation would include the complex history of the *Pimería Alta* and the park's connection to the larger mission system, including other historic sites in the Santa Cruz River valley. Interpretation would also include the importance of the Santa Cruz River (i.e., the river is a microcosm of the issues that are facing the southwest and the world—water quality, loss of species, importance to ranching and other activities).

Alternative 2 is different from alternative 1 in the following ways:

- a loop trail would be formalized in the riparian section of the Tumacácori unit
- three to five picnic areas would be established in the mesquite bosque in the Tumacácori unit
- two to four access points to the river would be formalized in the Tumacácori unit
- expanded cultural demonstrations would occur
- a new “Mission Trail” would link the Calabazas and Guevavi units
- trail segments would be established to link existing trails in the Calabazas and Guevavi units
- virtual tours may be developed to provide opportunities to experience the Calabazas and Guevavi units
- an open-air shade ramada would be built in the Calabazas unit and the existing shade structure in the Guevavi unit would be replaced with a similar structure
- a parking area would be formalized in the Guevavi unit

Environmental Consequences. Overall, compared to alternative 1, alternative 2 would have a long-term, moderate, beneficial impact to vegetation, primarily due to increased efforts to remove and revegetate visitor-created trails and better designate existing trails, and increased monitoring and management efforts with local community participation. There would be long-term, minor, adverse impacts to wildlife in localized areas, primarily due to increased numbers of people and facilities in the bosque and riparian areas of the Tumacácori unit. Alternative 2 would have a long-term, negligible, adverse impact on the southwestern willow flycatcher and a long-term, minor, adverse impact on the yellow-billed cuckoo, primarily due to the disturbance of individual birds by the presence and activities of people in the Tumacácori unit. The alternative may affect, but would not likely adversely affect, these two species.

Overall, compared to alternative 1, alternative 2 would have permanent, minor, adverse impacts to archeological resources, primarily due to ground disturbance activities associated with developments in all three units and increased visitor use of the Tumacácori unit from additional special events. Impacts to historic structures would be long-term, negligible to minor, and beneficial due to preservation work performed on the structures. Alternative 2 would have long-term, negligible, adverse impacts to cultural landscapes primarily due to the construction and installation of new features in or near the landscapes.

Alternative 2 would result in beneficial impacts to visitor use and experience in all three units of the park. Overall, the impacts would be minor to moderate, long-term, and beneficial due to enhanced, expanded, and inclusive visitor experiences, interpretation, and community connections. The interpretation of cultural resources and the sponsorship of special events in the park that involve culturally associated groups of people would be particularly beneficial.

For the socioeconomic environment, alternative 2 would result in both short- and long-term, minor, beneficial impacts as government expenditures enter the local economy. An anticipated increase in visitor spending would result in a long-term, minor, beneficial impact.

Alternative 2 would result in long-term, minor, adverse impacts on park operations and facilities primarily due to the increase in the proposed new facilities and operational activities the park would manage.

Alternative 3

Concept. Alternative 3 would focus on the connections of the park to the larger community through the Santa Cruz River and more broadly on how the past connects with the future in the Santa Cruz River valley. The river is the feature that unites the three park units and interconnects the valley's history, inhabitants, and natural resources. After visiting Tumacácori National Historical Park, visitors would understand that the history preserved and interpreted at the park is only part of the broader history of the river valley. For this reason, visitors would be encouraged to experience other related sites as part of a longer tour of the Santa Cruz River valley.

Visitors would be provided diverse interpretive and recreational opportunities that would instill a sense of stewardship in the park by emphasizing traditional ties to the park and its natural and historic resources. The river would be used as the starting point to interpret the natural history of the area. Within the park current activities and special events would continue and could be enhanced. Park staff would work with community partners to develop new visitor activities and events outside the park that would be designed to put Tumacácori National Historical Park into the broader historic context of the river valley.

As in all of the alternatives, visitor activities would be focused on the Tumacácori unit.

Park management would focus on the preservation of cultural resources and the restoration of natural resources.

Alternative 3 is different from alternative 1 in the following ways:

- one to two picnic areas would be established in the mesquite bosque in the Tumacácori unit
- a new “Mission Trail” would link the Calabazas and Guevavi units
- new trail segments linking existing trails would be established in the Calabazas unit
- virtual and auto tours would be developed to provide opportunities to experience the Calabazas and Guevavi units
- an open-air shade ramada would be built in the Calabazas unit and the existing shade structure in the Guevavi unit would be replaced with a similar structure
- community stewardship of the river and collaboration with partners on regional activities would be emphasized
- a parking area would be formalized in the Guevavi unit
- a feasibility study would be conducted to determine if it is feasible to reestablish perennial wetland habitat in the Tumacácori unit

Environmental Consequences. Overall, compared to alternative 1, alternative 3 would have a long-term, moderate, beneficial impact to vegetation, primarily due to increased monitoring and increased efforts to remove and revegetate visitor-created trails and better designate existing trails. There would be long-term, minor, adverse impacts to wildlife in localized areas, primarily due to increased numbers of people and facilities in the bosque and

riparian areas of the Tumacácori unit. Alternative 3 would have a long-term, negligible, adverse impact on the southwestern willow flycatcher and a long-term, minor, adverse impact on the yellow-billed cuckoo, primarily due to the disturbance of individual birds by the presence and activities of people in the Tumacácori unit.

Overall, compared to alternative 1, alternative 3 would have permanent, minor, adverse impacts to archeological resources, primarily due to ground disturbance activities associated with developments in all three units. Impacts to historic structures would be long-term, negligible to minor, and beneficial due to the efforts to preserve the structures. Alternative 3 would have long-term, negligible, adverse impacts to cultural landscapes primarily due to the construction and installation of new features in or near the landscapes.

Alternative 3 would result in beneficial impacts to visitor use and experience in all three units of the park. Overall, the impacts would be minor to moderate, long-term, and beneficial due to enhanced, expanded, and inclusive visitor experiences, interpretation, and community connections.

For the socioeconomic environment, alternative 3 would result in both short- and long-term, minor, beneficial impacts as government expenditures enter the local economy. A slight increase in visitor spending would result in a long-term, negligible, beneficial impact.

Alternative 3 would result in long-term, minor, adverse impacts on park operations and facilities, primarily due to the increase in proposed new facilities and operational activities for the park to manage.

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CHAPTER 1 ◈ INTRODUCTION



INTRODUCTION

This *General Management Plan / Environmental Assessment* articulates the management philosophy and establishes the framework for long-term decision making at Tumacácori National Historical Park. General management plans provide guidance for 15–20 years.

This plan and environmental assessment presents and analyzes three alternatives for the management and use of Tumacácori National Historical Park for a period of 15–20 years. Alternative 2 is the National Park Service’s preferred alternative. In accordance with regulations and policies, the potential environmental impacts of all alternatives have been identified and assessed in this plan.

This document is organized in accordance with the Council on Environmental Quality (CEQ) implementing regulations for the National Environmental Policy Act, the National Park Service’s “Park Planning Program Standards,” and Director’s Order 12: *Conservation Planning, Environmental Analysis, and Decision Making* and accompanying Director’s Order 12 Handbook.

Chapter 1: Introduction sets the framework for the entire document. It describes why the plan is being prepared and what needs it must address. It gives guidance for the management alternatives that are being considered—guidance that is based on the park’s legislation, its purpose, the significance of its resources, special mandates and administrative commitments, and servicewide laws and policies.

The chapter also details the planning opportunities and issues that were raised during public scoping meetings and initial planning team efforts; the alternatives in chapter 2 address these issues and concerns. In addition, the introduction defines the

scope of the environmental impact analysis—specifically what impact topics were or were not analyzed in detail. The chapter concludes with a description of next steps in the planning process and caveats on implementation of the plan.

Chapter 2: Alternatives, Including the Preferred Alternative, begins by describing the development of the alternatives and identifies the management zones that would be used to manage the park in the future. It includes the continuation of current management practices and trends in the park (alternative 1, no action). Two alternatives for managing the park, alternative 2 (the preferred alternative) and alternative 3, are presented. Mitigative measures proposed to minimize or eliminate the impacts of some proposed actions in the alternatives are described, followed by a discussion of future studies or implementation plans that would be needed. The environmentally preferable alternative is identified next, followed by a discussion of alternatives or actions that were considered but dismissed from detailed evaluation. The chapter concludes with summary tables of the alternatives and the environmental consequences of implementing those alternatives.

Chapter 3: The Affected Environment describes those areas and resources that would be affected by implementing the actions contained in the alternatives. It is organized according to the following topics: natural resources, cultural resources, visitor use and experience, socioeconomic environment, and park operations and facilities.

Chapter 4: Environmental Consequences describes the methods used for assessing impacts. It then analyzes the effects of implementing the alternatives on the impact topics described in the “Affected Environment” chapter.

Chapter 5: Consultation and Coordination describes the history of public and agency coordination during the planning effort, including Native American consultation, and any future compliance requirements. It also lists agencies and

organizations that will be receiving copies of the document.

Appendices, Selected References, and a list of Preparers and Consultants are found at the end of the document.

BRIEF DESCRIPTION OF THE PARK

Tumacácori National Historical Park is located in Santa Cruz County, Arizona, 18 miles north of the city of Nogales and the United States-Mexico border, and 43 miles south of Tucson (see figure 1). The park protects three Spanish colonial mission ruins in southern Arizona: Mission San José de Tumacácori (Tumacácori), Mission Los Santos Ángeles de Guevavi (Guevavi), and Mission San Cayetano de Calabazas (Calabazas). Tumacácori, Guevavi, and Calabazas are commonly referred to as units of Tumacácori National Historical Park. Currently, the three units combined total 360 acres; the Tumacácori unit is the largest. These missions are among more than twenty established in the *Pimería Alta* by Father Eusebio Francisco Kino, a Jesuit missionary, and other Jesuits in the 17th and 18th centuries, and later expanded by Franciscan missionaries in the 19th century. (When the Spanish first arrived in the area of present-day southern Arizona and northern Sonora, Mexico, they called the O'odham Indians "Pimas." Thus, the area became known as the *Pimería Alta*—the place of the upper Pimas.)

In September 1908, presidential proclamation established Tumacácori

National Monument to preserve "the Tumacácori Mission, an ancient Spanish ruin . . . one of the oldest ruins in the southwest. . ." The original proclamation established a park area of 9.11 acres. A second proclamation in 1958 enlarged the national monument by 0.15 acres. The National Parks and Recreation Act of 1978 revised the authorized boundary of the national monument, adding 6.37 acres and removing 0.13 acres. In August 1990, Public Law (PL) 1001-344 changed the designation of the park from national monument to national historical park by combining the existing monument with two associated Spanish colonial sites located south of Tumacácori. The two associated sites or missions are Los Santos Ángeles de Guevavi (Guevavi), established in 1691, and San Cayetano de Calabazas (Calabazas), established in 1756. An additional 310 acres, including a 1-mile stretch of the Santa Cruz River and adjacent riparian area, gallery forest, and mesquite bosque, were added to the national historical park in 2002. The addition also includes a 1-mile section of the Juan Bautista de Anza National Historic Trail (see figure 2).

Tumacácori National Historical Park

Regional Map

Arizona

National Park Service
U.S. Department of the Interior

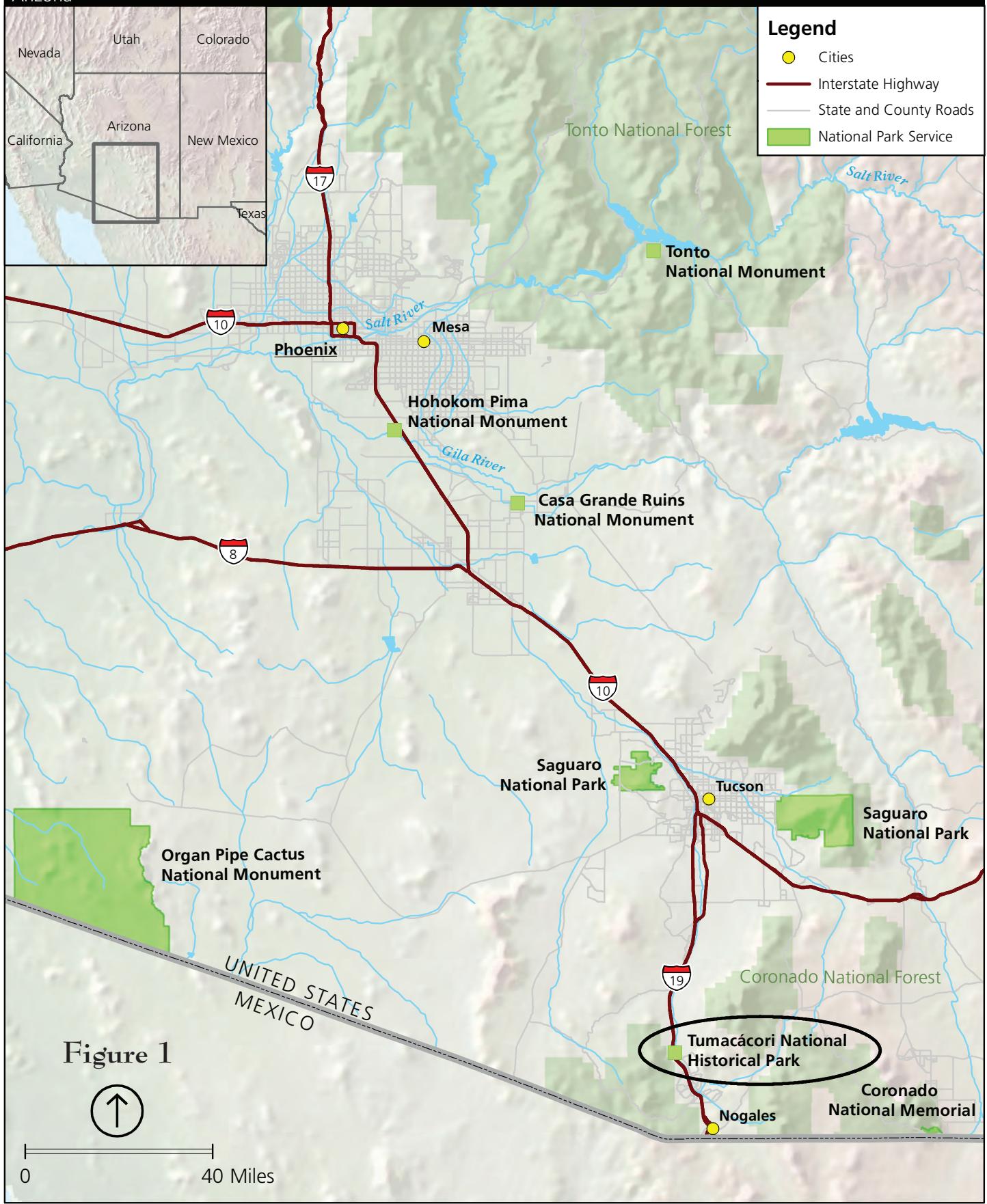
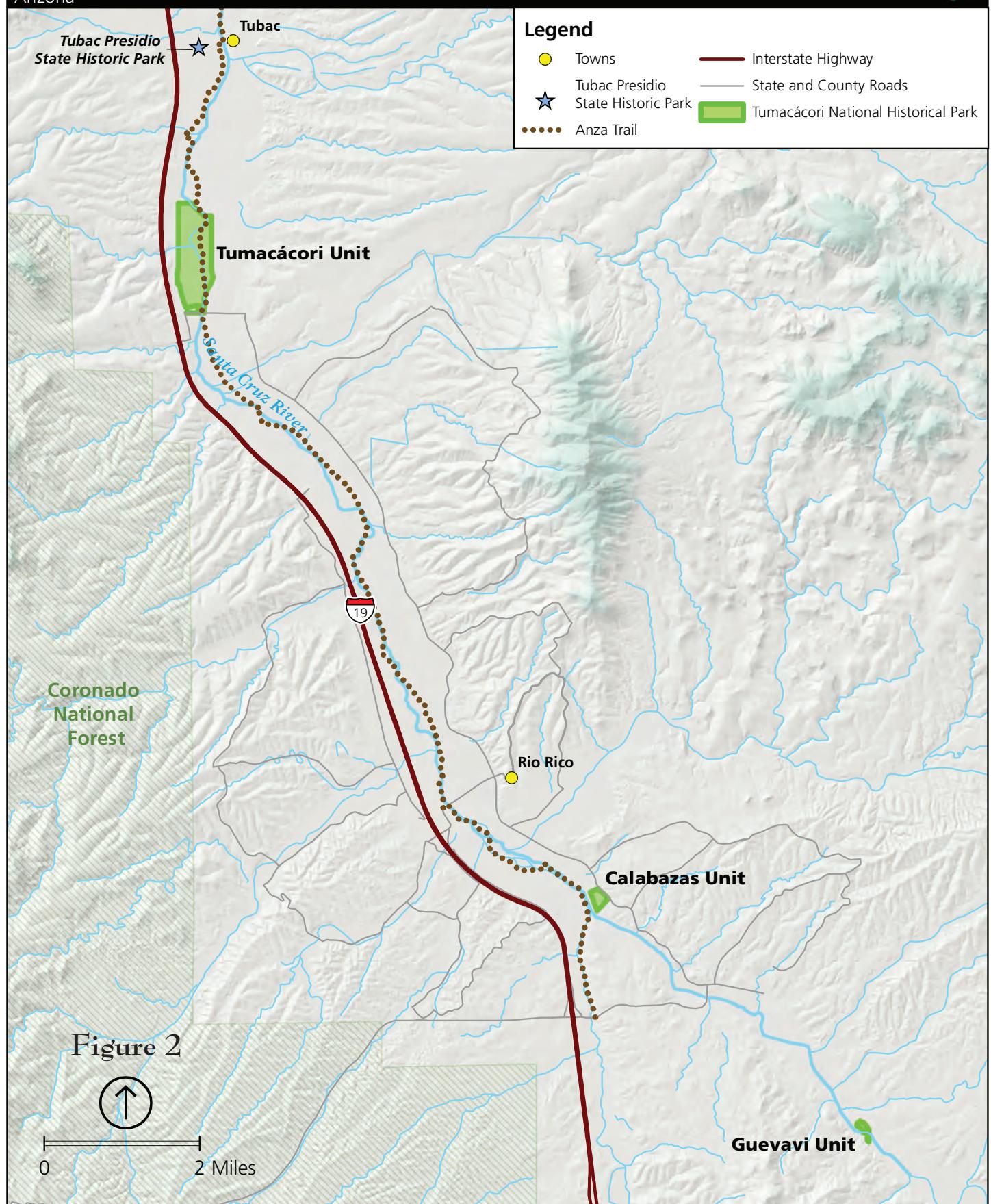


Figure 1

Tumacácori National Historical Park

Overview Map
Arizona

National Park Service
U.S. Department of the Interior



OVERVIEW OF THE NPS PLANNING PROCESS

GENERAL MANAGEMENT PLANS

The National Parks and Recreation Act of 1978 (PL 95-625) and the Redwood Amendment of 1978 (PL 95-250, section 101[6][b]) require the preparation and timely revision of general management plans for each unit of the national park system. NPS *Management Policies 2006* require each general management plan to “set forth a management concept for the park [and] establish a role for the unit within the context of regional trends and plans for conservation, recreation, transportation, economic development, and other regional issues.” Congress has also specifically directed the National Park Service, as part of the planning process, to address the following elements (16 *United States Code* (USC) 1a-7[b]):

General management plans for each unit shall include, but not be limited to

- measures for the preservation of the area’s resources
- indications of types and general intensities of development (including visitor circulation and transportation patterns, systems, and modes) associated with public enjoyment and use of the area, including general locations, timing of implementation, and anticipated costs
- identification of an implementation commitment for visitor carrying capacities (now called user capacity) for all areas of the unit
- indications of potential modifications to the external boundaries of the unit, and the reasons therefore

The purpose of a general management plan is to ensure that a national park system unit (park unit) has a clearly defined direction for resource preservation and visitor use that best achieves the National Park Service’s mandate to preserve resources unimpaired for the enjoyment of future generations. When creating a general management plan, the National Park Service considers the National Park Service Organic Act, the park’s foundation document, and relevant laws and policies (see appendix A). Overall, general management planning makes the National Park Service more effective, collaborative, and accountable by:

- Providing a balance between continuity and adaptability in decision making—this defines the desired conditions to be achieved and maintained in a park unit and provides a touchstone that allows NPS managers and staff to constantly adapt their actions to changing situations, while staying focused on what is most important about the park unit.
- Analyzing the park unit in relation to its surrounding ecosystem, cultural setting, and community—this helps NPS managers and staff understand how the park unit can interrelate with neighbors and others in ways that are ecologically, socially, and economically sustainable. Decisions made within such a larger context are more likely to be successful over time.
- Affording everyone who has a stake in decisions affecting a park unit an opportunity to be involved in the planning process and to understand the decisions that are made—park units are often the focus of intense public interest. Public involvement throughout the planning process

provides focused opportunities for NPS managers and staff to interact with the public and learn about public concerns, expectations, and values. Public involvement also provides opportunities for NPS managers and staff to share information about the park unit's purpose and significance, as well as opportunities and constraints for the management of park unit lands.

The ultimate outcome of general management planning for park units is an agreement between the National Park Service, its partners, and the public on why each area is managed as part of the national park system, what resource conditions and visitor experiences should exist, and how those conditions can best be achieved and maintained over time.

REQUIREMENTS OF THE NATIONAL ENVIRONMENTAL POLICY ACT

This plan is subject to the requirements of the National Environmental Policy Act of

1969, as amended (NEPA) that mandate an assessment of the environmental impacts, both adverse and beneficial, of those actions proposed by the federal government before those actions are implemented. Actions that could have a significant impact on the natural or human environment require the preparation of an environmental impact statement. Actions that do not appear to have a significant impact may use a shortened environmental assessment process. Because the actions in this document do not appear to have the potential for significant environmental consequences, this document incorporates an environmental assessment. If significant impacts are identified during public review, an environmental impact statement would be prepared.

The environmental assessment for this plan has been prepared in accordance with the National Environmental Policy Act of 1969, as amended, and implementing regulations, 40 CFR 1500-1508, NPS Director's Order 12 and the *Handbook for Environmental Impact Analysis*.

PURPOSE OF AND NEED FOR THE PLAN

PURPOSE OF THE PLAN

The approved general management plan will be the basic document for managing Tumacácori National Historical Park. The purposes of this plan are as follows:

Confirm the purpose, significance, and special mandates of Tumacácori National Historical Park; identify fundamental resources and values.

Clearly define resource conditions and visitor experiences to be achieved in Tumacácori National Historical Park. Provide a framework for park managers to use when making decisions about how to best protect park resources, how to provide quality visitor experiences, how to manage visitor use, and what types of facilities, if any, to develop in or near Tumacácori National Historical Park.

The planning process also ensures that this general management plan, which is to be used for decision making, has been developed in consultation with interested stakeholders and adopted by the NPS leadership after an adequate analysis of the benefits and adverse impacts and economic costs of alternative courses of action.

Legislation establishing the National Park Service as an agency and governing its management provides the fundamental direction for the administration of Tumacácori National Historical Park (and other units and programs of the national park system). Management of the park must also conform with the enabling legislation that established Tumacácori National Historical Park and to other federal laws, agency regulations, and policies. This general management plan proposes a set of actions that will help the park reach future management conditions that are consistent

with this body of laws, regulations, and policies and the park's enabling legislation, as described in "Appendix B: Desired Conditions to Be Achieved at Tumacácori National Historical Park Based on Servicewide Mandates and Policies."

NEED FOR THE PLAN

This general management plan is needed to update the management framework for the national historical park due to the addition of 310 acres to the Tumacácori unit in 2002; these lands are directly associated with the Mission San José de Tumacácori. Resources on the acquired land include the mission orchard and *acequia*, as well as farmlands and a portion of the Santa Cruz River. The 310 acres were not part of the park in 1996 when the last general management plan was completed; therefore, a new plan is needed to address these lands and the opportunities they present, as well as the new challenges facing the park not considered in the previous general management plan. Management direction is needed on how best to conserve the cultural and natural resources and the evolving and expanding opportunities for interpretation and visitor experiences.

This plan is also needed to meet the requirements of the National Parks and Recreation Act of 1978 and the Redwood Amendment of 1978, which mandates the preparation and timely revision of general management plans for each unit of the national park system, as well as the requirements outlined in *NPS Management Policies 2006*.

NEXT STEPS IN THE PLANNING PROCESS

After the distribution of the *General Management Plan / Environmental Assessment*, there will be a 45-day public review and comment period. After this comment period, the NPS planning team will evaluate comments from other federal agencies, tribes, organizations, businesses, and individuals regarding the plan.

Following the review of public comments, a decision document would be prepared. A Finding of No Significant Impact (FONSI) may be finalized or a Notice of Intent (NOI) to complete an Environmental Impact Statement may be prepared and submitted to the *Federal Register*. The planning team would respond through the use of errata sheets to comments that do not increase the degree of impact described in the environmental assessment. The combination of the environmental assessment and the errata sheets would form the complete and final record upon which either decision document would be based. If substantive issues are raised that have not been covered adequately in the plan, or if new alternatives are suggested that the NPS staff should consider, the general management plan would be rewritten to incorporate them and reissued for a second 45-day review.

IMPLEMENTATION OF THE PLAN

The approval of this plan does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. The implementation of the approved plan will depend on future NPS funding levels and servicewide priorities, and on partnership funds, time, and effort. It could also be affected by factors such as changes in NPS staffing, visitor use patterns, and unanticipated environmental changes. Full implementation could be many years in the future. Once the general management plan has been approved, additional feasibility studies and more detailed planning, environmental documentation, and consultations would be completed, as appropriate, before certain actions in the selected alternative can be carried out.

Future program and implementation plans, describing specific actions that managers intend to undertake and accomplish in the park, will tier from the desired conditions and long-term goals set forth in this general management plan.

THE FOUNDATION OF THE PLAN

The foundation of park planning defines the legal and policy requirements that direct the park's basic management responsibilities, and describes the resources and values that are fundamental to achieving the park's purpose and significance. The foundation also identifies special mandates that may affect park management. Although all units of the national park system must be managed in compliance with a large body of federal laws and policies, each park has its own specific purpose, established by Congress or the president, which provides the context for park management.

The foundation provides the base upon which all future planning efforts at the park are built, including this general management plan. The document identifies what is most important to the park through an examination of the park's enabling legislation, development of purpose and significance statements and primary interpretive themes, and it identifies any special mandates that affect management of the park. The foundation document also identifies fundamental resources and values that are critical to maintaining the park's purpose and significance. The foundation for Tumacácori National Historical Park was developed with input from park staff and stakeholders and was completed in 2009. Components of the park's foundation document are found below.

These components were instrumental in the development of this general management plan. An increased emphasis on government accountability and restrained federal spending make it imperative that park staff and stakeholders have a shared understanding of the park's foundation for planning and management to ensure that goals related to the fundamental resources and values of the park are achieved.

PARK PURPOSE AND SIGNIFICANCE STATEMENTS

The purpose is a clear statement of why Congress established the Tumacácori National Historical Park as a unit of the national park system.

Statements of significance define what is most important about the park's fundamental resources and values; they are based on the park's purpose.

FUNDAMENTAL RESOURCES AND VALUES

Fundamental resources and values are the most important resources, ideas, or concepts to be communicated to the public about the park. These resources and values warrant primary consideration during planning and management because they support and contribute to the park's significance and are critical to achieving the purpose for which the park was established. They could include systems, processes, features, stories, scenes, sounds, or scents. Without these resources and values, the park would not have national importance and could not accomplish the purpose for which it was established. In general, fundamental resources are tangible (e.g., a structure or a place) and fundamental values are intangible (e.g., solitude).

Understanding the purpose and significance of a park and identifying the fundamental resources related to the significance help guide planning and management decisions made about a park. Tumacácori National Historical Park's purpose and significance statements and corresponding fundamental resources and values are described in the following sections.

PURPOSE OF TUMACÁCORI NATIONAL HISTORICAL PARK

To protect, preserve, and interpret the natural and cultural heritage resources of the Jesuit and Franciscan missions of San José de Tumacácori, San Cayetano de Calabazas, and Los Santos Ángeles de Guevavi.

To provide access and educational opportunities for the public to understand the cultural interactions between native and European peoples in the Santa Cruz River valley from the 17th century to today.

SIGNIFICANCE OF TUMACÁCORI NATIONAL HISTORICAL PARK AND FUNDAMENTAL RESOURCES AND VALUES

Mission System (Infrastructure and Society)

Significance Statements. The cultural resources of Tumacácori National Historical Park collectively represent the culture of native peoples before and after the arrival of Europeans as well as the Spanish effort to colonize the Santa Cruz River valley through the Jesuit and Franciscan missionization of its native people.

The missions of Tumacácori National Historical Park are part of the *Pimería Alta* mission system, which includes more than 20 missions, extending from what is now Sonora, Mexico to southern Arizona, established by Father Eusebio Francisco Kino.

Tumacácori National Historical Park is the only NPS unit displaying an entire, original institutionalized Spanish mission landscape including a *cabecera*, *visita*, *ranchería*, and *ganadera*.

In addition to the physical structures and features, Tumacácori National Historical Park preserves a record of the social and

political hierarchy that was overlaid on the existing American Indian communities.

Fundamental Resources and Values

- Mission San José de Tumacácori preserves a nearly complete mission complex. Established by Eusebio Francisco Kino, the mission later became a Franciscan *visita*, and shortly thereafter it was made their *cabecera*.
- Mission Los Santos Ángeles de Guevavi is the only preserved earthen Jesuit *cabecera* in the United States. It has great potential to serve as an educational tool for learning about American Indian and Spanish colonial interaction because of well-preserved associated cultural sites and features, which include an associated Indian village.
- Mission San Cayetano de Calabazas includes the only known remaining standing Spanish colonial *visita* in the national park system.
- Tumacácori National Historical Park includes a portion of the Juan Bautista de Anza National Historic Trail (see figure 2), the first successful overland route facilitating the colonization of *Alta California* from previously established colonies in *Pimería Alta* of southern Arizona.
- The extensive associated archives and museum collections of Tumacácori National Historical Park help to preserve artifacts that contribute to cultural identity. Tumacácori National Historical Park preserves records including archeological resources, oral histories, written documents, and the pertinent databases.
- The integrity of the architecture, including the materials and other evidence of original construction techniques, greatly enhances

research opportunities at all three mission sites.

- Tumacácori National Historical Park provides a balanced and objective view into the lives of native people who were impacted by the mission and its goals for religious conversion and economic exploitation.
- The landscapes of Tumacácori National Historical Park provided resources important for development of communities before, during, and after the Spanish arrived in the area.
- The remnants of the *acéquia* and orchard/garden are representative examples of the agricultural infrastructure necessary to sustain populations.

Preservation

Significance Statement. Tumacácori National Historical Park is one of the few NPS venues that regularly teaches and incorporates traditional architectural preservation techniques in partnership with international, local, and Native communities.

Fundamental Resources and Values

- Tumacácori National Historical Park serves as a model and venue for traditional preservation techniques employing traditional methods and materials.
- Tumacácori National Historical Park fosters partnerships that promote community involvement by mentoring on traditional preservation methods and technologies.
- The church at Mission San Jose de Tumacácori reflects the existing conditions when original construction was halted because of

political and economic conditions of the time.

Architecture

Significance Statement. All three mission sites contain some of the best remaining examples of Spanish Mission period architectural styles, including original materials, features, and construction techniques.

Fundamental Resources and Values

- The site of Mission Los Ángeles de Guevavi is relatively undisturbed with few post-Jesuit mission period archeological resources present.
- The Mission of San Jose de Tumacácori is an excellent example of original 1800s Franciscan mission architecture with a number of distinctive, well-preserved features including a round mortuary chapel, scalloped niches, and an outstanding example of stenciled art, frescoes, murals, and original gypsum and plaster finishes. The final layout of the church includes discernible adaptations that reflect economic constraints at the time of construction.
- Mission Los Ángeles de Guevavi has remnants of the first mission church built in what is today Arizona. The church is the only known standing Jesuit earthen mission architecture found in the United States.
- Mission San Cayetano de Calabazas preserves a history of diverse and extensive adaptive reuse including a mission period *visita* and *ganadera*, Mexican governor's residence, U.S. cavalry camp, customs house, and a post office.
- Native people provided labor and knowledge regarding local materials

and resources and influenced the style and expression of church art.

Cultural Continuity

Significance Statements. Tumacácori National Historical Park maintains a record of cultural interaction, continuity, and change before, during, and after contact with Europeans. Today the park recognizes the distinct lifeways and the range of cultures that have existed since people were part of the landscape.

Fundamental Resources and Values

- Tumacácori National Historical Park is valued by individuals and groups who believe the mission sites are an important part of honoring, perpetuating, and celebrating their customs and traditions.
- Tumacácori National Historical Park is situated on ancestral lands of the O'odham, whose preexisting settlements influenced the location of the mission sites.
- The mission sites serve as tangible links to the past by providing connections to both personal heritage and general history of individuals, families, and groups.
- The experiences of people who resided at and near the mission sites exemplify persistence of culture, community, and belief.

Landscapes

Significance Statement. The landscapes at the three mission sites and the broader natural and cultural resources of the Santa Cruz River valley contain important elements of the environment that sustained people before, during, and after the missions were established. These features now allow visitors and residents to imagine and

understand the different communities' relationships to these landscapes over time.

Fundamental Resources and Values. The natural resources of the Santa Cruz River valley, including the rich diversity of plants and animals, the reliable water source, and the fertility of the soil attracted and sustained human settlement before, during, and after the mission period.

- Tumacácori National Historical Park offers opportunities for visitors and residents of the Santa Cruz River valley to understand and appreciate the importance of continued management to protect and improve its notable biological diversity, scarce riparian areas, and limited water resources.
- The distinct character of the landscape at each of the three sites offers a range of visitor experiences that provide opportunities for imaginative and personal insights into past and ongoing changes within the Santa Cruz River valley. Distinctive aspects of the three sites include the relatively unspoiled natural viewshed and soundscape at Mission Los Santos Ángeles de Guevavi, the contrasting industrial development that surrounds Mission San Cayetano de Calabazas, and the living community that includes Mission San José de Tumacácori.
- The landscapes and landforms surrounding Tumacácori National Historical Park are sacred to native peoples.
- Tumacácori National Historical Park recognizes that its landscapes are sacred and culturally significant to descendant communities, residents, and visitors.

PRIMARY INTERPRETIVE THEMES

Primary interpretive themes describe the most important ideas and concepts that will help people understand and appreciate the purpose and significance of Tumacácori National Historical Park.

1. The long history of the missions of Tumacácori National Historical Park serves as a doorway to the rich and complex stories of cultural encounter, cooperation, conflict, accommodation, and resistance that characterized the efforts of the Spanish Crown and the Catholic Church to establish colonies in northern New Spain and missionize the native peoples.
2. The Jesuits and Franciscans, in their efforts to modify the landscape and create a social order familiar to Europeans, attempted to impose their systems and institutions on the native peoples. Their response exemplifies the ability of individuals and cultures to adapt, survive, and retain identity and community coherence in the face of pervasive change.
3. Tumacácori National Historical Park continues to be a vital and vibrant focal point celebrating the cultures and communities associated with the Santa Cruz River valley—a meeting place and social center serving to perpetuate, celebrate, honor, and appreciate traditions and explore change.
4. The diversity and integrity of the architectural resources of Tumacácori National Historical Park and its more than 100 years of federal management provide outstanding opportunities to understand the history, science, and art of historic preservation.
5. The distinctive evolution and current character of the landscapes of Tumacácori National Historical Park are reflective of the enduring relationships between people and places—illustrating how people change and are, in turn, changed by the natural environment.

SPECIAL MANDATES AND ADMINISTRATIVE COMMITMENTS

Special mandates are legal mandates specific to the park that expand on a park's legislated purpose and identify any potential conflict with the park's purpose and significance. Tumacácori National Historical Park has one special mandate:

PUBLIC LAW 101-344, August 6, 1990

SECTION 2 (d) RECOGNITION OF FATHER EUSEBIO FRANCISCO KINO'S ROLE - In administering the park, the Secretary shall utilize such interpretative materials and other devices as may be necessary to give appropriate recognition to the role of the Jesuit Missionary Priest, Father Eusebio Francisco Kino, in the development of the mission sites and the settlement of the region.

Administrative commitments are, generally, agreements between the National Park Service and other parties that have been reached through formal, documented processes (e.g., memoranda of agreement or understanding). These commitments are revocable, and are subject to renegotiation or amendment. Tumacácori National Historical Park does have administrative commitments with the Santa Cruz County Sheriff's Office, Tubac Fire Department, and the Tohono O'odham Nation (designated as the lead repatriation tribe).

The National Park Service would continue working to formalize agreements with neighboring landowners to provide access to

the Calabazas and Guevavi units. In addition, the National Park Service would seek to formalize an agreement with the Anza Trail Coalition of Arizona, covering maintenance of the Juan Bautista de Anza National Historic Trail (Anza Trail) in the Tumacácori unit. This agreement would ensure effective and efficient maintenance of the trail.

NATIONAL PARK SERVICE LEGAL AND POLICY REQUIREMENTS / SERVICEWIDE LAWS AND POLICIES

This section (expanded in appendix B) discusses some of the most pertinent servicewide laws and policies related to planning and managing Tumacácori National Historical Park that the Park Service must comply with regardless of this planning effort. It is important to note that regardless of which alternative is chosen to implement from this general management plan / environmental assessment, the staff of Tumacácori National Historical Park must comply with all of these laws and policies.

The table in appendix B is broken down by topic, such as air quality, archeological resources, and visitor use and experience. Under each topic there is (1) a description of the desired conditions based on laws and policies that park staff members strive to achieve for that topic; (2) a list of the strategies for achieving the desired conditions; and (3) the pertinent servicewide laws and policies the National Park Service complies with that apply to that particular topic.

The National Park Service must comply with laws and policies regarding environmental quality, such as the Clean Air Act, the Endangered Species Act, and Executive Order 11990 “Protection of Wetlands;” laws governing the preservation of cultural resources, such as the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act; and laws about providing public services, such as

the Americans with Disabilities Act and Architectural Barriers Act—to name only a few. A general management plan is not needed to decide, for instance, that it is appropriate to protect endangered species, control exotic species, protect archeological sites, conserve artifacts, or provide for handicap access. The National Park Service will continue to strive to implement these requirements with or without a new general management plan.

Some of these laws and executive orders with which the National Park Service must comply are applicable solely or primarily to units of the national park system. These include the 1916 Organic Act that created the National Park Service; the General Authorities Act of 1970; the act of March 27, 1978, relating to the management of the national park system; and the National Parks Omnibus Management Act (1998). Other laws and executive orders have much broader application, such as the Endangered Species Act, the National Historic Preservation Act, and Executive Order 11990 that address the protection of wetlands.

The NPS Organic Act (16 USC 1) provides the fundamental management direction for all units of the national park system:

[P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations...by such means and measure as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

The National Park System General Authorities Act (16 USC 1a-1 et seq.) affirms

that while all national park system units remain “distinct in character,” they are “united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage.” The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, amendments state that NPS management of park units should not “derogat[e] . . . the purposes and values for which these various areas have been established.”

The National Park Service also has established policies for all units under its stewardship. These are identified and explained in a guidance manual entitled *NPS Management Policies 2006*. The “action” alternatives (alternatives 2 and 3) considered in this plan incorporate and comply with the provisions of these mandates and policies.

PL 95-625, the National Park and Recreation Act, requires the preparation and timely revision of general management plans for each unit of the national park system. Section 604 of that act outlines several requirements for general management plans, including measures for the protection of the area’s resources and “indications of potential modifications to the external boundaries of the unit and the reasons therefore.” *NPS Management Policies 2006* reaffirms this legislative directive.

The alternatives in this general management plan address the desired future conditions that are not mandated by law and policy and must be determined through a planning process. To truly understand the implications of an alternative, it is important to combine the servicewide mandates and policies with the management actions described in an alternative.

COMMERCIAL VISITOR SERVICES

Units of the national park system are special places, saved by the American people so that

all may experience the country’s natural and cultural heritage. The national parks movement of the mid-19th century was fueled by a determination to save beautiful and historic spots in America, in part to keep them from being “populated” with hotels, curio shops, and amusements. Over-commercialization and development can spoil the very character of the places visitors come to see. Yet some kinds of commercial activities are appropriate and may be necessary in national park units. They help visitors enjoy natural and cultural wonders to which they might not otherwise have access. Often commercial providers help protect park resources, too.

All commercial activities that occur within lands administered by the National Park Service must be authorized by a permit, contract, or other written agreement (36 *Code of Federal Regulations* (CFR) 5.3). Commercial activities may be authorized through a range of legal authorities using a variety of legal instruments, depending upon the type and location of the activity involved. The National Park Service must determine what types and levels of commercial activities are permissible under applicable laws and regulations. At a minimum, all commercial activities must operate in a manner that is consistent with the mission of the park and should provide high-quality visitor experiences while protecting important natural, cultural, and scenic resources. Other requirements may also apply. For example, the NPS Concessions Management Improvement Act of 1998 limits the development of concession services to those that are necessary and appropriate for public use and enjoyment of the park unit and that are consistent to the highest practicable degree with the preservation and conservation of the resources and values of the unit.

The NPS Organic Act of 1916 that established the National Park Service and the NPS Concessions Management and Improvement Act of 1998 (1998 Concessions Act) emphasize conservation and

preservation of park resources, while allowing for their use and enjoyment by means that leave them unimpaired for future generations. The 1998 Concessions Act mandates the use of concession contracts for authorizing any visitor services except as may otherwise be authorized by law (such as through a commercial use authorization if applicable). That act further places significant limitations on the types and kinds of public accommodations, facilities, and services that may be authorized by concession contracts. Such public accommodations, facilities, and services must be “necessary and appropriate for public use and enjoyment” of the unit in which located and must be “consistent to the highest practicable degree with the preservation and conservation of the resources and values of the unit” (16 USC 5951).

Depending on the analysis of commercial activities, different types of authorizations may be issued by the National Park Service. If an activity is found to be appropriate, but not necessary, then a commercial use authorization may be issued. If an activity is found to be necessary and appropriate, then a concession contract may be issued. The NPS Organic Act, the purpose and significance of the park, and this general management plan together form the basis for determining if commercial services are necessary and/or appropriate for Tumacácori National Historical Park. The criteria in table 1 would be used to evaluate existing and potential future commercial activities at the park to determine if these activities are necessary and/or appropriate.

Based in the criteria in table 1, the planning team has identified the following types of commercial operations that could be considered necessary and/or appropriate at Tumacácori National Historical Park:

- bus tours of the park units
- horseback riding tours along Anza Trail

- education-based tours including bird walks

Over the life of this plan, additional activities may be considered and will be evaluated on the necessary and appropriate criteria. Some activities are illegal within the park and therefore would not be considered either necessary or appropriate activities and so would not be eligible for any type of commercial visitor use agreement with the National Park Service.

SCOPE OF THE GENERAL MANAGEMENT PLAN

The general public, NPS staff, and representatives from organizations identified various issues and concerns during project scoping (early information gathering) for this general management plan. An issue is defined in this context as an opportunity, conflict, or problem regarding the use and management of public lands. During scoping, NPS staff provided an overview of the process, including the purpose and need for the general management plan. Comments were solicited at public meetings, through two planning newsletters, and on the NPS planning website (see “Consultation and Coordination”).

Comments received during scoping demonstrated the public likes many things about Tumacácori National Historical Park—its management, resources, and visitor opportunities. The issues and concerns that were expressed generally involve protecting park resources from vandals, stray cattle, invasive plant species, and other threats, and providing for an enjoyable visitor experience while maintaining desired resource conditions. The general management plan alternatives provide strategies for addressing the issues within the context of the park’s purpose and significance.

TABLE 1. COMMERCIAL SERVICES EVALUATION CRITERIA

Necessary	Appropriate
A service that is necessary accomplishes <u>one or more</u> of the following: <ol style="list-style-type: none"> 1. The service contributes to visitor understanding and appreciation of park purpose and significance. 2. The service enhances visitor experiences consistent with park area philosophies. 3. The service assists the park in managing visitor use and educating park visitors. 4. The service is an essential service or facility not available within a reasonable distance from the park. 	A service that is appropriate accomplishes <u>all</u> of the following: <ol style="list-style-type: none"> 1. The service is consistent with the purpose and significance of Tumacácori National Historical Park. 2. The service is consistent with laws, regulations, and policies. 3. The service does not compromise public health and safety. 4. The service does not significantly impact or impair park resources or values. 5. The service does not unduly conflict with other park uses and activities. 6. The service does not exclude the general public from participating in limited recreational opportunities.

While this general management plan will provide guidance for Tumacácori National Historical Park for the next 15 to 20 years, it will not

- describe how particular programs or projects will be implemented or prioritized; these decisions are deferred to detailed implementation planning
- provide specific details and answers to all the issues facing the park
- provide funding commitments for implementation of the plan

Issues and Opportunities to Be Addressed

Many aspects of the desired future conditions at Tumacácori National Historical Park are defined in the enabling legislation, the park's purpose and significance statements, and existing laws and policies. The resolution of questions or issues that have not already been addressed by the enabling legislation or laws and policies are a basis for developing different alternatives or approaches to managing the park into the future, because usually there is

more than one way an issue could be resolved. As with any decision-making process, there are key decisions that, once made, will dictate the direction of subsequent management strategies. Based on public comments and National Park Service concerns, the following seven issues were identified for Tumacácori National Historical Park and will be addressed in this general management plan. The bullets following each issue reflect the goal to be addressed through proposed actions in the general management plan. This information is based on internal or external comments received or information supported by research and/or management experience.

Cultural Resource Issue 1: Mission architecture, archeological sites, and associated features are being impacted by environmental and human-caused factors, including (1) natural weathering and deterioration, (2) damage from animals (e.g., bats, rodents, and birds), (3) inadvertent impacts from visitors, and (4) intentional looting and vandalism.

- **Goal:** Minimize environmental impacts to the park's cultural resources.

Cultural Resource Issue 2: Current management approaches for the three park units, including the recently acquired lands along the Santa Cruz River, do not convey a sense of place or historic context.

- **Goal:** Restore and protect the park's broader cultural landscape and historic context through cohesive management of mission-related elements and features at all three park units.

Natural Resource Issue 1: The recently acquired portion of the Santa Cruz River and its associated riparian habitat is being impacted by a number of factors, including cattle that enter through broken fences and trespass on park lands, nonnative plants, water pollution, trespass by all-terrain vehicles on park lands, and other human-caused impacts (e.g., visitor-created trails).

- **Goal:** Restore and protect aquatic and terrestrial features associated with the Santa Cruz River and associate riparian area located within the park.
- **Goal:** Work with adjacent landowners to help park staff reduce impacts to the park's natural resources.

Park Resources and Values Issue 1: Ongoing or potential changes in surrounding land uses (especially from residential development) are adversely affecting the overall character of the three park units, affects include impacts to the park's scenic viewsheds, natural soundscapes, cultural landscape, natural habitats, and visitor experience.

- **Goal:** Work with landowners to help the National Park Service to reduce the impacts from external developments on the park's resources and values.

Visitor Use and Experience Issue 1: The park hosts a variety of popular special events that draw large crowds; these events and associated crowds could impact the quality of the experience for some visitors.

- **Goal:** Accommodate special events in a manner that ensures a high-quality visitor experience, while minimizing resource impacts.

Visitor Use and Experience Issue 2: The three park units have the potential to provide a wider range of visitor opportunities (e.g., recreational activities and interpretive programs) than are currently being provided.

- **Goal:** Provide a wider range of visitor opportunities that are appropriate for each unit of the park, building on existing programs and activities.

Community Connections Issue 1: The park must strive to remain a vibrant part of the surrounding community, and it has the potential to become more relevant to the changing demographics of the area.

- **Goal:** Actively engage the surrounding community and work with other entities to establish strong community connections.
- **Goal:** Expand the park's existing architectural preservation program to increase community involvement and awareness.
- **Goal:** Strive to maintain the park's tradition of providing cultural demonstrations and special events that preserve the community's connection to its past.

Park Operations Issue 1: The park was expanded in 2002, by 310 acres, a 720% increase in total acres that introduced important new resource types into the park

with no concurrent increase in staff. The park's small staff faces many pressing demands, including managing visitors, resources, and facilities for three units and addressing illegal activities such as cattle and all-terrain vehicle trespass on park lands.

- **Goal:** The park staff strives to improve all elements of park operations, ensuring the park is maintained and operated in a sustainable manner.

Issues and Opportunities That Will Not Be Addressed

Not all of the issues and concerns raised by the public are included in this general management plan—some are part of the day-to-day management of the park, some suggested actions are against law or policy, and some suggested actions are covered by existing law or policy (e.g., management of endangered species).

Some of the issues and concerns raised by the public and the reasons for excluding them are as follows:

- Some commenters expressed interest in Tumacácori National Historical Park establishing an international commission for the purpose of preserving, studying, and interpreting the *Pimería Alta* and the resources within it. This suggestion was not included in the planning process because it does not relate to the purpose of the park and falls outside the scope of this general management plan.
- Some commenters expressed concern about vandalism to mission ruins and historic structures and the collection of artifacts on park lands. These are illegal activities that the park is already addressing and will continue to address. Because these illegal activities are operational issues and not planning issues, they

were not addressed in this general management plan.

- It was suggested the National Park Service address water quality and quantity issues. These are generally addressed in the plan, but specific actions dealing with these issues are beyond the scope of this general management plan and frequently beyond the control of the National Park Service.
- It was suggested that the National Park Service acquire Tubac State Park. This action was not included because the National Park Service is already working with Tubac State Park staff to coordinate with them as part of the its interpretation of historic sites in the region related to the historic sites preserved at the national historical park.

Climate Change

Climate change refers to any significant changes in average climatic conditions (such as mean temperature, precipitation, or wind) or climate variability (such as seasonality and storm frequency) lasting for an extended period (decades or longer). Recent reports by the Global Change Research Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change (IPCC 2007) provide clear evidence that climate change is occurring and will accelerate in the coming decades. The effects of climate change on national parks are beginning to emerge as both science and the impacts of climate change become clearer; however, it is difficult to predict the full extent of the changes that are expected under an altered climate regime. In addition, the ecosystem of this area is moderately to highly vulnerable to a change in dominant plant species, which may fundamentally alter ecosystem structure and function.

While climate change is a global phenomenon, it manifests differently depending on regional and local factors. Climate change is expected to result in many changes to the southwestern United States in general and Tumacácori National Historical Park in particular. Some of these changes are already occurring. An analysis of climate trends in the Sonoran Desert shows widespread winter and spring warming trends, a lengthening of the frost-free season, and increased minimum temperatures (Weiss and Overpeck 2005 as cited in Loehman 2010). The western U.S. is in a multiyear drought, and climate models indicate that arid regions of the southwest will become drier (Loehman 2010). Increases in soil dryness and air temperatures in the southwest over the 20th century have made the region more susceptible to forest fires (Groisman et al. 2004 as cited in Loehman 2010). There has been a consistent temperature-related shift across a broad range of plant and animal species, including changes in species density, northward range shifts, and changes in phenology (Root et al. 2003 as cited in Loehman 2010). In addition, the ecosystem of this area is moderately to highly vulnerable to change in dominant plant species, which may fundamentally alter ecosystem structure and function (Gonzalez et al. 2010).

Climate change could also affect the visitor experience in a variety of ways:

- The summer season will be longer; however, summer use in much of the park could decrease due to increasing aridity and high temperatures in midsummer.
- There may be increasing frequency and intensity of severe storms, which may accentuate both winter and summer floods.
- There may be increasing water demands combined with decreasing supply; this may result in water shortages.

- There may be decreasing streamflows and increasing water removal; competition from nonnative species will likely lead to changes in the park's riparian area.
- There may be changes in bird populations, which in turn will affect bird-watching activities.

Climate change may have potential impacts on cultural resources. For example, increasing frequency and intensity of severe storms and floods may pose threats to the park's historic structures and archeological resources, as well as administrative and visitor facilities (Loehman 2010). The potential for increased wildland fires also poses increased risks to the park's cultural resources.

Climate change science is a rapidly advancing field, and new information is being collected and released continually. The National Park Service recognizes that the major drivers of climate change are outside the control of the agency. However, climate change is a phenomenon whose impacts throughout the national park system cannot be discounted. The National Park Service has identified climate change as one of the major threats to national park system units and has developed the NPS *Climate Change Response Strategy* (NPS 2010), which focuses on science, adaptation, mitigation, and communication. Some climate change impacts are occurring or are expected to occur in the park during the time frame of this management plan. Therefore, climate change is included in this document to recognize its role in the changing environment of the park and to provide an understanding of its impact.

Climate change is a far-reaching and long-term issue that would affect the park, its resources, visitors, and management beyond the scope of this general management plan and its 15- to 20-year time frame. Although some effects of climate change are considered known or likely to occur, many

potential impacts are unknown. Much depends on the rate at which temperatures would continue to rise and whether global emissions of greenhouse gases could be mitigated before serious ecological thresholds are reached.

Thus, this plan does not provide definitive solutions or directions to resolving the issue of controlling impacts of climate change on Tumacácori National Historical Park. Rather, the plan provides some general directions and strategies that can help minimize the park's contribution to climate change (see desired conditions and strategies in appendix B). The plan also recognizes that the management actions and facilities being proposed in all of the alternatives need to be adopted with future climate change and impacts in mind because past conditions are not necessarily useful guides for future planning. The National Park Service would use the most current scientific information on climate change in developing implementation plans, facility siting, or designs, etc., such that these actions would be adaptive to climate change. Finally, the actions being proposed to mitigate impacts to natural resources in this plan would help to promote resource resilience to climate change effects.

Illegal Border-related Activity

The three units of Tumacácori National Historical Park lie within 20 miles of the United States / Mexico border. Although actual numbers are not known, it is believed that illegal border-related activities happen in the national historical park. These activities include undocumented immigrants and/or drug smugglers passing through one or all of the three units on their way to other destinations. The greatest likelihood of encountering illegal border-related activities exists in the Tumacácori unit, the only unit open to the public year-round. Not only is the Tumacácori unit the largest of the three units at 310 acres, but it also includes a 1-mile section of the Juan Bautista de Anza National Historical Trail, which pedestrian and equestrian user groups use frequently.

While illegal border-related activities may occur in the park, generally speaking they occur in the early mornings, evenings, and at night when visitors and employees are not present.

To date, illegal border-related activities, such as undocumented immigrants passing through the three units of the park, has not been a significant issue for Tumacácori National Historical Park. Although park visitors and employees encountering illegal activities have been limited, the park has developed and implemented safety procedures to minimize the potential risks to visitors and employees. These efforts include development of safety measures such as informational signs posted along trails and information on the park's website alerting visitors to the possibility of encountering illegal border-related activities in the park. The park has also developed safety procedures for employees to follow. These safety measures and procedures will continue and new ones will be developed as necessary. The park has requested additional funding for a law enforcement ranger. Issues associated with illegal border-related activities in the park are dealt with by law enforcement and operational procedures, in accordance with law and policy, and therefore they do not need to be addressed in the context of a general management plan.

IMPACT TOPICS (INCLUDING TOPICS CONSIDERED AND DISMISSED)

Identification of Impact Topics

An important part of planning is seeking to understand the consequences of making one decision over another. To this end, this general management plan is accompanied by an environmental assessment. Environmental assessments identify the anticipated impacts of possible actions on park resources and values and on park visitors and neighbors. Impacts are organized by topic, such as "impacts on the visitor experience" or "impacts on archeological

resources.” Impact topics serve to focus the environmental analysis and to ensure the relevance of impact evaluation. The impact topics identified for this general management plan are outlined in this section; they were identified based on federal laws and other legal requirements, CEQ regulations, NPS management policies, staff subject-matter expertise, issues and concerns expressed by the public and other agencies early in the planning process, and the potential for that topic to be affected by the actions outlined in the alternatives. Also included is a discussion of some impact topics that are commonly addressed, but that are not addressed in this plan for the reasons given. “Chapter Four: Environmental Consequences” contains a more detailed description of each impact topic to be affected by the actions described in the alternatives.

Impact Topics Retained and Dismissed

Impact topics were retained if there could be appreciable impacts from the actions of the alternatives considered. Impact topics were dismissed if they are commonly considered during the planning process but were not relevant to the development of this general management plan because either (a) implementing the alternatives would have no effect, negligible effect, or minor effect on the impact topic, or (b) the resource does not occur in the park. The following table identifies all of the impact topics considered for this *General Management Plan / Environmental Assessment* and states whether they were retained or dismissed. The table is organized by theme (e.g., natural resources, cultural resources, visitor use and experience, socioeconomic environment, public health and safety, and park operations) and includes a brief rationale as to why the impact topic was retained or dismissed.

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
Cultural Resource Impact Topics		
Archeological Resources	Retained	Under the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act, archeological resources are retained as an impact topic because ground disturbance associated with proposed development actions, such as for new or expanded trails or construction of a small-scale open-air ramada, could disturb currently unidentified archeological resources. This topic is also retained for further analysis as an impact topic because of potential impacts associated with increased visitation as more people use the park.
Ethnographic Resources and Sacred Sites	Dismissed	<p>Ethnographic resources are defined by the National Park Service as any “site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it” (NPS 28, Cultural Resource Management Guideline, 181).</p> <p>Although limited studies and research have been completed to identify ethnographic resources within the park, the addition of the lands along the river may be important for ethnographic reasons. Tohono O’odham and Apache peoples have expressed interest in Tumacácori National Historical Park as a whole.</p>

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
		<p>Under the National Historic Preservation Act and Executive Order 13007: Indian Sacred Sites (1996), the National Park Service has consulted with traditionally associated tribes for this general management plan, and will continue to consult in the future to identify and suitably protect ethnographic resources. Should consultation result in the identification of ethnographic resources and sites (including sites that have sacred or spiritual importance for tribal members), the National Park Service will accommodate, to the extent practicable, access to and ceremonial use of sacred sites by American Indian religious practitioners. The location of ethnographic sites would not be made public. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during park activities and projects, and are determined to be of American Indian origin, guidance for implementing the Native American Graves Protection and Repatriation Act of 1990 would be followed. The national historical park will continue to recognize the past and present existence of peoples in the region and the traces of their use as an important part of the cultural environment to be preserved and interpreted, and will develop and accomplish park programs in a way that respects the beliefs, traditions, and other cultural values of the American Indian tribes who have ancestral ties to national historic park lands.</p> <p>This topic was dismissed from further analysis because the actions proposed in the alternatives are unlikely to affect ethnographic resources or sacred sites.</p>
Historic Structures	Retained	Under the National Historic Preservation Act, this topic is retained for further analysis because of potential impacts associated with preservation activities on historic structures listed on the National Register of Historic Places.
Cultural Landscapes	Retained	Under the National Historic Preservation Act, this topic is retained for further analysis because of potential impacts associated with additional monitoring activities and development activities in known cultural landscapes.
Museum Collections	Dismissed	<p>The national historical park has museum collections consisting of archeological resources, archives, prehistoric and historic objects, and natural history items. The collections are stored at the Western Archeological and Conservation Center in Tucson, Arizona. There are approximately 77,000 items, and they are 91% cataloged. None of the GMP actions would affect museum collections. The national historical park's museum collections would continue to be acquired, accessioned and cataloged, preserved, protected, and made available for access and use according to NPS standards and guidelines.</p> <p>This topic is dismissed from further analysis as an impact topic because none of the actions will affect the park's museum collections.</p>

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
Indian Trust Resources	Dismissed	<p>The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. Secretarial Order 3175 requires that any anticipated impacts to Indian Trust Resources from a proposed project or action by U.S. Department of the Interior agencies be explicitly addressed in environmental documents.</p> <p>There are no Indian Trust Resources at Tumacácori National Historical Park. Therefore, this topic was dismissed from further analysis.</p>
Natural Resource Impact Topics		
Vegetation	Retained	<p>This impact topic has been retained, because the management actions described in the alternatives may result in increased visitor use of the newly acquired lands along the Santa Cruz River. This 1-mile stretch of the river protects rare riparian southwestern cottonwood-willow forest, one of the most endangered ecosystems in the United States, and adjacent mesquite bosque. The area is biologically diverse, supporting many plants that could not otherwise live in the surrounding desert and scrub environments. The park's vegetation is also being adversely affected by, or potentially may be affected by, trespass livestock, all-terrain vehicles, visitor-created trails, and nonnative species. Retaining this impact topic will provide an opportunity to analyze the effectiveness of the action alternatives at resolving these natural resource management issues.</p>
Terrestrial Wildlife	Retained	<p>This impact topic has been retained because the management actions described in the alternatives may result in increased visitor use of the newly acquired lands along the Santa Cruz River. This 1-mile stretch of the river contains important habitats for a number of wildlife species, including over 170 species of migratory bird species. Many birds and other animals could not live in this area without these habitats. These areas are also being impacted by trespass livestock, all-terrain vehicles, nonnative species, and trash flows. Retaining this impact topic will provide an opportunity to analyze the effectiveness of the action alternatives at resolving these natural resource management issues.</p>
Fish	Dismissed	<p>Four species of native fish are known to be present in the Santa Cruz River in the Tumacácori unit. None of the actions or developments proposed in the alternatives would affect fish populations or their habitats, including river flows and water quality. Thus, this impact topic was dismissed from further detailed analysis.</p>
Federal-listed Species (yellow-billed cuckoo, southwestern willow flycatcher)	Retained	<p>This impact topic has been retained because the alternatives have the potential to impact two federal-listed animal species that have been documented to occur within the park: the yellow-billed cuckoo (a candidate for listing), and the endangered southwestern willow flycatcher. Critical habitat for the flycatcher also has been proposed along the Santa Cruz River in the park. Both the yellow-billed cuckoo and southwestern willow flycatcher are very sensitive to disturbance. Due to the terrestrial wildlife habitat impacts listed above and the potential for increased visitor use, this impact topic has been retained for detailed analysis for these species.</p>

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
Federal- and State-listed Species (other than those noted above)	Dismissed	<p>Several federal- and state-listed species occur within the general vicinity of the park. The alternatives being considered would have no potential to affect most of these species. The threatened Mexican spotted owl has been documented in the Atascosa Mountains near the park, but the park itself does not have suitable habitat for this bird. The endangered Gila topminnow occurs in the Santa Cruz River, but no actions are being proposed in the alternatives that would affect this population or its habitat. The threatened Chiricahua leopard frog and northern Mexican garter snake, a candidate for listing) are known to occur in the vicinity of the park, but have not been documented as being present in the park. Likewise, the endangered Gila chub, endangered Pima pineapple cactus and endangered Huachuca water umbel have not been documented as occurring in the park. The endangered ocelot has not been documented in the park, although one was observed in the nearby Huachuca Mountains. Thus, all of the above species were dismissed from further analysis.</p> <p>The endangered lesser long-nosed bat migrates along the river and is present at times. One bat was observed in the park in the summer of 2010, and they are spotted at peoples' homes throughout the area. However, the bat's primary food source is not plentiful in the park. None of the actions in the alternatives would prevent the bat from using the river corridor. Although some trees would be removed due to the construction of picnic areas and trails, the bats would still be able to roost in the park. Thus, the alternatives would likely have at most a negligible adverse impact on the bats using the park. Therefore, the lesser long-nosed bat was dismissed from further analysis.</p>
Soundscape	Dismissed	<p>NPS <i>Management Policies 2006</i> and Director's Order 47: <i>Soundscape Preservation and Noise Management</i> recognize that natural soundscapes are a park resource and call for the National Park Service to preserve, to the greatest extent possible, the natural soundscapes of parks. The policies and director's order further state that the National Park Service will restore degraded soundscapes to the natural condition whenever possible, and will protect natural soundscapes from degradation due to noise (undesirable human-caused sound). Noise can adversely affect the natural soundscape and other park resources. It can also adversely impact the visitor experience. However, none of the alternatives being considered are proposing developments or actions that would substantially affect the park's soundscape. With the possibility of increased special events in one alternative, noise levels would increase in the developed mission area, but these events would support the purpose of the park and would be short term and localized, resulting in no more than a minor adverse impact. Although some noise would be temporarily generated due to the minimal development of visitor facilities, and increased use levels may increase noise levels in areas that have not received much use to date, any such adverse impacts would be expected to be minor at most. Therefore, this impact topic was dismissed from further analysis.</p>

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
Floodplain Values and Flooding	Dismissed	This impact topic was dismissed because no actions are being proposed that would noticeably affect the functions and values of the Santa Cruz River floodplain. The river's floodplain is important for wildlife and vegetation, as well as recreation and cultural values. The alternatives propose no substantial changes in the floodplain and how it is used. Although additional trails and waysides would be built, they would have a negligible effect on the floodplains, primarily affecting floodplain soils and vegetation. Trails are also excepted actions from floodplain protection requirements in the NPS Procedural Manual 77-2, "Floodplain Management." The alternatives would have no effect on river hydrology or flooding. Although more visitors would likely be traversing the floodplain in the action alternatives, they would not be expected to be present at times when flooding typically occurs (i.e., the monsoon).
Wetlands	Dismissed	Executive Order 11990 and Director's Order 77-1 require the National Park Service to protect and enhance natural wetland values, and examine impacts on wetlands. Wetlands are scarce water resources in the region. Trails would be the only proposed development in the alternatives that would affect wetlands. Trails are an excepted action from the wetland protection requirements in NPS Procedural Manual 77-1, "Wetlands Protection." The trails in the action alternatives would be built largely to avoid wetlands and any fill required in wetlands would be less than 0.1 acre. Any impacts from trails would have no more than a minor adverse impact on wetlands vegetation and hydrology. One of the action alternatives calls for a feasibility study to consider the reestablishment of wetlands in the Guevavi unit, but it is unknown if wetlands would actually be reestablished. Thus, this topic was dismissed as an impact topic.
Water Quality	Dismissed	The Santa Cruz River has a number of water quality problems that affect park resources. Effluent from the Nogales International Wastewater Treatment Plan adversely affects the park's water quality. Past studies have documented a variety of water quality problems, including 22 groups of parameters that exceed NPS criteria. U.S. Environmental Protection Agency criteria for the protection of freshwater aquatic life have been exceeded, and the Arizona Department of Environmental Quality has categorized the water as "impaired" in the Guevavi unit and along river stretches adjacent to the Calabazas and Tumacácori units (USGS 2005). Although visitors in the park may contribute some pollution to the river, these impacts would be no more than minor in magnitude. No actions or developments are being proposed in the alternatives that would be expected to increase the potential for water pollution within the park—any impacts accrued would be negligible. Therefore, this impact topic was dismissed from further analysis.
Water Quantity	Dismissed	This impact topic was dismissed from further analysis because no water withdrawals, diversions, or other activities are proposed in the alternatives that would affect water quantity or flows in the river.

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
Geologic and Soil Resources	Dismissed	<p>This impact topic has been dismissed from further analysis because the park's geologic and soil resources would be largely unaffected by actions described in the alternatives. Soil disturbing activities, such as demonstration farming and the construction of small visitor contact stations, would occur in areas that have been previously disturbed. A few new trails being proposed in the park would occur in areas that have already been disturbed by visitor-created trails, or would result in minimal topsoil disturbance. Impacts of these activities and developments on park soils would be minor. Therefore, this impact topic was dismissed from further analysis.</p>
Prime and Unique Farmlands	Dismissed	<p>In 1980, the Council on Environmental Quality directed federal agencies to assess the effects of their actions on farmland classified by the Natural Resources Conservation Service as prime or unique. Prime farmlands are defined as lands that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and are also available for these uses. Prime farmlands have the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. Unique farmlands are lands other than prime farmland that are used for the production of specific, high-value food and fiber crops.</p> <p>Tumacácori National Historical Park does not contain unique farmlands. It does have prime farmlands if irrigated. However, no lands in the park are being irrigated for farming or are in agricultural production (although one alternative proposes for interpretive purposes that some lands be used as an herb garden and for demonstration farming). No actions or developments are being proposed that would adversely affect these soils. Thus, this impact topic was dismissed from further consideration.</p>
Air Quality	Dismissed	<p>The Clean Air Act of 1955, as amended, was established to promote public health and welfare by protecting and enhancing the nation's air quality. The act established programs that provide special protection for air resources and air quality-related values associated with NPS units. Section 118 of the Clean Air Act requires parks to meet all state, federal, and local air pollution standards.</p> <p>The Environmental Protection Agency's 2008 air quality index chart indicated air quality is generally good to moderate in Santa Cruz County, where the park is located. The National Park Service strives to perpetuate the best possible air quality because air pollution, even at relatively low levels, affects ecological and human health, scenic views, and visitor enjoyment. Progress toward this goal is measured by examining current conditions and trends for key air quality indicators, including ozone, visibility, and atmospheric deposition. Despite these broader impacts, air quality (including visibility) would be largely unaffected by the management alternatives. Furthermore, the action alternatives would not result in any more pollutants from vehicle traffic or park operations than under the no-action alternative. Therefore, this impact topic was dismissed from further analysis.</p>

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
Carbon Footprint	Dismissed	<p>For the purpose of this planning effort, "carbon footprint" is defined as the sum of all emissions of carbon dioxide and other greenhouse gases (e.g., methane and ozone) that would result from implementation of either of the action alternatives. Understanding the carbon footprint of each alternative is important for determining its contribution to climate change.</p> <p>The action alternatives described in this document would emit a negligible amount of greenhouse gases that contribute to climate change. Therefore, this impact topic has been dismissed from detailed analysis in this plan. The reasons for dismissing this impact topic are that (1) the alternatives would not be expected to result in a substantial increase in park visitation, including a substantial increase in vehicular traffic; and (2) there would be minimal new developments built under the alternatives, and newer sustainable building practices should help limit greenhouse gas emissions. Because of the negligible amount of greenhouse gas emissions that would result from each alternative, a quantitative measurement of their carbon footprint was determined by the planning team not to be practicable.</p>
Viewsheds	Dismissed	<p>This impact topic was dismissed because the actions and developments described in the alternatives would have a negligible effect on the park's viewsheds. None of the proposed new structures would substantially affect views from the park or into the park. Although the action alternatives call for steps such as planting vegetation to screen views outside the park, this would likely have only a minor beneficial effect on the viewshed. Non-NPS actions, such as ongoing residential and commercial developments along the park boundary, could further degrade the park's viewshed, but these actions are not part of the alternatives being analyzed.</p>
Night Skies	Dismissed	<p>The actions described in the alternatives would have no effect on the park's night skies. The National Park Service strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. The National Park Service also strives to ensure that all outdoor lighting is shielded to the maximum extent possible and to keep light on the intended subject and out of the night sky, so as to minimally contribute to surrounding light sources. Non-NPS actions, such as ongoing residential and commercial developments along the park boundary, could further degrade the park's dark night skies due to the increase in light pollution, but these actions are not part of the alternatives being analyzed. Therefore, this impact topic was dismissed from further analysis.</p>
Wilderness	Dismissed	<p>Per NPS <i>Management Policies 2006</i>, land additions to NPS units are evaluated for their eligibility for inclusion in the National Wilderness Preservation System. The new lands, even when combined with the original monument lands, are of insufficient size to be practicable for wilderness management and do not possess wilderness characteristics. Therefore, this impact topic was dismissed from further analysis.</p>
Energy Requirements and Conservation Potential	Dismissed	<p>The implementing regulations of the National Environmental Policy Act require that energy requirements, natural or depletable resource requirements, and conservation potential be analyzed. The National Park Service's <i>Guiding Principles of Sustainable Design</i> (1993) provide a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. Sustainability can be described as the result achieved by doing things without compromising the environment or its capacity to provide for present and future generations. The guidebook describes principles to be</p>

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
		<p>used in the design and management of visitor facilities that emphasize environmental sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. Sustainable practices minimize the short- and long-term environmental impacts of developments and other activities through resource conservation, recycling, waste minimization, and the use of energy efficient and ecologically responsible materials and techniques.</p> <p>Tumacácori National Historical Park strives to reduce energy costs, eliminate waste, and conserve energy resources by using energy-efficient and cost-effective technology wherever possible. Energy efficiency would also be incorporated into any decision-making process affecting park operations. Value analysis would be used to examine energy, environmental, and economic implications of proposed development. The park staff would encourage suppliers, permittees, and contractors to follow sustainable practices and address sustainable practices in interpretive programs. Thus, under all management alternatives, there would be negligible impacts on energy requirements and conservation potential. Therefore, this topic was dismissed as an impact topic.</p>
Natural Resource Requirements and Conservation Potential	Dismissed	<p>None of the alternatives being considered would result in the extraction of resources from the park. Relatively small quantities of depletable resources would be used in the construction of new facilities in the alternatives, but the impact on these resources would be negligible. Under all of the alternatives ecological principles would be applied to ensure that the park's natural resources were maintained.</p>
Visitor Use and Experience Impact Topics		
Visitor Use and Experience	Retained	<p>This topic is retained for further analysis as an impact topic because of potential impacts associated with the development of a greater variety of visitor opportunities to experience the park.</p>
Interpretation	Retained	<p>This topic is retained for further analysis as an impact topic because of potential impacts associated with engaging visitors in the history and resources of the park through additional interpretive and educational opportunities.</p>
Public Health and Safety	Dismissed	<p>Outdoor recreational activities such as hiking pose some inherent risks to visitors including heat, lack of water, and sudden change in conditions (e.g., flash floods along the Santa Cruz River). The actions proposed in the alternatives in this document would not result in any additional risks to human health or safety not already inherent in the arid environment of southern Arizona. To help inform visitors about these risks, safety messages are posted along trails and on the park's website, which would continue under all alternatives. With these safety procedures in place, it is expected that any impacts to public health and safety would be negligible.</p> <p>In addition, illegal border-related activity is known to occur in the park including an unknown number of undocumented immigrants passing through the park. To date, the interaction between undocumented immigrants and visitors has been infrequent, presumably because these encounters are more likely to occur in the early morning, evenings, and at night when few if any visitors are present. Procedures are in place for handling such encounters should they occur. Signs are posted along trails in the park and information on the park's website alerts visitors to the</p>

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
		<p>possibility of encountering illegal border-related activities. Additional methods for notifying visitors would be developed if necessary. These efforts are operational in nature and would be implemented even without the general management plan.</p> <p>Implementing this general management plan would have a negligible impact on visitor health and safety. Because management actions related to illegal border-related activities are law enforcement and operational issues rather than a general management plan issue, this impact topic has been dismissed from further analysis.</p>
Socioeconomic Impact Topics		
Socioeconomics	Retained	<p>Money generated from visitors to and the operation of Tumacácori National Historical Park contributes to the economy of surrounding communities in Santa Cruz County. Accordingly, park neighbors and businesses in the county are concerned about changes in management or operations of the national historical park. The alternatives presented in this general management plan could change the visitation levels or the need for housing, supplies, or materials from the current situation. Because implementing the alternatives in this plan could affect the socioeconomic of nearby communities, this topic is retained for further analysis.</p>
Environmental Justice	Dismissed	<p>Executive Order 12898 requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.</p> <p>According to the Environmental Protection Agency, environmental justice is the</p> <p style="padding-left: 20px;">fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.</p> <p>None of the alternatives being considered would have a disproportionately high and adverse effect on any minority or low-income population or community. This conclusion is based on the following information:</p> <ul style="list-style-type: none"> ▪ The proposals in the alternatives would not be likely to result in any identifiable adverse human health effects. Therefore, there would be no direct, indirect, or cumulative adverse effects on any minority or low-income population or community. ▪ No adverse impacts to natural resources resulting from the alternatives were identified that would significantly and adversely affect minority or low-income populations or communities. ▪ The alternatives would not result in any identified effects that would be specific to any minority or low-income community. ▪ The planning team actively solicited public comments during the development of the general management plan and gave equal

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
		<p>consideration to all input from persons, regardless of age, race, sex, income status, or other socioeconomic or demographic factors.</p> <ul style="list-style-type: none"> ▪ No impacts were identified that would substantially alter the physical and social structure of the nearby communities. <p>Therefore, this topic will not be analyzed further.</p>
Park Operations and Facilities Impact Topics		
Park Operations and Facilities	Retained	<p>This topic covers such things as NPS staffing, maintenance activities, management flexibility, productivity, operational efficiencies, and response times. Park operations would be affected by the actions in the alternatives, including staffing changes, facility construction, and facility or infrastructure maintenance. Therefore, this topic was retained for further analysis.</p>
Employee Health and Safety	Dismissed	<p>National Park Service employee health and safety procedures are guided by laws and policies rather than through a general management planning process. None of the actions being proposed in the alternatives would affect employee health and safety or modify existing law or policy.</p> <p>When new issues arise, the National Park Service would continue to address these concerns through park operations. For example, illegal border-related activities occur in the park including an unknown number of undocumented immigrants passing through the three park units. While employees encountering illegal border-related activities have been limited, a number of procedures have been put in place to minimize potential health and safety risks for employees. These procedures include requirements that staff work in teams while in the field and report into park headquarters when leaving and returning from the field. These procedures would continue and additional ones would be developed as needed. The park has also requested funding for a law enforcement ranger. With these safety procedures in place, it is expected that any impacts to employee health and safety would be negligible. Therefore, this impact topic was dismissed from further analysis.</p>
Other Impact Topics		
Conformity with Local Land Use Plans	Dismissed	<p>Actions proposed in the alternatives would not be in conflict with any local, state, or tribal land use plans, policies, or controls for the area.</p> <p>The basic land use of the park as a public recreation and resource management area is in conformance with the Santa Cruz County Comprehensive Plan. The creation of additional recreation and visitor experience opportunities as proposed in the alternatives would be consistent with existing park land uses or local land use plans. Therefore, this topic was dismissed from further analysis.</p>
Wild and Scenic Rivers	Dismissed	<p>The Santa Cruz River in the park is not included in the nationwide rivers inventory or proposed for wild and scenic river study. Therefore, this topic was dismissed from further analysis.</p>

TABLE 2. IMPACT TOPICS RETAINED AND DISMISSED FROM FURTHER ANALYSIS

Impact Topic	Retained or Dismissed	Rationale
Urban Quality and Design of the Built Environment	Dismissed	The quality of urban areas is not a concern in this plan. Park-compatible design would be taken into consideration for structures built under all of the action alternatives. Emphasis would be placed on designs and materials and colors that blend in and do not detract from the natural and built environment. Therefore, adverse impacts would be expected to be negligible. Therefore, this topic was dismissed from further analysis.

RELATIONSHIP OF OTHER PLANNING EFFORTS TO THIS GENERAL MANAGEMENT PLAN

A few plans and studies have influenced or would be influenced by the *Tumacácori National Historical Park General Management Plan / Environmental Assessment*. These plans have been prepared by the National Park Service and other organizations. Some of these plans are described briefly here, along with their relationship to this management plan.

Fire Management Plan / Environmental Assessment (in process)

Tumacácori National Historical Park has initiated an environmental assessment for the management of fire and hazardous fuel reduction within the park's boundaries. The park has an existing fire management plan; however, the environmental compliance document is being updated. Decisions reached in this environmental assessment would be used to revise the existing fire management plan, if necessary. Specific goals for fire management in the existing fire management plan are consistent with and will help achieve the desired conditions related to natural and cultural resource management and general park administration described in this *General Management Plan / Environmental Assessment*.

Draft Vegetation Restoration Plan (2011)

This plan discusses vegetation restoration of specific portions of the agricultural areas and lower elevation riparian zone in the Tumacácori unit. The emphasis of the plan is on riparian area restoration. The plan discusses project goals and objectives, research and baseline data collection, detailed test plot descriptions, project schedule, monitoring and test plot analysis, and recommendations for parkwide restoration. All of the actions proposed in this *General Management Plan / Environmental Assessment* are consistent with this vegetation restoration plan.

Feasibility Study for the Santa Cruz Valley National Heritage Area (2005)

The Center for Desert Archaeology (Tucson, Arizona) completed a *Feasibility Study for the Santa Cruz Valley National Heritage Area*. A national heritage area is a place designated by the United States Congress where natural, cultural, historic, and recreational resources combine to form cohesive, nationally distinctive landscapes arising from patterns of past and present human activities shaped by geography. These patterns make the regions representative of the national experience through the physical features that remain and the cultural traditions that have evolved in the areas. The study area that was the basis for the Santa Cruz Valley national heritage area feasibility study

includes Tumacácori National Historical Park. If Congress passes legislation to formally designate the Santa Cruz Valley as a national heritage area, the park would have additional roles in helping manage it. The creation of the Santa Cruz Valley National Heritage Area would be consistent with the desired conditions related to visitor use and experience described in this *General Management Plan / Environmental Assessment*.

Santa Cruz County 2004 Comprehensive Plan

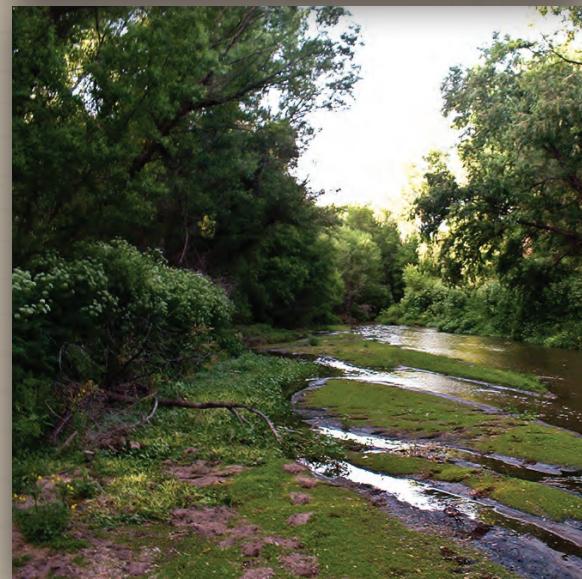
From the plan, “[t]he purpose of the Comprehensive Plan is to provide guidance to the County Board of Supervisors in maintaining the diverse development styles, cultures, and environments that make Santa Cruz County a special place to live.” The vision in the plan outlines how to meet the future service, transportation, resource, and other needs of Santa Cruz County citizens. The plan calls for the preservation of historic and cultural heritage of the county, such as Tumacácori. Open space and natural terrain should remain dominant features of the landscape. Viewsheds should be protected and conservation areas maintained and protected from development. The Santa Cruz River and its watershed are to be conserved and managed as a living river ecosystem. The plan also states that the county will work with stakeholders to assist in completing construction of the Santa Cruz sections of the Anza Trail. All of the actions proposed in this general management plan are consistent with the county plan.

Juan Bautista de Anza National Historic Trail Comprehensive Management and Use Plan (1996)

Designated by Congress in 1990, the Juan Bautista de Anza National Historic Trail

runs 1,210 miles from Nogales, Arizona, to San Francisco, California. It commemorates, protects, marks, and interprets the route traveled by Juan Bautista de Anza from Sonora, Mexico, to bring settlers to establish a mission and presidio in present-day San Francisco, California. This plan responds to the congressional designation of the trail and the requirements of the National Trail System Act, as amended. The plan called for marking the historic route, identifying an automobile route, and envisioning a continuous multiuse recreational retracement trail. Historic and interpretive sites were identified, including Tumacácori National Historical Park. Resource protection techniques, and visitor experience and interpretive objectives were documented for the trail. Tumacácori National Historical Park and other national park system units were encouraged to include de Anza’s trek in the interpretation program. Visitors on the trail would have opportunities to hike, bicycle, horseback ride, and tour by motor vehicle. The plan also identified the proposed Mission Trail that would connect to Guevavi as a trail link from the Anza Trail. The trail between Tubac Presidio State Park and the Tumacácori unit is complete. One mile of the Anza Trail passes through the Tumacácori unit. Work is also underway to complete segments of the Anza Trail that would connect the Tumacácori and Calabazas units (see figure 2). The actions proposed in the *Draft General Management Plan / Environmental Assessment*, including use of the Anza Trail in the Tumacácori unit and establishment of the Mission Trail, are consistent with the *Juan Bautista de Anza National Historic Trail Comprehensive Management and Use Plan / Final Environmental Impact Statement*.

CHAPTER 2 ◈ THE ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE



INTRODUCTION

This chapter describes three alternatives for managing Tumacácori National Historical Park over the next 15–20 years. The three alternatives embody the range of what the public and NPS staff want to see accomplished regarding natural resource conditions, cultural resource conditions, visitor use and experience conditions, and management at Tumacácori National Historical Park. Alternative 1, the no-action alternative, presents a continuation of current management direction and is included as a baseline for comparing the consequences of implementing each of the other alternatives. The action alternatives are alternative 2 (the NPS preferred alternative) and alternative 3. These alternatives present different ways to manage resources and visitor use and to improve facilities and infrastructure in the park.

The National Park Service would continue to follow existing agreements and servicewide mandates, laws, and policies regardless of the alternatives considered in this plan. These mandates and policies are not repeated in this chapter (see “National Park Service Legal and Policy Requirements / Servicewide Laws and Policies” in chapter 1, and “Desired Conditions” in appendix B). Likewise, parkwide desired conditions (and

potential strategies to achieve those conditions) for topics ranging from ecosystem management to sustainable design and practices are presented in the appendixes and would apply regardless of which alternative is ultimately selected for implementation.

Before describing the alternatives, this chapter explains how the alternatives were developed and the preferred alternative was identified. Other sections describe the management zones (a key element of the alternatives) and the approaches taken to address user capacity and boundary adjustments. After the alternatives are described, user capacity is discussed, mitigative measures that would be used to reduce or avoid impacts are listed, needed future studies and implementation plans are noted, the environmentally preferable alternative is identified, and several actions are noted that the planning team considered but dismissed. At the end of the chapter, there are tables that summarize the key differences among the alternatives, the costs of the alternatives, and the differences in impacts that would be expected from implementing each alternative based on the analysis in “Chapter 4: Environmental Consequences.”

FORMULATION OF THE ALTERNATIVES

Both the National Environmental Policy Act and NPS policies require that park managers consider a full range of reasonable alternatives, including a “no-action” alternative. An “alternative” is a set of actions or directions that address management of the entire park, including its resources, visitors, facilities, and staff operations. Each alternative typically includes an overall management concept; potential boundary adjustments, if appropriate; a management zoning scheme (which identifies which potential resource conditions and visitor experience opportunities should be emphasized in different areas of the park); a description of area-specific desired conditions and actions; the identification of partnership opportunities, if applicable; and implementation and cost considerations. The “no-action” alternative, which is required under the National Environmental Policy Act, is a baseline for comparing the effects of the action alternatives. It is the continuation of current management actions and directions into the future.

The park planning team considered a variety of sources when developing the alternatives in this document. For example, many aspects of the desired conditions of Tumacácori National Historical Park are defined in the establishing legislation, the park’s purpose and significance statements, fundamental resources and values, and the servicewide mandates and policies that are described in the appendixes. Within these parameters, the National Park Service solicited input from the public, NPS staff, governmental agencies, tribal officials, and others regarding issues and desired conditions for the park. Planning team members also gathered information about existing visitor use and the condition of the park’s facilities and resources.

More specifically, the two action alternatives included in this chapter were largely

developed based on the key issues identified by the public and NPS staff in the scoping period (see “Scope of the General Management Plan” in chapter 1). The planning team in turn identified seven overarching or guiding questions, which helped shape the alternatives:

- How can the preservation program for architecture, archeological sites, and associated features in the three units be enhanced?
- How should the newly acquired cultural landscape elements and natural resources (e.g., riparian area) in the park be managed?
- How can visitor services and park operations be expanded or improved?
- What is the best way to improve access to the Guevavi and Calabazas units?
- How should the park staff manage special events?
- How can the National Park Service continue to contribute to the greater community locally, regionally, nationally, and internationally?
- What should the National Park Service do to ensure the park is maintained and operated in a sustainable manner?

All of the above information, including the range of ideas proposed by the public and NPS staff, was combined and integrated together into a set of management alternatives. Each alternative is intended to effectively and efficiently manage the park and address all of the issues and guiding questions. Both of the action alternatives seek to incorporate both resource protection and visitor opportunities, and were

developed to be functional and viable. Although all of the alternatives are consistent with maintaining the park's purposes, significance, and fundamental resources and values, they vary in their focus with regard to opportunities for visitor experiences and facilities in the park's three units.

The alternatives focus on *what* resource conditions and *what* visitor experiences and opportunities should be at Tumacácori National Historical Park, rather than on details of *how* these conditions, uses, and experiences would be achieved. Thus, the alternatives do not include many details on how resources or visitor use would be managed.

More detailed plans or studies would be required before most conditions proposed in the alternatives are achieved. The implementation of any alternative also depends on future funding and environmental and cultural compliance. This plan does not guarantee that funding will be forthcoming. The plan establishes a vision of the future that would guide day-to-day and year-to-year management of the park, but full implementation could take many years.

IDENTIFICATION OF THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

Section 1505.2(b) of the CEQ regulations implementing the National Environmental Policy Act requires the identification of the environmentally preferable alternative. The environmentally preferable alternative is defined as "... the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." The environmentally preferable alternative is determined based on the sum results of the analysis of natural and cultural resource impacts described in chapter 4.

The environmentally preferable alternative is identified at the end of this chapter.

IDENTIFICATION OF THE NPS PREFERRED ALTERNATIVE

In addition to identifying the environmentally preferable alternative, an NPS preferred alternative is identified. Although the environmentally preferable alternative and the NPS preferred alternative are often the same, there is no requirement that they be the same. The National Park Service uses a value analysis method called "Choosing by Advantages" (CBA) to decide which alternative is the preferred alternative. The CBA process is a tool for determining the specific advantages each alternative would provide toward meeting specific park objectives. The advantages described in the CBA process represent the benefits that would be gained under each alternative. The advantages for each alternative are compared to the expected costs of each alternative to determine the cost/benefit ratio of each alternative. The alternative that provides the most benefit per dollar, with the least adverse environmental impacts, is the best value alternative and the one that is labeled "preferred" in this plan.

The benefits or advantages of each alternative were compared for each of the following CBA factors:

- protect natural resources—prevent loss, maintain and improve conditions
- preserve cultural resources—prevent loss, maintain and improve conditions
- provide for visitor experience/orientation through improvements to visitor services and direct resource interactions through educational, interpretation, and recreational opportunities

- improve operational efficiency and sustainability
- promote health, safety and welfare for visitors and employees, and resources
- promote positive relationships with surrounding landowners and communities

The advantages of each alternative were considered in the development of the preferred alternative. The preferred alternative gives the National Park Service the greatest overall benefits for each factor listed above for the most reasonable cost.

CONSIDERATION OF BOUNDARY ADJUSTMENTS

The National Park and Recreation Act of 1978 requires general management plans to address whether boundary modifications should be made to park units. As stated in *NPS Management Policies 2006* (section 3.5), boundary adjustments may be recommended in order to

- protect significant resources and values or to enhance opportunities for public enjoyment related to park purposes
- address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads
- otherwise protect park resources that are critical to fulfilling park purposes

Additionally, all recommendations for boundary changes must meet the following two criteria:

- the added lands will be feasible to administer considering their size,

- configuration, and ownership; costs of administration; the views of and impacts on local communities and surrounding jurisdictions; and other factors such as the presence of hazardous substances or exotic species
- other alternatives for management and resource protection are not adequate

For a boundary adjustment to be recommended, at least one of criteria 1–3 above must be met, as well as meeting both criteria 4 and 5.

No boundary adjustments are being proposed for the Tumacácori or Calabazas units in the alternatives being considered in this document. The 1996 general management plan called for a boundary adjustment for the Guevavi unit. Consistent with section 3.5 of *NPS Management Policies 2006*, a boundary study for the Guevavi unit would be completed under all of the alternatives in this plan. The study would consider acquisition of fee simple interest and alternative approaches, e.g., acquiring easements, to protect significant cultural resources adjacent to the unit's boundary.

USER CAPACITY

The national parks contain natural and cultural resources of great importance to the nation. Given the significance of this resource base, public interest in seeing and experiencing these areas has been increasing over the past 30 years. However, by their very presence visitors can affect park resources and other visitors. Impacts of visitors, intentional or unintentional, have been observed on soils, water, vegetation, wildlife, soundscapes, and cultural resources in parks.

The concept of carrying capacity, or user capacity, is intended to safeguard the quality of both park resources and visitor

experiences. Under the 1978 National Parks and Recreation Act (PL 95-625), the National Park Service is required to address the issue of user capacity in its general management plans. NPS management policies and planning standards acknowledge this responsibility.

The National Park Service defines user capacity as the types and level of visitor use that can, or should, be accommodated while sustaining desired resource conditions and visitor experiences that complement the purpose of a park. In addressing user capacity, the National Park Service identifies indicators, standards, and potential management strategies, allocated by management zones. Managing user capacity in national parks is complex and depends not only on the number of visitors, but also on where they go and the “footprints” they leave behind. Thus, when managing for user capacity, the park staff relies on a variety of management tools and strategies, rather than solely on regulating the number of people in a park or simply establishing limits on visitor use.

Tumacácori National Historical Park user capacity, including indicators, standards, and management strategies, is discussed in detail after the description of the alternatives. This discussion applies only to the two action alternatives.

MANAGEMENT ZONES

Management zones are a key element of the alternatives for managing Tumacácori National Historical Park. Management zones apply to different areas of the park and describe the desired conditions for cultural and natural resources, visitor experiences, and appropriate kinds and levels of management, development, and access in those different areas. Together, they identify the widest range of potential resource conditions, visitor experiences, and facilities that fall within the scope of Tumacácori National Historical Park’s

purpose and significance. The management zones also contribute directly to the identification of user capacity, which is discussed later in the chapter.

Five potential management zones were identified for Tumacácori National Historical Park in the two action alternatives: natural, cultural, special cultural protection, mission support, and visitor services. These zones only apply to the two action alternatives. Each of these zones has its own set of desired resource conditions, expected visitor experiences, and appropriate activities and facilities. Table 3 compares the potential management zones. In formulating the two action alternatives, the management zones were placed in different locations or configurations on a map of the park’s three units according to the overall concept of each alternative. Following is a summary of the zones.

- **Natural Zone**—This zone was only applied in the Tumacácori unit. Lands in the natural zone would be managed to protect and restore the broader ecological integrity of the Santa Cruz River valley within the park. Only low impact recreational activities would be allowed.
- **Cultural Zone**—This zone was only applied in the Tumacácori unit. Lands in this zone would be managed to emphasize the protection and interpretation of historic structures and archeological sites. Visitors would have opportunities to experience cultural resources through low impact interpretive programs and self-discovery.
- **Special Cultural Protection Zone**—This zone was applied in all of the units. Lands in this zone would be managed to protect highly sensitive and fragile sites while still providing visitors with opportunities to experience and learn about the resources.

- *Visitor Services Zone*—These areas, located in all three units, would be managed to support higher levels of development and visitor services to accommodate concentrated visitor use, including special events and educational and interpretive opportunities.
- *Mission Support Zone*—This zone was only applied in the Tumacácori unit. Lands in this zone would support administrative facilities for park operations and maintenance.

TABLE 3. MANAGEMENT ZONES

Desired Conditions	Natural Zone	Cultural Zone	Special Cultural Protection Zone	Mission Support Zone	Visitor Services Zone
Overview	These areas would be managed to protect and restore the broader ecological integrity of the Santa Cruz River valley within the park. Only low impact recreational activities would be allowed. Visitors would expect to have fewer encounters with others and opportunities to experience a natural setting.	These areas would be managed to emphasize the protection and interpretation of historic structures and archeological sites. Visitors would have opportunities to experience cultural resources through low impact interpretive programming and self-discovery. Special events would be highly managed to limit impacts to cultural resources.	These areas would be managed to emphasize the protection of historic structures and archeological sites. Visitor access would be strictly managed to protect these highly sensitive and fragile sites, yet provide visitors with opportunities to experience and learn about these cultural resources.	These areas would be managed to support administrative facilities for park operations and maintenance. To minimize the need for future development, historic structures would be adaptively reused. Visitors would generally not be expected in this zone.	These areas would be managed to support higher levels of development and visitor services in order to accommodate concentrated visitor use including special events, and educational and interpretive opportunities. Visitors would expect to have a high level of interaction with other visitors and park staff.
Cultural Resources	Ecological process and function would be maintained to the extent practicable.	Cultural resources would be managed so that archeological and historic resources would be monitored frequently to help protect them. Minimal impacts to surface artifacts would be acceptable during special events. Efforts to minimize impacts would be implemented.	This zone would include the most sensitive cultural resources. Cultural resources would be monitored regularly to help protect them. Visitor activities would be controlled to allow for access with the least amount of impact.	Archeological resources would remain undisturbed to the extent practicable. The historic district would be maintained while allowing for rehabilitation of existing facilities.	Some impacts to cultural resources from visitor services would be tolerated in this zone. There may be isolated impacts to cultural resources in this zone mostly during special events. The effects of development and visitor use would be minimized through planning, design, and monitoring.
Natural Resources	Ecological function would be maintained or improved by the preservation and restoration of natural features and processes. Native species would be reintroduced and nonnative species would be removed as appropriate.	Cultural resources would be preserved with the least amount of impact to natural resources. Natural resources would be managed to preserve and protect historic and archeological sites.	Habitat would be maintained with minimal impacts to cultural resources. Any revegetation would occur in a way that would have minimal impacts to cultural resources.	Moderate impacts to natural resources would be tolerated to accommodate activities that support the mission of the park (e.g., maintenance, material storage).	Natural resources would be managed to accommodate minimal impacts from visitor use. Natural resources would be managed to maintain the character of the cultural and historic settings (e.g., historic orchard).
Visitor Experience	Visitors would encounter natural systems with opportunities to experience solitude and to engage in low-impact recreational activities.	Visitors would be provided with a wide range of interpretation and education opportunities. High levels of visitor encounters would be expected. Group size could be limited to minimize impacts to resources.	Visitor access would be controlled to maximize resource protection. Some areas would only be accessible as part of a NPS-led or NPS-authorized tour.	Visitors would not be expected in this zone unless on official business or participating in special activities staged in this area (e.g., meetings, outdoor events).	Moderate to high levels of interaction would be expected in this zone. The design setting would support high levels of use including a variety of visitor services.
Appropriate Activities	Activities could include hiking, birding, horseback riding, photography, and self-guided interpretation.	Activities could include visitor orientation, education and interpretative programs, guided walks, self-guided trails, and possible self-discovery options.	At Guevavi, visitors would walk through the church; however, at Calabazas, the church would not be entered.	Activities would relate to maintenance, preservation, storage, and administration.	Moderate to high levels of activities would occur in this zone. Special events such as Fiesta would be staged in this zone, as well as other regular recurring activities.
Operations / Levels of Development	Minimal facilities would be provided in this zone e.g., picnic tables, trail markers, and waysides. Any developments would support resource protection and make possible low impact uses.	Trails, roads, and other recreational facilities would be unobtrusive and blend with the natural and cultural environment. Facilities would include historic structures and associated landscape features, developed trails, interpretive waysides and signs, paved and gravel roads, fences, picnic areas, and associated improvements.	Minimal development, such as unpaved trails, would be provided in a manner that avoids archeological sites and features. Construction would be limited to the minimum necessary for shade structures or waysides with consideration of visual impacts.	A high level of development and infrastructure to support park administration and activities would be expected in this zone. Minimal impacts would be allowed for park operations, maintenance, and preservation activities.	A moderate to high level of development would be expected in this zone. Development in this zone would include visitor center, bookstores, museum, waysides, parking areas, trails, sidewalks, outdoor education areas, restrooms, picnic areas, and crafts and demonstration areas.

ALTERNATIVE 1: CONTINUATION OF CURRENT MANAGEMENT

MANAGEMENT CONCEPT

This alternative is the “no-action” alternative and provides a baseline for evaluating changes and impacts that could result from the other alternatives. Under alternative 1, the National Park Service would continue to manage Tumacácori National Historical Park for the protection and interpretation of natural and cultural resources as outlined in the 1996 *Tumacácori National Historical Park General Management Plan*. Park management practices would also continue to follow applicable laws, NPS policies, and natural and cultural resource management mandates while responding accordingly to visitor safety needs, infrastructure deficiencies, fiscal constraints, changes in regional conditions, and changes in visitor use. Since the lands along the Santa Cruz River were added to the Tumacácori unit in 2002 (six years after the completion of the general management plan), the park staff would manage these lands according to applicable laws and NPS policies since no other guiding framework exists. Management of these lands would include the restoration of natural resources with available funding and staff. For the time frame of this plan there would be no substantial changes in the management directions of the three units from what is now occurring. All existing facilities, resource programs, and visitor use opportunities would continue as they are.

MANAGEMENT ZONING

Figures 3, 4, and 5 illustrate the allocation of management zones in alternative 1. For alternative 1 the park would continue to be zoned as described in the 1996 *General Management Plan*. The park units would be

included in historic and development “management areas.” Specifically, most of the Tumacácori unit would be in a historic management area, with a small area for development in the southeast corner. The lands along the Santa Cruz River in the Tumacácori unit were not included in the 1996 plan. Thus, under alternative 1 this area would continue to be outside of any management area or zone.

It should be noted that the desired conditions for the above management areas were not defined in the 1996 plan, nor were the areas mapped. Thus, these management areas should not be compared with the management zones in the two action alternatives (alternatives 2 and 3) in this document.

CULTURAL RESOURCE MANAGEMENT

Under alternative 1, the park staff would continue to focus on historic preservation through documentation of historic structures and archeological sites, public education, management of museum collections, and research. The park staff would continue to emphasize the preservation and maintenance of the mission sites in the three units. These sites would all receive regular cyclic maintenance.

Additional data need to be collected and analyzed on the cultural landscapes in the three units. Under alternative 1, research would be initiated and cultural landscape reports written for the Tumacácori, Guevavi, and Calabazas units.

NATURAL RESOURCE MANAGEMENT

Under alternative 1, the park's natural resources would continue to be protected while accommodating a range of visitor uses. The management of natural resources would continue as present, focusing on achieving the desired conditions described in appendix B. The management staff would continue to emphasize the riparian corridor and mesquite bosque in the Tumacácori unit.

Water pollution, decreasing surface water flows, and the spread of nonnative species are issues in all of the units. Park staff would continue to work with neighboring landowners and interested organizations, such as the state of Arizona, to maintain surface water flows and improve water quality in the Santa Cruz River. Efforts would also continue to maintain and control the spread of nonnative species in the park.

VISITOR USE AND EXPERIENCE AND USER CAPACITY

Visitor Use and Experience

Existing visitor activities, consistent with park purposes and NPS management policies, would continue under alternative 1, including hiking, walking, dog walking (on leashes), horseback riding, birding, photography, sightseeing, self-guided interpretation, and participating in ranger-guided interpretive and educational programs. Visitors would continue to have year-round access to cultural resources and the Santa Cruz River at the Tumacácori unit and access to the Calabazas and Guevavi units via guided tours during the winter season, typically January through April.

User Capacity

In this alternative, NPS managers would continue managing visitor use and activities as they have in the past. Visitor use would be

restricted to ranger-guided trips in the Calabazas and Guevavi units. In the Tumacácori unit, the park staff would continue to respond to user capacity issues on a case-by-case basis, with facility capacity (e.g., parking lot sizes) largely setting the park's user capacity. No major new initiatives would be pursued to manage visitors, and a parkwide user capacity approach (i.e., monitoring indicators and standards) would not be established.

INTERPRETATION

Interpretive and educational services provided by NPS personnel and volunteers would continue at present levels. The interpretive program would continue to focus on the park's history and cultural resources at the three mission sites. Interpretation would continue to occur at the park's visitor center, through ranger- or volunteer-guided tours at all three units, and roving interpreters at the Tumacácori unit. Cultural demonstration such as paper flower making, Mexican reverse-glass painting, O'odham basketry, pottery, and tortilla making would also continue on the weekends. Special tours, living history presentations, and special interest talks and tours would continue to be available by advanced request and as staffing allows. The park would continue to provide, on a limited basis, educational programs to local schools.

COMMUNITY CONNECTIONS AND PARTNERSHIPS

Promoting positive relationships with surrounding communities and other partners would continue to be a key action under alternative 1. National Park Service staff would maintain and strengthen ties with associated communities, American Indian tribes, and other groups connected to Tumacácori National Historical Park. One way this would be accomplished is through the continuation of special events such as historic reenactment Mass, La Fiesta de

Tumacácori, and Luminarias, which have become a tradition for community residents. On a limited basis, NPS staff would continue to collaborate on other special events such as the Anza Days celebration. To facilitate these activities, the park staff would continue to develop specific guidance for contacting traditional practitioners and demonstrators, American Indian tribal representatives, local ethnic and community groups, historic preservation professionals, and international partners.

The park staff would continue to work with neighboring landowners and interested organizations to retain surface water and improve water quality in the Santa Cruz River; with local organizations to accomplish parkwide activities including river cleanup, cleanup following special events, and grounds maintenance; with local citizens to provide training opportunities in resource preservation and interpretation; and with current partners to interpret the river ecosystem and to study water quality impacts.

MANAGEMENT OF SPECIFIC AREAS

Tumacácori Unit

Selected landscapes in the unit, such as the mesquite bosque, abandoned farm fields, and riparian area, would continue to be revegetated with native plants as resources allow.

Opportunities for pedestrian and horse access would continue to be provided to the Juan Bautista de Anza National Historic Trail from three existing trailheads in the unit: the northeast boundary, north of the Fiesta grounds, and from Santa Gertrudis Lane. Opportunities would also continue to be provided for visitors to cross the Santa Cruz River at the Anza Trail footbridge.

Anza Trail. No changes would occur in the management and use of the Anza Trail segment that passes through the Tumacácori

unit. Pedestrian and equestrian access would continue. Bicyclists who want to pass through the park would continue to be prohibited from the section of the trail within the park.

Guevavi and Calabazas Units

Visitors would continue to access the Guevavi and Calabazas units on ranger- or volunteer-guided tours.

Boundary Study. Significant archeological sites are present on lands adjacent to the boundary of the Guevavi unit. The NPS lands do not include the associated American Indian village and Spanish Colonial remains, which date to the early 18th century, that are east, north, and south of the Guevavi church. In addition, most of the mission *acequia* (irrigation ditch) is not on park lands.

The archeological sites are on land owned by the City of Nogales. Discussions with city officials have been underway on how to protect these resources. NPS staff would continue to pursue various possibilities for protecting these resources under alternative 1. One potential action could be a boundary adjustment, with the National Park Service acquiring the land with or without some property rights. Other possibilities could include establishing a conservation easement for the lands.

An easement also would allow NPS staff to assist in permitting and monitoring research to ensure work is consistent with professional practice standards. Another possibility would be to enter into a cooperative agreement with the city to provide protection of the area. A boundary study would be prepared to determine which approach would provide the best level of protection for these resources.

PARK OPERATIONS AND FACILITIES

The existing administrative and visitor facilities would be maintained to current standards, and NPS staff would continue to seek funding as needed to address impacts to resources. Efforts would also continue to prevent illegal uses of the park. To address current management needs, an additional one-half full-time equivalent (FTE) would be added under this alternative.

The park staff would upgrade the two existing recreational vehicle/trailer pads, located just east of the NPS employee residence in the Tumacácori unit. The upgrade would include adding sewer hook-ups to both pads (water and electrical service is already available at both sites), and building small shade ramadas in keeping with traditional architecture. These upgrades would address deferred maintenance needs associated with the pads.

ESTIMATED COSTS

Cost estimates for alternative 1 are identified below. These cost estimates, in 2011 dollars, are only intended to indicate a very general relative comparison of costs among the alternatives; they are not to be used for budgeting purposes. Identification of these costs does not guarantee future NPS funding.

Costs have been broken down into two categories—annual operating costs and one-time costs. Annual costs include the costs associated with ongoing maintenance, utilities, staffing, supplies and materials, and any leasing costs. One-time costs include projects such as trail building, native species restoration, and structure rehabilitation. None of the alternatives calls for construction of new buildings.

Annual Costs

The park may employ up to the equivalent of 14 full-time positions (one FTE is one

person working 40 hours per week for one year, or the equivalent). One law enforcement ranger, to be shared with Saguaro National Park, would be added to the existing staff under alternative 1, bringing the total FTE to 14.5. Seasonal and student employees and volunteers also supplement the park staff, and would continue to support the park as needed. Employee salaries and benefits make up a large portion of the park's annual operating costs. Under this alternative, the park's annual operating budget would remain the same.

One-time Costs

Alternative 1 would continue the current level of facilities. No substantial capital improvement projects would be planned under this alternative. In fiscal year 2011, project costs totaled \$498,000 and funded an interpretive trail, project staff, and several other projects.

Deferred Maintenance

Deferred maintenance refers to maintenance activities for assets in the park that were not performed when scheduled. Assets include infrastructure such as buildings, including the historic structures, trails, interpretive waysides, and boundary fencing. The park staff has identified approximately \$1.063 million of deferred maintenance related to assets in the park. This figure is representative of when the assessment was made and is not necessarily indicative of future deferred maintenance needs.

When the assessment was conducted, the majority of the deferred maintenance costs in the park related to the historic structures and buildings. Under this alternative, the park staff would address this and other deferred maintenance activities. In particular, the park would address deferred maintenance related to the Ruins trail and the recreational vehicle pads for park VIPs in the Tumacácori unit. The park staff would continue to address deferred maintenance of park assets as expeditiously as possible.

TABLE 4: SUMMARY OF COSTS FOR ALTERNATIVE 1

ANNUAL OPERATING COSTS	
Annual Operating Costs	\$1,327,000
Staffing (additional FTE)	14 (+0.5)
ONE-TIME CAPITAL COSTS	
Funded Projects (2011)	\$ 498,000
Total one-time capital costs	498,000
Deferred Maintenance	\$1,063,000

Note: All costs are in 2011 dollars.

FIGURE 3:

**DRAFT ALTERNATIVE ONE
NO-ACTION ALTERNATIVE
TUMACÁCORI UNIT**



Structures

- Mission
- Historic
- Modern

Trails

- Multi-Use, Proposed
- Multi-Use, Existing

Existing Features

- Park Unit Boundary
- 2002 Boundary Expansion
- Archeological
- Historic Ditch Alignment
- Historic Wall
- Intact Irrigation Ditch
- Mission Wall
- Mortuary Chapel
- Shade Structure

December 21, 2012



FIGURE 4:
DRAFT ALTERNATIVE ONE
NO-ACTION ALTERNATIVE
CALABAZAS UNIT

Existing Features		Trail
—	Mission Ruins	— Pedestrian, Existing
	Fence	
■	Metal Roof	
- - - - -	Calabazas Unit Boundary	

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FIGURE 5:
DRAFT ALTERNATIVE ONE
No-Action Alternative
GUEVAVI UNIT



Existing Features

- Park Unit Boundary
- Mission Ruins
- Aequia
- Shade Shelter

Trails

- Pedestrian, Existing

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ALTERNATIVE 2: NPS PREFERRED ALTERNATIVE

MANAGEMENT CONCEPT

Under alternative 2, park management would focus on engaging visitors, park neighbors, and partners in the history and outstanding natural and cultural resources found at all three park units. Visitors would be encouraged to spend their time connecting with the three park units. Visitor activities would be focused on the Tumacácori unit. Park management would focus on the preservation of cultural resources and the restoration of natural resources.

The park would provide a greater variety of visitor opportunities that reflect the significance of place, the complex history of the *Pimería Alta* and the connections to the larger mission system, and the importance of natural resources to communities over time. The park would also provide opportunities for visitors to develop personal connections to the park, its resources, and its history through interpretation, increased special events, and education and outreach.

Partnership efforts would focus on integrating the community into the park so they become directly engaged in resource protection, interpretation, and the continuation of cultural demonstrations and special events. Expanded use of partnerships would enable parties to better leverage resources, allowing for more effective collaborations.

Natural and cultural resource management would be integrated to tell the complete story of the park (i.e., the broad cultural history of the park including the tribal and other perspectives with links to natural resources and cultural preservation). Interpretation would include the complex history of the *Pimería Alta* and the park's connection to the larger mission system, including other historic sites in the Santa Cruz River valley. Interpretation would also include the importance of the Santa Cruz River (i.e., the river is a microcosm of the issues that are facing the Southwest and the world—water quality, loss of species, and changes in traditional land uses).

Primary Differences of Alternative 2 from Alternative 1

In alternative 2

- a loop trail would be established in the riparian section of the Tumacácori unit
- three to five picnic areas would be established in the mesquite bosque in the Tumacácori unit
- two to four access points to the river would be formalized in the Tumacácori unit
- expanded cultural demonstrations would occur in the Tumacácori unit
- the new Mission Trail would link the Calabazas and Guevavi units
- virtual tours may be developed to provide opportunities to experience the Calabazas and Guevavi units
- an open-air shade ramada would be built in the Calabazas unit and the existing shade structure in the Guevavi unit would be replaced with a similar structure
- new trail segments connecting existing trails would be established in the Calabazas and Guevavi units
- a parking area would be formalized in the Guevavi unit

MANAGEMENT ZONING

Under alternative 2 the potential management zones described in table 9 would be applied to the park as presented in the maps of alternative 2 (see figures 6, 7, and 8). Most of the Tumacácori unit (~75%) would be in the natural zone, while the mission historic structures would be in the cultural protection zone, and the fiesta grounds would be in the visitor services zone.

Note: All of the trails shown on the maps would be part of the zone where they are embedded.

In the Calabazas and Guevavi units, the vast majority of the lands would be in the special cultural protection zone. Small areas in the two units would be included in visitor services zones.

CULTURAL RESOURCE MANAGEMENT

In alternative 2, as in alternative 1, NPS managers would focus on preservation of the park's cultural resources and in completing cultural landscape reports for all three units. In addition, efforts would be taken to restore and protect the park's broader cultural landscapes and historic context. National Park Service managers would develop additional monitoring strategies to increase cultural resource protection and reduce vandalism. Park staff would work with existing programs such as the Arizona Site Steward Program to provide opportunities for community members to become involved in monitoring efforts and assist staff in protecting cultural resources. An outreach program would be developed that focuses on increasing understanding of preservation of historic structures and the traditional adobe preservation techniques used in the park.

NATURAL RESOURCE MANAGEMENT

In alternative 2, as in alternative 1, park staff would focus on protecting the park's natural resources, with emphasis being placed on the riparian corridor and mesquite bosque in the Tumacácori unit. Park managers would also continue to address the issues of water pollution, decreasing surface water flows, and the spread of nonnative species in all of the units.

In alternative 2, additional efforts would be undertaken to revegetate selected landscapes, as resources allow. Park managers would also take several actions to proactively address natural resource issues facing the park. In the Tumacácori unit, some existing visitor-created trails would be removed and the area revegetated, while others would be formalized to reduce trail erosion. Formalizing the trails would include clearing and weed whacking—no hardening of the surfaces would occur. Increased monitoring would occur along the trail corridors for the spread of existing and introduced nonnative species that may occur with increased horse and pedestrian use in this alternative. Vegetation restoration plans would also be prepared for the Calabazas and Guevavi units, providing management direction for restoration of native plants in these areas.

Park managers would work more closely with neighboring landowners to address natural resource issues and minimize adverse impacts from neighboring land uses such as trespass by livestock and the spread of nonnative species.

Efforts also would be undertaken to expand community participation, such as enlisting volunteers to assist park managers in natural resource monitoring and management. For example, volunteers could assist managers in monitoring and controlling the spread of nonnative species, and in monitoring water quality in the Santa Cruz River.

FIGURE 6:
DRAFT ALTERNATIVE TWO
TUMACÁCORI UNIT



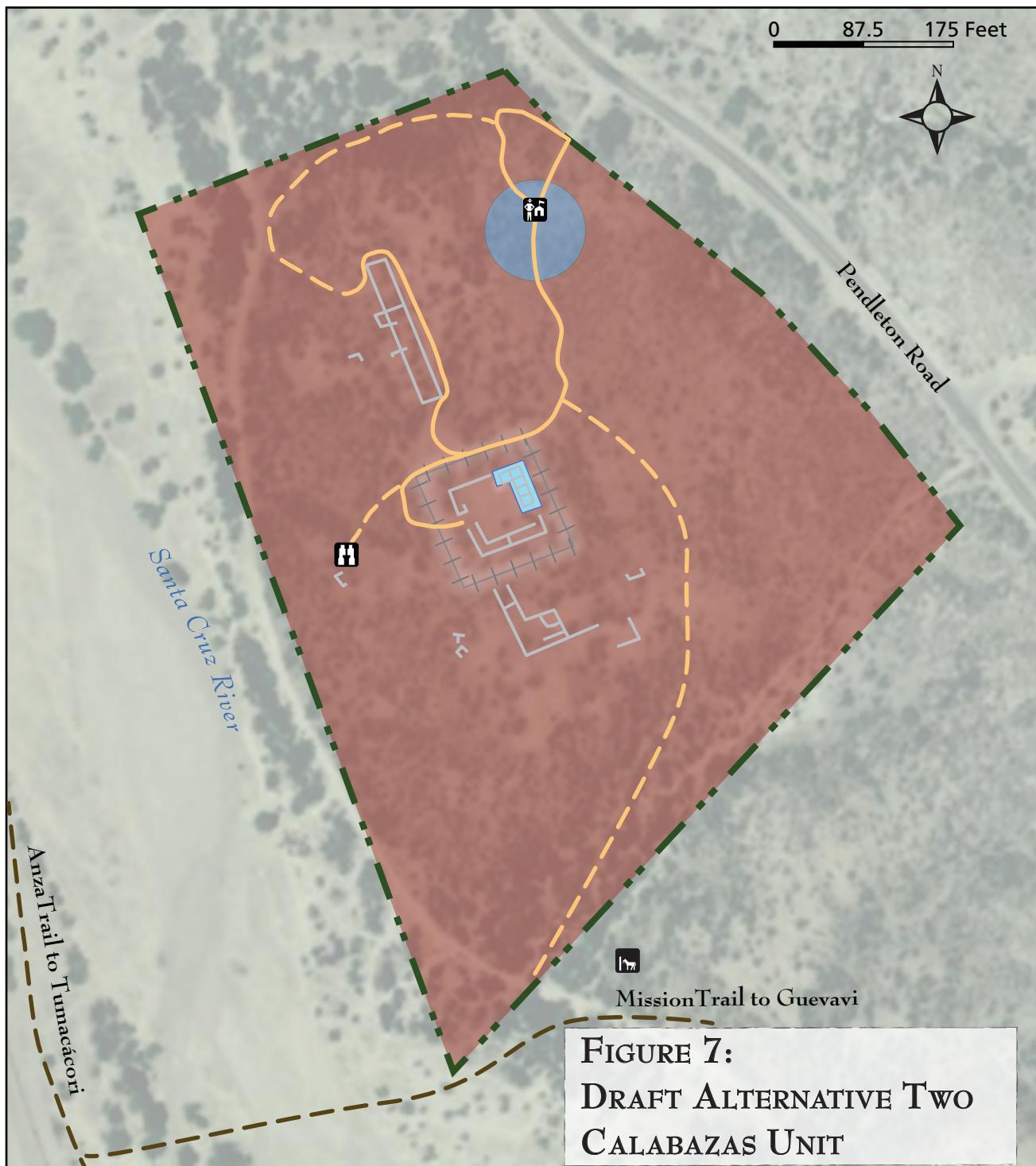
Zones
Special Cultural Protection
Cultural Protection
Visitor Services
Mission Support
Natural

Trails
Multi-Use, Proposed
Multi-Use, Existing

Existing Features
Park Unit Boundary
Archeological
Historic Ditch Alignment
Historic Wall
Intact Irrigation Ditch
Mission Wall
Mortuary Chapel

Proposed Features
Demonstration Farming
Shade Structure (Improvements)
Picnic Area
Horse Hitching Post

August 30, 2011



Zones

- [Red Box] Special Cultural Protection
- [Yellow Box] Cultural Protection
- [Blue Box] Visitor Services
- [Purple Box] Mission Support
- [Green Box] Natural

Trails

- [Dashed Yellow Line] Pedestrian, Proposed
- [Dashed Black Line] Multi-Use, Proposed
- [Solid Yellow Line] Pedestrian, Existing
- [Solid Black Line] Multi-Use, Existing

Existing Features

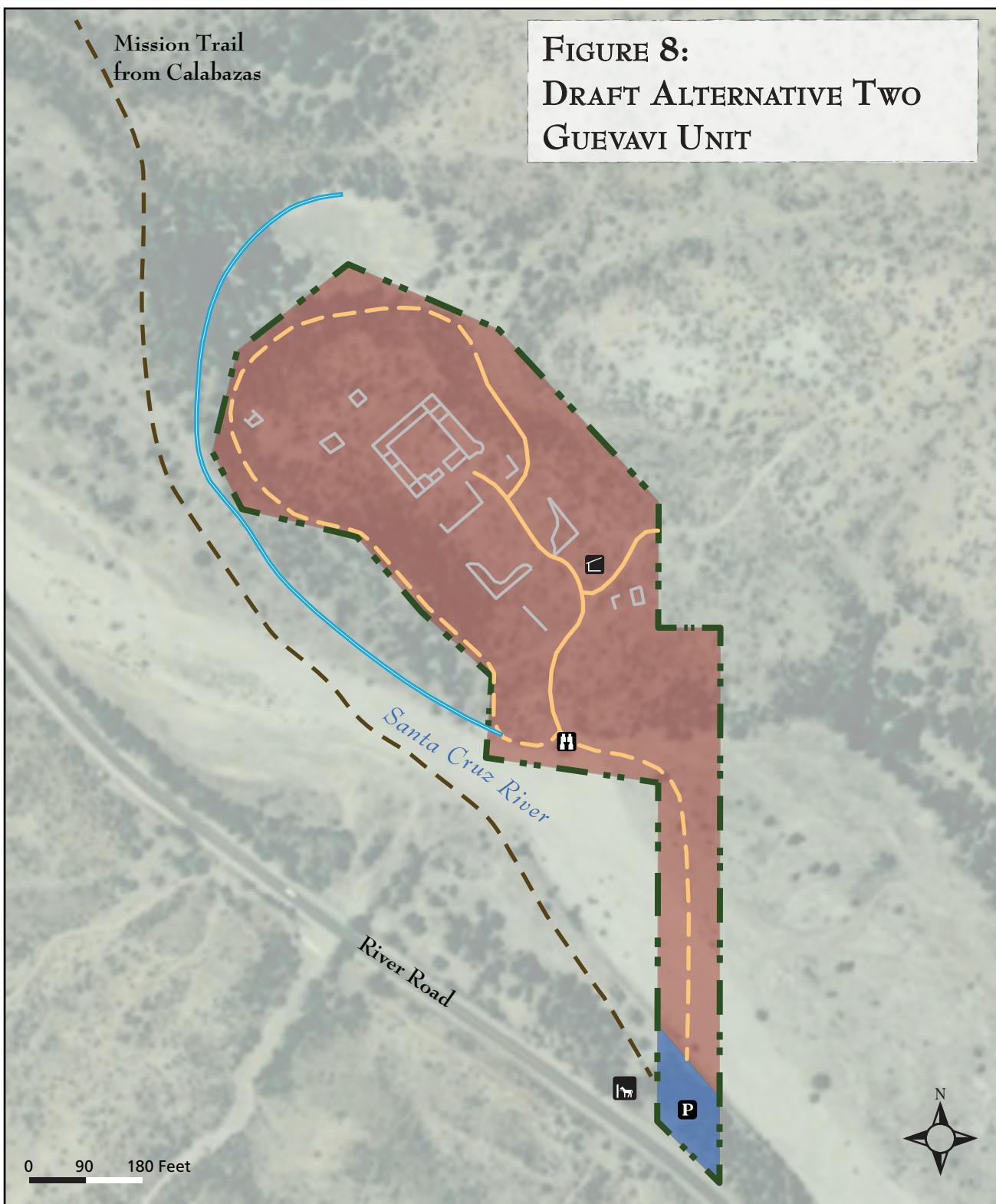
- [Dashed Green Line] Park Unit Boundary
- [Grey Line] Mission Ruins
- [Fence Icon] Fence
- [Blue Box] Metal Roof

Proposed Features

- [Visitor Contact Station Icon] Visitor Contact Station
- [Horse Hitching Post Icon] Horse Hitching Post
- [Overlook Icon] Overlook

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FIGURE 8:
DRAFT ALTERNATIVE TWO
GUEVAVI UNIT



Zones

- [Brown Box] Special Cultural Protection
- [Orange Box] Cultural Protection
- [Blue Box] Visitor Services
- [Purple Box] Mission Support
- [Green Box] Natural

Existing Features

- [Dashed Green Line] Park Unit Boundary
- [Grey Line] Mission Ruins
- [Blue Line] Acequia

Trails

- [Yellow Dashed Line] Pedestrian, Proposed
- [Black Dashed Line] Multi-Use, Proposed
- [Solid Orange Line] Pedestrian, Existing
- [Solid Black Line] Multi-Use, Existing

Proposed Features

- [Icon with person] Overlook
- [Icon with car] Parking Area
- [Icon with diagonal line] Shade Structure (Improvements)
- [Icon with horse head] Horse Hitching Post

December 21, 2012

VISITOR USE AND EXPERIENCE AND USER CAPACITY

Visitor Use and Experience

Existing visitor activities, consistent with park purposes and NPS management policies, would continue under alternative 2. Visitors would continue to have year-round access to cultural resources at the Tumacácori unit and access to the Calabazas and Guevavi units via guided tours during the winter season. Public use would continue to be prohibited in the fenced portion of the Calabazas unit or the Guevavi unit without NPS staff or authorized volunteers.

In this alternative, several new visitor facilities, including trails, picnic areas, and overlooks would be provided to expand opportunities for visitors primarily in the Tumacácori unit (see “Management of Specific Areas” below). Expanded programs, including cultural demonstrations and special events, also may be provided in the Tumacácori unit.

Virtual tours, such as podcasts or web-based camera views, may be developed to provide opportunities for visitors to experience the Calabazas and Guevavi units throughout the year, outside of the ranger- and volunteer-guided tours.

Anza and Mission Trails. As discussed in chapter 1 of the 1996 *Juan Bautista de Anza National Historic Trail Comprehensive Management and Use Plan / Final Environmental Impact Statement* (NPS 1996b), independent of this general management plan, a segment of the Anza Trail would link the Tumacácori and Calabazas units. In alternative 2, the National Park Service would formalize the Anza Trail segment through the Tumacácori unit so visitors would use one trail rather than a number of visitor-created trails.

In this alternative, the National Park Service would work with partners to establish the

new Mission Trail that would link the Calabazas and Guevavi units. Early Spanish explorers and missionaries established a trail that linked the three units of the park with areas to the north and south. This route was traveled by a number of Jesuit missionaries in the 17th century; in particular by Father Eusebio Francisco Kino who established many missions in the *Pimería Alta*. The route later traveled by Juan Bautista de Anza in the 18th century followed the trail between the Calabazas and Tumacácori units (NPS 1996b).

There is a long-standing interest in Santa Cruz County in establishing a spur trail off the Anza Trail, linking the Calabazas and Guevavi units. (This spur trail would not be part of the Anza Trail because de Anza never visited the Guevavi mission.) The park’s 1996 general management plan (NPS 1996) called for a trail linking the three units, documenting the need for a connecting segment from the Calabazas to Guevavi units. The *Juan Bautista de Anza National Historic Trail Comprehensive Management and Use Plan / Final Environmental Impact Statement* (NPS 1996b) also identified a proposed mission trail that would connect to the Guevavi unit as a trail link with the Anza Trail. The Mission Trail would start from the Anza Trail by the Calabazas unit, run by the southern end of the Calabazas unit, and follow existing trail and road segments on public land to the extent possible, ending at the Guevavi unit. The trail between the units would be multiuse, consistent with the use of the Anza Trail. The trail would connect, but not actually enter the two units. Additional details on the Mission Trail, including the route, signage, where new development may be needed, and funding, would be included in a future plan and compliance document. It must be stressed that partners would be essential for establishing and maintaining this trail. Planning for the trail would be coordinated with agencies and organizations that have an interest in trails and recreation along the Santa Cruz River, such as Santa Cruz County, the State of Arizona, and the Anza Trail Coalition of Arizona.

User Capacity

In this alternative, park staff would monitor social and resource indicators, evaluate current conditions against the standards, and take appropriate steps to ensure that the park's user capacity is not exceeded. See the "User Capacity" section at the end of the alternatives for the user indicators, standards, and management and monitoring strategies that would be followed under alternative 2.

INTERPRETATION

As in alternative 1, in alternative 2 the interpretation program would continue to be centered in the park's visitor center and on the three mission sites. However, the interpretive/education focus would be broadened to cover the park's connection to the larger mission system, including other historic sites in the Santa Cruz River valley, and to include the importance of the park's natural resources. The park's interpreters would develop programs to discuss changes in the Santa Cruz River valley over time and the impacts on resources. Additional emphasis also would be placed on increasing visitor understanding of cultural preservation processes and techniques using interpretive signs. Wayside exhibits and kiosks would be provided that connect visitors to the park's resources. All of these actions would be aimed at increasing awareness of the park and its resources. In alternative 2, living history programs would continue to be provided. In addition, cultural demonstrations in the Tumacácori unit would be expanded. This may include livestock and farming demonstrations. An herb garden also may be established in the historic orchard.

In alternative 2, additional park outreach programs would occur. An outreach program would be developed to increase students' understanding of historic structures preservation in general, and the techniques used in the park in particular.

Mentors would help students expand their abilities. School programs also would be expanded to include opportunities for hands-on learning related to preservation techniques.

COMMUNITY CONNECTIONS AND PARTNERSHIPS

As in alternative 1, in alternative 2 park staff would continue to focus on promoting positive relationships with surrounding communities and other partners. Increased efforts would be undertaken to forge and maintain partnerships with associated communities, tribes, academic institutions and schools, user groups, and other groups connected to Tumacácori National Historical Park. The focus of partnership efforts would be to integrate communities and other groups into the park so they become directly engaged in resource protection, interpretation, and the continuation of cultural demonstrations and special events inside the parks. Partnerships should enable all parties to leverage resources, allowing for more effective collaborations.

The National Park Service would continue to sponsor several annual special events, such as historic reenactment Mass, La Fiesta de Tumacácori, and Luminarias. In addition, NPS staff would consider expanding special events at the park to emphasize the park's connections with the surrounding communities and that help visitors make connections to the history within the park. Before new events would be allowed, criteria would be developed to determine the appropriateness of special events consistent with the park purpose, significance, and this alternative concept. The criteria could be similar to the criteria developed for commercial visitor services (e.g., criteria to determine necessary and appropriate activities). Criteria may include factors such as (1) how does the special event theme complement the park's purpose and significance, (2) is the scale of the event

appropriate for the size of the Tumacácori unit, and (3) would the activities associated with the event have an adverse impact on natural and cultural resources. (Development of the criteria within this general management plan is not appropriate because it is too detailed and not within the scope of this plan; rather it would happen outside of this planning effort.)

In alternative 2, additional steps would be taken to more actively engage local communities in the park. Actions that would be taken include the following:

- expanding the living history program to include more community involvement
- expanding tribal participation in interpretation efforts (e.g., demonstrations, presentations)
- establishing a mentoring program for cultural demonstrations to maintain the tradition of these activities in the park
- developing an outreach program to increase understanding of historic structures preservation using students
- including community members in appropriate natural resource management activities in the park (e.g., volunteers participating in river cleanups, water quality monitoring)

Park staff would work with partners, such as Tubac Presidio State Park, to provide a more complete history of the park and its links to the surrounding communities. For example, park staff could work with state park interpreters in providing off-site interpretation of local history and ranching.

Park staff would work more actively with neighboring landowners to minimize adverse impacts to resources by controlling nonnative species, managing trespass

livestock, and expanding resource management efforts such as river cleanup.

Several other partnerships would be pursued. For example, park staff would work with the Anza Trail Coalition of Arizona to address management issues and common interests in managing the trail in the park. Partnerships would be sought to establish the Mission Trail. Additional efforts would be undertaken to work with the state of Arizona, cities, and the county to maintain surface water flows and improve water quality in the Santa Cruz River. Park staff would work with The University of Arizona Cooperative Extension in establishing a demonstration farming/livestock operation and garden. The National Park Service also could work with the Arizona Land and Water Trust, a nonprofit corporation, in pursuing options related to the protection of lands adjacent to the Guevavi unit.

Also in this alternative, the National Park Service would sponsor forums at the park, which would provide an opportunity for both scholarly discussion and the sharing of different perspectives on such topics as

- preservation techniques
- history of the park/region
- restoration of the riparian areas inside the park boundary

MANAGEMENT OF SPECIFIC AREAS

Tumacácori Unit

As in alternative 1, in alternative 2 selected landscapes in the unit—such as the mesquite bosque and riparian area—would continue to be revegetated with native plants as resources allow. Opportunities for pedestrian and horse access would continue to be provided to the Juan Bautista de Anza National Historic Trail from three existing trailheads in the unit.

Additional actions would be taken to expand opportunities for visitors in the unit. A loop trail would be established in the riparian area. No new trails would need to be built to establish the loop trail. Rather, the existing Anza Trail on the west side of the river would be better marked and other visitor-created trails closed and revegetated so the Anza Trail route is clearly apparent to visitors. On the east side of the river, a visitor-created trail would be clearly marked and other visitor-created trails would be closed and revegetated. Consistent with current use along the Anza Trail, the loop trail would be used by pedestrians and horseback riders. Visitors would cross the river at two points via footbridges. Waysides and informational kiosks would be developed along the trail and at the points where the trail enters the park. Appropriate compliance would be completed before the loop trail is established.

Bicycles are allowed on the Anza Trail. However, bicycle use on the Anza Trail within the Tumacácori unit is not permitted because the National Park Service does not allow bicycle use on trails in parks without being considered in a trail-specific analysis in a plan addressing trail use (36 CFR 4.30, NPS *Management Policies 2006*, section 9.2.2.4). Before bicycle use could be permitted, the suitability of the existing trail surface and soil to accommodate bicycle use must be evaluated. Life cycle maintenance costs, safety considerations, strategies to prevent or minimize user conflict, and methods of protecting natural and cultural resources also must be considered in the evaluation. In addition, an impact analysis must be completed—bicycle use on a trail can only be permitted if there are no significant impacts.

The evaluation on whether to allow bicycles on the Anza Trail in the Tumacácori unit would be included in the parkwide trail plan (see the following “Parkwide Trail Plan” section). The decision document for the parkwide trail plan would include a superintendent’s determination on whether

bicycle use on the Anza Trail would be consistent with the protection of the park’s natural, cultural, scenic, and esthetic values and safety considerations and management objectives, and would not result in the disturbance of wildlife or other park resources. This written determination would be published in the *Federal Register*. After a review of public comments, the regional director would then need to approve the superintendent’s written determination before bicycle use could be allowed on the Anza Trail in the park.

Horse hitching posts would be provided on the east side of the mission complex. If bicycling is allowed on the Anza Trail, then bicycle racks also would be provided. The hitching posts and bike racks would be in separate locations. Visitors could then enter the mission complex on foot.

Three to five picnic areas would be established in the mesquite bosque along the Anza Trail. These areas would include only picnic tables. Visitors would pack out their waste.

Two to four access points would be formalized from the Anza Trail and the proposed trail on the east side to provide access to the river. The location and number of the access points would be determined as part of future planning and compliance actions.

The existing shade structures in the Fiesta grounds also would be improved so they are more sustainable.

In the mission complex, emphasis would be placed on maintaining a sense of place and spiritual healing in part of the complex. Visitors would have opportunities for reflection in quiet spaces.

Calabazas Unit

Several new visitor facilities would be built in this area under alternative 2. An unstaffed, open-air ramada (shade structure) would be

developed to provide orientation and interpretive information. The structure would also provide benches and some shelter for visitors. The low-profile structure would be designed to blend in to the environment and have minimal impact on the park's resources and viewshed. Wayside exhibits at an overlook and waysides along the trails also would be built to connect visitors to the important resources in the area. A new unpaved pedestrian trail segment would be established to connect existing trails, creating a loop trail (see figure 7). Other unpaved trail segments would be established to an overlook, and to the southern end of the unit to connect with the Mission Trail. After the unit's boundary is fenced, the two-track trail along the west boundary would be closed and revegetated within the park.

Horse hitching posts and possibly bicycle racks would be provided in separate areas on the southern periphery of the unit. These visitors would then walk into the unit as part of a ranger- or volunteer-guided tour. With the establishment of the Mission Trail, a gate and sign would be erected at the park boundary, informing visitors about access into the unit.

Guevavi Unit

The existing deteriorating shade structure would be replaced with a more sustainable, similar-sized structure. As with the Calabazas unit shade structure described above, this one would be designed to have a minimal impact on resources and the viewshed, provide some interpretive information, and provide some shelter for visitors. Wayside exhibits at an overlook and waysides along the trails in the area also would be provided.

A parking area off River Road would be established with marked parking spaces and signs. Spaces for tour vans and a limited number of cars would be provided. The parking area would be used by both people accessing the southern end of the Mission

Trail and for people going to the Guevavi unit. The area would be signed to indicate that the Guevavi unit was only open to visitors accompanied by NPS staff or volunteers. A spur trail would branch off to a gate on the south side of the unit. A new unpaved pedestrian trail segment also would be established on the north and west sides of the unit, forming a loop with the existing trail. The exact route of this trail would be determined during future planning. All visitors on tours would access the unit by using the spur trail and crossing the riverbed. Although there would be very little chance of a flood occurring, stranding people across the river, the park staff would prepare a response plan to address this situation.

A horse hitching post and possibly bicycle racks would be provided in separate areas near the new parking area.

Boundary Study. As in alternative 1, a boundary study would be prepared to examine various possibilities for protecting the significant cultural resources adjacent to the Guevavi unit under alternative 2. These potential actions could include a boundary adjustment, with the National Park Service acquiring the land with or without the water rights, establishing a conservation easement on the lands, or entering into a cooperative agreement with the city of Nogales to protect the area.

PARK OPERATIONS AND FACILITIES

The existing administrative and visitor facilities, as well as the new facilities described above, would be maintained to current standards, and NPS staff would continue to seek funding as needed to address impacts to resources. Efforts would also continue to prevent illegal uses of the park. Permanent park staffing levels (FTEs) would increase with the added facilities and programs in this alternative (see the annual costs section below).

All new facilities in the park units would be designed using a cohesive, consistent look and feel. For example, the same style of signs and waysides would be used in all three units.

As in alternative 1, the two existing recreational vehicle/trailer pads, located just east of the NPS employee residence in the Tumacácori unit, would be upgraded. The upgrade would include adding sewer hookups to both pads and building small shade ramadas in keeping with traditional architecture. These actions would address some deferred maintenance in the park.

To accommodate additional staff in this alternative the existing staff offices in the park would be redesigned and reconfigured.

The park's boundary is not clearly marked for the three units. Boundary signs would be applied where appropriate. A fence also would be built and maintained around the boundary of the Calabazas unit to protect resources and stop illegal uses, such as all-terrain vehicles driving within the unit. Prior to construction, public outreach efforts would occur explaining the need for the fence, and a law enforcement ranger would be hired to monitor use of the area (see the "Estimated Costs" section below).

Park staff would develop and implement management approaches to minimize impacts to park resources, visitors, and operations during special events. Examples of new approaches could include developing alternative parking arrangements and conducting archeological surveys of the area before the special events.

Steps would be taken to minimize impacts on the soundscape and viewsheds inside the three units. This could include removing vegetation or other visual obstructions to important views. Park staff would work with partners to protect views from the park and minimize or avoid noises that affect the park's soundscape (see also the desired conditions in appendix B.)

Parkwide Trail Plan

A parkwide trail plan with appropriate compliance would be prepared to address trail and resource and access issues in the three units. Among the topics the trail plan would address include

- formalizing the loop trail in the Tumacácori unit
- formalizing two to four access points to the river in the Tumacácori unit
- evaluating whether to permit bicycle use along the Anza Trail in the Tumacácori unit
- providing new access opportunities in the Calabazas unit, including establishing a new unpaved trail from the existing park trail to the unit's southern boundary to create a loop trail
- establishing a new trail segment in the Guevavi unit

The trail plan would focus on trails on NPS lands and therefore would not address the Mission Trail.

ESTIMATED COSTS

Cost estimates for alternative 2 are identified below. These cost estimates, in 2011 dollars, are only intended to indicate a very general relative comparison of costs among the alternatives; they are not intended for budgeting purposes.

Identification of these costs does not guarantee future NPS funding. Project funding may not come all at once; it would likely take many years to secure and may be partially obtained through partners, donations, or other non-NPS federal sources. Although the National Park Service hopes to secure this funding, the park may not receive enough funding to achieve all desired conditions within the time frame of

this management plan (the next 15 to 20 years).

Costs have been broken down into two categories: annual operating costs and one-time costs. Annual costs include the costs associated with ongoing maintenance, utilities, staffing, supplies and materials, and any leasing costs. One-time costs include projects such as trail building, native species restoration, and structure rehabilitation. None of the alternatives calls for construction of new buildings.

Annual Costs

Implementation of alternative 2 is estimated to result in \$1.348 million in annual costs in 2011 dollars, a 34% increase over alternative 1. These costs include additional staff salaries and benefits, as well as changes in maintenance costs. The staffing costs include an additional 1.5 FTE positions over current staffing levels. Seasonal and student employees and volunteers also supplement the park staff and would continue to support the park as needed. Costs associated with the ongoing maintenance of new trails and interpretive panels would be somewhat offset through anticipated savings in maintenance costs resulting from the installation of sustainable structures, such as the proposed shade structures.

For this alternative to be fully implemented, it would require additional staff to address resource management, visitor experience, and operational needs. The staffing needs have been prioritized and the following positions would allow the National Park Service to implement certain aspects of the general management plan:

- one resource management position (1 FTE)
- one shared law enforcement position (0.5 FTE)

Some actions could not be initiated until there are appropriate personnel to maintain

and implement all actions proposed in this alternative. In particular, the park would require additional staff to address maintenance and partnership activities. Park managers would explore opportunities to work with partners, volunteers, and other federal agencies to leverage resources to effectively and efficiently manage the park. Additional staff or agreements would be necessary to fully implement this alternative.

One-time Costs

It is estimated that alternative 2 would result in one-time costs of \$818,000 in 2011 dollars.

These costs would be primarily associated with establishment of new trails and shade structures and the remodeling existing space for NPS employee offices. These actions would be initiated when the park has the available resources to initiate and maintain the completed facilities.

Planning, constructing, and maintaining the proposed Mission Trail would be a considerable effort and one that would be undertaken only with commitment from the many partners invested in the trail's establishment. The trail would be located outside of the park, and therefore cost estimates for the National Park Service reflect a portion of the eventual total cost to establish the trail. Substantial efforts by the partners would be necessary to bring the trail to fruition.

Deferred Maintenance

Deferred maintenance refers to maintenance activities for assets in the park that were not performed when scheduled. Assets include infrastructure such as buildings, including the historic structures, trails, interpretive waysides, and the boundary fencing. The park staff has identified approximately \$1.063 million of deferred maintenance related to assets in the park. This figure is representative of when the assessment was made and is not necessarily indicative of future deferred maintenance needs.

When the assessment was conducted, the majority of the deferred maintenance costs in the park related to the historic structures and buildings. Under this alternative, the park staff would address this and other deferred maintenance activities. In

particular, the park would address deferred maintenance related to the Ruins trail and the recreational vehicle pads for park VIPs in the Tumacácori unit. The park staff would continue to address deferred maintenance of park assets as expeditiously as possible.

TABLE 5: SUMMARY OF COSTS FOR ALTERNATIVE 2

ANNUAL OPERATING COSTS	
Annual Operating Costs	\$1,348,000
Staffing (additional FTE)	15 .5 (+1.5)
ONE-TIME CAPITAL COSTS	
Tumacácori Unit • Livestock and farming demonstration area* • Trails, interpretive panels, directional signs • Picnic tables* • Interpretive kiosks • Staff offices: rehabilitation of existing space • Support costs for staff	\$ 334,000
Calabazas Unit • Open-air ramada, trails, fence • Vegetation restoration plan	180,000
Guevavi Unit • Shade structure • Parking area • Trailhead sign • Vegetation restoration plan	56,000
All Units • plans • Virtual tour*	20,000
Mission Trail*	\$ 228,000
Total One-Time Capital Costs	\$ 818,000
Deferred Maintenance	\$1,063,000

Note: All costs are in 2011 dollars.

*These projects are desirable, but lower priority; while important to the full implementation of the alternative, they may be accomplished with nonfederal funds or many years in the future.

ALTERNATIVE 3

MANAGEMENT CONCEPT

Alternative 3 would focus on the connections of the park to the larger community through the Santa Cruz River and more broadly on how the past connects with the future in the Santa Cruz River valley. The river is the feature that unites the three park units and interconnects the valley's history, inhabitants, and natural resources. After visiting Tumacácori National Historical Park, visitors would understand that the history preserved and interpreted at the park is only part of the broader history of the river valley. For this reason, visitors would be encouraged to experience other related sites as part of a longer tour of the Santa Cruz River valley.

Visitors would be provided diverse interpretive and recreational opportunities

designed to instill a sense of stewardship in the park by emphasizing traditional ties to the park and its natural and historic resources. The river would be used as the starting point to interpret the natural history of the area. Within the park, current activities and special events would continue and could be enhanced. Park staff would work with community partners to develop new visitor activities and events outside the park that would be designed to put Tumacácori National Historical Park into the broader historic context of the river valley.

As in all of the alternatives, visitor activities would be focused on the Tumacácori unit. Park management would focus on the preservation of cultural resources and the restoration of natural resources.

Primary Differences of Alternative 3 from Alternative 1

In alternative 3

- one to two picnic areas would be established in the mesquite bosque in the Tumacácori unit
- the Mission Trail would link the Calabazas and Guevavi units
- new trail segments linking existing trails would be established in the Calabazas unit
- virtual and auto tours would be developed to provide opportunities to experience the Calabazas and Guevavi units
- an open-air shade ramada would be built in the Calabazas unit and the existing shade structure in the Guevavi unit would be replaced with a similar structure
- community stewardship of the river and collaboration with partners on regional activities would be emphasized
- a parking area would be formalized in the Guevavi unit
- a feasibility study would be conducted to determine if it is feasible to reestablish perennial wetland habitat in the Tumacácori unit

MANAGEMENT ZONING

Figures 9, 10, and 11 illustrate the allocation of management zones in alternative 3. Most of the Tumacácori unit (~75%) would be in

the natural zone, while the mission historic structures would be in the cultural protection zone, and the fiesta grounds would be in the visitor services zone.

Note: All of the trails shown on the maps would be part of the zone where they are embedded.

In the Calabazas and Guevavi units, the vast majority of the lands would be in the special cultural protection zone.

CULTURAL RESOURCE MANAGEMENT

With respect to cultural resource management, alternative 3 is very similar to alternative 2. In alternative 3, as in all of the alternatives, NPS managers would focus on preservation of the park's cultural resources and in completing cultural landscape reports for all three units. In addition, efforts would be taken to restore and protect the park's broader cultural landscapes and historic context. NPS managers would develop additional monitoring strategies to increase cultural resource protection and reduce vandalism. Park staff would work with existing programs such as the Arizona Site Steward Program to provide opportunities for community members to become involved in monitoring efforts and assist staff in protecting cultural resources.

NATURAL RESOURCE MANAGEMENT

Alternative 3 is also very similar to alternative 2 regarding the management of natural resources. As in all of the alternatives, park staff would focus on protecting the park's natural resources, with an emphasis on the riparian corridor and bosque in the Tumacácori unit. Park managers would continue to address the issues of water pollution, decreasing surface water flows, and the spread of nonnative species in all of the units. Increased monitoring would occur along the trail corridors for the spread of existing and introduced nonnative species that may occur with increased horse and pedestrian use in this alternative.

In alternative 3, additional efforts would be undertaken to revegetate selected landscapes, as resources allow. Park managers would remove and revegetate visitor-created trails in the Tumacácori unit. Vegetation plans would also be prepared for the Calabazas and Guevavi units, providing management direction for restoration of native plants in the areas.

Park managers would work more closely with neighboring landowners to address natural resource issues and minimize adverse impacts from neighboring land uses, such as trespass by livestock and the spread of nonnative species.

Efforts also would be undertaken to expand community participation, such as enlisting volunteers to assist park managers in natural resource monitoring and management. For example, volunteers could assist managers in monitoring and controlling the spread of nonnative species, and monitoring water quality in the Santa Cruz River.

As noted in the “Affected Environment” section, much of the wetlands in the Tumacácori unit have been lost or altered. In alternative 3, a study would be conducted to determine if it is feasible to reestablish *cienega* (perennial wetland) habitat in the Tumacácori unit. Water is the primary factor in determining if this action would be feasible. Other factors, such as current and future effects of climate change and economic issues, also would need to be considered in the development of this feasibility study. If it is determined to be feasible, then a plan would be developed and implemented to reestablish the wetland habitat.

VISITOR USE AND EXPERIENCE AND USER CAPACITY

Visitor Use and Experience

Existing visitor activities, consistent with park purposes and NPS management policies, would continue under alternative 3. Visitors would continue to have year-round access to cultural resources at the Tumacácori unit and access to the Calabazas and Guevavi units via guided tours during the winter season. Public use would continue to be prohibited in the fenced portion of the Calabazas and Guevavi units without NPS staff or authorized volunteers.

In alternative 3, there would be expanded opportunities for visitors along the Santa Cruz River in the Tumacácori unit by promoting interpretive/educational activities. Several new visitor facilities, including picnic areas and overlooks, would be provided to expand opportunities for visitors primarily in the Tumacácori unit (see “Management of Specific Areas” below).

Virtual tours, such as podcasts or web-based camera views, and automobile tours in the Santa Cruz River valley would be developed to connect the three park units and to connect the park to the larger community in the valley. The virtual tours would provide visitors with an opportunity to experience the Calabazas and Guevavi units when guided tours were not available.

Anza and Mission Trails. As discussed in chapter 1 of the 1996 *Juan Bautista de Anza Trail Comprehensive Management and Use Plan / Final Impact Statement* (NPS 1996b), independent of this general management plan, a segment of the Anza Trail would link the Tumacácori and Calabazas units. In alternative 3, as with alternative 2, the National Park Service would formalize the Anza Trail segment through the Tumacácori unit.

In this alternative, the National Park Service would work with partners to establish a new

mission trail that would link the Calabazas and Guevavi units. There is a long-standing interest in Santa Cruz County in establishing a spur trail off the Anza Trail, linking the Calabazas and Guevavi units. The 1996 general management plan (NPS 1996) called for a trail linking the three units, documenting the need for a connecting segment from the Calabazas to Guevavi units. The *Juan Bautista de Anza Trail Comprehensive Management and Use Plan / Final Impact Statement* (NPS 1996b) also identified a proposed mission trail that would connect to the Guevavi unit as a trail link with the Anza Trail. The Mission Trail would start from the Anza Trail by the Calabazas unit, run by the southern end of the Calabazas unit, then follow existing trail and road segments on public land to the extent possible, ending at the Guevavi unit. The trail between the units would be multiuse, consistent with the use of the Anza Trail. The trail would pass by, but not actually enter the two units. Additional details on the Mission Trail, including the route, signage, and location of new development, and funding would be included in a future plan and compliance document. It must be stressed that partners would be essential for establishing and maintaining this trail. Planning for the trail would be coordinated with agencies and organizations that have an interest in trails and recreation along the Santa Cruz River, such as Santa Cruz County, the Anza Trail Coalition of Arizona, and the State of Arizona.

User Capacity

In this alternative, park staff would monitor social and resource indicators, evaluate current conditions against the standards, and take appropriate steps to ensure that the park’s user capacity is not exceeded. See the “User Capacity” section at the end of the alternatives for the indicators, standards, and management and monitoring strategies that would be followed under alternative 3.

FIGURE 9:
DRAFT ALTERNATIVE THREE
TUMACÁCORI UNIT



Zones

- Special Cultural Protection
- Cultural Protection
- Visitor Services
- Mission Support
- Natural

Trails

- Multi-Use, Proposed
- Multi-Use, Existing

Existing Features

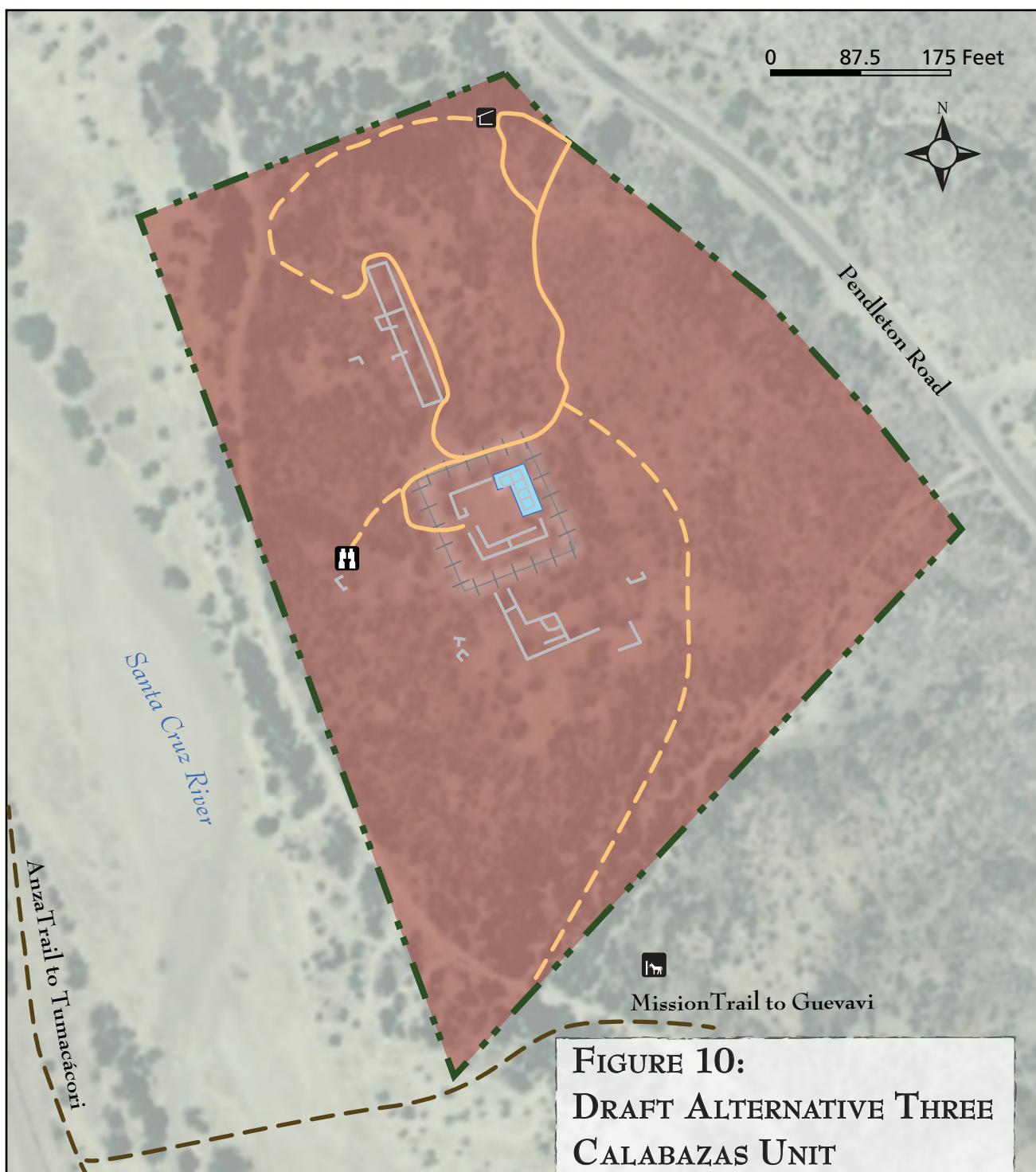
- Park Unit Boundary
- Archeological
- Historic Ditch Alignment
- Historic Wall
- Intact Irrigation Ditch
- Mission Wall
- Mortuary Chapel

Proposed Features

- Shade Structure (Improvements)
- Picnic Area
- Horse Hitching Post

Structures

- Mission
- Historic
- Modern



Zones

- Special Cultural Protection
- Cultural Protection
- Visitor Services
- Mission Support
- Natural

Trails

- Pedestrian, Proposed
- Multi-Use, Proposed
- Pedestrian, Existing
- Multi-Use, Existing

Existing Features

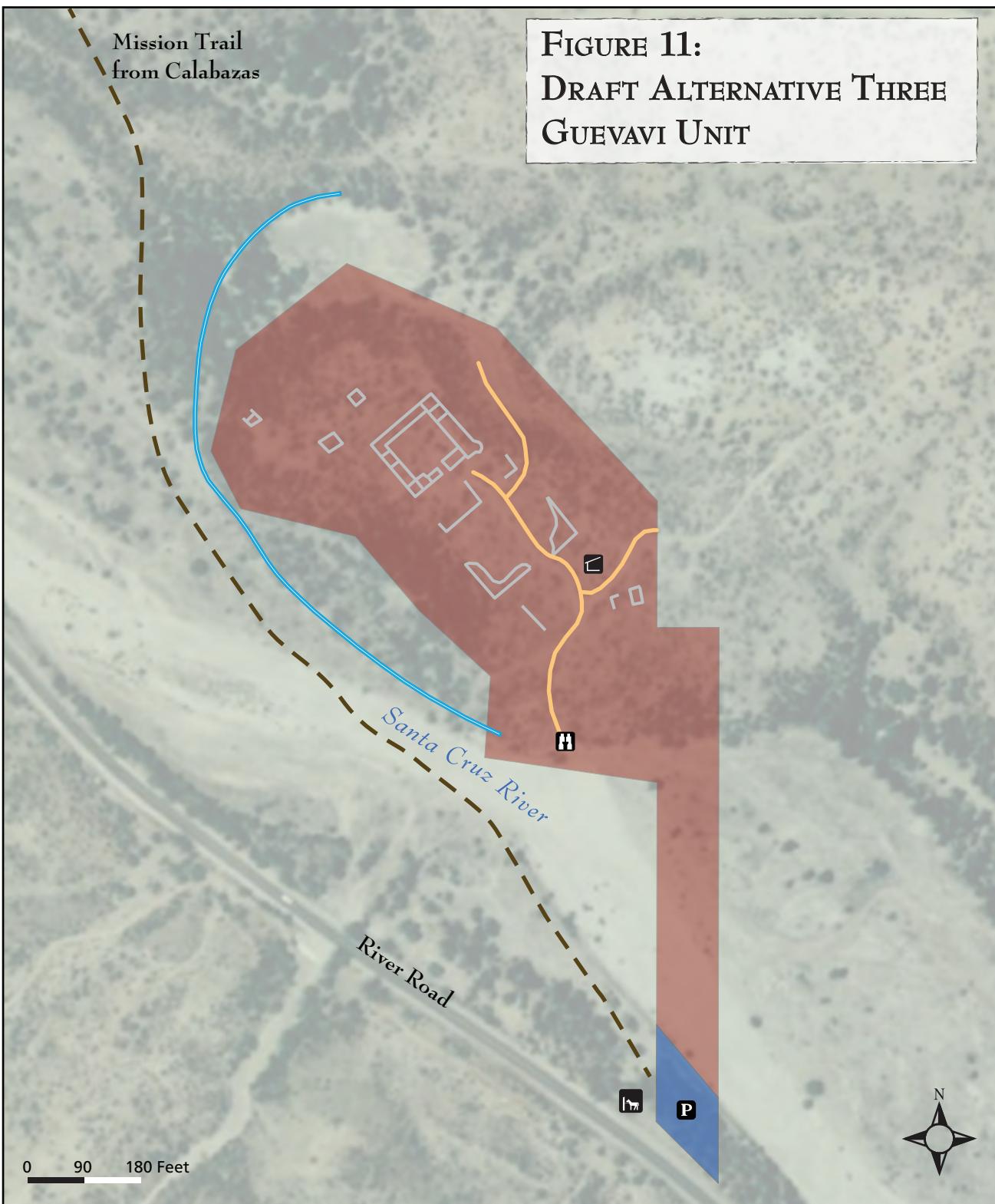
- Park Unit Boundary
- Mission Ruins
- + + + + Fence
- Metal Roof

Proposed Features

- Overlook
- Shade Structure
- Horse Hitching Post

December 21, 2012

FIGURE 11:
DRAFT ALTERNATIVE THREE
GUEVAVI UNIT



Zones

- [Red Box] Special Cultural Protection
- [Orange Box] Cultural Protection
- [Blue Box] Visitor Services
- [Purple Box] Mission Support
- [Green Box] Natural

Existing Features

- [Dashed Green Line] Park Unit Boundary
- [Grey Line] Mission Ruins
- [Blue Line] Aequia

Trails

- [Dashed Orange Line] Pedestrian, Proposed
- [Dashed Black Line] Multi-Use, Proposed
- [Solid Orange Line] Pedestrian, Existing
- [Solid Black Line] Multi-Use, Existing

Proposed Features

- [P] Parking
- [People icon] Overlook
- [Shade Structure icon] Existing Shade Structure
- [Horse Hitching Post icon] Horse Hitching Post

December 21, 2012

INTERPRETATION

As in the other alternatives, in alternative 3 the interpretation program would continue to be centered in the park's visitor center and on the three mission sites. However, the interpretive focus would broaden to cover the park's connection to the larger mission system, including other historic sites in the Santa Cruz River valley, and on the importance of the park's natural resources. The park staff would interpret the connections between the area's natural resources, settlement in the area, and the cultural resources in the park and related sites in the valley. Changes in the Santa Cruz River valley over time and the impacts on resources would be discussed. Wayside exhibits and kiosks would connect visitors to the park's resources.

Under alternative 3, interpretive opportunities would be developed related to natural and cultural resource management techniques including, but not limited to, using informal interpretive or temporary wayside-style signs near ongoing historic preservation work taking place at one of the units.

COMMUNITY CONNECTIONS AND PARTNERSHIPS

In alternative 3, as in the previous alternatives, park staff would continue to focus on promoting positive relationships with surrounding communities and other partners. Increased efforts would be undertaken to forge and maintain partnerships with associated communities, tribes, academic institutions and schools, user groups, and other groups connected to Tumacácori National Historical Park. The focus of partnership efforts would be to expand the virtual boundaries of the park into the communities in the greater river valley by emphasizing natural and cultural connections to the river. Park staff would seek community partners to collaborate on

regional activities affecting the park and the valley. These could include

- cultural history within the heritage corridor (e.g., American Indian history and culture, history of the missions, ranching)
- shared history between the river and the park
- promoting stewardship of natural and cultural resources (e.g., water conservation)

In this alternative, efforts would be made to expand community stewardship of the river. National Park Service staff would work with communities outside of the park on large-scale natural resource issues along the river corridor. Partnerships would be developed to improve land management activities that affect the river, such as water pumping and runoff from lands adjacent to the river. Multiday river restoration projects, educational programs, volunteer opportunities, and special events to celebrate the river are examples of actions that could be pursued in this regard. These actions also would provide an opportunity to build and strengthen NPS-community connections.

Park staff would seek to build relationships with the American Indian tribes that historically and traditionally used the river. Efforts would be undertaken to document the tribes' traditional stories and understand current issues related to the river.

In alternative 3, the National Park Service would strive to instill a sense of community pride and ownership in the park by emphasizing traditional ties to the park and its resources, especially the Santa Cruz River. In this regard, the National Park Service would continue to sponsor several annual special events, such as historic reenactment Mass, La Fiesta de Tumacácori, and Luminarias. Consideration would also be given to introducing new events with

activities outside the park. In addition, all three park units would be offered as a venue for community events related to the river. However, before new events would be allowed criteria would be developed to determine the appropriateness of special events consistent with the park purpose, significance, and this alternative concept. The criteria could be similar to the criteria developed for commercial visitor services (e.g., criteria to determine necessary and appropriate activities).

As in alternative 2, several other partnerships would be pursued. Partnerships would be sought to establish the Mission Trail. Park staff would work with the Anza Trail Coalition of Arizona to address management issues and common interests in managing the trail in the park. The National Park Service could work with the Arizona Land and Water Trust, a nonprofit corporation, in pursuing options related to the protection of lands adjacent to the Guevavi unit.

MANAGEMENT OF SPECIFIC AREAS

Tumacácori Unit

As in alternative 1, in alternative 3 selected landscapes in the unit—such as the mesquite bosque and riparian area—would continue to be revegetated with native plants as resources allow. Opportunities for pedestrian and horse access would continue to be provided to the Juan Bautista de Anza National Historic Trail from three existing trailheads in the unit. The existing Anza Trail would be better marked and other visitor-created trails closed and revegetated so the Anza Trail route is clearly apparent to visitors. Visitors would continue to cross the river via a footbridge on the Anza Trail.

Several additional actions would be taken to expand opportunities for visitors in the area. One or two picnic areas would be established in the mesquite bosque along the Anza Trail. These areas would include only picnic tables. Visitors would pack out their

waste. Waysides and informational kiosks would be developed along the Anza Trail and at the points where the trail enters the park. The existing shade structures in the Fiesta grounds also would be improved so they are more sustainable.

Bicycles are allowed on the Anza Trail. However, bicycle use on the Anza Trail within the Tumacácori unit is not permitted because the National Park Service does not allow bicycle use on trails in parks without being considered in a trail-specific analysis in a plan addressing trail use (36 CFR 4.30, NPS *Management Policies 2006*, section 9.2.2.4). Before bicycle use could be permitted, the suitability of the existing trail surface and soil to accommodate bicycle use must be evaluated. Life cycle maintenance costs, safety considerations, strategies to prevent or minimize user conflict, and methods of protecting natural and cultural resources also must be considered in the evaluation. In addition, an impact analysis must be completed—bicycle use on a trail can only be permitted if there are no significant impacts.

The evaluation on whether to allow bicycles on the Anza Trail in the Tumacácori unit would be included in the parkwide trail plan (see the following “Parkwide Trails Plan” section). The decision document for the parkwide trails plan would include a superintendent’s determination on whether bicycle use on the Anza Trail would be consistent with the protection of park natural, cultural, scenic, and esthetic values and safety considerations and management objectives, and would not result in the disturbance of wildlife or other park resources. This written determination would be published in the *Federal Register*. After a review of public comments, the regional director would then need to approve the superintendent’s written determination before bicycle use could be allowed on the Anza Trail within the park.

Horse hitching posts would be provided on the east side of the mission complex. If

bicycling is allowed on the Anza Trail, then bicycle racks also would be provided. The hitching posts and bike racks would be in separate locations. Visitors could then enter the mission complex on foot.

Calabazas Unit

Several new visitor facilities would be built in this area in alternative 3. An unstaffed, open-air ramada (shade structure) would be developed to provide orientation and interpretive information, although the structure would be smaller in alternative 3 than in alternative 2. The structure also would provide benches and some shelter for visitors. The low-profile structure would be designed to blend in to the environment and to have minimal impact on the park's resources and viewshed. An overlook with wayside exhibits and waysides along the trails also would be built to connect visitors to the important resources in the area. A new unpaved pedestrian trail segment would be established to connect existing trails, creating a loop trail (see figure 10). Other unpaved trail segments would be established to an overlook and southern end of the unit to connect with the Mission Trail. After the unit's boundary is fenced, the two-track trail along the west boundary would be closed and revegetated.

Horse hitching posts and possibly bicycle racks would be provided in separate areas on the periphery of the unit. These visitors would then walk into the unit as part of a ranger- or volunteer-guided tour. With the establishment of the Mission Trail, a gate and sign would be erected at the park boundary, informing visitors about access into the unit.

Guevavi Unit

The existing deteriorating shade structure would be replaced with a more sustainable, similar-sized structure. Like the Calabazas unit facility, this one would be designed to have a minimal impact on resources and the viewshed, provide some interpretive

information, and provide some shelter for visitors. An overlook with wayside exhibits and waysides along the trails in the area also would be provided.

As in alternative 2, in alternative 3 a parking area off of River Road would be established with marked parking spaces and signs.

Spaces for a limited number of cars would be provided for visitors using the Mission Trail. There would be no signs about the Guevavi unit or spur trails to the unit. All visitors entering the Guevavi unit would be on ranger- or volunteer-guided tours and would access the unit from the east driving over land, with the permission of landowners.

A horse hitching post and possibly bicycle racks would be provided in separate areas near the new parking area.

Boundary Study. As in the previous alternatives, alternative 3 would have a boundary study prepared to examine various possibilities for protecting the significant cultural resources outside the Guevavi unit. These potential actions could include a boundary adjustment, with the National Park Service acquiring land with or without the water rights, establishing a conservation easement for the lands, or entering into a cooperative agreement with the City of Nogales to protect the area.

PARK OPERATIONS AND FACILITIES

In alternative 3, the existing administrative and visitor facilities, as well as the new facilities described above, would be maintained to current standards, and NPS staff would continue to seek funding as needed to address impacts to resources. Efforts also would continue to prevent illegal uses of the park. Permanent park staffing levels (FTEs) would increase with the added facilities and programs in this alternative (see the annual costs below section).

All new facilities in the park units would be designed using a cohesive, consistent look and feel. For example, the same style of signs and waysides would be used in all of the units.

As in all of the alternatives, to address a deferred maintenance need, the two existing recreational vehicle/trailer pads, located just east of the NPS employee residence in the Tumacácori unit, would be upgraded under alternative 3. The upgrade would include adding sewer hookups to both pads, and building small shade ramadas in keeping with traditional architecture.

To accommodate additional staff in this alternative, the existing staff offices would be redesigned and reconfigured.

The park's boundary is not clearly marked for the three units. To address this problem, boundary signs would be applied where appropriate. A fence would also be eventually built and maintained around the boundary of the Calabazas unit to protect resources and stop illegal uses, including all-terrain vehicles that drive through the unit. Prior to construction, public outreach efforts would occur explaining the need for the fence, and a law enforcement ranger would be hired to monitor use of the area (see the "Estimated Costs" below).

Park staff would develop and implement management approaches to minimize impacts to park resources, visitors, and operations during special events. Examples of new approaches could include developing alternative parking arrangements and conducting archeological surveys in the area before the special events.

Steps would be taken to minimize impacts on the soundscape and viewsheds inside the three units. This could include removing vegetation or other visual obstructions to important views. Park staff would work with partners to protect views from the park and minimize or avoid noises that affect the

park's soundscape (see also desired conditions in appendix B.)

Parkwide Trail Plan

A parkwide trail plan with appropriate compliance would be prepared to address trail and resource and access issues in the three units. Among the topics the trail plan would address include

- evaluating whether to permit bicycle use along the Anza Trail in the Tumacácori unit
- providing new access opportunities in the Calabazas unit, including establishing a new unpaved trail from the existing park trail to the unit's southern boundary

The trail plan would focus on trails on NPS lands and therefore would not address the Mission Trail.

ESTIMATED COSTS

Cost estimates for alternative 3 are identified below. These cost estimates, in 2011 dollars, are only intended to indicate a very general relative comparison of costs among the alternatives; they are not to be used for budgeting purposes.

Identification of these costs does not guarantee future NPS funding. Project funding may not come all at once; it would likely take many years to secure and may be partially obtained through partners, donations, or other non-NPS federal sources. Although the National Park Service hopes to secure this funding, the park may not receive enough funding to achieve all desired conditions within the time frame of this management plan (the next 15 to 20 years).

Costs have been broken down into two categories: annual operating costs and one-time costs. Annual costs include the costs

associated with ongoing maintenance, utilities, staffing, supplies and materials, and any leasing costs. One-time costs include projects such as trail building, native species restoration, and structure rehabilitation. None of the alternatives call for construction of new buildings.

Annual Costs

Alternative 3 is estimated to result in \$1.348 million in annual costs in 2011 dollars, a 2% increase over alternative 1. These costs include changes in salaries and benefits and facility operations. The staffing costs include an additional 1.5 FTE positions over current staffing levels. Seasonal student employees and volunteers supplement the park staff and would continue to support the park as needed. Ongoing maintenance of new trails and interpretive panels would be somewhat offset by the anticipated savings in maintenance costs that would result from installation of sustainable structures, such as the proposed shade structures.

To fully implement this alternative would require additional staff to address resource management, visitor experience, and operational needs. The staffing needs have been prioritized and the following positions would allow the National Park Service to begin implementing some aspects of the general management plan:

- one resource management position (1 FTE)
- one shared law enforcement position (0.5 FTE)

Some actions cannot be initiated until there are appropriate personnel to maintain and implement all the actions proposed in this alternative. In particular, the park would require additional staff to address maintenance and partnership activities. Park managers would explore opportunities to work with partners, volunteers, and other federal agencies to leverage resources to effectively and efficiently manage the park.

Additional staff or agreements would be necessary to fully implement this alternative.

One-time Costs

It is estimated that alternative 3 would result in one-time costs of \$704,000 in 2011 dollars. These costs would primarily be due to development of new facilities such as multi-use trails, virtual and auto tours, remodeling space for NPS employee offices, and interpretive panels and kiosks. These actions would be initiated when the park has the available resources to initiate and maintain the completed facilities.

Planning, constructing, and maintaining the proposed Mission Trail would be a considerable effort and one that would be undertaken only with commitment from the many partners invested in the trail's establishment. The vast majority of the trail would cross land outside of the park, and therefore, cost estimates for the National Park Service reflect a portion of the eventual total cost to establish the trail. Substantial efforts by the partners would also be necessary to bring the trail to fruition.

Deferred Maintenance

Deferred maintenance refers to maintenance activities for assets in the park that were not performed when scheduled. Assets include infrastructure such as buildings, including the historic structures, trails, interpretive waysides, and boundary fencing. The park staff has identified approximately \$1.063 million of deferred maintenance related to assets in the park. This figure is representative of when the assessment was made and is not necessarily indicative of future deferred maintenance needs.

When the assessment was conducted, the majority of the deferred maintenance costs in the park related to the historic structures and buildings. Under this alternative, the park staff would address this and other deferred maintenance activities. In particular, the park would address deferred

maintenance related to the Ruins trail and the recreational vehicle pads for park VIPs in the Tumacácori unit. The park staff would

continue to address deferred maintenance of park assets as expeditiously as possible.

TABLE 6: SUMMARY OF COSTS FOR ALTERNATIVE 3

ANNUAL OPERATING COSTS	
Existing Park Operations and Facilities	\$1,348,000
Staffing (additional FTE)	15.5 (+1.5)
Tumacácori Unit <ul style="list-style-type: none"> • Formalized river trail • Picnic area • Overlooks • Interpretive kiosks and panels • Staff offices: rehabilitation of existing space • Support costs for staff 	\$ 135,000
Calabazas Unit <ul style="list-style-type: none"> • Overlooks • Interpretive panels • Vegetation restoration study 	\$ 85,000
Guevavi Unit <ul style="list-style-type: none"> • Overlooks • Interpretive panels • Shade structure • Parking area • Trailhead sign • Vegetation restoration study 	\$ 126,000
All Units <ul style="list-style-type: none"> • Virtual tour • Auto tour 	\$ 130,000
Mission Trail	\$ 228,000
Total one-time capital costs	\$ 704,000
Deferred Maintenance	\$1,063,000

Note: All costs are in 2011 dollars.

USER CAPACITY

OVERVIEW

General management plans for national park system units are required by law to identify and address implementation commitments for user capacity, also known as carrying capacity. The National Park Service defines user capacity as the types and levels of visitor use that can be accommodated while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park. Managing user capacity in national parks is inherently complex and depends not only on the number of visitors, but also on where the visitors go, what they do, and the “footprints” they leave behind. In managing for user capacity, the park staff and partners rely on a variety of management tools and strategies rather than relying solely on regulating the number of people in a park area. In addition, the ever-changing nature of visitor use in parks requires a deliberate and adaptive approach to user capacity management.

The basis for making user capacity decisions in this general management plan are the purpose, significance, and management zones associated with the park. The purpose and significance define why the park was established and identify the most important resources, values, and visitor opportunities that would be protected and provided. The management zones in each action alternative describe the desired resource conditions and visitor experiences, including appropriate types of activities and general use levels, for different locations throughout the park. The zones, as applied in the alternatives, are consistent with, and help the National Park Service achieve, its specific purpose and significance. As part of the Park Service commitment to implement user capacity, the park staff would abide by these directives for guiding the types and levels of visitor use that would be accommodated while

sustaining the quality of park resources and visitor experiences consistent with the purposes of the park.

In addition to these important directives, this plan includes indicators and standards for Tumacácori National Historical Park. Indicators and standards are measurable variables that would be monitored to track changes in resource conditions and visitor experiences. The indicators and standards help the National Park Service ensure that desired conditions are being attained, supporting the fulfillment of the park’s legislative and policy requirements. The general management plan also identifies the types of management actions that would be taken to achieve desired conditions and related legislative and policy requirements.

Table 6 includes the indicators, standards, and potential future management strategies, allocated by management zones, which would be implemented as a result of this planning effort. The planning team considered many potential issues and related indicators that would identify impacts of concern, but those described below were considered the most significant, given the importance and vulnerability of the resource or visitor experience affected by visitor use. The planning team also reviewed the experiences of other parks with similar issues to help identify meaningful indicators. Standards that represent the minimum acceptable condition for each indicator were then assigned, taking into consideration the qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, staff management experience, and scoping on public preferences.

User capacity decision making is a form of adaptive management (see figure 12) in that it is an iterative process in which management decisions are continuously

informed and modified. Indicators are monitored, and adjustments are made as appropriate. As monitoring of conditions continues, managers may decide to modify or add indicators if better ways are found to measure important changes in resource and

social conditions. Information on the NPS monitoring efforts, related visitor use management actions, and any changes to the indicators and standards would be available to the public.

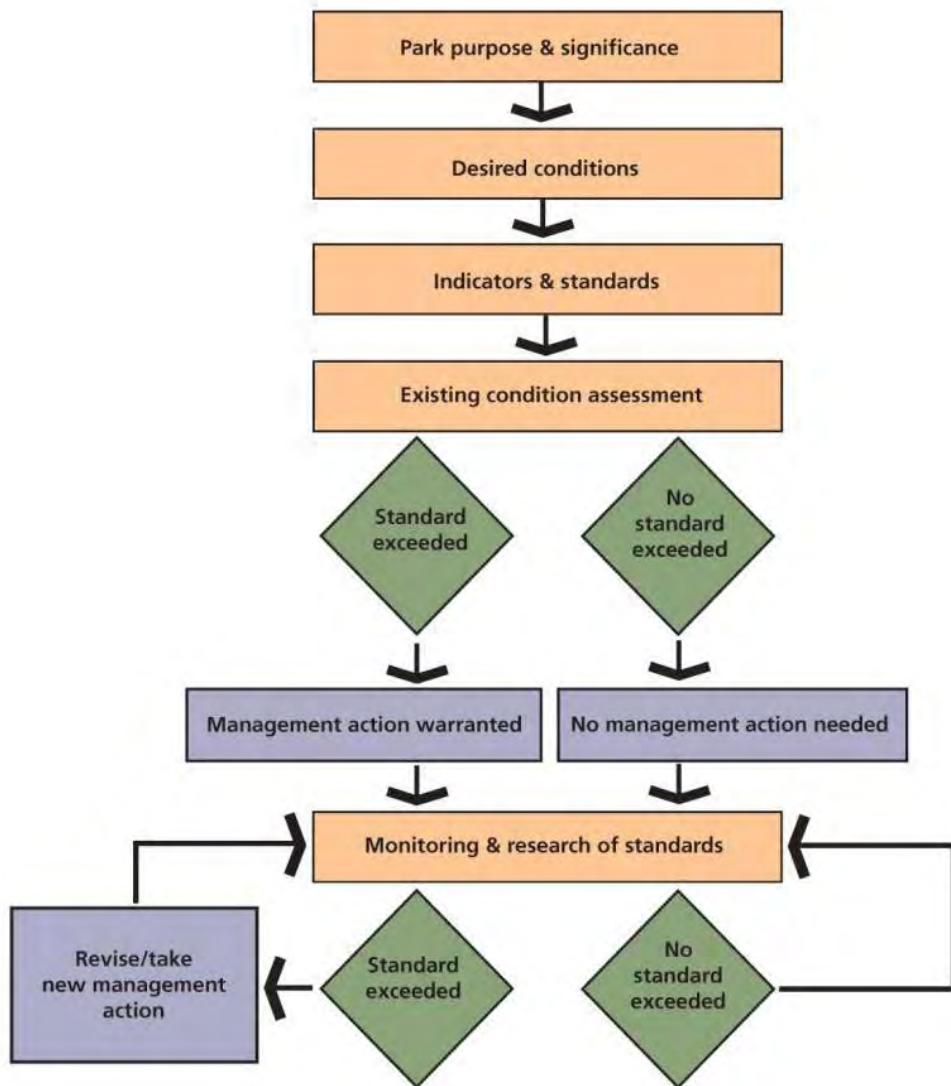


FIGURE 12. USER CAPACITY FRAMEWORK

INDICATORS AND STANDARDS

The priority indicators for Tumacácori National Historical Park are associated with the following issues:

- visitor-created trails
- incidents of digging (treasure hunting)
- intentional breaches to the park fenceline
- incidents of visitors with metal detectors in the park
- loss of artifacts during special events
- complaints related to special events in the park
- incidents of hiker and horseback rider conflicts
- incidents of graffiti
- loss of historical fabric to intentional actions

Visitor-created Trails

Trails within the park are susceptible to overuse, which leads to erosion, compaction, and visitor-created trails. These impacts degrade the area adjacent to the trail and lead to a diminished visitor experience. Conditions such as muddiness, standing water, and exposed tree roots are common on overused trails (Marion and Leung 2001). Visitor-created trails can lead to areas with sensitive cultural sites or fragile vegetation, and thus affect the natural and cultural resources of that area. For these reasons, an indicator was developed for visitor-created trails with the standard being no more than three “new” visitor-created trails off the designated trail per year. This indicator excludes the riparian areas adjacent to the Santa Cruz River. The river corridor floods and any visitor-created trails that may have existed are washed away annually. Park managers can take actions to reduce the amount of impacts that visitor-created trails

may have (outside the riparian area) when the standard is at or near the above threshold. Examples of actions that could be taken include educating visitors about the impacts of visitor-created trails, such as a visitor orientation regarding the trail system; providing visitors with trail maps and potentially placing waysides or kiosks along the trails; relocating trails or removing them from sensitive areas; and potentially closing a troubled area if impacts from visitor-created trails persist.

Incidents of Digging

The park has many buried cultural resources that are irreplaceable and priceless. Occasionally, park staff will find evidence of visitors digging for these artifacts or hear from a visitor who observed someone digging in the park. Many instances of this illegal activity occur in areas that are typically closed to visitor use (except with a ranger-guided tour) such as the Calabazas and Guevavi units. This act of vandalism on park grounds can lead to loss of artifacts, a loss of knowledge associated with the stolen artifacts, and damage to buried features and archeological sites. The digging for artifacts also has the unintended consequences of creating opportunities for erosion to further damage the site. The cultural resources are extremely sensitive to incidences of digging; for this reason, an indicator was established for measuring the number of times per year that digging for resources occurs in the park. The standard of no more than one incident of digging per year was set intentionally low to ensure that resources are not lost through digging in the park. If this standard is exceeded, the park staff may need to increase their educational and interpretive efforts, increase condition assessment monitoring, place more signs around the park, and place remote cameras to provide 24-hour surveillance of the areas that are most prone to digging. Finally, if the standard is repeatedly violated, temporary or permanent closure of the area may be necessary.

Breaches to the Fenceline

The park is enclosed by a fence that runs the majority of the official boundary. The lands adjacent to the park are primarily private property that accommodates a wide variety of uses. The National Park Service recently acquired a new parcel of land along the Santa Cruz River that had been traditionally used by the local people. The rules that govern the park are often in conflict with these traditional uses, which often include such activities as the grazing of livestock and the use of all-terrain vehicles (ATVs). These factors—the addition of the new land and the park being surrounded by private property—have led to incidences of trespassing by people, livestock, and ATVs. Often associated with this trespassing are acts of vandalism, mostly in the form of cutting or destroying park fences.

Trespassing by both animals and humans is currently prohibited; monitoring this activity may reveal where this type of activity is occurring, which may reveal access and use patterns of the owners of the lands surrounding the park. The park staff already has in place a protocol for monitoring the fenceline of the park, and has established an indicator measuring the number of intentional breaches to the fenceline. The standard for this indicator was split between the Tumacácori unit and the Calabazas and Guevavi units to account for the more sensitive nature of the remote sites. For the Tumacácori unit, the standard was set at no more than two intentional breeches of the fenceline per month; for the Calabazas and Guevavi units, the standard was set at no more than one intentional breach of the fenceline per three month period. The management strategies would be the same regardless of the unit. The development of stronger relationships with surrounding landowners and the creation of a neighborhood watch program to foster a sense of stewardship can be implemented if the standards are being violated. Park managers may also consider an increase in the number of patrols of the fenceline as well as the placement of remote cameras in

known problem areas. The park does not currently have law enforcement staff, but if this standards is being exceed on a regular basis, a full-time law enforcement ranger may be needed.

Incidents of Metal Detectors

The park has many cultural resources that are irreplaceable and priceless that lay on or just below the surface. Occasionally park staff will observe visitors using metal detectors or hear from a visitor who observed someone using a metal detector in the park. Although this happens parkwide, fewer of these illegal acts occur in areas that are typically closed to visitors use such as the Calabazas and Guevavi units. This act of potential vandalism on park grounds can lead to loss of artifacts, a loss of knowledge associated with the stolen artifacts, and damage to buried features and archeological sites. This indicator is closely tied to the indicator for digging. If an artifact is found as a result of using a metal detector, the individual is likely to try to dig it up. Therefore, to complement the digging indicator, an indicator was developed measuring the number of reported incidents of visitors using metal detectors in the park. The standard of no more than one incident of visitors using metal detectors per year was set intentionally low to ensure that resources are not lost through this action in the park. If this standard is exceeded, the park staff may need to increase their educational and interpretive efforts, increase condition assessment monitoring, place more signs around the park, and place remote cameras to provide 24-hour surveillance of those areas most prone to digging. Finally, if the standard is repeatedly violated, temporary or permanent closure of the area may be necessary.

Loss of Artifacts During Special Events

Visitor use impacts on irreplaceable archeological sites include intentional and unintentional disturbances and theft of

archeological resources. These resources are nonrenewable, so impacts, especially those resulting from unlawful behavior, must be minimized to the extent possible. This is especially true during special events held at the park that attract large numbers of people (e.g., La Fiesta de Tumacácori). The park staff is already using internal guidelines to monitor cultural resources; these monitoring efforts would now include the loss of artifacts related to special events. The indicator for loss of artifacts during special events is based on this existing monitoring protocol and the standard would be no more than a 40% loss of artifacts after a special event within a predetermined grid (based on existing protocol). This standard would apply only to the Tumacácori unit because this is where all special events are currently held. Managers would focus on educational efforts for visitors and vendors during special events if the loss of artifacts was trending upward. Increasing the monitoring of special event participants and potentially relocating the special events may be needed if the standard is continually violated.

Complaints Related to Special Events

Visitors can generally expect to see very few people at the park during regular hours. However, during special events, the park can become busy and crowded, and thus provide a different experience than the casual visitor might expect when they arrive. Special events, such as La Fiesta de Tumacácori, are important to the mission of the park and to the interpretation of the history of the site, but may need to be regulated to preserve the visitor experience. By monitoring and tracking visitor complaints related to special events (including special use permits) park managers can document the impacts from special events on visitor experience and thus gauge the appropriateness of certain events in the park. A standard of no more than three complaints related to special use permits per year was developed to protect the visitor experience and limit the potential impacts related to special use permits. To ensure that this standard is not exceeded,

park managers may consider providing detailed information on the park website about when special events may occur and potentially adjusting the timing of the events. If the number of complaints is trending upward, limiting the size of the groups or limiting the total number of special events per year may be considered.

Hiker and Horseback Rider Conflicts

The trail system within the park connects to several adjacent trails outside the park. Some of these trails are created by the surrounding landowners, while the Juan Bautista de Anza National Historic Trail connects directly to the park's trails system. The section of the Anza Trail from the park to Tubac is one of the most popular sections in the area for horseback riding. Due to the popularity of horseback riding surrounding the park, there is the potential for conflict between visitors hiking on the trails at the park and horseback riders using these same trails—hikers may not expect to see horses, there may be horse manure on the trails, and horses may be spooked by hikers (McClaran and Cole 1993). For this reason, an indicator was developed measuring the number of complaints per year related to hikers and horseback rider conflicts. The standard was set at no more than two complaints a year related to hiker and horseback rider conflicts before management action is needed. If the number of complaints is more than two per year, park managers may consider increasing their educational efforts by providing visitor orientation regarding the use of the trails or constructing informational kiosks along the trails. Construction of new trails, relocation, removal, or closure of trails may also be considered. If the number of complaints consistently exceeds the standard, the separation of horseback riders and hikers may be enacted.

Incidents of Graffiti

The cultural resources at the park are extremely vulnerable to intentional acts of

vandalism such as graffiti on the walls of the historical structures. The structures at the Tumacácori unit have areas of specific concern, specifically the sacristy, the sanctuary, and the baptistery. Park managers also found it important to monitor for graffiti at the Calabazas unit. The park staff is already tracking this visitor impact to cultural, historical, and archeological resources. The indicator for graffiti is based on this existing monitoring protocol. The standard was set at no more than one incident of graffiti per year for the sacristy, the sanctuary, and the baptistery, combined. There would be no more than one incident of graffiti per year at the Calabazas unit. To ensure these standards are maintained, visitor education (interpretation of historic graffiti) and enforcement of park regulations would be continued. A possible increase in surveillance and ranger-guided tours would also be options. Complete closure of an area to the public may be needed if the standard is being exceeded on a regular basis.

Loss of Historic Fabric

The historic structures within the park are vulnerable to visitor impacts, intentional and unintentional. The intentional impacts are of the most concern to park managers and thus need to be constantly monitored. Impacts to the historic resources (e.g., walls) can lead to a loss of knowledge from the damage caused by the acts of vandalism. Use patterns and unauthorized entrance into controlled areas of the park can also be determined by monitoring intentional acts of damage to historic fabric. A standard of no more than one incident of loss of historic fabric per year would allow park managers to take immediate action to remedy the situation if it arises. Educational messages regarding the extremely sensitive nature of the historic fabric would be the initial management action if the standard is being violated. Park

managers may also employ the use of remote cameras to monitor areas of particular concern. If park managers are finding it difficult to stay within standards, they may consider increasing the number of staff available for tours and special events and in extreme cases close selected areas of concern temporarily or permanently.

LONG-TERM MONITORING

The staff would continue monitoring use levels and patterns throughout the park. In addition, the park staff would monitor these user capacity indicators. The rigor of monitoring the indicators (e.g., frequency of monitoring cycles, amount of geographic area monitored) might vary considerably depending on how close existing conditions are to the standards. If the existing conditions are far from exceeding the standard, the rigor of monitoring might be less than if the existing conditions are close to or trending towards the standard.

Initial monitoring of the indicators would determine if the indicators are accurately measuring the conditions of concern and if the standards truly represent the minimally acceptable condition of the indicator. Park staff might decide to modify the indicators or standards and revise the monitoring program if better ways are found to measure changes caused by visitor use. Most of these types of changes should be made within the first several years of monitoring. After this initial testing period, adjustments would be less likely to occur. Finally, if use levels and patterns change appreciably, the park staff might need to identify new indicators to ensure that desired conditions are achieved and maintained. This iterative learning and refining process, a form of adaptive management, is a strength of the NPS user capacity management program.

TABLE 7. SUMMARY OF USER CAPACITY INDICATORS, STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES

Indicator	Assigned Zone	Standard	Management Strategies
Number of visitor-created trails off the designated trails outside of the riparian areas	Natural	No more than three visitor-created "new" trails off the designated trails per year	Provide visitor orientation about trail system Develop partnerships with user groups and stakeholder Provide kiosk/trail maps Clear delineation of trails through signage Provide regulatory signs (e.g., about types of use allowed) Relocation of trails Construction/improvement of trails Removal of trails Potential closure of trouble areas
Number of digging incidents per year	Parkwide	No more than one incident of digging per year	Increase education and interpretation Neighbor partnerships (to reduce incidents of digging) Site stewards that monitor archeological sites Increase condition assessment monitoring Increase in staff monitoring and reporting More signs Increase in staff monitoring and reporting Monitoring with cameras Permanent or temporary closure of areas
Number of intentional breaches to the fenceline per month	Parkwide	No more than two intentional breaches of fenceline per month (Tumacácori unit) No more than one intentional breach of fenceline per three months (Calabazas and Guevavi units)	Develop better relationships with surrounding landowners and partners Develop neighborhood watch program, develop stewardship Increased reporting of breaches—case incident reports More signs (regulatory and informational) Increase monitoring frequency of fenceline Increase patrols of fenceline GPS areas of concern to identify trouble areas More involvement by law enforcement staff Use different fencing material (pipe fence)
Number of reported incidents of visitors with metal detectors per year	Parkwide	No more than two incidents of visitors using metal detectors in the park per year	Increase education and interpretation Develop neighbor partnerships to help report incidents of visitors using metal detectors Use site stewards to monitor archeological sites

TABLE 7. SUMMARY OF USER CAPACITY INDICATORS, STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES

Indicator	Assigned Zone	Standard	Management Strategies
Percentage of artifacts lost after special events	Cultural protection Visitor services (Tumacácori unit)	No more than 40% loss of artifacts (within a grid) after a special event for each zone	<ul style="list-style-type: none"> Increase signs Increase condition assessment monitoring Increase in staff monitoring and reporting Institute monitoring with cameras Temporary or permanent closure of area
Number of complaints related to special events (including special use permits)	Parkwide	No more than three complaints related to special use permits in a year	<ul style="list-style-type: none"> Increase in staffing Institute website updates about special events Increase the restrictions outlined in the special use permits Evaluate staff capacity to manage special events (special use permits) Adjust the timing of special events Group management (size limits) Limit number of special event and groups for special use permits
Number of complaints related to horse/hiker conflicts per year	Natural Special Cultural Protection	No more than two complaints related to horse/hiker conflicts in a year per zone	<ul style="list-style-type: none"> Provide information on the website about the trails Placement of comment box at trail heads Develop partnerships with user groups and stakeholders Provide visitor orientation about trails use Provide kiosk/trail maps Provide regulatory and information signs Construction of trails Relocation of trails Permitting user groups Separation of different types of visitor uses Removal of trails Potential closure of trouble areas

TABLE 7. SUMMARY OF USER CAPACITY INDICATORS, STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES

Indicator	Assigned Zone	Standard	Management Strategies
Number of incidents of graffiti in the sacristy, the sanctuary, and the baptistery per year	Cultural Protection (Tumacácori unit)	No more than one incident of graffiti per year	Provide information on the website about historical graffiti and impacts of new graffiti Educate visitors about sensitive nature of the church Increased interpretation of historical graffiti Provide signs Station interpreters Institute camera monitoring Closure of the selected areas within the church Limit use to ranger-guided tours only
Number of incidents of graffiti at Calabazas per year	Special Cultural Protection (Calabazas unit)	No more than one incident of graffiti per year	Provide information on the website about historical graffiti and impacts of new graffiti Education about sensitive nature of the Calabazas unit Establish site stewardship—patrolling of site Provide signs Institute camera monitoring Increase staff patrol of site Reduce size of tours Closure of the selected areas
Incidents of loss to historic fabric due to intentional actions per year	Cultural Protection Special Cultural Protection	No more than one incident of loss of historic fabric per year per zone	Provide information on the website about the sensitive nature of the historic fabric Educate visitors about impacts on historic fabric Establish site stewardship—patrolling of site Provide signs Institute camera monitoring Increase staff patrol of site Increase staff for tours and special events Reduce size of tours Closure of selected areas

COST SUMMARY OF THE ALTERNATIVES

National Park Service decision makers and the public must consider an overall picture of the complete costs and advantages of the alternatives, including the no-action alternative, to make wise planning and management decisions for Tumacácori National Historical Park. In estimating the costs of the alternatives, both annual recurring and one-time project costs were considered.

The cost figures shown here and throughout the plan are intended to provide only an estimate of the relative costs of the alternatives. National Park Service and industry cost estimating guidelines were used to develop the costs (in 2011 dollars) to the extent possible, but the estimates should not be used for budgeting purposes. Specific

costs will be determined in subsequent, more detailed planning and design exercises, and with consideration for resource protection needs and changing visitor expectations. Actual costs to the National Park Service will vary depending on if and when the actions are implemented, and on contributions by partners and volunteers.

The implementation of the approved plan, no matter which alternative is selected, will depend on future funding levels and servicewide priorities, and on partnership funds, time, and effort. The approval of this plan does not guarantee that funding and staffing needed to implement the plan will be forthcoming. Full implementation of the plan could be many years in the future.

TABLE 8: ESTIMATED COSTS OF THE ALTERNATIVES (IN 2011 DOLLARS)

	Alternative 1 (No Action)	Alternative 2 (NPS Preferred)	Alternative 3
Annual Operating Costs	\$1,374,000	\$1,395,000	\$1,395,000
Staffing (additional FTE)	14.5 (+0.5)	15.5 (+1.5)	15.5 (1.5)
One-time Capital Costs	\$ 498,000	\$ 818,000	\$ 704,000

Notes:

Annual operating costs are the total costs per year for maintenance and operations associated with each alternative, including utilities, supplies, staff salaries and benefits, leasing, and other materials. Cost and staffing estimates assume that the alternative is fully implemented as described in the narrative.

The staffing figure (total number of FTEs) is the number of person-years of staff required to maintain the assets of the park at a good level, provide acceptable visitor services, protect resources, and generally support the park's operations. The FTE number indicates operationally funded NPS staff only, not volunteer positions or positions funded by partners. FTE salaries and benefits are included in the annual operating costs.

One-time capital costs include projects related to facilities, preservation of resources, and other park management activities that would require substantial funding above park annual operating costs.

Costs associated with developing a boundary study for the Guevavi unit are not included in the cost estimates.

MITIGATIVE MEASURES COMMON TO ALL ACTION ALTERNATIVES

Congress charged the National Park Service with managing the lands under its stewardship “in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (NPS Organic Act, 16 USC 1). As a result, NPS staff routinely evaluate and implement mitigative measures whenever conditions occur that could adversely affect the sustainability of national park system resources.

Mitigative measures are the practicable and appropriate methods that would be used under the action alternative to avoid or minimize harm to park natural and cultural resources and the visitor experience.

The general management plan provides a management framework for the park. Within this broad context, the following mitigative measures would be used to avoid or minimize potential impacts from the implementation of the action alternatives. These measures would be applied to all of the action alternatives, subject to funding and staffing constraints. Additional mitigation would be identified as part of implementation planning and for individual projects to further minimize resource impacts.

The National Park Service would prepare environmental review (i.e., those required by the National Environmental Policy Act, National Historic Preservation Act, and other relevant legislation) for these future actions where appropriate. As part of the environmental review, the National Park Service would avoid, minimize, and mitigate adverse impacts when practicable. The implementation of a compliance monitoring program would be within the parameters of NEPA and NHPA compliance documents, etc.

The following mitigative measures and best management practices would be applied to avoid or minimize potential impacts from implementation of the action alternatives. These mitigative measures have been developed by using existing laws and regulations, best management practices, conservation measures, and other known techniques from past and present work in and around Tumacácori National Historical Park.

CULTURAL RESOURCES

The National Park Service would preserve and protect, to the greatest extent possible, resources that reflect human occupation of the park. Specific mitigative measures include the following:

- Appropriately preserve and protect national register-listed or national register-eligible cultural resources, any stabilization, preservation, and rehabilitation efforts would be undertaken in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995).
- Continue documenting cultural and ethnographic landscapes in the units and identify treatments to ensure their preservation.
- Conduct additional background research, resource inventory, and National Register of Historic Places evaluation where information about the location and significance of cultural resources is lacking, including development of a multiple property historic context for

- national register eligibility for archeological resources. Incorporate results of these efforts into site-specific planning and compliance documents.
- Should archeological resources be discovered during any construction, work would stop in that location until the resources are properly recorded by the National Park Service and evaluated under the Archeological Resources Protection Act and the eligibility criteria of the National Register of Historic Places. Because stopping construction can be expensive, preconstruction resource inventories and assessments will be conducted to minimize the probability of work stoppage. If, in consultation with the Arizona state historic preservation officer, the resources are determined eligible for listing in the national register, appropriate measures either to avoid further resource impacts or to mitigate the loss or disturbance of the resources would be implemented.
 - Align documentation according to standards of the Historic American Buildings Survey / Historic American Engineering Record / Historic American Landscape Survey (HABS/ HAER/HALS). The level of this documentation, which includes photography, archeological data recovery, and/or a narrative history, would depend on significance (national, state, or local) and individual attributes (such as an individually significant structure or individual elements of a cultural landscape) and be determined in consultation with the state historic preservation officer. In addition, the historical alteration of the human environment and reasons for that alteration would be interpreted to park visitors.
 - Wherever possible, locate projects and facilities in previously disturbed or existing developed areas. Design facilities to avoid archeological resources.
 - Whenever possible, modify project design features to avoid effects on cultural resources. New developments would be relatively limited and would be on sites that blend with cultural landscapes and are not adjacent to ethnographic resources. If necessary, use vegetation screening to minimize impacts on cultural landscapes and ethnographic resources.
 - Encourage visitors through interpretive programs to respect, and leave undisturbed, tribal offerings and archeological resources.
 - Strictly adhere to NPS standards and guidelines on the display and care of artifacts. This would include artifacts used in exhibits in the visitor center.

NATURAL RESOURCES

General

- New facilities would be built in previously disturbed areas or in carefully selected sites with as small a construction footprint as possible.
- Site-specific surveys would be conducted before any ground disturbance takes place to ensure impacts are minimized and important resources are avoided as much as possible.

- Interpretive displays and programs, ranger patrols, and regulations would be used to minimize impacts due to visitors.
- Construction materials (including sand, fill, and soil) and supplies would be stored, transported, and inspected in a manner to minimize the potential for transporting nonnative plants or animals into the park.

Air Quality

Mitigative measures to minimize, avoid, and reduce adverse effects to air quality could include implementation of a dust abatement program for any construction. Standard dust abatement measures could include the following elements:

- Water or otherwise stabilize soils.
- Minimize vegetation clearing.
- Revegetate areas after construction.

Soundscape

Standard noise abatement measures would be implemented during construction to mitigate impacts to natural soundscapes. Standard measures could include the following elements:

- Schedule work to minimize impacts on nearby noise-sensitive areas or activities.
- Use the best available noise control techniques wherever feasible.
- Locate stationary noise sources as far from sensitive areas or activities as possible.
- Site and design facilities to minimize the frequencies, magnitudes, and durations of human-caused sound.

Water Resources

To prevent water pollution during construction, mitigation would include the following:

- Follow best management practices such as the use of silt fences, to ensure that construction-related soil erosion and loss are minimal and to prevent long-term impacts on water quality, wetlands, and aquatic species.
- Minimize discharge to drainages.
- No vehicle maintenance or refueling would occur within 100 feet of streams.
- Regularly inspect construction equipment for leaks of petroleum and other chemicals.

Wetlands

To avoid adverse effects on wetlands, the National Park Service would do the following:

- Delineate wetlands to inform the design and apply best management practices during construction; wetlands would be delineated by qualified NPS staff or certified wetland specialists and clearly marked before construction work.
- Perform construction activities using site-specific methods to prevent damage caused by equipment, erosion, and siltation.
- As feasible, work to remove nonnative plants/animals and restore natural water flows.

Soils

The National Park Service would implement mitigative measures to minimize, avoid, and offset adverse effects to soils. These measures could include the following elements:

- Ensure that proposed development would be on appropriate soil types.
- Minimize soil erosion by limiting the time that soil is left exposed and by applying other erosion control measures, such as erosion matting and silt fencing, in construction areas to reduce erosion, surface scouring, and discharge to drainages.
- Once work is completed, revegetate construction areas with native plants in a timely manner.

Native Vegetation

Mitigative measures would be taken to minimize, avoid, and reduce adverse effects to vegetation. These measures could include the following:

- Monitor areas used by visitors, such as trails, for signs of native vegetation disturbance; use public education, revegetation of native plants, erosion control measures, and barriers to control potential impacts on plants from trail erosion or the creation of trails by visitors.
- Use barriers and closures to prevent trampling and loss of vegetation in riparian areas.
- Develop revegetation plans for disturbed areas, including construction sites, and require the use of native species; revegetation plans should specify such features as seed and plant sources, seed and plant mixes, and soil preparation; use salvaged vegetation from

construction activities to the extent possible.

Nonnative Species

Standard measures would be taken to prevent the introduction and spread of nonnative species. These measures could include the following elements:

- Ensure that construction-related equipment arrives on site free of mud or seed-bearing material.
- Inform visitors about the potential for spreading nonnative species.
- Monitor trails for presence of nonnative species and take appropriate action to control the spread of these plants if they are detected.
- Certify all seed and straw material as weed free.

Prior to construction, identify areas of noxious weeds and treat noxious weeds or noxious weed topsoil by methods such as topsoil segregation, storage, or herbicide treatment.

Revegetate with appropriate native species.

Native Wildlife

Mitigative measures would be taken to minimize, reduce, or avoid adverse effects on wildlife. These measures could include the following:

- Implement standard measures to protect wildlife and wildlife habitat during construction, such as scheduling, biological monitoring, erosion and sediment control, use of fencing or other means to protect sensitive resources adjacent to construction, removal of all food-related items or rubbish, topsoil salvage, and revegetation; this could include specific construction

monitoring by resource specialists as well as treatment and reporting procedures.

- Employ techniques to reduce visitor impacts on wildlife, including visitor education programs, restrictions on visitor activities, and park ranger patrols.
- Manage visitor use and access to avoid particularly sensitive wildlife habitats, such as nesting or foraging areas, or particular times when wildlife may be more susceptible to disturbance, such as breeding or nesting seasons.

Threatened and Endangered Species

Mitigative actions would occur during normal park operations as well as before, during, and after construction to minimize immediate and long-term impacts to rare, threatened, and endangered species. These actions would vary by specific project and area. Many of the measures listed below for vegetation and wildlife also would benefit threatened and endangered species by helping to preserve habitat. Mitigative actions specific to threatened and endangered species would include the following:

- To inform the location and design of facilities/actions, and avoid potential adverse impacts, conduct surveys for rare, threatened, and endangered species as warranted.
- Locate and design facilities/actions to avoid adverse effects on rare, threatened, and endangered species; conduct work outside of critical periods for the specific species; in particular, all construction activities would occur as much as possible outside of the southwestern willow flycatcher and yellow-billed cuckoo migratory and breeding season, from April through September; if avoidance is infeasible, minimize and

compensate adverse effects on the species as appropriate and in consultation with the appropriate resource agencies.

- Develop and implement restoration and/or monitoring plans as warranted; plans should include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.
- Implement measures to reduce adverse effects of nonnative plants and wildlife on rare, threatened, and endangered species.
- Manage visitor use and access in rare, threatened, or endangered species' habitats to avoid, offset, and minimize potential adverse effects to the habitats or species; this could include education, trail or area closures, temporary or seasonal restrictions, or rerouting of visitor access.

VISITOR SAFETY AND EXPERIENCES

Visitor safety, use, and experience would be protected and enhanced with the following:

- Implement measures to reduce adverse effects of construction on visitor safety and experience.
- Continue the use of directional signs and education programs to promote understanding among visitors.
- Implement adaptive visitor use management, as outlined in the user capacity section of this plan, when resource and visitor experience conditions trend toward or violate a user capacity standard.
- Employ management strategies such as visitor education, site management, visitor use regulations, rationing or reallocation of visitor

use, and enforcement, as appropriate.

HAZARDOUS MATERIALS

Mitigative measures to minimize, reduce, or avoid potential exposure to or adverse effects from hazardous materials would include the following:

- Employ best management practices for hazardous materials storage and handling, and for spill containment, cleanup, and reporting.
- Limit refueling and other activities involving hazardous materials to upland or nonsensitive sites.

SCENIC RESOURCES

Mitigative measures are designed to minimize visual intrusions. These include the following:

- Where appropriate, use facilities such as boardwalks and fences to route people away from sensitive natural and cultural resources while still permitting access to important viewpoints.
- Design, site, and build facilities to avoid or minimize adverse effects on natural and cultural resources and visual intrusion into the natural viewshed and/or landscape.
- Provide vegetation screening where appropriate.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

As defined in the Council of Environmental Quality's "Forty Most Asked Questions,"(Q6a) the environmentally preferable alternative is defined as "...the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources."

In analyzing the impacts to natural and cultural resources, as described in Chapter 4, none of the alternatives would result in more than moderate adverse impacts—most adverse impacts would be negligible to minor in intensity. Indeed, most of the park's natural resources would not be affected by the alternatives. Compared to alternative 1, both alternatives 2 and 3 would have about the same level of adverse impacts. Some localized minor impacts would occur to the construction and use of new facilities in the action alternatives. However, both action alternatives would better protect the park's natural resources through increased monitoring, increased volunteer and outreach efforts (which would

increase visitor awareness of the park's natural resources), increased native vegetation restoration efforts, better designation of existing trails, increased cooperation with neighbors and development of partnerships, and the application of user capacity indicators and standards. Likewise, alternatives 2 and 3 would better protect the park's cultural resources through increased monitoring of archeological resources, historic structures and cultural landscapes, and increased outreach and education efforts, which in turn would increase visitor awareness and community stewardship efforts.

Comparing alternatives 2 and 3, there is little if any differences in both the adverse and beneficial impacts of the alternatives. Both alternatives would have about the same level of adverse impacts on park resources and beneficial impacts, protecting park resources. Thus, from an environmentally preferable standpoint, both alternatives 2 and 3 would be environmentally preferable compared to alternative 1.

FUTURE STUDIES AND IMPLEMENTATION PLANS

After the completion and approval of this general management plan, other more detailed studies and plans will be needed before specific actions can be implemented. As required, additional environmental compliance (related to the National Environmental Policy Act, National Historic Preservation Act, and other relevant laws and policies) and public involvement would be conducted. The following list of plans and studies is not exhaustive—other plans may be identified in the future. Plans and studies that need to be prepared for the park include

- an ethnographic overview and assessment for the entire park
- cultural landscape reports for all three units
- a parkwide trail plan, with appropriate compliance, covering trails and access points in the three units, and an evaluation of whether or not to allow bicycle use on the Anza Trail in the Tumacácori unit
- a comprehensive interpretation plan that describes the park's interpretive program, including both nonpersonal media and personal services programs, visitor experience goals, and visitor issues and influences; the plan will help the park staff decide priorities for their objectives, determine what stories to tell, identify their audiences, and describe the most effective mix of media and personal services to use
- plant restoration plans for the Guevavi and Calabazas units, focusing on the current condition of vegetation communities and identifying priorities for restoration of native habitat and increasing biodiversity

- user capacity monitoring protocols, which describe how, who, when, and where the park staff will monitor the user capacity indicators
- a space plan to accommodate additional staff
- a scope of collections statement that defines the purpose and significance of the museum collection, establishes limits for subject matter, identifies geographic location and time periods to which the collection relates, states what types of objects would be acquired to fulfill the purpose of the park's museum collection, and briefly outlines policies, priorities, and procedures for the acquisition, preservation, and use of the collections
- a response plan to address potential flooding in the Guevavi unit, which could strand visitors and staff
- a special events management plan
- a commercial visitor services plan
- a boundary study for the Guevavi unit

In addition to the above plans and studies, a park resource stewardship strategy would be prepared. This plan would provide a strategic approach for long-range management of the park's natural and cultural resources. The resource strategy would translate the conceptual information in this plan into specific desired conditions and management actions to achieve those conditions.

In cooperation with partners, an implementation plan would be prepared, with appropriate compliance, for establishing the Mission Trail linking the Calabazas and Guevavi units.

ALTERNATIVES AND MANAGEMENT ACTIONS CONSIDERED BUT DISMISSED

During the planning process, several potential actions were considered by the planning team in developing the alternatives. However, for various reasons these actions were not included in the alternatives. Below is a short description of these items and a brief reason for their dismissal.

DESIGNATION OF A PORTION OF THE TUMACÁGORI UNIT AS A RESEARCH NATURAL AREA

Research natural areas are part of a national network of sites designed to facilitate research and preserve natural features. These areas are usually established in a typical example of an ecological community type, preferably one having had very little disturbance in the past and where natural processes are not unduly impeded. NPS *Management Policies 2006* (section 4.3.1) further state that these areas “... contain prime examples of natural resources and processes, including significant genetic resources that have value for long-term observational studies or as control areas for manipulative research taking place outside the parks.”

A suggestion was made to designate a research natural area in the Tumacágori unit riparian area. Long-term bird research has been conducted in the riparian area for 11 years. This is a long-term database seldom enjoyed by a small park. However, the riparian area has been substantially altered and although it is more “natural” than the rest of the park, it does not meet the above conditions. The park’s enabling legislation, which covers the riparian area, also focuses on the preservation of cultural resources. In addition, as noted in management policies, activities in research natural areas are generally restricted to education and other

activities that do not detract from an area’s research values. Limiting public access in this area would be inconsistent with the park’s purposes (i.e., to protect, preserve, and interpret the natural and cultural heritage resources of the missions, and to provide access and educational opportunities for the public to understand cultural interactions in the Santa Cruz valley).

RESTORATION OF WETLANDS AND FARMING IN THE GUEVAVI UNIT

A suggestion was made to restore the *cienega* (wetlands) and farming in the Guevavi unit. Both wetlands and farming once occurred in the area. However, water is necessary for both of these proposals, and existing water in the area is largely being used or is committed to other uses (e.g., residential growth, agriculture). Thus, there is little or no water available in the Santa Cruz River to make these actions feasible. In addition, the National Park Service does not own rights to use this water.

ERECT A VEGETATIVE BARRIER TO SCREEN ADJACENT LAND USES AT THE CALABAZAS UNIT

Adjacent land uses, such as a water treatment plant, detract from views from the Calabazas unit. It was suggested that vegetation be planted to screen these views. However, this proposed action is infeasible due to the absence of water in the area.

ALLOW UNESCORTED ACCESS INTO THE CALABAZAS AND GUEVAVI UNITS

It was suggested that visitors be allowed into the two units without an NPS ranger escort or on an NPS-approved tour. However, the cultural resources in these units are very sensitive to disturbance. The risk of adverse impact to the historic structures and archeological resources is too great to allow visitors into these units on their own. Thus, this action was dismissed from further consideration.

RESTRICT USE OF A PORTION OF THE ANZA TRAIL TO PEDESTRIANS IN THE TUMACÁCORI UNIT

This action was proposed to avoid potential impacts between pedestrians and other users on the Anza Trail. However, there is no evidence that such impacts (e.g., conflicts between horse users and pedestrians) are occurring, and no reason to expect such impacts would occur in the future, given the anticipated levels of use. This action is not technically and economically feasible

because it would be very difficult to manage the trails if parts were open to multiple uses while other parts were open only to pedestrians—e.g., horseback users would face problems if they had to go around a portion of a trail. It would be difficult to enforce this restriction, given park resources and staffing.

PROVIDE A CAMPGROUND IN THE PARK

A suggestion was made to provide a new opportunity for visitors to camp in the Tumacácori unit. This proposal was dismissed because it is not technically or economically feasible. There is not enough space in the unit for a campground. Development and use of the campground would require increased staffing and funds that are not likely available. A campground also would increase the potential for severe adverse impacts to cultural resources, with people walking around unescorted. In addition, there is no need for such a campground in the park because there are other locations near the park where visitors can camp.

TABLE 9: COMPARISON OF THE KEY DIFFERENCES IN THE ALTERNATIVES

ALTERNATIVE 1 (CONTINUATION OF CURRENT MANAGEMENT)	ALTERNATIVE 2 (CONNECTING VISITORS TO THE PARK) NPS PREFERRED ALTERNATIVE	ALTERNATIVE 3 (CONNECTING THE PARK TO THE LARGER COMMUNITY THROUGH THE SANTA CRUZ RIVER)
Concept: The park would continue to manage for the protection and interpretation of natural and cultural resources as outlined in the 1996 Tumacácori National Historical Park General Management Plan. Since the lands along the Santa Cruz River were added to the Tumacácori unit in 2002 (six years after the completion of the general management plan), the park staff would manage these lands according to applicable laws and NPS policies. Management of these lands would include the restoration of natural resources with available funding and staff.	Concept: Under this alternative, park management would focus on engaging visitors, park neighbors, and partners in the history and outstanding natural and cultural resources found at all three park units. Visitors would be encouraged to spend their time connecting with the three park units. Visitor activities would be focused on the Tumacácori unit. Interpretation would include the complex history of the <i>Pimería Alta</i> and the park's connection to the larger mission system, including other historic sites in the Santa Cruz River Valley. Park management would focus on the preservation of cultural resources and the restoration of natural resources. The Park Service would provide a greater variety of visitor opportunities and experiences that reflect the significance of place. The park would also provide opportunities for visitors to develop personal connections to the park, its resources, and its history through interpretation, special events, and education and outreach. Partnership efforts would focus on integrating the community into the park so they become directly engaged in resource protection, interpretation, and the continuation of cultural demonstrations and special events. Natural and cultural resource management would be integrated to tell the complete story of the park. Interpretation would also include the importance of the Santa Cruz River.	Concept: The purpose of this alternative is to emphasize how the Santa Cruz River connects the past with the future in the Santa Cruz River Valley. Visitors would be encouraged to experience other related sites as part of a longer tour of the Santa Cruz River Valley. Visitors would be provided diverse interpretive and recreational opportunities that would instill a sense of stewardship in the park by emphasizing traditional ties to the park and its natural and historic resources. The river would be used as the starting point to interpret the natural history of the area. Within the park current activities and special events would continue and could be enhanced. Park management would focus on the preservation of cultural resources and the restoration of natural resources.
Natural Resources		
The park would strive to continue to meet the following natural resource management objectives on a year-to-year basis, with existing staff and funding consistent with NPS <i>Management Policies 2006</i> . The range of activities include: Revegetate selected landscapes (e.g., mesquite bosque, abandoned farm	In addition to the actions in alternative 1, park staff would Expand natural resource management to include community participation in management activities (e.g., volunteer programs). Remove and revegetate some existing visitor-created trails in the Tumacácori unit.	In addition to the actions in alternative 2, park staff would proactively Conduct a study to determine if it is feasible to reestablish <i>cienega</i> (perennial wetland) habitat in the Tumacácori unit.

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fields, riparian area, etc.) with native plants as resources allow. Continue to work with neighboring landowners and interested organizations to maintain surface water flows and improve water quality in the Santa Cruz River. Monitor and control nonnative species in the park.		
Cultural Resources		
The park would continue to focus on historic preservation through documentation, preservation of historic structures and archeological sites, public education, management of museum collections, and research. Activities would include: Complete cultural landscape reports for the Tumacácori, Guevavi, and Calabazas units.	In addition to the actions in alternative 1, the park staff would Develop additional monitoring strategies to increase resource protection and reduce vandalism.	In addition to the actions in alternative 1, the park staff would Develop additional monitoring strategies to increase resource protection and reduce vandalism.
Visitor Use and Experience		
Continue to provide visitors with year-round access to cultural resources at the Tumacácori unit and ranger-guided access to the Calabazas and Guevavi units during the winter season. Continue to provide pedestrian and horse access to the Juan Bautista de Anza National Historic Trail (Anza Trail) from three existing trail heads at the Tumacácori unit. At the Tumacácori unit, continue to provide opportunities for visitors to access the river at the education site and cross the river at the Anza Trail footbridge.	In addition to the actions in alternative 1, the park staff would Establish a loop trail in the riparian area in the Tumacácori unit. Allow horseback riding on the loop trail in the Tumacácori unit. Provide a horse hitching post area and possibly bicycle racks near the Tumacácori mission complex. Establish three to five picnic areas in the mesquite bosque along the Anza Trail in the Tumacácori unit. Formalize access points on both sides of the river in the Tumacácori unit. Consider expanding special events at the park. Expand cultural demonstrations. Establish connector segments to form loop trails in the Calabazas and Guevavi units In cooperation with partners, establish the Mission Trail to link the Calabazas and Guevavi units. Provide horse hitching post areas and	In addition to the actions in alternative 1, the park staff would Develop both virtual and auto tours in the Santa Cruz River Valley to connect the three units of the park and to connect the park to the larger community. Establish one to two picnic areas in the mesquite bosque along the Anza Trail in the Tumacácori unit. Opportunities to access and cross the Santa Cruz River at Tumacácori would be via the Anza Trail and Anza Trail footbridge. Provide a horse hitching post area and possibly bicycle racks near the Tumacácori mission complex. Establish a connector segment to form a loop trail in the Calabazas unit. In cooperation with partners, establish the Mission Trail to link the Calabazas and Guevavi units. Provide horse hitching post areas and possibly bicycle racks at

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	<p>possibly bicycle racks at Calabazas and Guevavi.</p> <p>Virtual tours may be developed to provide opportunities to experience Calabazas and Guevavi.</p>	Calabazas and Guevavi.
Interpretation		
Interpretation would continue to focus on the cultural resources of the park. The park would continue to have cultural demonstrations on weekends and during special events, living history programs with NPS staff, and limited outreach to schools.	<p>In addition to the actions in alternative 1, the park staff would</p> <p>Interpret/discuss changes in the Santa Cruz River Valley over time and the impacts on resources.</p> <p>Develop an outreach program to increase understanding of historic structures preservation.</p> <p>Expand school programs to include opportunities for hands-on learning related to preservation techniques.</p>	<p>In addition to the actions in alternative 1, the park staff would</p> <p>Interpret the connections between the natural resources, settlement in the area, and the cultural resources in the park and related sites in the valley.</p> <p>Develop interpretive opportunities related to natural and cultural resource management techniques.</p>
Community Connections		
Continue to sponsor special events. Continue to maintain and strengthen ties with associated communities, tribes, and other groups connected to Tumacácori National Historical Park.	<p>In addition to the actions in alternative 1, the park staff would</p> <p>Develop discussion forums that provide an opportunity for both scholarly discussion and the sharing of different perspectives.</p> <p>Expand the living history program to include more community involvement.</p> <p>Expand tribal participation in interpretation.</p> <p>Establish mentoring program for cultural demonstrations.</p> <p>Expand natural resource management to include community participation in management activities inside the park.</p> <p>Develop an outreach program to increase understanding of historic structures preservation.</p>	<p>In addition to the actions in alternative 1, the park staff would</p> <p>Instill a sense of community pride and ownership in the park by emphasizing traditional ties to the park and its resources, especially the Santa Cruz River. Strategies include the following:</p> <p>Continue special events with the potential to introduce new events.</p> <p>Expand from alternative 2 community stewardship of the river—work outside the park boundary with the community on large-scale natural resource issues along and in the river corridor.</p> <p>All three units of the park would be offered as a venue for community events.</p> <p>Initiate discussions with the tribes as related to their traditional use of the river.</p>

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Operations and Facilities		
Existing facilities would be maintained to current standards and the park would seek funding to address adverse impacts to resources.	<p>In addition to the actions in alternative 1, the park staff would</p> <p>Construct and maintain an open-air ramada at Calabazas and replace the existing basic rustic shade structure with a more sustainable shade structure for visitors at Guevavi.</p> <p>Expand cultural demonstrations, which may include livestock and farming in the Tumacácori unit.</p> <p>Establish and maintain a loop trail in the riparian area in the Tumacácori unit.</p> <p>Provide and maintain a horse hitching post area and possibly bicycle racks near the Tumacácori mission complex.</p> <p>Establish and maintain three to five picnic areas in the mesquite bosque along the Anza Trail in the Tumacácori unit.</p> <p>Formalize two to four access points to provide access to the river in the Tumacácori unit.</p> <p>Consider expanding special events at the park.</p> <p>Establish connector segments to form loop trails in the Calabazas and Guevavi units</p> <p>Provide and maintain horse hitching post areas and possibly bicycle racks at Calabazas and Guevavi.</p>	<p>In addition to the actions in alternative 1 the park staff would</p> <p>Construct and maintain an open-air ramada at Calabazas and replace the existing shade structure at Guevavi with a more sustainable shade structure (the structure at Calabazas would be smaller in this alternative than in alternative 2).</p> <p>Establish and maintain one to two picnic areas in the mesquite bosque along the Anza Trail in the Tumacácori unit.</p> <p>Continue to provide visitors an opportunity to access and cross the Santa Cruz River in the Tumacácori unit via the Anza Trail and Anza Trail footbridge.</p> <p>Provide and maintain a horse hitching post area and possibly bicycle racks near the Tumacácori mission complex.</p> <p>Establish a connector segment to form a loop trail in the Calabazas unit</p> <p>Provide and maintain horse hitching post areas and possibly bike racks at Calabazas and Guevavi.</p>
Partnerships		
<p>Continue to work with neighboring landowners and interested organizations to retain surface water and improve water quality in the Santa Cruz River.</p> <p>Continue to work with local organizations to accomplish parkwide activities.</p> <p>Continue providing training opportunities in resource preservation and interpretation as resources allow.</p> <p>Continue current partnerships to interpret the river ecosystem and to study water quality impacts.</p>	<p>Focus of partnership efforts is to integrate the community into the park so they become directly engaged in resource protection, interpretation, and the continuation of cultural demonstrations and special events inside the park.</p> <p>In addition to the actions in alternative 1, potential partnerships include:</p> <p>Engage area youth in ongoing activities as well as a training/mentoring program in historic preservation</p>	<p>Focus of partnership efforts is to expand the virtual boundaries of the park into the community by emphasizing natural and cultural connections across the community through the lens of the Santa Cruz River. The National Park Service would intentionally seek community partners to collaborate on bigger picture/regional activities outside the park including:</p> <p>Cultural history within the heritage corridor</p>

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	<p>techniques and cultural demonstrations.</p> <p>Develop partnerships that enable the National Park Service and its partners to provide a more complete history of the park that links the three units to the surrounding communities.</p> <p>Develop partnerships to help establish the Mission Trail.</p>	<p>Shared history between the river and the park</p> <p>Promoting stewardship of natural and cultural resources</p> <p>In addition to the actions in alternative 1, potential partnerships include the following:</p> <p>Develop both virtual and auto tours in the valley to connect the three units of the park and to connect the park to resources in the larger community.</p> <p>Develop partnerships to improve land management activities that impact the river.</p> <p>Develop partnerships to help establish the Mission Trail.</p>
Boundary Study		
Prepare a boundary study to examine different ways to protect lands adjacent to the Guevavi unit that are associated with the original village and hold important archeological sites.	Same as alternative 1	Same as alternative 1

MEETING THE PURPOSE OF AND NEED FOR THE PLAN

The actions proposed in a general management plan should meet the purpose of and need for the plan (see the chapter 1 discussion on purpose and need).

Alternatives 2 and 3 meet the purpose of and need for the plan including how to manage the additional 310 acres added to the Tumacácori unit in 2002. Alternative 1 meets the purpose, but it does not meet the need for the plan because it does not address the 310-acre addition.

A general management plan should also address project issues and opportunities. Table 10 compares the ability of these alternatives to address project issues and opportunities (as outlined in chapter 1). As shown in table 10, alternative 2 addresses all eight project issues and opportunities, while the other two alternatives do not.

TABLE 10: DEGREE TO WHICH THE ALTERNATIVES ADDRESS ISSUES AND OPPORTUNITIES

ISSUES AND OPPORTUNITIES	ALTERNATIVE 1 (CONTINUATION OF CURRENT MANAGEMENT)	ALTERNATIVE 2 (CONNECTING VISITORS TO THE PARK) NPS PREFERRED ALTERNATIVE	ALTERNATIVE 3 (CONNECTING THE PARK TO THE LARGER COMMUNITY THROUGH THE SANTA CRUZ RIVER)
Cultural Resource Issue 1: Minimize environmental and human-caused impacts to mission architecture, archeological sites, and associated features.	No. Historic structures and archeological resources are not given further protection under this alternative.	Yes. Proposed monitoring, preservation, and operational activities would help protect historic structures and archeological resources.	Yes. Proposed monitoring, preservation, and operational activities would help protect historic structures and archeological resources.
Cultural Resource Issue 2: Management approaches help convey a sense of place or historic context in all three park units, including recently acquired lands along the Santa Cruz River.	No. No additional interpretation or cultural resource management activities would occur under this alternative.	Yes. Additional interpretation at all three park units would convey a sense of place and historic context. Interpretation would include the historical significance of the Santa Cruz River to the region.	Yes. Additional interpretation at all three park units would convey a sense of place and historic context.
Natural Resource Issue 1: Minimize the impacts to the recently acquired land along the Santa Cruz River and its associated riparian habitat.	Partially. Revegetating the riparian area, monitoring nonnative species, and improving water quality would occur under this alternative.	Yes. Proposed actions would include those in alternative 1 as well as actions to address trespass issues and visitor-created trails.	Partially. Although trespass and visitor-created trail issues would be addressed under this alternative, other natural resource issues would not.
Park Resources and Values Issue 1: Minimize impacts from ongoing or potential changes in surrounding land uses (especially from residential development) that are adversely affecting the overall character of the three park units.	No.	Partially.	Partially.
Visitor Use and Experience Issue 1: Minimize the impacts to visitor quality of experience from the variety of popular special events that draw large crowds.	No. While the number and types of special events would not change, no actions are proposed to deal with the quality of the visitor experience during these events.	Yes. Park would develop and implement criteria to determine the appropriateness (e.g., consistency with the management concept of the park) of special event requests submitted by the public.	Yes. Park would develop and implement criteria to determine the appropriateness (e.g., consistency with the management concept of the park) of special event requests submitted by the public.

TABLE 10: DEGREE TO WHICH THE ALTERNATIVES ADDRESS ISSUES AND OPPORTUNITIES

ISSUES AND OPPORTUNITIES	ALTERNATIVE 1 (CONTINUATION OF CURRENT MANAGEMENT)	ALTERNATIVE 2 (CONNECTING VISITORS TO THE PARK) NPS PREFERRED ALTERNATIVE	ALTERNATIVE 3 (CONNECTING THE PARK TO THE LARGER COMMUNITY THROUGH THE SANTA CRUZ RIVER)
Visitor Use and Experience Issue 2: Enhance or increase the range of visitor opportunities (e.g., recreational activities and interpretive programs) provided by the three park units.	No. No additional visitor opportunities are proposed under this alternative.	Yes. Additional visitor opportunities would include more hiking trails, places to ride and hitch a horse, new picnic areas, an increase in special events and cultural demonstrations, more places to access the Santa Cruz River, establishment of a new Mission Trail linking the Calabazas and Guevavi units, and a new virtual tour of the park.	Yes, but fewer visitor opportunities would be available compared to alternative 2.
Community Connections Issue 1: Strive to remain a vibrant part of the surrounding community, and become more relevant to the changing demographics of the area.	No. The park would not do any additional outreach to the community.	Yes. The park would develop more connections with the surrounding community and seek their involvement in the interpretation of the park and the protection of cultural and natural resources.	Yes, but the level of community involvement in park interpretation and resource protection would be at a lesser extent than alternative 2.
Park Operations and Facilities Issue 1: Strive to improve all elements of park operations, ensuring the park is maintained and operated in a sustainable manner.	No. Except for the upgrade of the RV/trailer pads in the Tumacácori unit, no additional actions would be taken that would affect park operations.	Partially. Additional staff and management actions would help improve park operations.	Partially. Additional staff and management actions would help improve park operations, to a lesser extent than in alternative 2.

TABLE 11: SUMMARY OF KEY IMPACTS OF THE ALTERNATIVES

	Alternative 1	Alternative 2 (NPS Preferred)	Alternative 3
NATURAL RESOURCES—VEGETATION	<p>Most of the native vegetation in the park would not be affected. There would continue to be localized adverse impacts due to people and horses, and illegal cattle and ATV trespass.</p> <p>Overall, the alternative would have a long-term, minor to moderate, beneficial impact, primarily due to continued restoration activities in the Tumacácori unit. Native vegetation in the Guevavi and Calabazas units would not be affected by the alternative.</p> <p>There would be the potential for a long-term, moderate to major, adverse cumulative impact, but the beneficial increment of alternative 1 would slightly reduce the overall adverse cumulative impact.</p>	<p>Most of the park's native vegetation would not be directly affected. Most native vegetation that would be affected by the alternative would be in the Tumacácori unit. There would be some localized long-term, minor, adverse impacts due to establishment of several new facilities (e.g., open-air shade ramada, picnic areas, unpaved trails), and higher visitor use levels in the mesquite bosque and riparian areas in the Tumacácori unit.</p> <p>Overall, compared to alternative 1, alternative 2 would have a long-term, moderate, beneficial impact, primarily due to increased efforts to remove and revegetate visitor-created trails and better designate existing trails, and increased monitoring and management efforts with local community participation.</p> <p>There would be the potential for a long-term, moderate to major, adverse cumulative impact, but the beneficial increment of alternative 2 would somewhat reduce the overall adverse cumulative impact.</p>	<p>Most of the park's native vegetation would not be directly affected. Most native vegetation that would be affected by the alternative would be in the Tumacácori unit. There would be long-term, minor, adverse impacts to native vegetation in localized areas due to the establishment of a few minimal new facilities (e.g., unpaved trails, picnic areas) in the park and increased visitor use of the Tumacácori unit.</p> <p>Overall, compared to alternative 1, alternative 3 would have a long-term, moderate, beneficial impact, primarily due to increased monitoring and increased efforts to remove and revegetate visitor-created trails and better designate existing trails.</p> <p>There would be the potential for a long-term, moderate to major, adverse cumulative impact, but the beneficial increment of alternative 3 would somewhat reduce the overall adverse cumulative impact.</p>
NATURAL RESOURCES—WILDLIFE	<p>From a parkwide perspective, alternative 1 would have both beneficial and adverse impacts on the park's wildlife. Most of the park's wildlife and habitat would not be affected by the actions under alternative 1.</p> <p>Overall, the alternative would be expected to have a long-term, minor, adverse impact on the park's wildlife, primarily due to the disturbance of some individual animals by people in the Tumacácori unit. No changes to the park's wildlife populations would be</p>	<p>Most of the park's native wildlife and habitat would not be directly affected. Most wildlife that would be affected by this alternative would be in the Tumacácori unit. There would be localized, long-term, minor to moderate, beneficial impacts due to restoration efforts in this area.</p> <p>Overall, compared to alternative 1, alternative 2 would have a long-term, minor, adverse impact in localized areas, primarily due to increased numbers of people and facilities in</p>	<p>Most of the park's native wildlife and habitat would not be directly affected. Most wildlife that would be affected by the alternative would be in the Tumacácori unit. There would be localized, long-term, minor to moderate, beneficial impacts due to restoration efforts in the Tumacácori unit.</p> <p>Overall, compared to alternative 1, alternative 3 would have a long-term, minor, adverse impact in localized areas, primarily due to increased numbers of people and facilities in</p>

TABLE 11: SUMMARY OF KEY IMPACTS OF THE ALTERNATIVES

	Alternative 1	Alternative 2 (NPS Preferred)	Alternative 3
NATURAL RESOURCES—WILDLIFE (continued)	expected to occur as a result of alternative 1.	the bosque and riparian areas of the Tumacácori unit.	the bosque and riparian areas of the Tumacácori unit.
NATURAL RESOURCES—FEDERAL-LISTED AND CANDIDATE SPECIES	There would be the potential for a long-term, major, adverse cumulative impact, although alternative 1 would add a very small increment to the overall adverse cumulative effect.	There would be the potential for a long-term, moderate to major, adverse cumulative effect on the park's wildlife, although alternative 2 would add a very small increment to the overall adverse cumulative impact.	There would be the potential for a long-term, moderate to major, adverse cumulative impact, although alternative 3 would add a very small increment to the overall adverse cumulative impact.

TABLE 11: SUMMARY OF KEY IMPACTS OF THE ALTERNATIVES

	Alternative 1	Alternative 2 (NPS Preferred)	Alternative 3
CULTURAL RESOURCES—ARCHEOLOGICAL RESOURCES	<p>Most of the archeological resources in the park would not be affected by alternative 1. There would continue to be site-specific adverse impacts due to people and horses, and illegal cattle and ATV trespass.</p> <p>Overall the alternative would have a long-term, negligible to minor, beneficial impacts, primarily due to continued documentation, preservation, and protection activities in all three units.</p> <p>There would be permanent, moderate, adverse cumulative impacts to the park's archeological resources. However, alternative 2 would add a very small adverse increment to the overall adverse cumulative impacts.</p>	<p>Most archeological resources affected by the alternative would be in the Tumacácori unit. Overall, compared to alternative 1, alternative 2 would have permanent, minor, adverse impacts, primarily due to ground disturbance activities associated with developments in all three units.</p> <p>There would be permanent, minor to moderate, adverse cumulative impacts to the park's archeological resources. However, alternative 3 would add a very small adverse increment to the overall adverse cumulative impacts.</p>	<p>Most archeological resources affected by the alternative would be in the Tumacácori unit. Overall, compared to alternative 1, alternative 3 would have permanent, minor, adverse impacts, primarily due to ground disturbance activities associated with developments in all three units.</p> <p>There would be permanent, minor to moderate, adverse cumulative impacts to the park's archeological resources. However, alternative 3 would add a very small adverse increment to the overall adverse cumulative impacts.</p>
CULTURAL RESOURCES—HISTORIC STRUCTURES	<p>Alternative 1 would have long-term, negligible to minor, site-specific, adverse impacts to historic structures primarily due to visitors coming into contact with the fragile adobe and plaster on the structures.</p> <p>There would be the potential for a long-term, negligible to minor, adverse cumulative impacts. The adverse impact of alternative 1 would add a slight adverse increment to the overall adverse cumulative impact.</p>	<p>Alternative 2 would have long-term, negligible to minor, site-specific, beneficial impacts to historic structures primarily due to preservation work performed on the structures.</p> <p>There would be the potential for a long-term, negligible to minor, beneficial cumulative impacts. The beneficial increment of alternative 2 would be a large increment of the overall beneficial cumulative impact.</p>	<p>Alternative 2 would have long-term, negligible to minor, site-specific, beneficial impacts to historic structures primarily due to the efforts to preserve the structures.</p> <p>There would be the potential for a long-term, negligible to minor, adverse cumulative impacts. The beneficial increment of alternative 3 would somewhat reduce the overall adverse cumulative impact.</p>

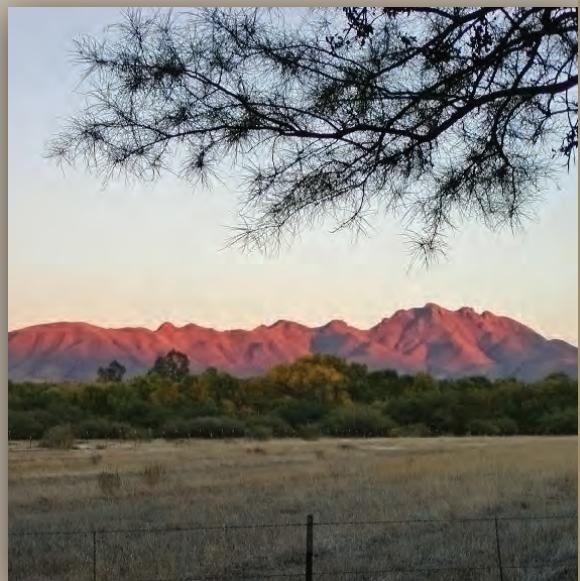
TABLE 11: SUMMARY OF KEY IMPACTS OF THE ALTERNATIVES

	Alternative 1	Alternative 2 (NPS Preferred)	Alternative 3
CULTURAL RESOURCES—CULTURAL LANDSCAPES	<p>Alternative 1 would have beneficial, long-term, negligible, site-specific impacts to cultural landscapes due to continued preservation efforts.</p> <p>There would be the potential for a long-term, minor, adverse cumulative impacts. The beneficial increment of alternative 1 would somewhat reduce the overall adverse cumulative impacts.</p>	<p>Alternative 2 would have long-term, negligible, site-specific, adverse impacts to cultural landscapes primarily due to the construction and installation of new features in or near the landscapes.</p> <p>There would be the potential for a long-term, negligible, adverse cumulative impact. The adverse impact of alternative 2 would add a very small adverse increment to the overall adverse cumulative impact.</p>	<p>Alternative 3 would have long-term, negligible, site-specific, adverse impacts to cultural landscapes primarily due to the construction and installation of new features in or near the landscapes.</p> <p>There would be the potential for a long-term, negligible, adverse cumulative impact. The adverse impact of alternative 3 would add a very small adverse increment to the overall adverse cumulative impact.</p>
VISITOR USE AND EXPERIENCE	<p>Alternative 1 would result in beneficial impacts in all three units of the park. Overall the impacts would be negligible to minor, long-term, and beneficial due to the continuation of current visitor experiences, the interpretation of cultural resources, and the sponsorship of special events in the park that involve culturally associated groups of people.</p> <p>There would be long-term, minor, beneficial cumulative impacts to visitor use and experience at the park. Alternative 1 would add a small beneficial increment to the overall beneficial cumulative impact.</p>	<p>Alternative 2 would result in beneficial impacts in all three units of the park. Overall the impacts would be minor to moderate, long-term, and beneficial due to enhanced, expanded, and inclusive visitor experiences, interpretation, and community connections. The continuation of visitor experiences, the interpretation of cultural resources, and the sponsorship of special events in the park that involve culturally associated groups of people would be particularly beneficial.</p> <p>There would be long-term, moderate, beneficial cumulative impacts to visitor use and experience at the park. Alternative 2 would add a large beneficial increment to the overall beneficial cumulative impact.</p>	<p>Alternative 3 would result in beneficial impacts in all three units of the park. Overall the impacts would be minor to moderate, long-term, and beneficial due to enhanced, expanded, and inclusive visitor experiences, interpretation, and community connections. There would be long-term, moderate, beneficial cumulative impacts to visitor use and experience at the park. Alternative 3 would add a modest beneficial increment to the overall beneficial cumulative impact.</p>
SOCIOECONOMIC ENVIRONMENT	<p>Alternative 1 would result in short-term, negligible, beneficial impacts and ongoing long-term, minor, beneficial impacts as government expenditures and visitor spending enter the local economy. The cumulative effect would be minor and beneficial.</p>	<p>Alternative 2 would result in both short- and long-term, minor, beneficial impacts as government expenditures enter the local economy. An anticipated increase in visitor spending would result in a long-term, minor, beneficial impact. The cumulative effect would be minor and beneficial.</p>	<p>Alternative 3 would result in both short- and long-term, minor, beneficial impacts as government expenditures enter the local economy. A slight increase in visitor spending would result in a long-term, minor, beneficial impact. The cumulative effect would be minor and beneficial.</p>

TABLE 11: SUMMARY OF KEY IMPACTS OF THE ALTERNATIVES

	Alternative 1	Alternative 2 (NPS Preferred)	Alternative 3
PARK OPERATIONS AND FACILITIES	<p>Alternative 1 would have long-term, moderate, adverse impacts to park operations and facilities as a result of continuing high demands on the park's limited staff.</p> <p>There would be the potential for a long-term, minor to moderate, adverse cumulative impact. Alternative 1 would add a substantial increment to the overall adverse cumulative impact.</p>	<p>Overall, compared to alternative 1, alternative 2 would have a long-term, minor, adverse impact on park operations and facilities primarily due to the increase in the proposed new facilities and operational activities in the park.</p> <p>There would be the potential for a long-term, minor adverse cumulative impact. Alternative 2 would add a large increment to the overall adverse cumulative impact.</p>	<p>Overall, compared to alternative 1, alternative 3 would have a long-term, minor, adverse impact on park operations and facilities primarily due to the increase in the proposed new facilities and operational activities in the park.</p> <p>There would be the potential for long-term, minor, adverse cumulative impacts.</p> <p>Alternative 3 would add a large increment to the overall adverse cumulative impact.</p>

CHAPTER 3 ◆ AFFECTED ENVIRONMENT



INTRODUCTION

This chapter describes the existing environment of Tumacácori National Historical Park. The focus is on the park resources, visitor experiences, socioeconomic environment, and park operations and facilities that could be affected by implementation of the alternatives. These topics were selected based on federal laws and regulations, executive orders, NPS expertise, and concerns expressed by other agencies or members of the public during scoping for this general management plan. The conditions described in this chapter establish the baseline for the evaluation of environmental consequences that is provided in chapter 4.

This chapter incorporates information on the additional resources that were added to the Tumacácori unit in 2002. The 310 acres that were added to the park (see figure 3) included a 1-mile stretch of the Santa Cruz

River (and adjacent riparian area, gallery forest, and mesquite bosque), the mission orchard and acequia, and lands historically used for farming. This area also includes a 1-mile section of the Anza Trail (see figure 2). All of the lands added in 2002 are now managed as part of the Tumacácori unit.

The CEQ (1978) guidelines for implementing the National Environmental Policy Act require that the description of the affected environment must focus on describing the resources that might be affected by implementation of the alternatives. The following sections—natural resources, cultural resources, visitor use and experience, socioeconomic environment, and park operations and facilities—provide detailed descriptions of the existing conditions of the park resources that could be affected by implementing the alternatives described in chapter 2.

NATURAL RESOURCES

VEGETATION

Tumacácori National Historical Park lies within the Sonoran Desert. Vegetation in the three units is typical of the lower Sonoran Desert semidesert grassland association. However, because of the park's location along a river corridor, with water flowing most of the year, the park supports diverse ecosystems and vegetation. The park's vegetation primarily consists of cottonwood-willow riparian forest and woodland along the Santa Cruz River channel (see appendix E for scientific names of all species included in this section). Velvet mesquite forest or bosque exist on low terraces and border the river channel, grading to savanna, semidesert grassland, and desert (mesquite) scrub on the uplands away from the river (Drake et al. 2009). Figures 13 and 14 are vegetation maps of the three park units.

A total of 378 plant species were recorded during surveys from 2000 to 2003, including native and nonnative species (Powell et al. 2005). Within the dominant forest and woodland communities, netleaf hackberry and Mexican elderberry are common species and, in some places, are the dominant woody species along the upland edges where woodlands give way to savannas. Other associated species include acacias, wolfberry, graythorn, and desert broom.

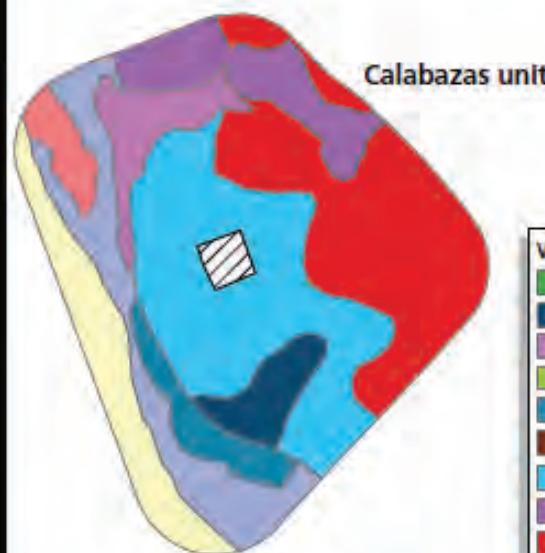
Different communities across the three park units exhibit different densities and species composition, depending not only on their site characteristics relative to the river, but also on their specific land-use histories. Although significant grass communities are scattered throughout the park, there is a

notable dominance by disturbance-tolerant species, such as nonnative Bermudagrass. A total of 191 species of vascular plants were recorded at the Tumacácori unit (Powell et al. 2005). The authors suggested the plant species richness is high because of the diversity of habitats. Tumacácori contains xeric and mesic riparian habitats, mesquite bosque, semidesert grasslands, and landscaped areas. There are diverse cottonwood-willow gallery forests associated with the Santa Cruz River. Fremont cottonwood, Goodding's willow, and Arizona walnut form dense and structurally diverse stands of vegetation in mesic riparian areas, particularly adjacent to the river. Other riparian species include netleaf hackberry, spiny hackberry, and velvet ash. On the drier riparian areas of upper floodplains and terraces are areas of dense mesquite bosque. Velvet mesquite, netleaf hackberry, and Mexican elderberry are common in these areas. There are 10 acres of abandoned farmland that are succeeding back to dominance by mesquite, and include relatively high densities of carelessweed. Vegetation around the mission is sparse, except in landscaped areas that include many of the nonnative species recorded in the park. There is a small orchard area where fig, pomegranate, and quince were planted in 2007. A stand of mesquite, netleaf hackberry, and elderberry exists on the perimeter of the orchard and is the primary stand of mature trees in the developed area of the park.

A total of 175 species of vascular plants were documented in the Calabazas unit (Powell et al. 2005). The vegetation here is dominated by velvet mesquite and grasslands. In the Guevavi unit, 151 species were recorded, with velvet mesquite and grasslands being dominant.

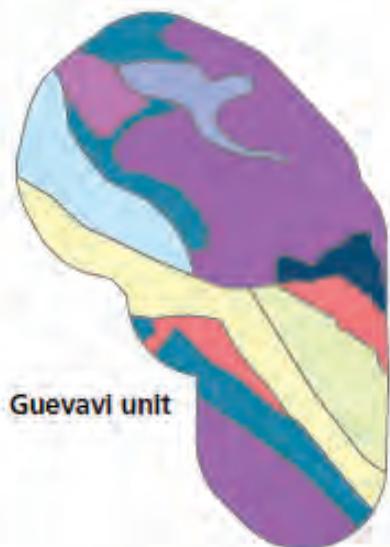


Vegetation Maps, Calabazas and Guevavi Units



Calabazas unit

Vegetation and Land Cover	
Populus fremontii - <i>Salix gooddingii</i> / <i>Baccharis salicifolia</i> Forest	
<i>Prosopis velutina</i> Forest Alliance (P)	
<i>Celtis laevigata</i> var. <i>reticulata</i> Forest Alliance	
Populus fremontii - <i>Salix gooddingii</i> Woodland	
<i>Prosopis velutina</i> Woodland Alliance	
<i>Acacia greggii</i> Woodland Alliance (P)	
<i>Prosopis velutina</i> / [<i>Prosopis velutina</i> - <i>Acacia greggii</i>] Wooded Shrubland Alliance (P)	
<i>Prosopis velutina</i> - <i>Acacia greggii</i> Shrubland	
<i>Acacia constricta</i> Shrubland Alliance (P)	
<i>Tamarix</i> spp. Semi-natural Temporarily Flooded Shrubland Alliance	
Populus fremontii / Mixed Annual Wooded Herbaceous Alliance (P)	
<i>Prosopis velutina</i> / Mixed Annual Wooded Herbaceous Alliance (P)	
<i>Prosopis velutina</i> / <i>Amaranthus palmeri</i> Shrub Herbaceous Alliance (P)	
<i>Hymenoclea monogyna</i> / [<i>Amaranthus palmeri</i> - <i>Chloris virgata</i>] Shrub Herbaceous Alliance (P)	
[<i>Amaranthus palmeri</i> - <i>Salsola kali</i> - <i>Chenopodium</i> spp.] Annual Herbaceous Alliance (P)	
Inland Freshwater Strand Beach Sparse Vegetation	
Developed Woodland	
Cropland and Pasture	
Park Facilities	
(P) = Proposed	



Guevavi unit



0 125 250 500
Meters

Produced by OALS

March 2009

Figure 12: Vegetation map of the Calabazas and Guevavi units of Tumacácori National Historical Park



Vegetation Map, Mission Unit



Vegetation and Land Cover	
Green	<i>Populus fremontii</i> - <i>Salix gooddingii</i> / <i>Baccharis salicifolia</i> Forest
Dark Blue	<i>Prosopis velutina</i> Forest Alliance (P)
Purple	<i>Celtis laevigata</i> var. <i>reticulata</i> Forest Alliance
Light Green	<i>Populus fremontii</i> - <i>Salix gooddingii</i> Woodland
Blue	<i>Prosopis velutina</i> Woodland Alliance
Brown	<i>Acacia greggii</i> Woodland Alliance (P)
Cyan	<i>Prosopis velutina</i> / [<i>Prosopis velutina</i> - <i>Acacia greggii</i>] Wooded Shrubland Alliance (P)
Purple	<i>Prosopis velutina</i> - <i>Acacia greggii</i> Shrubland
Red	<i>Acacia constricta</i> Shrubland Alliance (P)
Orange	<i>Tamarix</i> spp. Semi-natural Temporarily Flooded Shrubland Alliance
Light Yellow	<i>Populus fremontii</i> / Mixed Annual Wooded Herbaceous Alliance (P)
Light Blue	<i>Prosopis velutina</i> / Mixed Annual Wooded Herbaceous Alliance (P)
Light Yellow	<i>Prosopis velutina</i> / <i>Amaranthus palmeri</i> Shrub Herbaceous Alliance (P)
Yellow	<i>Hymenoclea monogyna</i> / [<i>Amaranthus palmeri</i> - <i>Chloris virgata</i>] Shrub Herbaceous Alliance (P)
Red	[<i>Amaranthus palmeri</i> - <i>Salsola kali</i> - <i>Chenopodium</i> spp.] Annual Herbaceous Alliance (P)
Light Yellow	Inland Freshwater Strand Beach Sparse Vegetation
Grey	Developed Woodland
Light Green	Cropland and Pasture
Diagonal Hatching	Park Facilities
(P) = Proposed	



0 200 400 800
Meters

Figure 13: Vegetation map of the Mission unit of Tumacácori National Historical Park

Riparian Environment

The Tumacácori unit protects 1 mile of the Santa Cruz River and its rare cottonwood-willow riparian environment. Riparian plant communities in the southwestern United States account for less than 1% of the landscape cover (Skagen et al. 1998 as cited in Powell et al. 2005). However, these ecosystems are essential habitat for many plants, birds, and other animals that could not otherwise live in the surrounding desert scrub and grassland environments. Perennial streams and the ecosystems they support are biological “hot spots” within the expansive, semiarid landscape of the Sonoran Desert and are the primary drivers of ecological integrity in the region.

It is estimated that greater than 50% of southwestern bird species and up to 80% of all wildlife species in the southwest are dependent on riparian areas (Knopf and Samson 1994 and Chaney et al. 1990 as cited in Powell et al. 2005). Due to their structural and floristic diversity compared to surrounding areas, riparian corridors in arid lands support a high diversity of bird species. Riparian areas also serve many other functions. Mesic riparian vegetation, such as cottonwoods, willows, and ash, have been found to decrease levels of heavy metals in water and soil, decrease water temperatures, provide a source of organic matter, and stabilize stream banks (Karpiscak et al. 2001, Karpiscak et al. 1996, Osborne and Kovacic 1993, all cited in Powell et al. 2005). However, the Bureau of Land Management estimates that less than 20% of the western United States’ potential riparian vegetation remains to perform these functions (BLM 1994 as cited in Powell et al. 2005). Powell et al. noted that “[s]uch loss highlights the importance of maintaining these rare riparian plant communities along the Santa Cruz River.”

Nonnative Species

Powell et al. (2005) noted that nonnative plant species are a “significant management

issue” at the park, particularly in the Tumacácori unit. A total of 67 nonnative species were recorded from 2000 to 2003 in all three units. Excluding ornamentals, the percentage of nonnative species averaged 15% among the three units, but varied considerably. The highest percentage of nonnative species was found in the Tumacácori unit (18%), followed by 11% in the Guevavi unit, and 9% in the Calabazas unit. The grass family (Poaceae) constituted the highest percentage of nonnative species in the three units (33%) (Powell et al. 2005). The authors speculated that the Guevavi and Calabazas units contained fewer nonnative plant species because they are closed to the general public, are less subject to seed dispersal from the Santa Cruz River, and are less subject to ongoing disturbances (e.g., construction, grazing, or flood events).

A 2006 invasive nonnative plant inventory of the three units found 14 species, all of which were documented during the 2003 biological inventory or during other projects (Studd and Zepp 2009). Table 10 lists the species found in the three units and the area affected. Four other species were subsequently encountered in 2007 in the old agricultural fields and pasture, but are not listed in the table: wild oats, rescue brome, field bind weed, and Mediterranean grass.

A 2008 NPS environmental assessment identified 78 invasive nonnative species, of which 11 were identified as being of high priority for treatment. Prominent nonnative species that were considered a high priority for treatment included Bermudagrass, tree of heaven, carelessweed, Malta starthistle, yellow starthistle, tree tobacco, buffelgrass, and fountain grass. Bermudagrass in particular is a difficult species to control. This grass was found in all of the fields; Studd and Zepp (2009) noted it would be nearly impossible to control. Tamarisk also was a high priority species in 2006, but was treated in 2007–2009 and controlled. However, adjacent landowners on all sides of the park and upstream have tamarisk on

their properties and it could spread back into the park.

In the spring of 2010, a new invasive nonnative species, Siberian elm, was documented in the riparian area of the Tumacácori unit (J. Welborn, Tumacácori National Historical Park, pers. comm., April 28, 2011).

In the Tumacácori unit invasive plants such as Bermudagrass and Russian thistle are well-established. Nonnative species occur on the mission grounds, old agricultural fields, mesquite bosque, desert scrub, floodplain and riparian areas, and riparian scrub/woodland (Studd and Zepp 2009). The old agricultural fields in the southern portion of the unit, which are currently mowed, are composed almost exclusively of carelessweed and Bermudagrass. Invasive nonnative plants also occur to the north of the fiesta grounds, including Russian thistle and Bermudagrass. The riparian corridor has several invasive species, including Bermudagrass, poison hemlock, and tree tobacco. However, nonnative species have only become dominant in a few cases and areas (Studd and Zepp 2009). Overall, the most serious invasive plant species present

that are a high priority for treatment in the unit include tree tobacco and carelesseweed. Tree tobacco is present in low densities, but it can spread rapidly through riparian areas and displace native species. (This plant is targeted for control by park management.) Carelesseweed is prevalent on the areas of abandoned farmland and along the edges of the riparian area where it is displacing native herbaceous species (NPS 2008).

In the smaller Calabazas and Guevavi units, Russian thistle, Bermudagrass, carelesseweed, stink grass, and Lehmann's lovegrass are the most common nonnative invasive species. The introduction of exotic *Eragrostis* species can be traced to grazing practices that shape the two units' land use histories. In the Calabazas unit, nonnative species occur on the mission site, hilltop, east corner, the south drainage, riparian scrub, and a channel of the Santa Cruz River. In the Guevavi unit, nonnative species occur in the northern drainage, southeast drainage, mission site, hilltop, and a channel of the Santa Cruz River (Studd and Zepp 2009). However, as noted above these units are in relatively good shape overall, compared to the Tumacácori unit from a nonnative species perspective.

TABLE 12: TOTAL AREA AFFECTED BY TARGETED NONNATIVE SPECIES IN TUMACÁCORI NATIONAL HISTORICAL PARK 2006

Species	Area Affected (acres)	Percent of Unit Affected
Tumacácori Unit		
Tree of heaven	T	T
Palmer's amaranth	250	76%
Giant reed	T	T
Poison hemlock	113	34%
Bermuda grass	238	72%
Stink grass	45	13%
Lehmann lovegrass	120	36%

**TABLE 12: TOTAL AREA AFFECTED BY TARGETED NONNATIVE SPECIES IN
TUMACÁCORI NATIONAL HISTORICAL PARK 2006**

Species	Area Affected (acres)	Percent of Unit Affected
Cheese weed	4	1%
Horehound	33	10%
Russian thistle	202	61%
London rocket	40	12%
Sowthistle	6	2%
Johnson grass	33	10%
Tamarisk *	139*	42%*
Calabazas Unit		
Palmer's amaranth	19	86%
Bermuda grass	6	27%
Stink grass	8	37%
Lehmann lovegrass	12	55%
Russian thistle	16	73%
Guevavi Unit		
Palmer's amaranth	8	95%
Bermudagrass	2	21%
Stink grass	4	48%
Lehmann lovegrass	2	24%
Russian thistle	7	84%

'T' denotes an area less than 0.2 acres or less than 0.1%.

*Tamarisk was cut and treated in 2007–2009 and was largely eliminated from the Tumacácori unit.

Adapted from Studd and Zepp 2009.

Vegetation and People

People have lived in and modified the vegetation and ecosystems in the park and surrounding Santa Cruz Valley for thousands of years (Drake et al. 2009). Surface flows in the Santa Cruz River have been manipulated for thousands of years for agricultural irrigation by the native Hohokams; this in turn has likely affected

plant species (numbers and distributions). It is likely that the small subsistence-based agricultural O'odham communities affected the areas as well; although there is uncertainty about their overall impact. With Spanish colonization, human impacts in the area dramatically increased. Large numbers of sheep and cattle grazed in the area: 4,000 sheep were reported at Tubac in 1804, and more than 4,000 cattle were in the area of the

Tumacácori unit in 1821. With additional settlement, more changes occurred along the Santa Cruz River: mesquite bosque and mature stands of cottonwood-willow trees were cleared for agricultural purposes. The area around the original Tumacácori National Monument was converted to agricultural fields in the 1940s, replacing what appears to have been mesquite bosque. More agricultural fields were established in the late 1950s. The different ages of mesquite bosque largely relate to the time when disturbance ceased. However, with the abandonment of the agricultural fields surrounding Tumacácori beginning in the 1970s, the fields are converting back to upland semidesert grassland communities. Monitoring of a recently abandoned field shows that these old agricultural fields can become shrubland within three to five years (J. Moss, Tumacácori National Historical Park, pers. comm., April 20, 2011).

In the 1930s, groundwater extraction to support agriculture began throughout the watershed. As a result of over pumping from the groundwater aquifer and the concurrent drop in the local water table, widespread mortality of riparian vegetation occurred, along with the systematic removal of mature cottonwood trees (Herrera Environmental Consultants 2011). By 1940, the riparian areas had been altered into a functionally different ecosystem that exhibited xeric riparian conditions (mesquite and other upland species)—the area could no longer support healthy, mesic riparian communities due to insufficient aquifer recharge and compromised ecological integrity. Before the wastewater treatment plant began substantial operations in the 1970s, the riparian area at Tumacácori was barren and largely devoid of vegetation. This condition, however, changed with the development of the Nogales International Wastewater Treatment Plant. Effluent from the treatment plant, along with periodic flooding and the abandonment of agricultural fields adjacent to the river, has led to the reestablishment and increase in riparian vegetation along the river (Webb

et al. 2007 and Powell et al. 2005, as cited in Drake et al. 2009).

The Guevavi unit was part of a ranch until its acquisition by the National Park Service in 1990. It had small, subsistence agricultural fields during the period of mission occupation, but had none of the large fields that surrounded the main unit in the 20th century. The Calabazas unit experienced similar land use.

People are continuing to affect the vegetation in the park, particularly in the Tumacácori unit. Cattle ranching has occurred uninterrupted since Spanish colonization, and continues today around the park. Irrigated agriculture and livestock grazing occurs on much of the undeveloped land adjacent to the Tumacácori unit. Despite the park staff's efforts to maintain boundary fences, trespass cattle continue to graze in the riparian area and act as a vector in the spread of nonnative plants, trample herbaceous vegetation, and increase erosion of stream banks (Powell et al. 2005). Horses and trespass by all-terrain vehicles have likely affected plants in the Tumacácori unit riparian area, trampling vegetation. Although it has not been documented, horse use in the Tumacácori unit may be introducing and spreading nonnative species in the park through their droppings (Hammett and Cole 1998; Newsome et al. 2002; Wells and Lauenroth 2007). Visitors have also trampled vegetation in the Tumacácori unit, creating visitor-created trails. In the Calabazas unit, periodic trespass by all-terrain vehicles and livestock, and trespass by livestock in the Guevavi unit have likely affected some vegetation in these units.

In recent years, NPS staff has been taking action to control invasive nonnative species, and prevent cattle from entering the park. Most known populations of tamarisk and tree tobacco have been treated in the Tumacácori unit, although retreatment may be needed in the future.

As noted above, the presence of the Nogales International Wastewater Treatment Plant affects both water quality and quantity in the Tumacácori unit, which in turn affects the park's vegetation. Without the flow from the treatment plant, more than 9 miles (15 km) of the river would otherwise be dry much of the year (Powell et al. 2005). Loss of water due to a proposed treatment plant in Nogales, Sonora, Mexico could result in a degradation of the riparian area. In addition, increased residential development is occurring near the Calabazas unit due to the growth of nearby Nogales, and could occur to the north and south of the Tumacácori unit due to the growth of Rio Rico and Tubac. New developments will likely increase groundwater withdrawals, which in turn could reduce the surface water available to vegetation.

Climate change will also affect the park's vegetation communities in the future, although the rate and magnitude of specific vegetation changes are not known. The southwestern United States has generally become more arid over the past few decades, which is expected to intensify with increased temperatures and a less rainfall (Loehman 2010, Lenart 2007). However, according to computer-based climatic modeling, precipitation and flooding events are likely to become more extreme. The dates that plants flower may change: studies indicate that the date Sonoran shrubs flower in the southwest and northwestern Mexico has advanced by 20 to 41 days between 1894 and 2001 (Bowers 2007 as cited in Southwest Climate Change Network 2008). River and riparian ecosystems are likely to be negatively affected by decreased stream flows, increased water removal due to groundwater extraction and surface water management practices in the United States and Mexico, and by competition from nonnative species (Backlund et al. 2008 as cited in Loehman 2010). With continuing drought conditions, plant species suited to upland desert scrub habitat consequently will likely increase in abundance in the park. The potential for increased fire activity may

also increase in the riparian wooded area. In addition, if species such as red brome, Mediterranean grass and buffelgrass were to spread into the park, as is occurring in southwestern deserts, they would provide fuels for desert fires (Southwest Climate Change Network 2008, Lenart 2007). Outbreaks of forest insects and the spread of weeds into the park also could increase (Southwest Climate Change Network 2008). For example, decreased precipitation may result in the expansion of cheatgrass into the area (Loehman 2010). This in turn could lead to increased fires in the area.

WILDLIFE

Although Tumacácori National Historical Park is relatively small, it supports a diverse number of wildlife species, including fish, amphibians, reptiles, birds, and mammals. (No terrestrial invertebrate studies have been done in the park, but the park also likely supports a diverse population of insects and arachnids (spiders). The mesquite bosque and riparian forest are particularly important habitat for wildlife in the area. Because streams like the Santa Cruz River are scarce in this semiarid landscape, the Tumacácori unit's riparian corridor supports many species that are not found in the surrounding area, including the Calabazas and Guevavi units. This corridor also is an important regional link, providing for movement of species between natural core areas.

According to park records, six native amphibian species, primarily toads, and 23 native reptile species, primarily snakes and lizards, have been documented in the park. Most of the species were recorded in the Tumacácori unit due to its variety of vegetation communities and location along a riparian area. However, the Calabazas and Guevavi units also appear to support a moderately rich diversity of amphibian and reptile species. Powell et al. (2005) noted "... although far from pristine, [the park units] maintain moderate species richness both in

the presence of human activity (Tumacácori unit) and in relative isolation from human activity (Calabazas and Guevavi units)." Common reptiles include ornate tree lizard, Sonoran spotted whiptail, and desert grassland whiptail. Common amphibians include Couch's spadefoot and great plains toad. Two venomous snakes have been recorded: the western diamond-backed rattlesnake and Sonoran coralsnake. The 2001–2003 survey found several species that are associated with riparian areas, such as the eastern fence lizard, Woodhouse's toad, and Sonoran mud turtle. Many species typically associated with water and riparian vegetation were not observed, such as native frogs and garter snakes. Two species reported in the park, the western narrow-mouthed toad and desert tortoise, are state wildlife species of concern.

Tumacácori National Historical Park supports a very diverse population of birds. In their 2001–2003 comprehensive inventory of the park, Powell et al. (2005) noted, "[w]e do not hesitate to conclude that the park possesses valuable and regionally unique resources for birds and maintains a remarkable avifauna." Several species of special conservation status have been recorded in the park including two federal-listed species. Twelve bird species are also listed by the state of Arizona as wildlife species of concern.

Park records indicate a total of 175 native bird species being present in the park. The 2001–2003 inventory recorded 146 bird species, including 129 species in the Tumacácori unit, 80 species in the Calabazas unit, and 74 species in the Guevavi unit (Center for Desert Archeology 2005). The cottonwood-willow riparian area in the Tumacácori unit was of particular importance for certain birds. Bird species such as the yellow warbler, common yellowthroat, and song sparrow rely almost completely on these rare southwestern forests for nesting habitat (Rosenberg et al. 1991 as cited in Powell et al. 2005).

Some of the common bird species found in the park include broad-billed hummingbird, red-tailed hawk, turkey vulture, mourning dove, northern raven, Veremillion flycatcher, phainopepla, and white-crowned sparrow. Ten raptor species have been identified as well as the peregrine falcon, although most of these species are uncommon or rare. Many of the bird species recorded in the park are migrants who use the park during the spring and/or fall migrations. According to Powell et al. 2005, 70% of the species recorded in 2001–2003 were neotropical migrants. Park records identify 73 species as breeding in the park.

One species of management concern that occurs in the park is the brown-headed cowbird. This bird thrives in riparian areas that exist in the park. In the 2001–2003 inventory, brown-headed cowbirds were abundant during the breeding season. They pose a threat to many native birds due to nest parasitism, reducing the productivity of host species. Species particularly susceptible to cowbird parasitism in the park include four abundant neotropical migrants: western Bell's vireo, song sparrow, yellow-breasted chat, and yellow warbler.

A total of 35 native mammal species have been recorded in the park, with the majority being rodents (mice). The 2001–2003 inventory reported the highest species richness of small mammals in the Calabazas and Guevavi units, which is consistent with semidesert grasslands that occur in these areas (Powell et al. 2005). The Sonoran Desert pocket mouse was the most abundant rodent in both of the units and the second most abundant in the Tumacácori unit; the cactus mouse was the most abundant in the latter unit. Predators that have been observed in the park include coyote, bobcat, black bear, and all four species of skunk that occur in Arizona. The Virginia opossum, perhaps a relatively new inhabitant of the area, was the most frequently observed large mammal in the 2001–2003 survey (Powell et al. 2005). Six bat species, including the federally endangered lesser long-nosed bat,

were recorded in the park in the summer of 2010 by park staff (J. Welborn, Tumacácori National Historical Park, pers. comm., April 5, 2011).

Several nonnative wildlife species also are present in Tumacácori National Historical Park. All of these species have affected both native plants and wildlife in the area. The American bullfrog is a particularly destructive species, with both adults and tadpoles eating many native fish, reptile, and amphibians in the southwest. Nonnative birds include house sparrows, which are abundant around the mission, and starlings. Nonnative mammals include house mice, feral cats and dogs, and domestic cattle. Cats can pose a serious problem for park native vertebrates, such as birds, while cattle have contributed to a decline in understory herbaceous vegetation volume and total vegetation cover in the Tumacácori unit's riparian area (Powell et al. 2005).

Wildlife and People

Like vegetation, Tumacácori National Historical Park's wildlife has been modified by people for thousands of years. Several species may have occurred in the park, but in the last 100 years have been extirpated; these include grizzly bear, jaguar, Mexican gray wolf, and bighorn sheep. The jaguar is extremely rare in the area, and is the only one of the above species that has been seen in the vicinity of the park in the past 50 years (Powell et al. 2005).

People have altered, and continue to alter, the park's wildlife population both directly and indirectly. Livestock grazing has altered the area's vegetation, which in turn has altered wildlife populations through habitat modification and competition for resources. Although cattle are prohibited from the park, they continue to affect the Tumacácori unit's riparian area (see vegetation above). In addition, cattle and all-terrain vehicle trespass may be affecting fossorial species (organisms adapted to digging and life underground) and slow-moving vertebrates,

such as ornate box turtle, through increased mortality and crushed burrows. The flow and quality of water in the Santa Cruz River, which is affected by the Nogales International Wastewater Treatment Plant and other developments, also affects the park's wildlife directly (e.g., treated effluent provides surface flows most of the year, which in turn supports wildlife that may otherwise not occur here) and indirectly (e.g., pollutants in the water ingested by fish may, in turn, be ingested by birds in the area, which can affect these birds' health). In a 1999 study on the Santa Cruz River by the U.S. Fish and Wildlife Service, almost half of the invertebrate samples contained concentrations of chromium that could be harmful to animals that feed on these invertebrates, and four of eight killdeer carcasses contained DDE levels that are associated with impaired reproduction (King et al. 1999 as cited in Powell et al. 2005). Powell et al. (2005) observed that high levels of ammonia from the treatment plant may reduce the likelihood that additional native aquatic or semiaquatic animals will colonize the Tumacácori unit. However, with the upgrade of the wastewater treatment plant in 2008, the amounts of ammonia in the stream have decreased substantially and have allowed fish and other aquatic and semi-aquatic populations to reestablish. Fish surveys in 2009 and 2010 showed an increase in fish including longfin dace and mosquito fish (J. Moss, Tumacácori National Historical Park, pers. comm., April 20, 2011). Increasing development adjacent to the park may disrupt animal movement patterns, and result in increased harassment and mortality of native wildlife due to free roaming pets such as dogs and cats. Finally, the park is attracting more birders, who in turn may be affecting the behavior of some of the park's birds.

Climate change also will likely affect the park's wildlife populations, although the degree and timing of these impacts is unknown. Changes in vegetation, phenological events (e.g., flower blooming periods), wild fires, spread of nonnative

species, increased frequency and severity of droughts, decreased stream flows, increases in flooding events, and outbreaks of forest insects, can all affect wildlife habitats and populations directly and indirectly. Reductions in available drinking water, habitat and food (both vegetation and prey) can increase competition and mortality rates, and decreased reproductive success for native wildlife (Southwest Climate Change Network 2008). Earlier flower blooms could have substantial effects on migratory hummingbirds in the Sonoran Desert and in the park (Bowers 2007 as cited in Southwest Climate Change Network 2008). In the same vein, earlier leaf-out events of riparian plant species may affect the behavior of neotropical migrants that depend completely upon habitat along a body of water.

Drought-related stress has been observed to affect cavity-nesting birds, such as ash-throated flycatchers and violet-green swallows that occur in the park. Decreases in adult weight, reduced clutch sizes, reduced nestling body mass, and lower overall survival rates have been observed for these birds (Fair and Whitaker 2008 as cited in Loehman 2010). With drought likely to continue and increase in severity, these birds may experience additional stress.

Disease may also increase in park wildlife populations with climate change. Changes in minimum and mean temperatures and amount and timing of precipitation may increase the presence of hantavirus plague and West Nile virus in wildlife populations (Patz et al. 2000, Epstein 2001, Field et al. 2007, all cited in Loehman 2010).

FEDERAL-LISTED SPECIES AND CANDIDATES

Two federal-listed or candidate species occur within the park and potentially could be affected by this plan: the endangered southwestern willow flycatcher and, a candidate for listing, the western yellow-

billed cuckoo. Both of these species are also listed by the state of Arizona as wildlife species of concern. The park supports other federal- and state-listed species, but the alternatives being considered would not affect those species and they are not discussed here.

Southwestern Willow Flycatcher

The southwestern willow flycatcher is a neotropical migrant that breeds in the southwestern United States and winters in Mexico, Central America, and extreme northern South America. The flycatchers are found in riparian ecosystems below an elevation of about 8,500 feet. The primary elements of critical habitat include riparian plant species with dense canopies in a successional riverine environment (for nesting, foraging, migration, dispersal, and shelter), specific structure of this vegetation, and insect populations for food (USFWS 2006). Flycatchers occur in dense riparian habitats where cottonwood, willow, boxelder, and arrowweed are present. They also occur in nonnative vegetation such as tamarisk and Russian olive. This species prefers relatively dense vegetation to reduce predation both from mammals such as coyotes, foxes, and cowbirds. The flycatcher is shy and easily disturbed by people.

The flycatcher typically arrives in the region in late April to early June and stays through August. The birds breed early in the season, with nesting occurring from mid-May to mid-August. They nest in thickets of trees and shrubs, 13 to 23 feet in height, among dense homogenous foliage. In almost all cases, water that is still or slowly moving or saturated soils are present at or near the breeding site (USFWS 2002).

Riparian areas are dynamic, and the size and location of flycatcher habitat changes over time in response to natural disturbances and regeneration events such as flood, fire, and drought. As a result, habitat may become unsuitable for breeding through maturation or disturbance but could remain suitable for

migration or foraging. It is not uncommon for patches that have been disturbed to cycle back into suitability for breeding (USFWS 2002).

The southwestern willow flycatcher was listed by the U.S. Fish and Wildlife Service as endangered on February 27, 1995, and critical habitat along the Santa Cruz River in the park was proposed on August 15, 2011, (76 Fed. Reg. 157:50574). The species was listed primarily due to the loss, modification, and fragmentation of riparian breeding habitat; about 90% of the flycatcher's traditional habitat has been lost or modified such that it no longer provides suitable habitat. Other factors that have led to its decline include loss of wintering habitat and brood parasitism by the brown-headed cowbird (Sogge et al. 1997, McCarthey et al. 1998, as cited in USFWS 2006). Habitat loss and degradation are caused by various factors, including livestock grazing. Fire is an increasing threat to the flycatcher's habitat (Paxton et al. 1996 as cited in USFWS 2006), especially in areas where water diversions or groundwater pumping desiccates riparian vegetation (Sogge 1997 as cited in USFWS 2006). Drought conditions are especially hard on willow flycatchers; regional droughts that influence the overall abundance of insects may also be critical drivers of productivity for willow flycatchers (Durst et al. 2008 as cited in Loehman 2010).

In the 2001–2003 vertebrate inventory, one southwestern willow flycatcher was documented along the river in the Tumacácori unit, and was determined to be migrating. Three other flycatchers were recorded but were not determined to be the southwestern subspecies (Powell et al. 2005). No nesting or territorial flycatchers have been detected in or adjacent to the park, and it is unclear whether the riparian area in the Tumacácori unit provides adequate breeding habitat for the species (Powell et al. 2005). Likewise, the U.S. Fish and Wildlife Service noted that no flycatcher territories have been confirmed along the Santa Cruz River since 1991 (USFWS 2012). The habitat

structure at the park is less desirable for this species as the cottonwood-willow canopy is less dense than they prefer for nesting (J. Welborn, Tumacácori National Historical Park, pers. comm., January 28, 2011). However, the U.S. Fish and Wildlife Service has proposed critical habitat designation for the Santa Cruz River because the river may be able to develop and sustain flycatcher habitat and territories (76 Fed. Reg. 157:50574).

Yellow-billed Cuckoo

The yellow-billed cuckoo is a riparian obligate species—species that depend completely upon habitat along a body of water. Suitable habitat for this species in the western United States is limited to narrow and often widely separated blocks of riparian cottonwood-willow galleries. Cuckoos feed exclusively on insects. These neotropical migrants winter in South America and are one of the last migratory bird species to arrive in North America. They migrate north in late June and early July. Breeding begins in early July and continues through August. They arrive so late that they have little time to build a nest, select a mate, lay eggs, and raise their young. Because it nests relatively late in the season when water levels are lower, the cuckoo prefers the relatively humid environment of the gallery forest. Dense understory foliage appears to be an important factor in nest site selection. Unlike the southwestern willow flycatcher, these birds are reclusive, nest high in the canopy, and are more difficult to disturb.

The population segment of the yellow-billed cuckoo west of the Rocky Mountains was determined to be a candidate for federal listing by the U.S. Fish and Wildlife Service in 2001. (Listing actions were precluded by higher-priority listings (71 Fed. Reg. 53755).) Threats to the cuckoo include habitat loss, overgrazing, and larvicide and pesticide treatment that contaminates foliage and kills the species' primary prey, caterpillars. Available breeding habitats for cuckoos have

also been substantially reduced in area and quality by groundwater pumping and the replacement of native riparian plants. Overuse by livestock has been a major factor in the degradation and modification of riparian habitats, resulting in changes in watershed hydrology and in reductions of plant species diversity and density, especially broadleaf plants like willow and cottonwood saplings (*Federal Register* 75(217): 69240). This likely has affected yellow-billed cuckoo habitat and populations. Losses of riparian habitats from historic levels have been substantial in Arizona. Despite this, the cuckoo is still found in all counties in Arizona.

There is potentially suitable nesting and foraging habitat in the Tumacácori unit. It is

possible they may be residents, although this has not been confirmed (J. Welborn, pers. comm., January 28, 2011). Park biologists believe the park supports a healthy, relatively abundant population. Indeed, this riparian area has one of the highest densities of yellow-billed cuckoos in the western United States (Powell 2000 as cited in Powell et al. 2005). Although only four birds were recorded during the 2001–2003 survey, it is likely that more cuckoos were present than were observed. Data from 2010 yellow-billed cuckoo surveys at the park, following the methods established by Powell (2000), resulted in 65 call responses and 21 bird visuals. On 11 occasions mating pairs were observed, although the actual total number of mating pairs could not be determined.

CULTURAL RESOURCES

INTRODUCTION

The National Park Service is charged with the stewardship of many of the nation's most important cultural resources and is responsible for preserving these resources for the enjoyment of present and future generations. By their nature, these resources are finite and nonrenewable; as a result, National Park Service management activities and policies must reflect awareness of their irreplaceable character. NPS *Management Policies 2006* categorizes cultural resources as archeological resources, ethnographic resources, historic structures, cultural landscapes, and museum collections (as discussed in chapter 1, ethnographic resources and museum collections were dismissed as impact topics for this general management plan). This section is an overview of the existing environment for archeological resources, historic structures, and cultural landscapes at Tumacácori National Historical Park.

HISTORIC OVERVIEW

Humans have been living in the Santa Cruz Valley for thousands of years. To better understand the human history of the valley as it relates to Tumacácori National Historical Park, the following excerpt was taken from the *Feasibility Study for the Santa Cruz Valley National Heritage Area* prepared by the Center for Desert Archeology, April 2005. (http://www.cdarc.org/pdf/scvna/chapter04_e.pdf, accessed on May 23, 2011)

Prehistory

Near the end of the Ice Age, about 11,000 B.C., Paleoindian hunters of the Clovis culture traveled the Santa Cruz Valley in search of mammoths and other now-extinct large

mammals. Their spear points are currently the oldest evidence of human presence in the region, and they mark the beginning of the long and rich human history of the valley. Traces of a series of prehistoric cultures that flourished during various time spans between about 11,000 B.C. and the late seventeenth century A.D. are preserved on and beneath the surface. These cultures included groups of the earliest people on the continent, the first farmers and villagers in the Southwest, unique variants and blends of the Hohokam and Trincheras cultures of the Sonoran Desert, and the first southern Arizona tribe to come in permanent contact with Europeans. All of these prehistoric cultures were centered on the linear oasis created by the river—the common thread through their histories.

Direct radiocarbon dates on archaeological maize (corn) remains indicate agriculture arrived in southern Arizona from Mexico by 2000 B.C. To supplement wild resources, hunter-gatherers in the region planted maize and grew some of their food for the first time. These part-time farmers built pithouses and storage pits in summer camps near their fields along the Santa Cruz River and made the first ceramic figurines and pottery in the Southwest. This modest start began 2,000 years of increasing dependence on agriculture and sedentism [sic], a period during which this region was perhaps the foremost center of population and cultural development in the Southwest.

By 1200 B.C., farmers living in early villages along the Santa Cruz River in

the western Tucson Basin constructed the earliest known irrigation canals in North America. In addition to maize, they cultivated squash, tobacco, and possibly beans and cotton. Objects resembling spindle whorls for spinning yarn may be evidence that they were also the first cotton weavers in the Southwest. A string of culturally related farming communities along the river maintained close social connections with each other and developed trade connections with distant parts of the Southwest, California, and northern Mexico to acquire volcanic glass for making dart points and seashells for making jewelry. House groups and large, special buildings that appeared in villages along the Santa Cruz River after 800 B.C. are indications that communities were composed of multiple households that were integrated by public meetings and ceremonies. Small stone projectile points suggest the bow-and-arrow began to be used in southern Arizona about this time—earlier than in other regions of the Southwest.

Following a decline in the water table and a cycle of channel downcutting near A.D. 100, new types of architecture, pottery, stone tools, and burial types appeared in the Tucson Basin, perhaps indicating the arrival of a new cultural group from the uplands of the Southwest. If so, overlapping radiocarbon dates mean this new group coexisted for about 100 years with the older farming culture in the valley. Pithouses shifted from round to rectangular about A.D. 400; large villages developed along the Santa Cruz River, with village locations moving to terraces above the floodplain. There, communities grew and developed—some in the same locations for a millennium—as the river flow and floodplain remained stable. Between roughly A.D. 550 and

750, styles of architecture, artifacts, graphic symbols, and burial practices of the Hohokam culture spread from the Phoenix Basin into the middle Santa Cruz Valley and the rest of the Tucson Basin. Plazas became the central features of villages, the largest of which also had Mesoamerican-style ballcourts by about A.D. 800. By A.D. 1000, villages were spread out along expanded canal systems. Ballcourts were no longer built in the Tucson Basin and most other Hohokam areas after about A.D. 1050.

Beginning approximately A.D. 750, villages in the upper Santa Cruz Valley were also influenced by the Trincheras culture centered in Sonora. For the next several hundred years, the valley was a borderland between these two Sonoran Desert cultures, which were blended in local communities. The valley was also a corridor of trade in locally made seashell jewelry, pottery, and probably cotton textiles, as well as macaws and copper items from Mesoamerica.

Near A.D. 1150, many Hohokam villages in the middle Santa Cruz Valley were abandoned and new villages were established, possibly in response to a major cycle of channel downcutting that forced the abandonment of canal systems in the floodplain. After this, new types of runoff farming were developed on the bajadas above the floodplain. Walled compounds and aboveground adobe architecture appeared in the new villages, and platform mounds were built as public ceremonial structures. The population of the region became concentrated in a few large villages by A.D. 1275, perhaps in response to increasing warfare.

Between about A.D. 1400 and 1450, the Hohokam culture of southern Arizona collapsed after a population

decline. In the Phoenix Basin, this decline was marked by malnutrition and high mortality rates, perhaps due to overpopulation and a series of droughts punctuated by large floods that destroyed most canal systems. What happened to the Hohokam villages in the middle Santa Cruz Valley is less well understood. To the south, the numbers and sizes of Trincheras villages also began to decline during this period for unknown reasons.

During the period between approximately A.D. 1450 and the 1690s, several related Piman tribes lived in villages in the Santa Cruz Valley. They farmed the floodplain with floodwaters and canals, but also continued to hunt and gather wild plant foods. Their material culture resembled those of other Piman peoples in southern Arizona and northern Sonora. Archaeologists do not currently know much about the people living in southern Arizona during this period, because very few sites have been identified or investigated. However, gaps in the Santa Cruz Valley archaeological record may reflect intervals of abandonment, as appear to have happened in the neighboring San Pedro Valley.

The available archaeological and documentary evidence suggests that, at about the same time in the late seventeenth century, Apaches arrived from the north and began to raid native Piman villages, while Europeans entered the valley from the south. Spanish colonists founded cattle ranches in the upper Santa Cruz Valley in the 1680s, and in the 1690s, Jesuit missionaries started a chain of missions in native villages in the upper and middle valley. With the establishment of these permanent contacts with Europeans who made

maps and kept written records, the human story of the Santa Cruz River Valley entered into historical time.

The Tohono O'odham (People of the Desert)

During the late 1600s, the Jesuit missionary Eusebio Francisco Kino explored the borderland region that now includes northern Sonora [Mexico] and southern Arizona. He and other early Spanish missionaries, explorers, soldiers, and colonists found the region inhabited by the O'odham people, who they called the Pima Altas (Upper Pimas) to distinguish them from the Pima Bajos (Lower Pimas) living in southern Sonora. Among the O'odham, they distinguished several subgroups, including the Sobaipuri of the Santa Cruz and San Pedro river valleys, the Papago of the desert region between the Santa Cruz and Colorado rivers, and the Gileños living along the Gila River to the north. Over the next 300 years, several O'odham groups disappeared as a result of diseases introduced by the Spanish and displacements by colonizing Spanish and raiding Apaches. The Sobaipuri of the San Pedro Valley fled from the Apaches and resettled in the Santa Cruz Valley, where they became integrated with the Papagos, now known as the Tohono O'odham (People of the Desert).

Some modern scholars think the Tohono O'odham are one of the most ancient peoples of southwestern North America, occupying this region for many thousands of years. The Tohono O'odham themselves, and some scholars, trace their origins to the Hohokam culture that flourished in this region between about A.D. 450 and 1450. Another view supported by a few scholars, and also by an oral history version of the origin of the Gila River Pimas recorded in the early

1900s, is that the O'odham migrated from southern Sonora to this region in the 1400s, and then warred with the Hohokam culture, contributing to its collapse. Regardless of which version is accepted, the Tohono O'odham are clearly a very ancient culture of the Sonoran Desert and are part of a chain of related, Piman-speaking cultures that extends from Jalisco in western Mexico to Phoenix, Arizona. Some scholars argue that the Hohokam culture developed as a result of Mesoamerican influences that spread along this corridor of related cultures speaking Piman languages.

From ancient times until the late nineteenth century, the Tohono O'odham lived in dispersed villages along low-elevation drainages during the summer to grow crops of corn, squashes, melons, and beans in areas flooded by summer rains. They then moved to villages at higher elevations during the winter to use springs and wells that have water year-round. Today, some 18,000 members of the Tohono O'odham Nation live in three reservations in southern Arizona, including the San Xavier District in the Santa Cruz Valley, established in 1874. Located on the San Xavier District is a Spanish Colonial church completed in 1797, and representing a mixture of baroque and native styles. This church still serves the residents of the district, and the adjacent plaza is used for powwows and craft fairs. Traditional coiled baskets are made by elders, as well as by young people learning the craft. A farmers' cooperative produces and sells native crops near the church. The two casinos on the Tohono O'odham reservation provide important employment opportunities and are sources of funding for housing, education, and other services.

History

At the time of European contact, what is now southeastern Arizona supported an estimated 9,000 native people. The Pima, the Sobaipuri, the Papgo, and later the Apache lived north of the United States-Mexico border along the Santa Cruz, San Pedro, Gila, and Salt rivers.

The history of the Spanish missions in the vicinity of Tumacácori spans 157 years. The Jesuits were the first missionaries to inhabit *Pimería Alta*, when Father Eusebio Francisco Kino arrived in 1691. Seventy-six years later in 1767 the Jesuits were expelled and the Franciscans took over administration of the mission system. Several events contributed to the decline and eventual dismantling of the mission system, including continued Apache pressure and Mexican independence from Spain. By the middle of the 19th century, the missionaries had departed and their structures slowly began to deteriorate or be put to other uses.

In 1854, with the Gadsden purchase of Mexican land below the Gila River, that part of the Upper Sonora containing Tumacácori, Calabazas, and Guevavi became American territory. Hundreds of people from the United States and Mexico flocked to the territory as jobs were available in ranching and mining operations. The United States military established two garrisons at Calabazas: Camp Moore and Fort Mason. A gold mining operation was established at Guevavi. All three missions were eventually abandoned.

The missions of Tumacácori and Guevavi were established by Father Kino in 1691, and the *visita* of Calabazas was constructed in the 1750s. All three are part of Tumacácori National Historical Park.

Guevavi was the location of a Piman village where Kino baptized local residents. In 1732, Father Grazhoffer became the first resident priest for the first church, which consisted of a brush roof on posts. An adobe church was being constructed at Guevavi when the 1751 Pima revolt began, and the site was abandoned by the Spaniards. A Spanish priest returned in December 1753. The American Indian population of Guevavi gradually declined, and in 1771, Guevavi became a *visita* of Tumacácori. The complex was abandoned in 1775.

Calabazas was a *visita* of the mission of Guevavi in the 1750s. In 1760, a house was built and construction of a church begun. The church was still roofless in 1768, but was completed by 1773, when the Franciscans established a cemetery at the site. It was part of a rectangular compound with a central plaza. The church and other houses present at the *visita* were burned by Apaches in 1773, and the Pima abandoned the site in 1786. The church was later repaired in 1807, and served as a cattle ranch for the Tumacácori Mission until 1830, when it was again raided and burned by the Apaches. The land was acquired by Governor Gándara of Sonora in 1844, and was occupied by various people into the 1860s. Tumacácori began as a *visita* of Guevavi and was moved to its present location in 1751. A large number of buildings were eventually constructed; however, the standing church was begun in 1800 and, while it was in use by the early 1820s, construction was never completed. The mission was abandoned in 1848 and was only periodically reoccupied due to attacks by Apaches.

(End of Excerpt)

TUMACÁCORI UNIT

As stated in the Mission San José de Tumacácori National Register of Historic Places nomination and Cultural Landscape Inventory report, Tumacácori includes a varied mix of prehistoric and historic archeological sites and historic structures, representing a juxtaposition of different cultures and time periods. Tumacácori preserves not only cultural resources representing periods of American Indian, Spanish, and Anglo occupation dating from 1753 to 1908, but also prehistoric sites and 20th century National Park Service structures, which have architectural significance of their own. The entire unit was listed in the national register in 1966 for its nationally significant archeology and historic structures.

The cultural resources within the Tumacácori unit fall into four time periods: (1) American Indian prehistoric–1753; (2) Mission 1753–1848; (3) post Mission 1848–1908; and (4) NPS 1908–present. Starting in 1917 up to the present, numerous archeological investigations, surveys, and inventories have occurred at Tumacácori resulting in the discovery of archeological resources that date to all four time periods. During these surveys, if archeological resources were found, some of these resources were collected and kept at the national historical park or sent to the NPS Western Archeological and Conservation Center in Tucson, Arizona, for curation and proper storage. Otherwise the resources were left in place or buried. The most involved investigation of the Tumacácori unit took place in 2004, when the entire unit was surveyed.

Some of the more important archeological investigations indicated that the entire south half of the Tumacácori unit, which includes the lands acquired by the National Park Service in 2002, was once occupied by the *ranchería* of the Spanish Jesuit missionaries and the Pimas (Tohono O'odham), which was relocated from the east bank of the

Santa Cruz River to the present site on the west bank in 1753, and then developed into the Mission San José de Tumacácori. Mission development included the construction of several buildings, such as the church that was built in 1757. Today only the foundation of the small, modest Jesuit mission church survives. This structure is listed in the National Register of Historic Places as part of the Mission San José de Tumacácori nomination (listed 1966) and it is interpreted as part of the visitor experience. Other than earthen mounds and the Jesuit mission church foundation, no surface evidence of the Jesuit mission village exists; therefore, the area associated with the Jesuit period is treated as one large archeological site.

After the expulsion of the Jesuits in 1767, the Franciscans moved into the mission and they continued to use the Jesuit structures as they built their own complex nearby. Under the Franciscans, Mission San José de Tumacácori grew to include the following structures and sites, which are still seen today: the large mission church, *Campo Santo* (original mission cemetery), mortuary chapel within the *Campo Santo, convento*, granary, orchard, lime kiln, and the 1930s adobe wall that partially encloses the complex. All of these resources are listed in the National Register of Historic Places as part of the Mission San José de Tumacácori nomination (listed 1966), and they are interpreted as part of the visitor experience. Precise construction dates for these various structures in the Franciscan mission complex are not known, except that all apparently were constructed beginning in the 1770s and continuing into the early 1840s and were abandoned about 1848. The National Park Service acquired these structures and sites with the establishment of Tumacácori National Monument in 1908. These historic structures have undergone extensive historic preservation and are in good condition.

Once the Tumacácori mission became a national monument, the National Park

Service constructed the first permanent buildings during the 1930s New Deal era. In the course of this period of park development, the National Park Service constructed four structures—a museum (visitor center), a residence, a garden, and a comfort station as well as associated walks and paths, a service road, and small parking areas. These resources are in good condition and are still used today as they were originally intended. Visitors enter the national historical park through the museum and receive an orientation before heading into the garden and mission complex. The residence is used for NPS employee housing and the comfort station serves the visitors during normal operating hours. The residence is listed in the National Register of Historic Places as part of the Mission San José de Tumacácori nomination (listed 1966). In 1987, the National Park Service elevated the museum and associated garden and comfort station to National Historic Landmark status.

Using the previous archeological surveys and the National Register nominations as resources, the School of Landscape Architecture and Planning at The University of Arizona completed the *Mission San José de Tumacácori Cultural Landscape Inventory* in 2010. The report concluded the cultural landscape had enough extant historic integrity to be designated eligible for listing in the National Register of Historic Places. The cultural landscape centers on the historic structures and the area in close proximity to them. It does not include the riparian area along the Santa Cruz River or the mesquite bosque because they were not used during the historic period for which the cultural landscape is significant. The Tumacácori cultural landscape is managed according to NPS policies and standards. Before implementing proposed actions in this plan, the cultural landscape inventory would be consulted to confirm the actions would not have adverse effects on cultural landscapes. Future planning needs include further documentation of the Tumacácori landscape through the completion of a cultural landscape report.

GUEVAVI UNIT

As described in the 1996 *General Management Plan* and 2010 *Final Draft Cultural Landscape Inventory for Mission Los Santos Ángeles De Guevavi*, the site was originally a Tohono O'odham village that Jesuit Father Kino visited in 1691. In 1701, the Jesuits turned the village into the mission of Los Santos Ángeles de Guevavi, the first Jesuit *cabecera* established in what is now Arizona. It is believed the site was abandoned in 1775 due to increased attacks from Apache. As discovered during archeological investigations, the site includes the remains of a church, *convento*, plaza, several compounds, two large depressions, canals, bedrock mortars, rock alignments, and possible corrals.

National Park Service archeologists conducted archeological excavations, surveys, and detailed site mapping at Guevavi from 1991 to 1992 that covered the entire unit. The 1991 excavations at Guevavi focused on architecture, culture history, subsistence, and American Indian acculturation. The 1992 survey identified 36 features at Guevavi. Most of the features appear related to the Spanish mission occupation of the site, but several of the recorded features are relatively recent (concrete canal, capped wells, trash dump), and others may be prehistoric in age (roasting pits, bedrock mortars). Of the 36 recorded features identified at Guevavi, 22 are located within the existing boundary, 11 are on city of Nogales land, and three straddle the boundary between the two.

In 2011, Desert Archaeology of Tucson conducted another 100% survey of the Guevavi unit that resulted in the identification of new archeological resources including multiple features outside of the NPS boundary at the unit. New mapping technology used during this survey allowed for better maps and site locations.

The most prominent feature at the site today is the ruin of the church. The unfired adobe

brick wall remains are over 3 feet thick and more than 6 feet high. The standing portion of the west wall is 50 feet long, and the east wall is 25 feet long. A small segment of the north end wall is less than 5 feet long. Remnants of a window and door are visible in the west wall. A substantial American Indian component, identified east of the boundary, may represent part of the Tohono O'odham village that drew the Jesuit missionaries.

A large, poorly drained area in the arroyo directly northwest of the Guevavi church ruin is of interest as a natural and/or cultural feature in several ways. The dark humic soil of the swale is similar to that used to make many of the adobe bricks in the church, and it may be a borrow area. Vegetation in and around the area indicate that the swale apparently becomes a shallow pond after heavy rains. A cultural/natural problem that plagued past inhabitants of Guevavi was water and insect-borne diseases. This microenvironment is an important feature of the cultural landscape around the site. The swale warrants further research and inclusion within the proposed boundary expansion.

In June 1990, the entire Guevavi site, including the church ruins and the other archeological resources found within, was designated a National Historic Landmark. At the time of this designation, cultural landscape features were not investigated and evaluated. Therefore, in 2010, the School of Landscape Architecture and Planning at the University of Arizona completed the *Los Santos Ángeles de Guevavi Cultural Landscape Inventory*. The findings in this report determined the cultural landscape at Guevavi is eligible for listing in the National Register of Historic Places. The cultural landscape centers on the church ruins and the features found in close proximity to it. The Guevavi unit is managed as an archeological site that is part of a larger cultural landscape and can be accessed only when accompanied by NPS staff. Before implementing proposed actions in this plan,

the cultural landscape inventory would be consulted to confirm the actions would not have adverse effects on cultural landscapes. Future planning needs include further documentation of the Guevavi landscape through the completion of a cultural landscape report.

CALABAZAS UNIT

As described in the 1996 *General Management Plan* and 2010 *Final Draft San Cayetano De Calabazas Cultural Landscape Inventory*, the Jesuits established Calabazas as a *visita* to the Guevavi mission in 1756. The site functioned as a *visita* until the Tohono O'odham and Franciscan missionaries (who took over the missions from the Jesuits) abandoned the site around 1834 due to increased attacks from Apache. After the end of the mission era, the site changed hands several times and was adaptively reused as a cattle ranch by Mexican Governor Manuel Gándara, followed by two different U.S. military regiments as camp headquarters and as a U.S. collections house. During the late 1800s and early 1900s, the land went through a phase of contentious land grabs.

National Park Service archeologists conducted archeological excavations, surveys, and detailed site mapping at Calabazas in 1991 and 1992 and covered the entire unit. The 1992 survey identified 26 features at the site, including 12 recorded by a previous archeological survey. The following features were found at the site: the remains of a church, compound, row house, other possible structural remains, rock alignments, a large depression, a ditch, and bedrock mortars. Remains of the church walls and a few scattered mounds mark the plaza and outlying walls. In the early 1980s, a metal roof was erected over a portion of the church ruins as a way to protect the walls from deterioration caused by rain. There are also the remains of a U.S. Army fort used during armed conflicts with the Apache.

In 2011, Desert Archaeology of Tucson conducted another 100% survey of the Calabazas unit that resulted in the identification of new archeological resources including multiple features outside of the NPS boundary at the unit. New mapping technology used during this survey allowed for better maps and site locations.

The compound at Calabazas is nearly the same size and orientation as the *convento* at Guevavi, and other features at Calabazas are suggestive of similar structures at Guevavi. The similarities in layout and design suggest the entire Calabazas compound was built during the Spanish mission period. In contrast to Guevavi, abundant historic artifacts were found at Calabazas. Most of the artifacts postdate the Spanish occupation of the site. A chain link fence encloses most of the features found at Calabazas, and entry into the enclosed area is allowed when accompanied by NPS staff or authorized volunteers.

In December 1990, the entire Calabazas site, including the church ruins and the other archeological resources found within, was designated a National Historic Landmark. At the time of this designation, cultural landscape features were not investigated and evaluated. Therefore, in 2010, the School of Landscape Architecture and Planning at The University of Arizona completed the *San Cayetano de Calabazas Cultural Landscape Inventory*. The findings in this report determined the cultural landscape at Calabazas is eligible for listing in the National Register of Historic Places. The cultural landscape centers on the historic structures, structural remains, and features found in close proximity to them. The Calabazas unit is managed as an archeological site that is part of a larger cultural landscape. Before implementing proposed actions in this plan, the cultural landscape inventory would be consulted to confirm the actions would not have adverse effects on cultural landscapes. Future planning needs include further documentation of the

Calabazas landscape through the completion of a cultural landscape report.

THE ROLE OF THE VANISHING TREASURES PROGRAM AT THE PARK

Tumacácori National Historical Park is one of several park units in the desert southwest that preserves structural and archeological ruins. The National Park Service recognized the need to provide parks like Tumacácori with additional assistance when dealing with the preservation of these deteriorating historic and archeological sites and, as a result, created the Vanishing Treasures Program. As a program participant, the national historical park staff documents the conditions of the historic and archeological sites, documents the rate these sites are deteriorating, repairs structures in imminent danger, and trains new craftsmen before the older ones retire. In addition, park staff provides preservation training to other federal and state agencies. Preservation activities take place at all three of the park units as well as at locations outside the park.

In 2008, the park participated in a Missions Initiative sponsored binational workshop called the *Taller Internacional de Conservacion y Restauracion de Arquitectura de Tierra* (TICRAT) or *International Workshop for the Conservation and Restoration of Earthen Architecture*.

Participants from the National Park Service and Mexico's *Instituto Nacional de Antropología e Historia* (INAH) worked in Tumacácori, Arizona, and Pitiquito, Sonora. The TICRAT Arizona/Sonora drew 50 participants, including NPS and INAH craftsmen and agency officials, academics, private-sector building professionals, community participants, and students from numerous states on both sides of the border, for a weeklong event of lectures, case studies, tours, and, most importantly, hands-on field workshops in the areas of building assessments and stabilization, adobe brickmaking, and lime plaster preparation and application. Tumacácori National Historical Park is committed to the continuation of these kinds of preservation activities and partnerships.

VISITOR USE AND EXPERIENCE

INTRODUCTION

The planning team identified visitor use and experience as an important issue that could be appreciably affected under the alternatives. The NPS Organic Act and NPS *Management Policies 2006* direct the National Park Service to provide visitor enjoyment opportunities that are uniquely suited and appropriate to the resources found at Tumacácori National Historical Park. Several aspects of visitation and enjoyment were evaluated, including visitor use characteristics, visitor experiences, interpretation, and community connections.

VISITOR USE CHARACTERISTICS

Visitation figures for the national historical park for the years 2000 through 2010 are shown in the following table. Visitation at Tumacácori National Historical Park has slightly declined over the last six years. The park has not conducted a formal or informal visitation study to understand the change in visitation, and therefore, there is no clear consensus as to the cause of this decline.

**TABLE 13: TUMACÁCORI NATIONAL HISTORICAL PARK
VISITATION NUMBERS BY YEAR AND MONTH 2000–2010**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Jan	5,276	4,753	4,601	4,675	4,647	4,540	3,548	3,843	3,481	3,489	3,758
Feb	7,644	6,123	6,114	6,110	7,023	5,862	5,559	5,295	5,815	5,646	5,437
Mar	8,239	7,303	6,930	6,989	6,704	7,919	7,037	6,353	6,692	5,600	6,530
Apr	5,522	5,750	4,991	5,086	5,251	5,282	4,497	5,290	4,037	3,699	3,752
May	2,767	3,114	2,740	2,720	2,892	2,497	3,112	3,203	2,146	2,055	2,760
Jun	1,902	1,791	1,863	1,854	1,490	1,597	1,436	1,202	1,160	1,418	1,635
Jul	1,999	1,722	1,473	1,597	1,747	1,335	1,455	1,328	1,351	1,420	1,106
Aug	1,889	1,606	1,531	1,523	1,533	1,138	1,240	1,239	1,261	1,198	1,035
Sep	2,152	1,588	1,529	1,786	2,131	1,696	1,594	1,537	1,868	1,445	1,266
Oct	2,970	2,942	2,690	3,319	2,890	2,998	2,453	2,260	2,205	2,146	2,403
Nov	3,509	3,118	3,404	3,797	3,005	2,805	2,751	2,922	3,114	4,789	2,193
Dec	9,760	9,728	10,021	12,870	8,789	9,079	10,333	11,012	12,001	7,732	7,991
Annual Total	53,629	49,538	47,887	52,326	48,102	46,748	45,015	45,484	45,131	40,637	39,866

Source: Tumacácori National Historical Park

The months of January through April receive the greatest number of visitors to the national historical park, except for December, in which two large annual events occur. In December, the park hosts La Fiesta de Tumacácori and Luminarias, which draw a higher number of visitors. It is anticipated that the number of visitors will rise with the additional visitor experiences and recreational activities proposed in alternatives 2 and 3 of this general management plan.

VISITOR EXPERIENCES

The national historical park is open 9:00 a.m. to 5:00 p.m. daily, except Thanksgiving Day and Christmas Day, when the park is closed. The entrance fee is \$3.00 per person, age 16 or older, and is valid for seven days. Two of the missions, San Cayetano de Calabazas and Los Santos Ángeles de Guevavi, are not open to the public and can be visited only on special reserved tours (more on this under “Interpretation” below).

Most visitors to the national historical park spend a short time touring Mission San José de Tumacácori. Visitors tend to enter through the visitor center, wander through the interpretive exhibits briefly, and exit out to the mission complex. During peak hours, the visitor center can be temporarily very busy, with much movement and noise. From the visitor center, visitors walk a short distance to reach the large mission church, *Campo Santo* (original mission cemetery), mortuary chapel within the *Campo Santo*, *convento*, granary, lime kiln, and the 1930s adobe wall that partially encloses the complex. Visitors tend to be quiet and reverential when viewing the mission church and associated structures; however, during peak times or when large tour and school groups are touring the complex, the noise level temporarily goes up. To see the mission orchard, garden and fiesta grounds, visitors must walk east of the mission church a short distance. All walking surfaces are dirt.

East of the mission complex are the Anza Trail and Santa Cruz River. Visitors leave the complex near the orchard and walk east a short distance to connect to the trail; beyond the trail, to the east, is the river. Visitors may also enter the Tumacácori unit via the Anza Trail at the northern and southern boundaries of the park. Eventually, visitors would be able to walk or ride from Tubac Presidio State Park (north of the park) through the Tumacácori unit (except for bicycles, which currently cannot be ridden in the park), and then walk or ride to the Calabazas unit. The visitor experience along the trail and river in the park is mostly peaceful even with the Interstate 19 traffic noise in the background.

Recreation activities available to visitors inside the park include sightseeing, wildlife watching, walking and hiking, and horseback riding on the Anza Trail, and picnicking. Guided ranger programs are available in addition to contact with roving interpreters. The most common activities for visitors to the national historical park are walking around the mission complex, taking photographs, going to the museum/visitor center, and shopping at the gift shop.

The visitor services at the national historical park are limited. Western National Parks Association is a nonprofit cooperating association that operates the bookstore inside the museum/visitor center. They provide high quality, and often hard to find, publications on subjects related to Tumacácori, missions, and the historical *Pimería Alta* region. Lodging and camping are not available in the park, but can be found in nearby towns, state parks, and national forests.

INTERPRETATION

Visitors have an opportunity to learn about the national historical park from interpretive exhibits in the museum/visitor center. There are also interpretive exhibits and signs throughout the mission complex. Visitors

can purchase for a nominal fee a self-guiding tour booklet that provides information about the different structures and features found inside the mission complex.

For a more personal experience with a park ranger or volunteer, visitors can go on several different guided tours at the park from January through April. A 45-minute walking tour of the Tumacácori mission church and grounds is offered at least twice a day. With a prior reservation and in groups of nine to 12, visitors can also take a walking tour of the Guevavi and Calabazas units for a small fee that includes the park entrance fee; these tours are limited to one day a week because of staff availability. One other option for visitors is to take a one-hour walking tour to the Santa Cruz River leaving from the museum/visitor center; this tour is free and only offered once on Wednesdays. By special request, another opportunity for a personal experience with a park ranger is a school program. School programs may be given by a park ranger at the school as well as on-site at the park. School programs tend to be given during the months of January through April, but can be offered any time of year by special request. Special tours, living history presentations, and special interest talks and tours may also be available by advanced request.

Additional interpretive opportunities for visitors are cultural demonstrations. Invited artisans demonstrate traditional crafts on the grounds of Tumacácori on the weekends from October through April and also at special events. Demonstrations may include paper flower making, Mexican reverse glass painting, O'odham basketry, pottery, and tortilla making. These demonstrations are held in a ramada located on the periphery of the mission complex. The park superintendent manages cultural demonstrations consistent with NPS *Management Policies 2006* (section 7.5.7 Cultural Demonstrators) and guidance from the NPS Intermountain Regional Office in Lakewood, Colorado. Each cultural demonstrator has a contract

with the National Park Service to demonstrate their craft or skill.

Visitors may also learn about the national historic site through the park brochure and website, www.nps.gov/tuma.

COMMUNITY CONNECTIONS

Tumacácori National Historical Park shares a strong sense of community with several different groups including, but not limited to, traditionally associated American Indian tribes, the Spanish, Mexicans, Catholics, historic preservationists, and local community members. One of the ways the park connects with community groups is through special events. One such event is historic reenactment Mass. Once each year visitors are invited to participate in a historic reenactment Mass inside the Tumacácori mission church as it would have been celebrated during the time that Tumacácori was an active mission community. A second event is La Fiesta de Tumacácori. In recognition and celebration of the many cultures that were historically and are presently associated with the Santa Cruz Valley, the fiesta presents the traditional creations of these cultures during the first weekend in December. The fiesta features numerous food and craft booths, continuous live entertainment on stage, and children's activities. A third event held at the park on Christmas Eve is Luminarias. Park volunteers and staff set up more than a thousand luminarias, or traditional Latin American Christmas lighting and ornamentation. These luminarias, which are small paper bags filled with sand that holds a lit candle, light up the walkway up to the church at Tumacácori as well as the interior and exterior features of the building, making the site glow. Luminarias has been an annual tradition at the national historic site for more than 50 years.

The national historical park staff also connects with historic preservationists from the local community and region by offering hands-on training in traditional adobe skills. People of all ages learn how to make adobe and apply it to historic structures as has been done in the southwest for hundreds of years.

SOCIOECONOMIC ENVIRONMENT

ECONOMICS IN THE STUDY AREA

For the purposes of this document, the study area (area of consideration) for socioeconomic analysis is Santa Cruz County, Arizona. Pima County is a relatively large county to the north of Tumacácori and includes the city of Tucson, Arizona. Although it is likely that most visitors come from or through Pima County, the influence of any change in management at the park on the economy of Pima County would be negligible at most, so it will not be included in detailed analysis.

The headquarters and all three units of the park are in Santa Cruz County, the smallest county in Arizona. The city of Nogales (a micropolitan statistical area) and smaller communities form the population base of this county. Nogales, a major port of entry along the international border with Mexico, serves as the county seat and a center of commerce. The U.S. Census Bureau estimates that the county's population was 43,771 in 2009. The population increased by 14% since 2000. The state of Arizona had an increase of 28.6% in population during the same period. The average number of people per square mile in the county was 30 in 2000, while the statewide average was 45 (Census Bureau 2011).

The median household income in Santa Cruz County in 2008 was \$38,490, while the median for Arizona was \$51,009. According to the 2009 figures provided by the Bureau of Economic Analysis, employment in Santa Cruz County is primarily in government (federal, military, state, and local); retail trade; wholesale trade; transportation and warehousing; and the accommodations and food service trade (Bureau of Economic Analysis 2011). These economic sectors, especially the latter group, are expected to

be affected by changes to operations or visitation at the park.

Federal spending from all sources in Santa Cruz County totaled \$379,558 in 2008 (Census Bureau 2011).

ECONOMIC AND SOCIAL BENEFITS OF THE NATIONAL PARK SERVICE

According to a study done for the National Parks Conservation Association (NPCA 2006), the National Park Service provides many economic and social benefits to local, regional, and national economies:

- National parks generate more than \$4 in value to the public for every tax dollar invested.
- Nationwide, the national parks support \$13.3 billion in local private-sector economic activity and 267,000 private-sector jobs.
- National parks attract businesses and individuals to the local area, resulting in economic growth in areas near parks that is an average of 1% per year greater than statewide rates over the past three decades.
- The social benefits of national parks are many and extend well beyond economic values.

Thus, the presence of a national park system unit has direct and indirect economic effects on a local economy. These include the direct effects of federal spending and visitor spending as well as the indirect effects resulting from a broader set of economic sectors that revolve around tourism-related businesses. In 2009, the total direct and indirect economic impact of Tumacácori National Historical Park's payroll was \$1.275

million in salaries and payroll benefits (Stynes 2011).

VISITOR SPENDING IN THE PLANNING AREA

Tumacácori National Historical Park hosted an annual average of about 43,000 visits in the last several years. According to recent visitation information provided by park staff, almost all visitors are on nonlocal, day trips with very few staying overnight in the county. There is a commercial tour operator who transports visitors to the two outer units under a commercial use authorization.

The NPS Money Generation Model was used to calculate the level of economic effect visitor spending has in the area. For analysis, the total visits (40,637 in 2009) were converted to 17,231 party days (party days equal the number of days each party of visitors stays in the vicinity). On average,

visitors spent \$36 per party, per day in the study area. Table 14 indicates the breakdown of estimated spending by park visitors.

The total impact of visitor spending is estimated to be \$1.369 million in 2009 (table 15). This includes direct, indirect, and induced effects from sales, income, and jobs in businesses selling goods and services.

- Direct Effect—Businesses receiving money directly from tourists (e.g., motels)
- Indirect Effects—Businesses receiving money from tourist businesses (e.g., linen supply services)
- Induced Effects—Businesses receiving money from workers that directly or indirectly impacted business (e.g., apartment rentals)

TABLE 14: VISITS AND ESTIMATED DIRECT SPENDING BY VISITOR SEGMENT 2009

	Day Trips Nonlocal	Day Trips Local	Hotel	Camping	Total
Visitor Parties	14,467	813	1,625	325	17,231
Segment Shares in Recreation Visits	79%	5%	5%	1%	100%
Avg. Spending Per Party Day	\$36	\$32	\$154	\$80	\$48
Total Spending	\$607,600	\$ 25,600	\$250,000	\$ 26,000	\$910,000

Source: NPS Public Use Statistics Office, Money Generation Model

TABLE 15: TOTAL SPENDING AND ECONOMIC IMPACTS OF PARK VISITORS ON LOCAL ECONOMY 2009

Estimated Impacts of Visitor Spending						
Visits	Overnight Stays	All Visitor Spending	Nonlocal Visitor Spending	Jobs	Labor Income	Value Added
40,637	0	\$1,369,000	\$1,275,000	18	\$477,000	\$811,000

Source: Stynes 2011

PARK OPERATIONS AND FACILITIES

PARK OPERATIONS

Tumacácori National Historical Park is administered by a park superintendent, four division chiefs, and several support staff who are stationed at the Tumacácori unit. The superintendent is responsible for managing all three park units, Tumacácori, Guevavi, and Calabazas, as well as directing park staff, and interacting with the public, other government agencies, traditionally associated American Indian tribes, federal and state elected officials, and private interests. As of 2011, the national historical park is authorized to have 14 full-time equivalent (FTE) employees. Full-time equivalent is defined by the Government Accountability Office as the number of total hours worked by an employee divided by the maximum number of compensable hours in a work year as defined by law. In addition to FTE personnel, staffing is supplemented with seasonal employees and volunteers-in-parks (VIP) personnel who donate their time. Personnel working under seasonal appointments typically work full-time for up to six months in a tour of duty.

Park operational activities are organized into the administration, resource management, facility management, and interpretation divisions. As of 2011, the park did not have law enforcement or emergency services staff; when law enforcement assistance or emergency services are needed, the Santa Cruz County Sheriff is called. The park also receives assistance from law enforcement rangers at nearby national park units such as Saguaro National Park. Staff is stationed in several buildings at park headquarters, which is just south of the mission complex in the Tumacácori unit. No employees or volunteers are stationed at the Guevavi or Calabazas units.

Some issues, such as the trespass of cattle and all-terrain vehicles in the Tumacácori unit, periodically occur and require staff attention.

Administration Division

The administration division is responsible for the park budget, human resources, travel, information technology, property management activities, purchasing, central filing, and providing overall administrative support for the superintendent and the other divisions. In 2011, there were three full-time equivalent employees in the administration division, including the park superintendent.

Resource Management Division

The resource management division is responsible for the preservation and protection of cultural and natural resources found in the park. The programs managed by this division include the following: archeology, ethnography, historic structures, Vanishing Treasures, cultural landscapes, museum collections, fire, exotic plant management, wildlife (mammals and birds), species of special concern, threatened and endangered species, vegetation, geographic information system (GIS), environmental and cultural compliance, research permits, and climate change. In 2011, there were three full-time equivalent employees in the resource management division.

Facility Management Division

The facility management division is responsible for the operations, maintenance, and repairs of all historic structures, administrative buildings, support structures, employee housing, roads, utilities, parking areas, trails, grounds, fencing, picnic areas, directional signs, volunteers-in-parks RV sites, and government vehicles. Included

under utilities are the operation, maintenance, and repair of two water wells and a septic field. The division manages facility project formulation and oversight, environmental and hazardous waste projects, the safety program, equipment replacement projects, the carbon footprint reduction project, and the Facility Management Software System data and work order reporting system. In 2011, there were four full-time equivalent and two seasonal employees in the facilities management division.

Interpretation Division

The interpretation division is responsible for orienting visitors to the park and the visitor services offered, interpreting park resources, running the museum/visitor center at Tumacácori, developing and presenting interpretive programs to visitors at all three park units, leading guided tours, developing and distributing educational materials to visitors and local schools, developing and delivering educational programs for local schools, maintaining the park website, informal interpretive contacts with visitors, developing new interpretive exhibits, issuing special use permits, managing the federal fee program, running the Volunteers-In-Parks program, and working with Western National Park Association, the cooperative association that runs the book store in the museum/visitor center. In 2011, there were four full-time equivalent employees and one seasonal employee in the interpretation division.

FACILITIES

Facilities open to visitor use at Tumacácori include the museum/visitor center, a garden adjacent to the museum/visitor center, a comfort station, 2.3 miles of trails, several historic structures and ruins, the historic orchard, the fiesta grounds, and the entrance road that leads into the visitor parking lot.

Tumacácori Museum and Visitor Center

As the hub of visitor services, the museum/visitor center offers the public a parking lot, restrooms (e.g., comfort station), bookstore, and interpretive exhibits. The visitor center also includes some office space for interpretive staff. The Tumacácori interpretive trail leads visitors from the museum/visitor center to the mission complex with all of its historic structures and ruins. (This trail was recently expanded and resurfaced.) Adjacent to the museum/visitor center is a designed, ornamental garden that visitors can walk through.

Juan Bautista de Anza National Historic Trail

The Juan Bautista de Anza National Historic Trail passes through the park in a north/south alignment for 1 mile. The park co-maintains the trail with the Juan Bautista de Anza National Historic Trail and Anza Trail Coalition of Arizona. The coalition is a nonprofit organization dedicated to the restoration, maintenance, protection, and interpretation of the Juan Bautista de Anza National Historic Trail.

Tumacácori Mission Complex

The historic mission complex consists of the Tumacácori interpretive trail and historic structures and ruins including the large mission church, *Campo Santo* (original mission cemetery), mortuary chapel within the *Campo Santo*, *convento*, granary, historic orchard, lime kiln, and the 1930's adobe wall that partially encloses the complex.

Fiesta Grounds

The fiesta grounds are adjacent to the mission complex. The area consists of mostly open space with some trees. The grounds are primarily used for the large special event in early December called La

Fiesta de Tumacácori (see “Visitor Use and Experience” section in this chapter for details). The fiesta grounds are also used during the annual Boy Scout Anza Trail trek event and to stage horses for the Anza ride.

Entrance Road and Visitor Parking Lot

The entrance road is approximately 0.1 mile of pavement; 32 cars can be accommodated in the visitor parking lot in front of the museum/visitor center.

Other facilities at Tumacácori that are used only for administrative purposes include the administrative office, two maintenance barns (one used for storage and the other for offices and a carpenter shop), a storage building, Bounty House (used for resource management offices), one NPS employee house, an administrative road that leads to the boundary and employee houses, and a road into the 310 acres of land added to the park in 2002.

Park Trails

All of the official maintained trails in the three units are in good condition. However, there are many visitor-created trails in the Tumacácori unit. The park staff have not been able to close and rehabilitate all of these unofficial trails.

Other Facilities

In the Tumacácori unit there is a park headquarters/administration building, the Boundey house (which contains resource management staff offices), a maintenance barn (which contains facility staff offices and shops), and several storage outbuildings. In addition, there are two recreational vehicles (RV) trailer pads located just east of the NPS employee residence. The trailer pads have water and electrical service, and are used by NPS volunteers.

In the Calabazas unit the park staff maintains a ramada (shade structure). Maintenance of the native materials that comprise the ramada requires substantial amounts of staff time.

CHAPTER 4 ◇ ENVIRONMENTAL CONSEQUENCES



INTRODUCTION

The National Environmental Policy Act mandates that environmental assessments disclose the environmental effects of proposed federal actions. In this case, the proposed federal action would be the adoption of a general management plan for Tumacácori National Historical Park. This “Environmental Consequences” chapter analyzes the potential effects of three management alternatives on natural resources, cultural resources, visitor use and experience, socioeconomic environment, and park operations and facilities at Tumacácori National Historical Park. By examining the environmental consequences of all alternatives on an equal basis, decision makers can decide which approach creates the most desirable combination of the greatest beneficial results with the fewest adverse effects on the park.

The alternatives in this general management plan provide broad management directions. Because of the general nature of the alternatives, the potential consequences of the alternatives are analyzed in similarly general terms using qualitative analyses. Thus, this environmental assessment should be considered a programmatic analysis. For the purposes of analysis, in the environmental assessment it is assumed that all of the specific actions proposed in the alternatives would occur during the life of the plan. This environmental assessment generally analyzes several actions that will need additional environmental and cultural resource analyses with appropriate documentation before implementation, consistent with the National Environmental Policy Act and the National Historic Preservation Act. These actions include possible efforts to protect lands adjacent to the Guevavi unit boundary, the possible reestablishment of wetlands in the Tumacácori unit, the establishment of designated picnic areas in the Tumacácori

unit, and the establishment of trails and overlooks in the Calabazas and Guevavi units. These possible actions are not evaluated in detail in this environmental assessment because there is not sufficient detailed information on the proposed actions and their locations. The establishment of the Mission Trail linking the Calabazas and Guevavi units is generally analyzed because there is insufficient detailed information on this trail to fully analyze the effects of the trail in this document. The decision on whether bicycles would be permitted to ride through the Tumacácori unit would be analyzed as part of the compliance for the future park trailwide plan.

The existing conditions for all of the impact topics that are analyzed here were identified in the “Affected Environment” chapter. All of the impact topics are assessed for each alternative. For each impact topic, there is a description of the positive (beneficial) and negative (adverse) effects of the alternative, a discussion of the cumulative effects when the alternatives are considered in conjunction with other actions occurring in the region, and a brief conclusion.

The no-action alternative (continue current management) analysis identifies what future conditions would be if no changes to facilities or park management occurred. The two action alternatives were then compared to the no-action alternative to identify the incremental changes that would occur as a result of changes in park facilities and management.

A brief summary of the impacts of each alternative was provided in table 9 at the end of “The Alternatives” chapter.

ASSUMPTIONS

For the purposes of analyzing the impacts of the alternatives, the following assumptions have been made:

- Parkwide, visitor use patterns will not substantially change from current patterns. Most visitors will continue to stay within developed areas. The vast majority of use will continue to be in the Tumacácori unit. Visitor use levels could increase but will not substantially increase. In particular, it is assumed that more visitors will visit the riparian corridor and bosque if additional visitor facilities are provided.
- All facilities proposed in the alternatives are built. When a range of facilities is proposed (e.g., three to five picnic areas), then a range of facilities is considered in the analysis.
- One to two additional annual special events will occur in the park.
- A segment of the Anza Trail linking the Tumacácori and Calabazas units and the Mission Trail, linking the Calabazas and Guevavi units, will be completed. There would be little, if any ground-disturbance construction in establishing these trails.
- Water will continue to flow in the Santa Cruz River through the Tumacácori unit.

Also for purposes of analysis in the action alternatives, it is assumed that bicycles will be allowed on designated trails and that bicycle racks will be provided in the three units. However, to allow this use, the National Park Service would need to promulgate a regulation, which is not included in this general management planning process.

CUMULATIVE IMPACTS

The CEQ regulations implementing the National Environmental Policy Act defines a cumulative impact as the “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.” Each cumulative impact analysis is additive, considering the overall impact of the alternative when combined with effects of other actions (inside and outside the park) that have occurred or would occur in the foreseeable future.

To determine potential cumulative impacts, projects in approximately a 25-mile area surrounding Tumacácori National Historical Park were identified.

The primary projects and actions that could contribute to cumulative effects are summarized below. These include ongoing and planned actions and projects in the park and on lands in the vicinity of the park (including nearby communities).

Actions and Projects Inside the Park

Vegetation Restoration in the Tumacácori Unit. Efforts are underway in several test plots to restore riparian forests damaged during forest fires in 2008, to control invasive species (primarily poison hemlock) in riparian areas, and to restore native vegetation (mesquite forest) in a portion of the agricultural fields (Herrera Environmental Consultants 2011).

Improved Tumacácori Interpretive Trail. The National Park Service recently expanded and resurfaced the interpretive trail within the mission complex at the Tumacácori unit. This construction was completed in 2012; the trail is accessible for disabled visitors. It follows the existing trail route to the mission church and associated features, and includes a new trail segment to the mission orchard. (A separate environmental compliance document was prepared for this project.)

Actions and Projects Outside the Park

Completion of the Juan Bautista de Anza Trail. The 1,200-mile Juan Bautista de Anza National Historic Trail eventually will run through Arizona and California. One completed section of the trail runs from Tubac Presidio State Park through the Tumacácori unit. Efforts are ongoing to complete remaining trail segments that will connect the Tumacácori and Calabazas units.

Establishment of the Santa Cruz Valley National Heritage Area. A feasibility study has been completed and efforts are underway to pass legislation to establish the Santa Cruz Valley National Heritage Area, which would include Tumacácori National Historical Park. It is likely the national historical park would help manage the national heritage area (the National Heritage Areas Program is run by the National Park Service).

Expansion of the Mariposa Crossing in Nogales, Arizona. Construction is underway, and should be completed by 2014, to expand the Mariposa Port of Entry, one of two ports in Nogales. The facility will include 12 lanes for cars, eight truck lanes, and separate pedestrian lanes for both northbound and southbound pedestrian traffic. Much of the traffic from the ports in Nogales continues north on Interstate 19 in Arizona, which is less than 0.25 miles west of

the Tumacácori unit. While it is difficult to predict how the new facility at the Mariposa port will affect traffic on I-19, it is reasonable to assume that the expanded facility will result in additional traffic on the interstate.

Development of the Los Alisos Waste-water Treatment Plant, Sonora, Mexico.

This treatment plant is expected to come online by the end of 2012. Los Alisos will treat an estimated 4–5 million gallons per day (mgd) initially, with plans to increase its capacity to 7.5 mgd within a relatively short time. This treatment plant will substantially reduce the volume of treated effluent that is discharged into the Santa Cruz River channel. Sewage diversion from the Nogales International Wastewater Treatment Plant, which discharges into the Santa Cruz River, to the Los Alisos Plant will result in an estimated 5–20% reduction in surface flow in the Santa Cruz River channel according to regional hydrologists (J. Welborn, Tumacácori National Historical Park, pers. comm., May 17, 2011).

Groundwater Pumping. Groundwater pumping in the Santa Cruz watershed has removed much of the Santa Cruz River's natural surface flows. Groundwater has been, is, and will continue to be pumped for a variety of uses, including municipal/residential development, agriculture, and industry use. Increased residential development in the Rio Rico area and Tubac, as well as the city of Nogales, is expected to continue to withdraw water. Although the treated effluent from the Nogales International Wastewater Treatment Plant has substituted for natural flows in the river, additional groundwater pumping would likely affect the river and surface water available for vegetation and wildlife in the park.

METHODOLOGY FOR ANALYZING IMPACTS

The planning team based the impact analysis and the conclusions in this chapter largely on information provided by experts in the Park Service, park staff insights and professional judgments, and on the review of existing literature and studies. The team's method of analyzing impacts is further explained below. It is important to remember that it is assumed in the analyses that the mitigative measures described in the alternatives chapter would be applied to minimize or avoid impacts. If these measures were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

The environmental consequences for each impact topic were defined based on impact type, intensity, context, and duration. Cumulative effects also were identified, but are discussed later in this section.

Effects can be either adverse or beneficial for the topic being analyzed. The effects also can be direct or indirect. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later or farther away, but are still reasonably foreseeable.

Impact intensity refers to the degree or magnitude to which a resource would be positively or negatively affected. Each impact was identified as negligible, minor, moderate, or major in conformance with the criteria for these classifications provided below by impact topic. Because this is a programmatic

document, the intensities were expressed qualitatively.

Context refers to the setting within which an impact is analyzed, such as the affected region or locality. In this document most impacts are either localized (site-specific) or parkwide. Cumulative impacts are either parkwide or regional (e.g., water quality impacts). For special status species, such as threatened and endangered species, the context is the species' range.

Impact duration refers to how long an impact would last. The planning horizon for this general management plan is approximately 15 to 20 years. Unless otherwise specified, in this document the following terms are used to describe the duration of the impacts:

- ***Short term:*** The impact would be temporary in nature, lasting one year or less, such as impacts associated with construction.
- ***Long term:*** The impact would last more than one year and may include changes that could be considered permanent in nature, such as the loss of soil due to the construction of a new facility. (Although an impact may occur for only a short duration at one time, if it occurs regularly over time the impact may be considered a long-term impact).
- ***Permanent:*** The impact would last indefinitely.

IMPACTS TO NATURAL RESOURCES

NATURAL RESOURCE METHODOLOGY AND DEFINITIONS

The natural resource topics that are analyzed in this document include vegetation, wildlife, and two federal-listed species (southwestern willow flycatcher and yellow-billed cuckoo). Information on known resources was compiled and compared with the locations of proposed developments and other actions. The impact analysis was based on the knowledge and best professional judgment of planners, resource specialists, data from park records, and studies of similar actions and impacts when applicable. The planning team qualitatively evaluated the impact intensities for all of the natural resource impact topics.

For vegetation and wildlife the following impact intensity definitions were used:

- ***Negligible Impact***—An impact that might result in a change in vegetation or wildlife, but the change would be at the lowest level of detection. Ecological processes would not be affected.
- ***Minor Impact***—An impact that would result in a detectable change, but the change would be slight and have a localized effect on a population. This could include changes in the abundance or distribution of individuals in a localized area, but not changes that affect the viability of local populations. Changes to localized ecological processes would be minimal.
- ***Moderate Impact***—An impact that would result in a clearly detectable change in a population and that could have an appreciable effect. This could include changes in the

abundance or distribution of local populations, but not changes that affect the viability of regional populations. Changes to localized ecological processes would be of limited extent.

- ***Major Impact***—An impact that would be severely adverse or exceptionally beneficial to a population. These impacts would be substantial, highly noticeable, and might result in widespread change. This could include changes in the abundance or distribution of a local or regional population to the extent that the population would not be likely to recover (adverse) or would return to a sustainable level (beneficial). Significant ecological processes would be altered, and landscape-level changes would be expected.

VEGETATION

Alternative 1: Continuation of Current Management

Analysis. With continued use of the three units, most visitors would be expected to stay in developed areas and on trails, and not affect native vegetation. No effects on native vegetation would be expected in the Guevavi and Calabazas units. However, some visitors would continue to wander off trails, either walking or on horseback, in the riparian/bosque areas in the Tumacácori unit, trampling, crushing, and damaging native vegetation. Continued creation of informal trails by people also would result in the loss of some native vegetation. Although efforts would continue to prevent livestock and all-terrain vehicle (ATV) trespass on park lands, these illegal activities would still likely

continue in the Tumacácori unit, all-terrain vehicle trespass in the Calabazas unit, and occasional livestock trespass in the Calabazas and Guevavi units, resulting in the trampling and loss of some native plants. These actions would be expected to continue to result in a minor to moderate, long-term adverse impact on native vegetation in localized areas in the Tumacácori unit and a long-term, minor, adverse impact in the Calabazas and Guevavi units.

The digging of a trench for a sewer hookup, associated with the upgrade of the recreational vehicle/trailer pads in the Tumacácori unit, would result in the short-term loss of some native vegetation. However, this disturbed area has relatively little native vegetation present. Thus, this action would have a short-term, negligible, adverse impact on the park's native vegetation.

It is likely that nonnative plants would continue to be introduced into the park due to seeds being transported from adjacent lands and from horse droppings in the Tumacácori unit. NPS efforts would continue under alternative 1 to monitor, control, and prevent the spread of these nonnative plants in the park. Continuing efforts to remove nonnative species through integrated pest management, including limited mechanical and chemical treatments, and education of visitors and adjacent landowners would help contain the spread of targeted nonnative invasive species in the park (NPS 2008). As a result, some native plant species likely would be maintained or increased in abundance. This would have a long-term, moderate, beneficial impact.

Continued restoration efforts in the riparian and bosque areas in the Tumacácori unit, including revegetation of disturbed areas, institution of erosion control measures, and limited removal of visitor-created trails, would be expected to decrease effects of past disturbance and increase native vegetation in the area. This would have a

long-term, moderate, beneficial impact on the area's native vegetation.

From a parkwide perspective, alternative 1 would have both beneficial and adverse impacts on the park's native vegetation. Overall, the alternative would be expected to have a long-term, minor to moderate, beneficial impact, primarily due to efforts to restore native vegetation and control nonnative vegetation in the Tumacácori unit. No changes to native vegetation would be expected in the Guevavi and Calabazas units.

Cumulative Impacts. As described in the "Affected Environment," the park's native vegetation has been substantially altered by past human activities, including ranching, farming, groundwater pumping, etc. The recent expansion and resurfacing of the interpretive trail in the Tumacácori unit, independent of this plan, would have a long-term, negligible, adverse impact on native vegetation as these disturbed areas have little native vegetation. The completion of the Anza Trail from the Tumacácori unit to the Calabazas unit likely would follow existing roads, trails, and drainages outside the park and result in little ground disturbance and loss of native vegetation. The adverse effect on vegetation likely would be negligible and long term. Continuing vegetation restoration efforts in the Tumacácori unit would be expected to have a moderate, long term, beneficial impact in localized areas in the riparian and bosque areas. On the other hand, the diversion of at least 5% of the surface water flowing in the Santa Cruz River in the park by the Los Alisos wastewater treatment plant, combined with continuing and expanded groundwater pumping in the Santa Cruz River water, would reduce overall water flows in the park, which would increase stress, reduce vigor, and increase the loss of vegetation. In particular, the trees along the river could die off if water flows decrease. This could have a moderate to major, long-term adverse impact on the park's riparian vegetation. When all of the effects of past, present, and future actions are added to the long-term,

minor to moderate beneficial impact of alternative 1, there would be a long-term, moderate to major, adverse impact on the park's native vegetation. However, the beneficial increment of alternative 1 would slightly reduce the overall adverse cumulative impact.

Conclusion. Most of the native vegetation in the park would not be affected by alternative 1. There would continue to be localized adverse impacts due to people and horses, and illegal cattle and ATV trespass. Overall, the alternative would have a long-term, minor to moderate, beneficial impact, primarily due to continued restoration activities in the Tumacácori unit. Native vegetation in the Guevavi and Calabazas units would not be affected by the alternative. There would be the potential for a long-term, moderate to major, adverse cumulative impact when all of the past, present, and future actions affecting the park are added to the effects of alternative 1. The beneficial increment of alternative 1 would slightly reduce the overall adverse cumulative impact.

Alternative 2: NPS Preferred Alternative

Analysis. Alternative 2 would have the same beneficial impacts as alternative 1 with regard to efforts to remove nonnative species in the park through integrated pest management and restoration efforts in the riparian and bosque areas in the Tumacácori unit. In addition, under alternative 2 increased efforts to remove and revegetate visitor-created trails and better designate existing trails, increased monitoring of trail corridors, and the application of user capacity indicator and standard for visitor-created trails, all would benefit native vegetation, decreasing impacts of visitors and increasing the abundance and distribution of some native plants. Increased cooperation with neighboring landowners to help prevent the spread of nonnative species and cattle trespass would also help protect and maintain the park's native flora.

Expanded volunteer participation in natural resource management activities, such as restoration efforts, would also help protect native plants. All of these actions would have a long-term, moderate, beneficial impact compared to alternative 1.

Increased efforts to monitor and prevent trespass by livestock in the three units and all-terrain vehicle trespass on lands in the Tumacácori and Calabazas units likely would reduce the trampling and loss of native plants in the park due to these actions, although there still likely would be some loss and damage to plants from these sources in localized areas. Compared to alternative 1, alternative 2 would result in a negligible to minor, beneficial impact on vegetation in the three units.

The fencing of the Calabazas unit boundary would prevent the trespass of all-terrain vehicles and livestock in the area, which in turn would stop the crushing and loss of some vegetation. However, the vehicles largely stay on the two-track trail through the unit, so any beneficial impacts from ceasing the trespass of the vehicles on the unit's vegetation would likely be negligible and long term.

Alternative 2 also would result in some adverse impacts to native vegetation in the park. As in alternative 1, in alternative 2 some visitors and their horses would likely wander off trails, trampling and damaging some native plants. With increased visitation likely in the bosque and riparian area in the Tumacácori unit there would be the potential for more visitors wandering off trails than in alternative 1. Some visitor-created trails also may continue to be established even with the management actions noted above. These actions would be expected to have a long-term, minor to moderate, adverse impact to native vegetation in localized areas in the Tumacácori unit.

In addition, there would be the potential for the spread of nonnative vegetation into new

areas with more visitors and horses using new trails in the Tumacácori unit. The nonnative species could affect the distribution, population size, and occurrence of some native species. Although increased monitoring and management efforts in alternative 2 would help contain the spread of the nonnative species, which would be beneficial compared to alternative 1, there still would likely be a long-term, minor, adverse impact to native vegetation.

Several new developments would be built in the riparian and bosque communities in the Tumacácori unit, including the establishment of new waysides, three to five picnic areas, and two to four access points to the river would result in the clearing and loss of some vegetation. The new trail in the Tumacácori unit on the east side of the river would follow an existing visitor-created trail and thus would have no impact on native vegetation. The establishment of new trail segment connections and overlooks in the Calabazas and Guevavi units would likely result in the clearing and loss of some vegetation. In addition, a visitor contact station would be built in the Calabazas unit, and overlooks in the Calabazas and Guevavi units, which would result in the loss of some vegetation. Replacement of the shade structure in the Guevavi unit would be in the same location as the present structure and should have no effect on native vegetation. Altogether, a total of no more than about 1 acre of the park would likely be directly affected by all of these developments. Mitigative measures would reduce the impacts of these new developments, and many of these new developments would be in areas with little native vegetation. Some native vegetation would still likely be damaged or lost during construction of these developments, resulting in a long-term, minor, adverse impact.

The digging of a trench for a sewer hookup, associated with the upgrade of the recreational vehicle/trailer pads in the Tumacácori unit, would result in the short-term loss of some native vegetation.

However, this disturbed area has relatively little native vegetation present. Thus, this action would have a short-term, negligible, adverse impact on the park's native vegetation.

Expanded social events should not affect the park's native vegetation, as the increase in visitor use would be confined to already developed areas with little or no native vegetation. Expanded cultural demonstrations, which may include livestock and farming in the Tumacácori unit could potentially affect native vegetation if seeds from the fields were to be transported into the bosque and riparian areas or if livestock were to escape. However, with careful management and monitoring, these potential impacts would be avoided.

In addition to the impacts to park vegetation, under alternative 2 the establishment of the Mission Trail linking the Calabazas and Guevavi units would result in the clearing and loss of some native vegetation outside of the park. Assuming the trail primarily follows existing roads and trails, and sensitive areas (e.g., areas with rare native vegetation) are avoided, the construction and use of the trail would be expected to have a long-term, minor, adverse impact on native vegetation.

From a parkwide perspective, alternative 2 would have both beneficial and adverse impacts on the park's native vegetation. There would be long-term, minor, adverse impacts to native vegetation in localized areas due to the construction of new facilities, higher visitor use levels in the bosque and riparian areas in the Tumacácori unit, and the potential for the spread of nonnative species into new areas. Overall, the alternative would be expected to result in a long-term, moderate, beneficial impact, compared to alternative 1, primarily due to increased efforts to remove and revegetate visitor-created trails and better designate existing trails, and increased monitoring and management efforts with local community participation.

Cumulative Impacts. Alternative 2 would have about the same potential for cumulative effects as alternative 1. Past actions have substantially altered the park's native vegetation. The completion of the Anza Trail from the Tumacácori unit to the Calabazas unit likely would follow existing roads, trails, and drainages outside the park and result in little ground disturbance and loss of native vegetation. The adverse effect on vegetation likely would be negligible and long term. The recent expansion and resurfacing of the interpretive trail in the Tumacácori unit, independent of the general management plan, would have a long-term, negligible, adverse impact because this area has little native vegetation. Continuing vegetation restoration efforts in the Tumacácori unit would be expected to have a moderate, long-term, beneficial impact in localized areas in the riparian and bosque areas. However, the potential diversion of at least 5% of the surface water flowing in the Santa Cruz River in the park by the Los Alisos wastewater treatment plant, combined with continuing and expanded groundwater pumping in the Santa Cruz River watershed, combined with continuing and expanded groundwater pumping in the Santa Cruz River watershed, would reduce overall water flows in the park, which would increase stress, reduce vigor, and increase the loss of vegetation. This would have a long term moderate to major adverse impact on the park's native vegetation. Adding all of the effects of past, present, and future actions to the long term, moderate, beneficial effects of alternative 2, there would be long-term, moderate to major, adverse cumulative impact on the park's native vegetation. However, the beneficial increment of alternative 2 would somewhat reduce the overall adverse cumulative impact.

Conclusion. As in alternative 1, under alternative 2 most of the park's native vegetation would not be directly affected. Most native vegetation that would be affected by the alternative would be in the Tumacácori unit. There would be some localized long-term, minor, adverse impacts

due to the establishment of new facilities and higher visitor use levels in the bosque and riparian areas in the Tumacácori unit. Overall, compared to alternative 1, alternative 2 would have a long-term, moderate, beneficial impact, primarily due to increased efforts to remove and revegetate visitor-created trails and better designate existing trails, and increased monitoring and management efforts with local community participation. When all of the past, present, and future actions affecting the park are added to the effects of alternative 2 there would be the potential for a long term, moderate to major, adverse cumulative impact. But the beneficial increment of alternative 2 would somewhat reduce the overall adverse cumulative impact.

Alternative 3

Analysis. Alternative 3 would have similar effects on the park's native vegetation as alternative 2. In alternative 3 there would be beneficial effects due to efforts to remove nonnative species in the park and restoration efforts, increased efforts to remove and revegetate visitor-created trails and better designate existing trails, increased monitoring of trail corridors, and the application of user capacity indicator and standard for visitor-created trails, and increased cooperation with neighboring landowners to help prevent the spread of nonnative species and cattle trespass, would all help maintain and protect native vegetation. These actions would result in a long-term, moderate, beneficial impact compared to alternative 1.

As in alternative 2, increased efforts to monitor and prevent trespass by livestock in the three units and all-terrain vehicle trespass on lands in the Tumacácori and Calabazas units likely would help reduce the trampling and loss of native plants in the park due to these actions, although there still would be some loss and damage to plants in localized areas. Compared to alternative 1, alternative 2 would result in a negligible to

minor beneficial impact on vegetation in the three units.

The fencing along the Calabazas unit boundary would prevent the trespass of all-terrain vehicles through the area, which in turn would stop the crushing and loss of some vegetation. However, these vehicles largely stay on the two-track trail through the unit, so any beneficial impacts from ceasing the trespass of the vehicles on the unit's vegetation would likely be negligible and long term.

Alternative 3 would result in several adverse effects on native vegetation. In this alternative there would be likely more people using the park than in alternative 1 (albeit less than in alternative 2). As a result, adverse effects to native vegetation would result from increased numbers of visitors wandering off trails in the Tumacácori unit. With increased use there also would likely be more trampling and damage to some native plants and the establishment of unofficial visitor-created trails in the Tumacácori unit. In addition, there would be the potential for the spread of nonnative vegetation into new areas with more visitors and horses using trails in the Tumacácori unit, which could adversely affect the distribution, population size, and occurrence of some native species. Although increased monitoring and management efforts in alternative 3 would help contain the spread of the nonnative species, which would be beneficial compared to alternative 1, there still would likely be an adverse impact on native vegetation. Overall, with increased use levels it is expected there would be long-term, minor to moderate, adverse impact to native vegetation in localized areas in the Tumacácori unit.

Several new developments would be built in the park under alternative 3 that would affect native vegetation. The construction of new waysides in the three units, one to two picnic areas in the Tumacácori unit, and a new shade structure in the Calabazas unit would result in the clearing and loss of some

native vegetation. The establishment of new trail segment connections in the Calabazas unit would result in the clearing and loss of some vegetation. A total of no more than about 0.5 acres of the park would probably be directly affected by these new developments. Mitigative measures would reduce the impacts of these new developments, and they would likely be in areas with little native vegetation. But some native vegetation would still likely be damaged or lost during construction of these developments, resulting in a long-term, negligible to minor, adverse impact.

As in the previous alternatives, the digging of a trench for a sewer hookup, associated with the upgrade of the recreational vehicle/trailer pads in the Tumacácori unit, would result in the short-term loss of some native vegetation. However, this disturbed area has relatively little native vegetation present. Thus, this action would have a short-term, negligible, adverse impact on the park's native vegetation.

In addition to the impacts to park vegetation, under alternative 3 the establishment of the Mission Trail linking the three park units would result in the clearing and loss of some native vegetation outside of the park. Assuming that (1) the trail primarily follows existing roads and trails, and (2) sensitive areas (e.g., areas with rare native vegetation) are avoided, the construction and use of the trail would be expected to have a long-term, minor, adverse impact on native vegetation.

From a parkwide perspective, alternative 3 would have both beneficial and adverse impacts on the park's native vegetation. There would be long-term, minor, adverse impacts to native vegetation in localized areas due to the construction of several new facilities in the park and increased use in localized areas. Overall, the alternative would be expected to result in a long-term, moderate, beneficial impact, compared to alternative 1, primarily due to increased efforts to remove and revegetate visitor-created trails and better designate existing

trails, and to increased monitoring and management efforts.

Cumulative Impacts. Alternative 3 would have about the same potential for cumulative effects as alternative 1. Past actions have substantially altered the park's native vegetation. The completion of the Anza Trail from the Tumacácori unit to the Calabazas unit likely would follow existing roads, trails and drainages outside of the park, and result in little ground disturbance and loss of native vegetation. The adverse effect on vegetation likely would be negligible and long-term. The recent expansion and resurfacing of the interpretive trail in the Tumacácori unit, independent of this general management plan, would have a long-term, negligible, adverse impact because this area has little remaining native vegetation. Continuing vegetation restoration efforts in the Tumacácori unit would be expected to have a moderate, long-term, beneficial impact in localized areas in the riparian and bosque areas. However, the potential diversion of water of at least 5% of the surface water flowing in the Santa Cruz River in the park by the Los Alisos wastewater treatment plant, combined with continuing and expanded groundwater pumping in the Santa Cruz River watershed, would reduce overall water flows in the park, which would increase stress, reduce vigor, and increase the loss of vegetation. This would have a long-term moderate to major, adverse impact on the park's native vegetation. Adding all of the effects of past, present, and future actions to the long-term, moderate, beneficial effects of alternative 3, there would be a long-term, moderate to major, adverse cumulative impact on the park's native vegetation. However, the beneficial increment of alternative 3 would somewhat reduce the overall adverse cumulative impact.

Conclusion. As in the previous alternatives, under alternative 3 most of the park's native vegetation would not be directly affected. Most native vegetation that would be affected by the alternative would be in the

Tumacácori unit. There would be long-term, minor, adverse impacts to native vegetation in localized areas due to the construction of several new facilities in the park and increased visitor use of the Tumacácori unit. Overall, compared to alternative 1, alternative 3 would have a long-term, moderate, beneficial impact, primarily due to increased efforts to remove and revegetate visitor-created trails and better designate existing trails, and increased monitoring. When all of the past, present, and future actions affecting the park are added to the effects of alternative 3, there would be the potential for a long-term, moderate to major, adverse cumulative impact. But the beneficial increment of alternative 3 would somewhat reduce the overall adverse cumulative impact.

WILDLIFE

Alternative 1: Continuation of Current Management

Analysis. Most wildlife populations in the park would not be affected by the continuation of existing uses and management efforts. Although some individual animals such as birds and mice may be disturbed or temporarily displaced, visitors would not be expected to adversely affect the park's overall wildlife populations or habitats. Some birds likely would be disturbed in the riparian and bosque areas due to the presence of bird watchers and other visitors, potentially affecting foraging and nesting activities. There would likely continue to be an adverse impact from some people letting their dogs run off leash, resulting in a few animals such as birds and mice being injured or killed. Although efforts would continue to prevent livestock and all-terrain vehicle (ATV) trespass on park lands, these illegal activities would still likely continue, resulting in injuries and mortality of slow-moving vertebrates and crushed burrows. All of these activities would be expected to result in long-term,

minor, adverse impacts to the park's wildlife, primarily in the Tumacácori unit.

Continued restoration efforts in the riparian and bosque areas in the Tumacácori unit, including revegetation of disturbed areas, would increase habitat for wildlife and increase the abundance of distribution of some species in localized areas, including birds, lizards and reptiles. This would likely have a long-term, moderate, beneficial impact.

From a parkwide perspective, alternative 1 would have both beneficial and adverse impacts on the park's wildlife populations. Overall, alternative 1 would be expected to result in a long-term, minor, adverse impact on wildlife and habitat, primarily due to the disturbance of individual animals by the presence and activities of people in the Tumacácori unit. The alternative would not affect the abundance or distribution of the park's wildlife populations. No actions would affect migration of wildlife along the river corridor or areas known to be important for breeding, nesting, or foraging. No actions would interfere with feeding, reproduction, or other activities necessary for the survival of wildlife species.

Cumulative Impacts. Like native vegetation, the park's native wildlife populations and habitats have been substantially altered by past human activities, including ranching, farming, groundwater pumping, etc. The recent expansion and resurfacing of the interpretive trail in the Tumacácori unit would have a short-term, negligible, adverse impact on native wildlife populations, as this disturbed area has little native wildlife. Continuing vegetation restoration efforts in the Tumacácori unit would be expected to have a moderate, long-term, beneficial impact in localized areas in the riparian and bosque areas. Some wildlife populations would increase in these areas, such as native birds such as the yellow warbler and common yellowthroat. On the other hand, the diversion of at least 5% of the surface

water flowing in the Santa Cruz River in the park by the Los Alisos wastewater treatment plant, combined with continuing and expanded groundwater pumping in the Santa Cruz River watershed, would reduce overall water flows in the park, as well as native riparian vegetation that depends on this water. The degradation of riparian habitat in turn would reduce water, food, and shelter for wildlife. This could have a moderate to major, long-term, adverse impact on the park's wildlife. When all of the effects of past, present, and future actions are added to the long-term, minor, adverse impact of alternative 1, there would be a long-term, major, adverse impact on the park's native wildlife populations and habitats. However, alternative 1 would add a very small adverse increment to the overall adverse cumulative impact.

Conclusion. From a parkwide perspective, alternative 1 would have both beneficial and adverse impacts on the park's wildlife. Most of the park's wildlife and habitat would not be affected by the actions under alternative 1. Overall, the alternative would be expected to have a long-term, minor, adverse impact on the park's wildlife, primarily due to the disturbance of some individual animals by people in the Tumacácori unit. No changes to the park's wildlife populations would be expected to occur as a result of alternative 1. There would be the potential for a long-term, major, adverse cumulative impact when all past, present, and future actions independent of the plan are added to the effects of alternative 1 (although alternative 1 would add very small increment to the overall adverse cumulative effect).

Alternative 2: NPS Preferred Alternative

Analysis. As in alternative 1, alternative 2 would not affect most of the park's wildlife populations and habitat, and most impacts would occur in Tumacácori unit. As in alternative 1, under alternative 2 there would likely be an adverse impact from some people letting their dogs run off leash, and

the trespass of livestock and all-terrain vehicles on park lands resulting in a few animals such as birds and mice being injured or killed. In addition, under alternative 2 more people would be expected to walk and ride horses and bikes through the riparian and bosque areas, increasing the potential for disturbance of wildlife and affecting foraging and nesting activities. Furthermore, the development of the picnic areas would probably lead to some improper food storage and feeding of wildlife, which could attract some animals such as mice and ravens. All of these activities would likely result in a long-term, minor, adverse impact on wildlife in the unit.

Construction of several new developments in the riparian and bosque communities in the Tumacácori unit, a visitor contact station in the Calabazas unit, and overlooks in the Calabazas and Guevavi units, as described earlier in the vegetation section, would affect a total of no more than about 1 acre of wildlife habitat. (Replacement of the shade structure in the Guevavi unit would be in the same location as the present structure and should have no effect on native vegetation.) It is expected that all of these facilities would be located to avoid important wildlife areas. Establishment of new trail segments could disturb some wildlife species and increase the potential for predation on species nesting in the riparian area in the Tumacácori unit, and in the Calabazas and Guevavi units, by increasing predator access. The short-term, minor adverse impacts of trail establishment could be minimized by timing trail work to avoid concentrations of wildlife to the extent practicable. The trails could also be designed to take advantage of naturally occurring open spaces and to avoid dense patches in the vegetation, thus minimizing alterations. These actions can minimize the creation of additional open spaces that could allow increased predation.

Construction activities, including the presence of people and increased noise, would result in the temporary displacement of wildlife such as mice and birds from these

areas, resulting in a localized minor, short-term, adverse impact. Subsequent use of the new trails, picnic areas, overlooks, and a visitor contact station by visitors could result in some birds temporarily altering their behavior. However, most wildlife remaining in these areas has likely adapted to the presence of people. The visitor facilities would be confined to a relatively small area, disturbances would be intermittent, and the number of visitors using these areas is expected to be modest. Species would have ample relatively undisturbed habitat remaining in the river corridor. Thus, the effects of use of the new facilities would be expected to result in a localized, minor, long-term, adverse impact.

Alternative 2 would also have several beneficial impacts on wildlife. Increased efforts to remove and revegetate visitor-created trails and better designate existing trails would help improve wildlife habitat and decrease the number of people wandering off official trails, and thus may increase the populations of some species such as lizards and reptiles. Increased cooperation with neighboring landowners to help prevent cattle and ATV trespass would help protect and maintain the park's wildlife. Expanded volunteer participation in natural resource management activities, such as restoration efforts, would also help protect the park's wildlife. All of these actions would have a long-term, minor to moderate, beneficial impact on wildlife compared to alternative 1.

From a parkwide perspective, alternative 2 would have both beneficial and adverse impacts on the park's wildlife. Overall, the alternative would be expected to result in a long-term, minor, adverse impact in localized areas, compared to alternative 1, primarily due to increased numbers of people and facilities in the bosque and riparian areas of the Tumacácori unit. The alternative would not affect the abundance or distribution of the park's wildlife populations. No actions would affect migration of wildlife along the river corridor

or areas known to be important for breeding, nesting, or foraging. No actions would interfere with feeding, reproduction, or other activities necessary for the survival of wildlife species. In addition, alternative 2 would result in some long-term, minor to moderate, beneficial impacts in localized areas, due to restoration efforts in the Tumacácori unit.

Cumulative Impacts. Alternative 2 would have about the same potential for cumulative effects as alternative 1. Past actions have substantially altered the park's native wildlife populations and habitats. The recent expansion and resurfacing of the interpretive trail in the Tumacácori unit, independent of the general management plan, would have a short-term, negligible, adverse impact, since this area has little native wildlife. Continuing vegetation restoration efforts in the Tumacácori unit would be expected to have a long term moderate beneficial impact in localized areas in the riparian and bosque areas, expanding habitat for native wildlife such as the yellow warbler and common yellowthroat. However, the potential diversion of at least 5% of the surface water flowing in the Santa Cruz River in the park by the Los Alisos wastewater treatment plant, combined with continuing and expanded groundwater pumping in the Santa Cruz River watershed, would reduce overall water flows in the park, as well as native riparian vegetation that depends on this water. The degradation of riparian habitat in turn would reduce water, food, and shelter for wildlife. This could have a moderate to major, long-term, adverse impact on the park's wildlife. Adding all of the effects of past, present, and future actions to the long-term, minor, adverse effects of alternative 2, there would be long-term, moderate to major, adverse cumulative impact on the park's native wildlife populations. However, alternative 2 would add a very small increment to the overall adverse cumulative impact.

Conclusion. As in alternative 1, under alternative 2 most of the park's native

wildlife and habitat would not be directly affected. Most wildlife that would be affected by the alternative would be in the Tumacácori unit. There would be localized, long-term, minor to moderate, beneficial impacts due to restoration efforts in this area. Overall, compared to alternative 1, alternative 2 would have a long-term, minor, adverse impact in localized areas, compared to alternative 1, primarily due to increased numbers of people and facilities in the bosque and riparian areas of the Tumacácori unit. There would be the potential for a long-term, moderate to major, adverse cumulative effect on the park's wildlife when all past, present, and future actions independent of this plan are added to the effects of alternative 2 (although alternative 2 would add a very small increment to the overall adverse cumulative impact).

Alternative 3

Analysis. Alternative 3 would have similar effects on the park's wildlife and habitat as alternative 2. Like the other alternatives, alternative 3 would not affect most of the park's wildlife populations and habitat, and most impacts would occur in Tumacácori unit. Also like the previous alternatives, there would be adverse impacts from some people letting their dogs run off leash, and the trespass of livestock and all-terrain vehicles on park lands resulting in a few animals such as birds and mice being injured or killed. In addition, under alternative 3 more people would be expected to walk and ride horses and bikes through the riparian and bosque areas than in alternative 1, increasing the potential for disturbance of wildlife, affecting foraging and nesting activities. Furthermore, the development of one to two picnic areas would probably lead to some improper food storage and feeding of wildlife, which could attract some animals such as mice and ravens. All of these activities would likely result in a long-term, minor, adverse impact on wildlife in the unit. Construction of several new developments in the riparian and bosque communities in the Tumacácori unit, a shade structure in the

Calabazas unit, and overlooks in the Calabazas and Guevavi units, and new trail segments in the Calabazas unit, as described earlier in the vegetation section, would affect a total of no more than about 0.5 acres of wildlife habitat. (Replacement of the shade structure in the Guevavi unit would be in the same location as the present structure and should have no effect on native vegetation.) It is expected that all of these facilities would be located to avoid important wildlife areas.

Construction activities, including the presence of people and increased noise, would result in the temporary displacement of wildlife such as mice and birds from these areas, resulting in a localized short-term, minor, adverse impact. Subsequent use of the picnic areas and overlooks would result in some birds temporarily altering their behavior. However, most wildlife remaining in these areas has likely adapted to the presence of people. The visitor facilities would be confined to a relatively small area, disturbances would be intermittent, and the number of visitors using these areas is expected to be modest. Species would have ample undisturbed habitat remaining in the river corridor. Thus, the effects of use of the new facilities would be expected to result in a localized, long-term, minor, adverse impact.

Like alternative 2, alternative 3 would also have several beneficial impacts on wildlife. Increased efforts to remove and revegetate visitor-created trails and better designate existing trails would help increase wildlife habitat and decrease the number of people wandering off official trails, and thus may increase the populations of some species such as lizards and reptiles. Increased cooperation with neighboring landowners to help prevent cattle and ATV trespass would help protect and maintain the park's wildlife. All of these actions would have a long-term, minor to moderate, beneficial impact on wildlife compared to alternative 1.

From a parkwide perspective, alternative 3 would have both beneficial and adverse

impacts on the park's wildlife. The alternative would result in some long-term, minor to moderate, beneficial impacts, in localized areas, due to restoration efforts in the Tumacácori unit. Overall, the alternative would be expected to result in a long-term, minor, adverse impact in localized areas, compared to alternative 1, primarily due to increased numbers of people and facilities in the bosque and riparian areas of the Tumacácori unit. The alternative would not affect the abundance or distribution of the park's wildlife populations. No actions would affect migration of wildlife along the river corridor or areas known to be important for breeding, nesting, or foraging. No actions would interfere with feeding, reproduction, or other activities necessary for the survival of wildlife species.

Cumulative Impacts. Alternative 3 would have about the same potential for cumulative effects as alternative 1. Past actions have substantially altered the park's native wildlife populations and habitats. The recent expansion and resurfacing of the interpretive trail in the Tumacácori unit, independent of the general management plan, would have a short-term, negligible, adverse impact, since this area has little native wildlife. Continuing vegetation restoration efforts in the Tumacácori unit would be expected to have a long-term, moderate, beneficial impact in localized areas in the riparian and bosque areas, expanding habitat for native wildlife such as the yellow warbler and common yellowthroat. However, the potential diversion of at least 5% of the surface water flowing in the Santa Cruz River in the park by the Los Alisos wastewater treatment plant, combined with continuing and expanded groundwater pumping in the Santa Cruz River watershed, would reduce overall water flows in the park, as well as native riparian vegetation that depends on this water. The degradation of riparian habitat in turn would reduce water, food, and shelter for wildlife. This could have a moderate to major, long-term, adverse impact on the park's wildlife. Adding all of the effects of past, present, and

future actions to the long term, minor, adverse effects of alternative 3, there would be long term, moderate to major, adverse cumulative impact on the park's native wildlife populations. However, alternative 3 would add a very small increment to the overall adverse cumulative impact.

Conclusion. As in alternatives 1 and 2, under alternative 3 most of the park's native wildlife and habitat would not be directly affected. Most wildlife that would be affected by the alternative would be in the Tumacácori unit. There would be localized, long-term, minor to moderate, beneficial impacts due to restoration efforts in the Tumacácori unit. Overall, compared to alternative 1, alternative 3 would have a long-term, minor, adverse impact in localized areas, primarily due to increased numbers of people and facilities in the bosque and riparian areas of the Tumacácori unit. There would be the potential for a long-term, moderate to major, adverse cumulative impact when past, present, and future actions independent of the plan are added to the effects of alternative 3 (although alternative 3 would add a very small increment to the overall adverse cumulative impact).

FEDERAL-LISTED AND CANDIDATE SPECIES

Impact Intensity Definitions. For federal-listed species, the following impact intensities apply. These definitions are consistent with the language used to determine effects on threatened and endangered species under the federal Endangered Species Act:

- **Negligible Effect**—The action could result in a change to a population or individuals of a species or designated critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence and would be well within natural fluctuations. This

impact intensity equates to a U.S. Fish and Wildlife Service “may affect, not likely to adversely affect.”

- **Minor Impact**—The action would result in a change to a population or individuals of a species or designated critical habitat. The change would be measurable, but small and not outside the range of natural variability. This impact intensity equates to a U.S. Fish and Wildlife Service “may affect, not likely to adversely affect” or a “likely to adversely affect” determination.
- **Moderate Impact**—The action would result in a detectable change to a population or individuals of a species or designated critical habitat. Changes to the population or habitat might deviate from natural variability, but the changes would not threaten the continued existence of the species in the park. This impact intensity equates to a U.S. Fish and Wildlife Service “may affect, not likely to adversely affect” or a “likely to adversely affect” determination.
- **Major Impact**—The action would result in a noticeable effect on the viability of a population or individuals of a species or designated critical habitat. Considerable changes may occur during key time periods for a species. Changes to the population or habitat would substantially deviate from natural variability and threaten or help ensure the continued existence of the species in the park. A major adverse impact would be considered a “take” situation and would equate to a U.S. Fish and Wildlife Service “likely to adversely affect” determination.

Alternative 1: Continuation of Current Management

Analysis. As noted in the “Affected Environment,” chapter of this document, southwestern willow flycatchers are not known to be nesting in the Tumacácori unit and the habitat structure may not be desirable for them. No actions would be taken in this alternative that would affect the flycatcher’s proposed critical habitat along the Santa Cruz River. It is possible that an individual flycatcher could be disturbed in the riparian area due to the presence of bird watchers and other visitors, potentially affecting foraging activities, or a bird could be harassed by some people letting their dogs run off leash. However, given the likelihood of southwestern willow flycatchers using the area, and the odds a visitor would encounter a bird in the summer, when few visitors would be walking in the riparian area, this potential impact would be extremely remote. Thus, alternative 1 could have a long-term, negligible, adverse impact on the southwestern willow flycatcher.

With regard to the yellow-billed cuckoo, visitors like bird watchers could disturb foraging and nesting activities in the riparian area. It is also possible that birds could be harassed by some people letting their dogs run off leash and by people illegally riding all-terrain vehicles in the area. However, again, it is unlikely that many visitors would be present in the riparian area in the summer when the birds would be breeding. Thus, although there could be some disturbance/harassment of individual birds, the area’s population would not be adversely affected. Alternative 1 consequently would have a long-term, minor, adverse impact on the park’s yellow-billed cuckoos.

Overall, alternative 1 would be expected to result in a long-term, negligible, adverse impact on the southwestern willow flycatcher and a long-term, minor, adverse impact on the yellow-billed cuckoo and its habitat, primarily due to the disturbance of

individual animals by the presence and activities of people in the Tumacácori unit. The alternative would not affect the abundance or distribution of the park’s two bird populations. No actions would affect migration of the birds along the river corridor or areas known to be important for breeding, nesting, or foraging. No actions would interfere with feeding, reproduction, or other activities necessary for the survival of the species.

Cumulative Impacts. Past actions, including ranching and diversion of water from the Santa Cruz River, as well as the removal of tamarisk, have likely affected the populations of southwestern willow flycatcher and yellow-billed cuckoo in the park. Two actions independent of this plan could affect southwestern willow flycatcher and yellow-billed cuckoos in the park. (The recent expansion and resurfacing of the interpretive trail in the Tumacácori unit would have no effect on the species.) Ongoing vegetation restoration efforts in the riparian area of the Tumacácori unit are expected to improve habitat for the two species, and could result in a long-term, moderate, beneficial impact. On the other hand, the diversion of at least 5% of the surface water flowing in the Santa Cruz River in the park by the Los Alisos wastewater treatment plant, combined with continuing and expanded groundwater pumping in the Santa Cruz River watershed, could modify the park’s riparian vegetation and result in a long-term, adverse impact to these species. Because the flycatcher is not known to be currently using the park, this action combined with the effects of alternative 1 would likely have a negligible cumulative adverse effect on this species. However, the magnitude of the adverse impact on the yellow-billed cuckoo population in the area could be moderate to major, depending on how much water is diverted from the river and how many trees die off. When the long-term, negligible adverse effects of alternative 1 are added to these other past, present, and future actions, there could be a long-term, moderate to

major, adverse impact on the yellow-billed cuckoo population in the area (but alternative 1 would add a very small increment to this overall adverse cumulative effect).

Conclusion. Alternative 1 could have a long-term, negligible, adverse impact on the southwestern willow flycatcher and would have a long-term, minor, adverse impact on the yellow-billed cuckoo, primarily due to the disturbance of individual birds by the presence and activities of people in the Tumacácori unit. The alternative would not affect the flycatcher's proposed critical habitat in the park. The alternative may affect, but would not likely adversely affect, these two species in the park. When past, present, and future actions independent of this plan are added to the effects of alternative 1, there would be the potential for a long-term, negligible, adverse cumulative impact on the southwestern flycatcher, and the potential for a long-term, moderate to major, adverse cumulative impact on the yellow-billed cuckoo population in the area.

Alternative 2: NPS Preferred Alternative

Analysis. Alternative 2 would have about the same effects on the southwestern willow flycatcher as alternative 1. The establishment of a couple of trails in the Tumacácori unit's riparian area should affect very little of the riparian vegetation, the density of the vegetation, or insect prey populations and thus have a negligible adverse effect on the flycatcher's proposed critical habitat in the park. As in alternative 1, in this alternative it is possible that an individual flycatcher could be disturbed in the riparian area due to the presence of bird watchers and other visitors, potentially affecting foraging activities, or a bird could be harassed by some people letting their dogs run off leash. As noted in alternative 1, such an impact would be highly unlikely. Thus, alternative 2 would have the same effect on the southwestern willow

flycatcher as alternative 1—a long-term, negligible, adverse impact.

As under alternative 1, it is possible that birds could be harassed by some people letting their dogs run off leash and by people illegally riding all-terrain vehicles in the area.

The establishment of trails in the Tumacácori unit's riparian area has the potential to affect the yellow-billed cuckoos. With the application of mitigative measures (e.g., not building facilities during the critical nesting period) and careful siting of the new facilities in the riparian area, yellow-billed cuckoo nesting areas should be largely avoided. It is also possible that with the establishment of new trails, predators such as Cooper's hawks, would have more access to the riparian area and could take more of the yellow-billed cuckoos. However, only two to four access points to the river would be established, which should not substantially increase predator access into the area.

Alternative 2 would have a higher potential to disturb yellow-billed cuckoos in the Tumacácori unit than alternative 1 due to the presence of more people. More people would likely be visiting the riparian area, with the new visitor facilities. Some birds may be disturbed by people, affecting their behavior in foraging and nesting, but these impacts would be expected to be intermittent and not result in any substantial changes to the population. In addition, most of these visitors would not likely be in areas in the summer where the cuckoo is nesting. Thus, although there could be some disturbance/harassment of individual birds, the area's population would not be adversely affected. Alternative 2 consequently would have a long-term, minor, adverse impact on the park's yellow-billed cuckoos.

Overall, alternative 2 could result in a long-term, negligible, adverse impact on the southwestern willow flycatcher and its proposed critical habitat in the park, and a long-term, minor, adverse impact on the

yellow-billed cuckoo and its habitat, primarily due to the disturbance of individual animals by the presence and activities of people in the Tumacácori unit. The alternative would not affect the abundance or distribution of the two bird populations. No actions would affect migration of the birds along the river corridor or areas known to be important for breeding, nesting, or foraging. No actions would interfere with feeding, reproduction, or other activities necessary for the survival of the species.

Cumulative Impacts. Alternative 2 would have about the same potential for cumulative effects as alternative 1. Past actions, including ranching and diversion of water from the Santa Cruz River, as well as the removal of tamarisk, have likely affected the populations of southwestern willow flycatcher and yellow-billed cuckoo in the park. The recent expansion and resurfacing of the interpretive trail in the Tumacácori unit would have no effect on the species. Ongoing vegetation restoration efforts in the riparian area of the Tumacácori unit are expected to improve habitat for the two species, and could result in a long-term, moderate, beneficial impact. On the other hand, the diversion of at least 5% of the surface water flowing in the Santa Cruz River in the park by the Los Alisos wastewater treatment plant, combined with continuing and expanded groundwater pumping in the Santa Cruz River watershed could modify the park's riparian vegetation and thus affect these species. Because the flycatcher is not known to be currently using the park, this action combined with the effects of alternative 2 would likely have a negligible cumulative adverse effect on this species. However, the magnitude of the adverse impact on the yellow-billed cuckoo population in the area could be long-term, moderate to major, depending on how much water is diverted from the river and how many trees die off. When the long-term, negligible adverse effects of alternative 2 are added to these other past, present, and future actions, there could be a long-term,

moderate to major, adverse impact on the yellow-billed cuckoo population in the area (but alternative 2 would add a very small increment to this overall adverse cumulative effect).

Conclusion. Alternative 2 could have a long-term, negligible, adverse impact on the southwestern willow flycatcher and its proposed critical habitat in the park, and a long-term, minor, adverse impact on the yellow-billed cuckoo, primarily due to the disturbance of individual birds by the presence and activities of people in the Tumacácori unit. The alternative may affect, but would not likely adversely affect, these two species or the flycatcher's proposed critical habitat in the park. When past, present, and future actions independent of this plan are added to the effects of alternative 2, there would be the potential for a long-term, negligible, adverse cumulative impact on the southwestern flycatcher, and the potential for a long-term, moderate to major, adverse cumulative impact on the yellow-billed cuckoo population in the area.

Alternative 3

Analysis. Alternative 3 would have very similar effects on the southwestern willow flycatcher and yellow-billed cuckoo as alternative 2. No actions would be taken in alternative 3 that would affect the flycatcher's proposed critical habitat in the park. As in the previous alternatives, in alternative 3 it is possible that an individual flycatcher could be disturbed in the riparian area due to the presence of bird watchers and other visitors, potentially affecting foraging activities; or a bird could be harassed by some people letting their dogs run off leash. As noted in alternative 1, such an impact would be highly unlikely. Thus, alternative 3 would have the same effect on the southwestern willow flycatcher as alternative 1—a long-term, negligible, adverse impact.

No new facilities would be built under alternative 3 that would affect yellow-billed cuckoos or their habitat.

Alternative 3 would have a higher potential to disturb yellow-billed cuckoos in the Tumacácori unit than alternative 1 due to the presence of more people. More people would likely be visiting the riparian area, under this alternative. Some birds may be disturbed by people, affecting their behavior in foraging and nesting, but these impacts would be expected to be intermittent and not result in any substantial changes to the population. In addition, most of these visitors would not likely be in areas in the summer where the cuckoo is nesting. Thus, although there could be some disturbance/harassment of individual birds, the area's population would not be adversely affected. Alternative 3 consequently would have a long-term, minor, adverse impact on the park's yellow-billed cuckoos.

Overall, alternative 3 could result in a long-term, negligible, adverse impact on the southwestern willow flycatcher and a long-term, minor, adverse impact on the yellow-billed cuckoo and its habitat, primarily due to the disturbance of individual animals by the presence and activities of people in the Tumacácori unit. The alternative would not affect the abundance or distribution of the park's two bird populations. No actions would affect migration of the birds along the river corridor or areas known to be important for breeding, nesting, or foraging. No actions would interfere with feeding, reproduction, or other activities necessary for the survival of the species.

Cumulative Impacts. Alternative 3 would have about the same potential for cumulative effects as alternative 1. Past actions, including ranching and diversion of water from the Santa Cruz River, and the removal of tamarisk, have likely affected the populations of southwestern willow flycatcher and yellow-billed cuckoo in the park. The recent expansion and resurfacing of the interpretive trail in the Tumacácori

unit would have no effect on the species. Ongoing efforts to restore vegetation in the riparian area of the Tumacácori unit is expected to improve habitat for the two species, and could result in a long-term, moderate, beneficial impact. On the other hand, the diversion of at least 5% of the surface water flowing in the Santa Cruz River in the park by the Los Alisos wastewater treatment plant, combined with continuing and expanded groundwater pumping in the Santa Cruz River watershed, could modify the park's riparian vegetation and thus affect these species. Because the flycatcher is not known to be currently using the park, this action combined with the effects of alternative 1 would likely have a negligible cumulative adverse effect on this species. However, there could be a long-term, moderate to major, adverse impact on the yellow-billed cuckoo population in the area, depending on how much water is diverted from the river and how many trees die off. When the long-term, negligible adverse effects of alternative 3 are added to these other past, present, and future actions, there could be a long-term, moderate to major adverse impact on the yellow-billed cuckoo population in the area (but alternative 3 would add a very small increment to this overall adverse cumulative effect).

Conclusion. Alternative 3 could have a long-term, negligible, adverse impact on the southwestern willow flycatcher and a long-term, minor, adverse impact on the yellow-billed cuckoo, primarily due to the disturbance of individual birds by the presence and activities of people in the Tumacácori unit. The alternative may affect, but would not likely adversely affect, these two species. There would be no effect on the flycatcher's proposed critical habitat in the park. When past, present, and future actions independent of this plan are added to the effects of alternative 3, there would be the potential for a long-term, negligible, adverse cumulative impact on the southwestern flycatcher, and a long-term, moderate to

major, adverse cumulative impact on the

yellow-billed cuckoo population in the area.

IMPACTS TO THE CULTURAL RESOURCES

CULTURAL RESOURCE METHODOLOGY

The cultural resource impact topics that are analyzed in this document include archeological resources, historic structures, and cultural landscapes. Information on known resources was compiled and compared with the locations of proposed developments and other actions. The impact analysis was based on the knowledge and best professional judgment of planners, resource specialists, data from park records, and studies of similar actions and impacts when applicable. The planning team qualitatively evaluated the impact intensities for all of the cultural resource impact topics.

ARCHEOLOGICAL RESOURCES

Impact Intensity Definitions

Negligible

- ***Adverse Impact***—Impact is at the lowest level of detection. Impact would be measurable but with no perceptible consequences.
- ***Beneficial Impact***—Impact is at the lowest levels of detection; barely measurable with no perceptible consequences.

Minor

- ***Adverse Impact***—Disturbance of a site(s) results in little loss of integrity but it would not diminish the overall integrity of the site(s).
- ***Beneficial Impact***—Proposed action is to maintain or preserve a site(s).

Moderate

- ***Adverse Impact***—Site(s) is disturbed but not obliterated, diminishing the overall integrity of the site(s) to the extent that its National Register of Historic Places eligibility could be jeopardized.
- ***Beneficial Impact***—Proposed action is to stabilize a site(s).

Major

- ***Adverse Impact***—Site(s) is obliterated, diminishing the integrity of the site(s) to the extent that it is no longer eligible to be listed in the National Register of Historic Places.
- ***Beneficial Impact***—Proposed action is to actively intervene to preserve a site(s).

Alternative 1: Continuation of Current Management

Analysis. Under alternative 1, park staff would continue to monitor, document, protect, stabilize, and preserve archeological resources in all three units. With particular regard to the standards and guidelines for treating archeological resources, the existing form and features of them would be preserved and thoroughly documented. Efforts would continue to prevent livestock and illegal ATV use in the park, which would protect archeological resources from irreparable damage. Continued documentation, preservation, and protection efforts for archeological resources would have long-term, site-specific, negligible to minor, beneficial impacts.

Year-round access to the Tumacácori unit, including the Anza Trail, and ranger-guided tours of the Calabazas and Guevavi units would continue. Archeological resources adjacent to or easily accessible from visitor use areas or trails would be vulnerable to inadvertent damage and vandalism. Inadvertent impacts would include picking up or otherwise displacing artifacts, compacting of cultural deposits, and creating visitor-created trails (which can lead to erosion and destabilization of the original site architecture). Vandalism would include removing artifacts and probing or digging in sites. Inadvertent damage or vandalism would result in a loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence. Many such adverse impacts could be mitigated through additional stabilization of the site, the elimination of user-created trails to disturbed or vulnerable sites, and/or systematically collecting surface artifacts for long-term curation. Continued patrols by park staff and efforts to educate visitors regarding the significance and fragility of such resources and how visitors can reduce their impacts to archeological resources would discourage vandalism and inadvertent impacts and minimize adverse impacts. Adverse impacts would be negligible to minor, permanent, and site-specific.

Implementation of the user capacity standards and management strategies would help lessen wear and tear, inadvertent damage, and vandalism to archeological resources. The impacts would be beneficial, negligible to minor, site-specific, and long-term.

From a parkwide perspective, alternative 1 would have an overall beneficial, negligible to minor, long-term, site-specific impact primarily due to efforts to monitor, document, protect, stabilize, and preserve archeological resources in all three units.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex

would have adverse, permanent, moderate, and site-specific impacts to archeological resources due to ground disturbance activities associated with these efforts that would displace archeological resources. While the future action of completing the Anza Trail would not happen on park land, archeological resources historically connected to all three units would be affected by the construction of the trail. Impacts would be adverse, permanent, negligible to minor, and site-specific. When negligible to moderate, permanent, site-specific, adverse impacts of other actions are added to the beneficial, negligible to minor, long-term, site-specific impacts of alternative 1, there would be permanent, moderate, site-specific, adverse cumulative impacts to the park's archeological resources. The beneficial increment of alternative 1 would not reduce the overall adverse cumulative impact.

Conclusion. There would continue to be site-specific, permanent, negligible to minor, adverse impacts to archeological resources due to people, illegal cattle, and ATV trespass. Overall, the alternative would have long-term, negligible to minor, beneficial impacts primarily due to continued documentation, preservation, and protection activities in all three units. There would be permanent, moderate, adverse cumulative impacts when all of the other actions affecting the park are added to the effects of alternative 1. The beneficial increment of alternative 1 would not reduce the overall adverse cumulative impact.

Alternative 2: NPS Preferred Alternative

Analysis. In addition to the actions described in alternative 1, actions proposed in alternative 2 would have some beneficial and adverse impacts to archeological resources in the park. Similar to alternative 1, the park would further increase the protection of archeological resources by developing additional monitoring strategies to enhance resource protection and to

reduce vandalism occurrences. These efforts would have long-term, negligible, site-specific, beneficial impacts to archeological resources.

Several actions involving ground disturbing activities associated with construction proposed in alternative 2 would result in adverse impacts to archeological resources. These actions include establishing three to five picnic areas in the mesquite bosque in the Tumacácori unit; installing trailhead signs, wayside exhibits, and directional signs along the Anza Trail in the Tumacácori unit; creating a horse hitching post area (and possibly bike racks) in all three units; constructing overlooks and installing wayside exhibits along trails in the Calabazas and Guevavi units; and constructing a more sustainable shade structure at Guevavi. These actions would result in adverse impacts that are permanent, negligible to minor, and site specific. The establishment of the Mission Trail to link the Calabazas and Guevavi units and the construction of an open-air ramada at Calabazas would have permanent, adverse, minor, site-specific impacts due to the amount of ground disturbance needed to complete the task as well as the locations of these actions within large archeological sites, which increases the chance of uncovering an archeological resource. While all three units have been surveyed for archeological resources, additional surveys would precede construction-related ground disturbance (the Mission Trail, picnic areas, ramada, wayside exhibits, etc.). Known archeological resources would be avoided during construction of the picnic areas, ramada, and wayside exhibits. If national register-eligible or national register-listed archeological resources could not be avoided during establishment of the Mission Trail, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer and traditionally associated American Indian tribes. Any adverse impacts to archeological resources would be permanent and minor in intensity.

Expanded special events would affect the park's archeological resources in the Tumacácori mission complex, as the increase in visitor use would be in an area known to have archeological resources. Impacts would be adverse, permanent, negligible to minor, and site-specific.

Implementation of the user capacity standards and management strategies would help lessen wear and tear and inadvertent damage and vandalism to archeological resources. The impact would be beneficial, negligible to minor, and long-term.

From a parkwide perspective, alternative 2 would have both beneficial and adverse impacts on the park's archeological resources. Overall, the alternative would be expected to result in permanent, minor, adverse impacts compared to alternative 1, primarily due to the increase in ground disturbance activities from construction and special events.

Cumulative Impacts. Alternative 2 would have the same potential for cumulative effects as alternative 1. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would have adverse, long-term, minor to moderate, and site-specific impacts to archeological resources due to ground disturbance activities associated with these efforts that would displace archeological resources. While completion of the Anza Trail would not happen on park land, archeological resources historically connected to all three units would be affected by the construction of the trail. Impacts would be adverse, long-term, negligible to minor, and site-specific. When all of the effects of other actions are added to the long-term permanent, minor, adverse impacts of alternative 2, there would be a long-term permanent, minor to moderate, adverse cumulative impacts to the park's archeological resources. However, alternative 2 would add a very small adverse increment to the overall adverse cumulative impacts.

Conclusion. Most archeological resources affected by alternative 2 would be in the Tumacácori unit. Overall, compared to alternative 1, alternative 2 would have permanent, minor, adverse impacts, primarily due to ground disturbance activities associated with developments in all three units and increased visitor use of the Tumacácori unit from additional special events. When all of the effects of other actions are added to the permanent, minor, adverse impacts of alternative 2, there would be permanent, minor to moderate, adverse cumulative impacts to the park's archeological resources. However, alternative 2 would add a very small adverse increment to the overall adverse cumulative impacts.

Alternative 3

Analysis. In addition to the actions described in alternative 1, actions proposed in alternative 3 would have some beneficial and adverse impacts to archeological resources in the park. Under alternative 3, the impacts on the park's archeological resources would be similar to alternative 2, but with fewer adverse impacts due to fewer construction-related activities. In alternative 3, the park would further increase the protection of archeological resources by developing additional monitoring strategies to enhance resource protection and to reduce vandalism occurrences. These efforts would have long-term, negligible, site-specific, beneficial impacts to archeological resources.

Alternative 3 would result in several adverse effects on archeological resources due to proposed construction actions involving ground disturbing activities. Establishing one to two picnic areas in the mesquite bosque in the Tumacácori unit; installing trailhead signs, wayside exhibits, and directional signs along the Anza Trail in the Tumacácori unit; creating a horse hitching post area (and possibly bike racks) in all three units; constructing overlooks and installing wayside exhibits along trails in the

Calabazas and Guevavi units; and constructing sustainable shade structures at Guevavi and Calabazas would result in adverse impacts that are permanent, negligible to minor, and site specific. The establishment of the Mission Trail to link the Calabazas and Guevavi units would have permanent, adverse, minor, site-specific impacts due to the amount of ground disturbance needed to complete the task as well as the locations of this action being within a large archeological site, which increases the chance of uncovering archeological resources. While all three units have been surveyed for archeological resources, additional surveys would precede construction-related ground disturbance (the Mission Trail, picnic areas, shade structures, wayside exhibits, etc.). Known archeological resources would be avoided during construction of the picnic areas, shade structures, and wayside exhibits. If national register-eligible or national register-listed archeological resources could not be avoided during establishment of the Mission Trail, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer and traditionally associated American Indian tribes. Any adverse impacts to archeological resources would be permanent and minor in intensity.

Implementation of the user capacity standards and management strategies would help lessen wear and tear and inadvertent damage and vandalism to archeological resources. The impact would be beneficial, negligible to minor, and long term.

From a parkwide perspective, alternative 3 would have both beneficial and adverse impacts on the park's archeological resources. In addition to the long-term, negligible to minor, site-specific, beneficial impacts, there would be permanent, negligible to minor, site-specific, adverse impacts to archeological resources due to ground disturbance activities associated with new developments in all three units, but there would be fewer developments

compared to alternative 2. Overall, alternative 3 would be expected to result in permanent, minor, adverse impacts compared to alternative 1, primarily due to the increase in ground disturbing activities.

Cumulative Impacts. Alternative 3 would have the same potential for cumulative effects as alternative 1. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would have adverse, permanent, moderate, and site-specific impacts to archeological resources due to ground disturbance activities associated with these efforts that would displace archeological resources. While the future action of completing the Anza Trail would not happen on park land, archeological resources historically connected to all three units would be affected by the construction of the trail. Impacts would be adverse, permanent, negligible to minor, and site-specific. When all of the effects of other actions are added to the permanent, minor, adverse impacts of alternative 3, there would be permanent, minor to moderate, adverse cumulative impacts to the park's archeological resources. However, alternative 3 would add a very small adverse increment to the overall adverse cumulative impact.

Conclusion. Most archeological resources affected by alternative 3 would be in the Tumacácori unit. Overall, compared to alternative 1, alternative 3 would have permanent, minor, adverse impacts, primarily due to ground disturbance activities associated with developments in all three units. When all of the effects of other actions are added to the permanent, minor, adverse impacts of alternative 3, there would be permanent, minor to moderate, adverse impacts to the park's archeological resources. However, alternative 3 would add a very small adverse increment to the overall adverse cumulative impacts.

HISTORIC STRUCTURES

Impact Intensity Definitions

Negligible

- ***Adverse Impact***—Impact is at the lowest level of detection, barely perceptible and measurable.
- ***Beneficial Impact***—Impact is at the lowest level of detection, barely perceptible and not measurable.

Minor

- ***Adverse Impact***—Impact affects character-defining features but would not diminish the overall integrity of the building or structure.
- ***Beneficial Impact***—Proposed action is to stabilize or preserve the character-defining features of the building or structure in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Moderate

- ***Adverse Impact***—Impact alters a character-defining feature(s), diminishing the overall integrity of the building or structure to the extent that its national register eligibility could be jeopardized.
- ***Beneficial Impact***—Proposed action is to rehabilitate the building or structure in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Major

- ***Adverse Impact***—Impact alters character-defining features, diminishing the integrity of the building or structure to the extent

that it is no longer eligible to be listed in the national register.

- ***Beneficial Impact***—Proposed action is to restore the building or structure in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Alternative 1: Continuation of Current Management

Analysis. Actions proposed in alternative 1 would have beneficial and adverse impacts to historic structures. Under alternative 1, park staff would continue to monitor, document, stabilize, and preserve historic structures in all three units in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties*. With particular regard to the standards and guidelines for treating historic structures, the existing form, features, and architectural detailing of historic structures would be retained. Preservation maintenance of character-defining features would be emphasized over replacement of historic fabric whenever possible. Implementation of these preservation measures would have long-term, site-specific, negligible to minor, beneficial impacts to historic structures due to continued preservation efforts.

The continuation of special events held in the mission church in the Tumacácori unit would result in adverse impacts that are long-term, negligible to minor, and site-specific due to the high concentration of visitors inside and outside the historic structure and the potential for visitors to advertently and inadvertently touch the structure's fragile adobe and plaster. Similarly, continued year-round access to the Tumacácori unit and ranger-guided tours of the Calabazas and Guevavi units would mean visitors would continue advertently and inadvertently touching the historic structures at these units, resulting in impacts that are long term, negligible to minor, site-specific, and adverse due to the fragile nature of the adobe and plaster.

Continued efforts to educate visitors regarding the significance and fragility of such resources and how visitors can reduce their impacts to the structures would discourage vandalism and inadvertent impacts, minimizing adverse impacts.

Implementation of the user capacity standards and management strategies would help lessen wear and tear and inadvertent damage and vandalism to historic structures. The impacts would be beneficial, negligible to minor, site-specific, and long-term.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would result in better access to the historic structures and may result in more visitors going into and near the structures. This would increase the potential for visitors to advertently and inadvertently touch the fragile adobe and plaster used on the historic structures. The impacts would be adverse, long term, negligible to minor, and site specific. When the effects of this action are added to the long-term, negligible to minor, adverse impacts of alternative 1, there would be long-term, negligible to minor, adverse cumulative impacts to the park's historic structures. Alternative 1 would add a slight adverse increment to the overall adverse cumulative impact.

Conclusion. Alternative 1 would have long-term, negligible to minor, site-specific, adverse impacts to historic structures primarily due to visitors coming into contact with the fragile adobe and plaster on the structures. There would be the potential for a long-term, negligible to minor, adverse cumulative impacts when the future actions affecting the park are added to the effects of alternative 1. The adverse impact of alternative 1 would add a slight adverse increment to the overall adverse cumulative impact.

Alternative 2: NPS Preferred Alternative

Analysis. In addition to the actions described in alternative 1, actions proposed in alternative 2 would have beneficial impacts to historic structures in the park. Similar to alternative 1, the park would further increase the protection of historic structures by developing additional monitoring strategies to enhance resource protection and to reduce vandalism occurrences. These efforts would have long-term, negligible, site-specific, beneficial impacts to historic structures. The development of an outreach program to teach local youth and visitors preservation techniques by using the park's adobe structures as the classroom would result in impacts to historic structures that are long term, beneficial, negligible to minor, and site specific due to stabilization work performed on the structures. The park would also expand school programs to teach students preservation techniques for adobe structures using a hands-on approach. Impacts would be beneficial, long term, negligible to minor, and site specific due to stabilization work performed on the structures.

Implementation of the user capacity standards and management strategies would help lessen wear and tear, inadvertent damage, and vandalism to historic structures. The impacts would be beneficial, negligible to minor, site-specific, and long-term.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would result in better access to the historic structures and may result in more visitors going into and near the structures. This would increase the potential for visitors to inadvertently and inadvertently touch the fragile adobe and plaster used on the historic structures. The impacts would be adverse, long term, negligible to minor, and site specific. When the effects of this action are added to the long-term, negligible to minor,

beneficial impacts of alternative 2, there would be long-term, negligible to minor, beneficial cumulative impacts to the park's historic structures. The beneficial increment of alternative 2 would be a large increment of the overall beneficial cumulative impact.

Conclusion. Alternative 2 would have long-term, negligible to minor, site-specific, beneficial impacts to historic structures primarily due to preservation work performed on the structures. There would be the potential for long-term, negligible to minor, beneficial cumulative impacts when the future actions affecting the park are added to the effects of alternative 2. The beneficial increment of alternative 2 would be a large increment of the overall beneficial cumulative impact.

Alternative 3

Analysis. In addition to the actions described in alternative 1, actions proposed in alternative 3 would have beneficial impacts to historic structures in the park. Similar to alternative 1, the park would further increase the protection of historic structures by developing additional monitoring strategies to enhance resource protection and to reduce vandalism occurrences. These efforts would have long-term, negligible, site-specific, beneficial impacts to historic structures. The beneficial impacts under alternative 3 would not be as great as those under alternative 2 because fewer historic preservation activities are proposed in this alternative.

Implementation of the user capacity standards and management strategies would help lessen wear and tear, inadvertent damage, and vandalism to historic structures. The impacts would be beneficial, negligible to minor, site-specific, and long-term.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would result in better access to the historic

structures and may result in more visitors going into and near the structures. This would increase the potential for visitors to inadvertently and inadvertently touch the fragile adobe and plaster used on the historic structures. The impacts would be adverse, long term, negligible to minor, and site specific. When the effects of this action are added to the long-term, negligible to minor, beneficial impacts of alternative 3, there would be long-term, negligible to minor, adverse cumulative impacts to the park's historic structures. The beneficial increment of alternative 3 would somewhat reduce the overall adverse cumulative impact.

Conclusion. Alternative 3 would have long-term, negligible to minor, site-specific, beneficial impacts to historic structures primarily due to the efforts to preserve the structures. There would be the potential for long-term, negligible to minor, adverse cumulative impacts when the future actions affecting the park are added to the effects of alternative 3. The beneficial increment of alternative 3 would somewhat reduce the overall adverse cumulative impact.

CULTURAL LANDSCAPES

Impact Intensity Definitions

Negligible

- **Adverse Impact**—Impact is at the lowest level of detection, barely perceptible and measurable.
- **Beneficial Impact**—Impact is at the lowest level of detection, barely perceptible and not measurable.

Minor

- **Adverse Impact**—Impact affects character-defining features or patterns but would not diminish the overall integrity of the landscape.

- **Beneficial Impact**—Proposed action is to preserve character-defining patterns and features in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.

Moderate

- **Adverse Impact**—Impact alters character-defining features or patterns, diminishing the overall integrity of the landscape to the extent that its national register eligibility would be jeopardized.
- **Beneficial Impact**—Proposed action is to rehabilitate a landscape or its patterns and features in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.

Major

- **Adverse Impact**—Impact alters character-defining features or patterns, diminishing the overall integrity of the landscape to the extent that it would no longer be eligible to be listed in the national register.
- **Beneficial Impact**—Proposed action is to restore a landscape or its patterns and features in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.

Alternative 1: Continuation of Current Management

Analysis. Actions proposed in alternative 1 would have beneficial impacts to cultural landscapes. Under alternative 1, park staff would continue to monitor, stabilize, and preserve cultural landscapes in all three units in accordance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. The continued actions include monitoring, stabilizing, and preserving the vegetation (historic orchard) and views and vistas in all three units. These efforts would have beneficial, negligible, long-term, site-specific impacts to cultural landscapes. With particular regard to the standards and guidelines for treating cultural landscapes, the existing form, features, and patterns of cultural landscapes would be retained. Preservation maintenance of character-defining features and patterns would be emphasized. These continued actions would have beneficial, negligible, long-term, site-specific impacts to cultural landscapes.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would result in a better designated trail; however, the trail may detract from the overall historic feel of the cultural landscape inside the mission complex because the trail did not exist when the mission was operational. The impact of the trail would be adverse, long term, minor, and site specific. When the effects of this action are added to the long-term, negligible, beneficial impacts of alternative 1, there would be long-term, minor, adverse cumulative impacts to the park's cultural landscapes. The beneficial increment of alternative 1 would somewhat reduce the overall adverse cumulative impacts.

Conclusion. Alternative 1 would have beneficial, long-term, negligible, site-specific impacts to cultural landscapes due to the

continued preservation efforts. There would be the potential for a long-term, minor, adverse cumulative impact when the future actions affecting the park are added to the effects of alternative 1. The beneficial increment of alternative 1 would somewhat reduce the overall adverse cumulative impacts.

Alternative 2: NPS Preferred Alternative

Analysis. In addition to the actions described in alternative 1, actions proposed in alternative 2 would have beneficial and adverse impacts to the park's cultural landscapes. Similar to alternative 1, the park would further increase the protection of cultural landscapes by developing additional monitoring strategies. These monitoring strategies would include assessing the conditions of the historic orchard and views and vistas of all three units two or three times a year (in the past done once a year). These efforts would have beneficial, negligible, long-term, site-specific impacts to cultural landscapes.

Alternative 2 would result in several adverse impacts to cultural landscapes due to the installation and/or construction of new features on the landscapes. Constructing overlooks and installing wayside exhibits along trails in the Calabazas and Guevavi units; constructing an open-air ramada at the Calabazas unit; and constructing a sustainable shade structure at the Guevavi unit would result in adverse impacts to cultural landscapes that are long term, negligible to minor, and site specific. The placement of new features in or near Calabazas and Guevavi may detract from the overall historic feel of these cultural landscapes. Careful design would ensure that the establishment of trail segments and construction of structures would minimally affect the scale and visual relationships among landscape features. In addition, the topography, vegetation, circulation features, and land use patterns of the landscape would remain largely unaltered from

establishing trail segments, resulting in negligible to minor adverse effects to cultural landscapes.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would result in a better designated trail; however the trail may detract from the overall historic feel of the cultural landscape inside the mission complex since the trail did not exist when the mission was operational. The impact of the trail would be adverse, long term, minor, and site specific. When the effects of this action are added to the long-term, negligible to minor, adverse impacts of alternative 2, there would be long-term, minor, adverse cumulative impacts to the park's cultural landscapes. The adverse impacts of alternative 2 would add a very small adverse increment to the overall adverse cumulative impacts.

Conclusion. Alternative 2 would have long-term, negligible to minor, site-specific, adverse impacts to cultural landscapes primarily due to the construction and installation of new features in or near the landscapes. There would be the potential for a long-term, minor, adverse cumulative impact when the future actions affecting the park are added to the effects of alternative 2. The adverse impacts of alternative 2 would add a very small adverse increment to the overall adverse cumulative impacts.

Alternative 3

Analysis. In addition to the actions described in alternative 1, actions proposed in alternative 3 would have beneficial and adverse impacts to the park's cultural landscapes. Similar to alternative 1, the park would further increase the protection of cultural landscapes by developing additional monitoring strategies. These monitoring strategies would include assessing the conditions of the historic orchard and views and vistas of all three units two or three times a year (in the past done once a year). These efforts would have beneficial,

negligible, long-term, site-specific impacts to cultural landscapes.

Similar to alternative 2, alternative 3 would result in several adverse effects on cultural landscapes due to the installation and/or construction of new features, but there would be fewer adverse impacts under this alternative. Constructing overlooks and installing wayside exhibits along trails in the Calabazas and Guevavi units and constructing sustainable shade structures at Calabazas and Guevavi would result in adverse impacts to cultural landscapes that are long term, negligible to minor, and site specific due to the addition of structures in the landscape viewshed. The placement of new features in or near Calabazas and Guevavi may detract from the overall historic feel of these cultural landscapes. Careful design would ensure that the establishment of trail segments and construction of structures would minimally affect the scale and visual relationships among landscape features. In addition, topography, vegetation, circulation features, and land use patterns of the landscape would remain largely unaltered from trail construction, resulting in negligible to minor adverse effects to cultural landscapes.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would result in a better designated trail; however, the trail may detract from the overall historic feel of the cultural landscape inside the mission complex since the trail did not exist when the mission was operational. The impact of the trail would be adverse, long term, minor, and site specific. When the effects of this action are added to the long-term, negligible to minor, adverse impacts of alternative 3, there would be long-term, minor, adverse cumulative impacts to the park's cultural landscapes. The adverse impact of alternative 3 would add a very small adverse increment to the overall adverse cumulative impacts.

Conclusion. Alternative 3 would have long-term, negligible to minor, site-specific, adverse impacts to cultural landscapes primarily due to the construction and installation of new features in or near the landscapes. There would be the potential for

a long-term, minor, adverse cumulative impacts when the future actions affecting the park are added to the effects of alternative 3. The adverse impact of alternative 3 would add a very small adverse increment to the overall adverse cumulative impact.

IMPACTS TO VISITOR USE AND EXPERIENCE

VISITOR USE AND EXPERIENCE METHODOLOGY AND DEFINITIONS

This impact analysis considers aspects of visitor use and experience at Tumacácori National Historical Park, including the effects on visitor ability to experience the park's primary resources and their natural and cultural settings, interpretation opportunities, and opportunities for community connections. The analysis is primarily qualitative rather than quantitative, based on the conceptual nature of the alternatives. Impacts were determined considering the best available information the park had regarding visitor use and experiences. This information was supplemented by data gathered during the planning process for this general management plan, including comments from park visitors and neighbors and information provided by park staff. Primarily, visitors expressed interest in more interpretation about how the history of Tumacácori, Guevavi, and Calabazas ties into the history of the greater Santa Cruz River valley. Interest was also expressed regarding interpretation of the natural and cultural roles the Santa Cruz River has played in the past up to today as well as a continuation of special events like Luminarias.

- **Negligible:** The changes in visitor use and experience would be below or at the lowest level of detection. The visitor would not likely be aware of the effects.
- **Minor:** Changes in visitor use and experience would be detectable, although the changes would be slight. The visitor would be aware of the effects, but the effects would be slight.
- **Moderate:** Changes in visitor use and experience would be readily

apparent. The visitor would be aware of the effects and would be able to express an opinion about the changes.

- **Major:** Changes in visitor use and experience would be readily apparent and have important consequences. The visitor would be aware of the effects and likely would express a strong opinion about the changes.

Beneficial impacts are those that most visitors would perceive as desirable. Adverse impacts are those that most visitors would perceive as undesirable.

Impact duration for visitor use and experience differs slightly than what is stated in the introduction of this section. The durations are defined as follows:

- A short-term impact would last less than one year and would affect only one season's use by visitors.
- A long-term impact would last more than one year and would be more permanent in nature.

Alternative 1: Continuation of Current Management

Analysis. Under alternative 1, visitor uses and experiences at Tumacácori National Historical Park would continue as they are now. The impacts from these continued uses and experiences would be both beneficial and adverse. Visitors would continue to have year-round access to all uses and experiences at the Tumacácori unit including the mission complex, museum/visitor center, and Santa Cruz River. Visitors would continue to have guided access to the Calabazas and Guevavi units between

January and April. Impacts to visitor use and experiences would be negligible, long term, and beneficial due to the continuation of access to the resources at all three units. Visitors who come to the park when guided tours of the Calabazas and Guevavi units are not offered would not have access to this visitor experience, and therefore, impacts would be adverse, long term, and negligible due to the missed opportunity to see and experience these two units.

Within the park, visitors would continue to be able to access from three trailheads the Juan Bautista de Anza National Historic Trail (Anza Trail) and walk or hike along it through the Tumacácori unit. Impacts to visitor use and experience would be negligible, beneficial, and long term due to the continued access of the trail. Visitors on horseback would also continue to ride on the Anza Trail in the Tumacácori unit, which would result in impacts that are negligible, beneficial, and long term due to the continued access visitors on horseback would have of the trail. For visitors on foot who encounter a horse on the trail, the impacts to visitor use and experience would be adverse, negligible to minor, and short term if they are not expecting and/or wanting to see horses on the trail. The continued presence of horses on the trail would result in negligible to minor, adverse, long-term impacts for visitors not expecting and/or wanting to see horses on the trail.

Interpretation

Interpretation under alternative 1 would continue as it is currently done. Visitors would continue to view interpretive exhibits and materials in the museum/visitor center before exiting into the mission complex at the Tumacácori unit where they can read additional interpretive signs about the park's cultural resources. The park would continue to have cultural demonstrations on weekends, present living history programs with NPS staff when time allows, and conduct outreach programs to local schools on a limited basis. Visitors on the ranger-

guided tours at the Calabazas and Guevavi units would continue to receive interpretive information from NPS staff. The continuation of interpretive programming at the park would result in impacts that are beneficial, negligible to minor, and long term due to the park providing interpretive programming to visitors.

Community Connections

Under alternative 1, the park would continue to sponsor special events such as historic reenactment Mass, La Fiesta de Tumacácori, and Luminarias, which have become a tradition for community members. The park would also continue to collaborate on a limited basis on other local special events like the Anza Days celebration. Impacts to visitor use and experience would be beneficial, negligible to minor, and long term due to the park's continued involvement in special events and interaction with community members. The park would also continue to maintain and strengthen connections with traditionally associated American Indian tribes, groups, and communities with ties to the park. This would include developing park-specific guidance for contacting traditional practitioners and demonstrators, tribal representative, local ethnic and community groups, historic preservation professional, and international partners. The impacts of maintaining and strengthening these ties would be beneficial, negligible to minor, and long term due to the continued, positive relationships the park would have with these groups.

From a parkwide perspective, alternative 1 would have beneficial, negligible to minor, long-term impacts to visitor use and experience primarily from the interpretive and special event opportunities visitors would be able to continue to experience and participate in at the park.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail within the mission complex would provide visitors with a better designated trail that is also accessible. Impacts to visitor use and experience from the improved trail would be beneficial, minor, and long term. The completion of the Anza Trail from the southern boundary of the Tumacácori unit to the Calabazas unit would result in impacts that are beneficial, moderate, and long term due to greater visitor access to the park and an enhanced visitor experience. The possible future establishment of the Santa Cruz Valley National Heritage Area would result in beneficial, minor, and long-term impacts to visitor use and experience due to the additional interpretation of the historical significance of the valley, including the three units of the national historical park, which would be available to visitors. When all of the effects of future actions are added to the long-term, negligible to minor, beneficial impacts of alternative 1, there would be long-term, minor, beneficial cumulative impacts to visitor use and experience at the park. Alternative 1 would add a small beneficial increment to the overall beneficial cumulative impact.

Conclusion. Alternative 1 would result in beneficial impacts to all three units of the park. Overall the impacts would be negligible to minor, long term, and beneficial due to the continuation of current visitor experiences, the interpretation of cultural resources, and the sponsorship of special events in the park that involve culturally associated groups of people. When all of the effects of future actions are added to the long-term, negligible to minor, beneficial impacts of alternative 1, there would be long-term, minor, beneficial cumulative impacts to visitor use and experience at the park. Alternative 1 would add a small beneficial increment to the overall beneficial cumulative impact.

Alternative 2: NPS Preferred Alternative

Analysis. In addition to the actions described in alternative 1, actions proposed in alternative 2 would have mostly beneficial and some adverse impacts.

Visitor Use and Experience

Under alternative 2, the proposed changes to uses and experiences would mostly be desirable to visitors. The Anza Trail would have better trailhead and wayfinding signage along with wayside exhibits along the trail. A loop trail would be created by using the Anza Trail on the west side of the Santa Cruz River and formalizing the visitor-created trail on the east side of the river. The loop trail would include two to four access points down to the river, a second footbridge across the river, and wayfinding and interpretive signs along the trail. Impacts from better trail signs and the creation of the loop trail would be beneficial, minor to moderate, and long term due to the enhanced visitor experience. In addition, the establishment of the Mission Trail, linking the Calabazas and Guevavi units, would result in impacts to visitor use and experience that are beneficial, moderate, and long term due to the additional opportunity for visitors to experience the park.

The Tumacácori unit loop trail and Mission trail would be for hikers, horseback riders, and possibly bicyclists. For visitors who encounter a horse(s) on any of the trails, the impacts to visitor use and experience would be adverse, negligible to minor, and short term for some visitors, if they are not expecting and/or wanting to see horses on the trails. The continued presence of horses on the trail would result in negligible to minor, adverse, long-term impacts for those visitors not expecting and/or wanting to see horses on the trails.

Horse hitching post areas and possibly bike racks would be provided in areas outside the major concentration of historic structures

and/or archeological resources at all three park units. Visitors on horses and bicycles would leave them safely behind and enter the mission complex at the Tumacácori unit on foot, and the Calabazas and Guevavi units on foot but with a ranger guide or authorized volunteer. The addition of the horse hitching posts and possibly bike racks would result in impacts to visitor use and experience that are beneficial, minor to moderate, and long term due to the opportunity to experience the park using multiple transportation methods.

Three to five picnic areas would be provided in the mesquite bosque along the Anza Trail in the Tumacácori unit. The creation of these picnic areas would result in impacts to visitor use and experience that are beneficial, minor to moderate, and long term due to the additional opportunity to experience the park.

At the Calabazas and Guevavi units, new trail segments would be established in the two units. In addition, overlooks would be provided and interpretive wayside exhibits would be installed at the overlooks and along the trails within each unit. Providing additional opportunities to see parts of the two units, and enhancing the visitor experience by increasing the presence of interpretive information at these park units would result in impacts that are beneficial, minor to moderate, and long term.

The park may develop virtual tours of the Calabazas and Guevavi units viewable through the park website, which could result in impacts to visitor use and experience that are beneficial, minor to moderate, and long term because visitors would have the opportunity to experience these park units year-round and outside of the ranger-guided tours.

Fencing the Calabazas unit boundary would not be expected to affect most visitor experience. Assuming the fence is well designed to fit in with the local environment and is not visually obtrusive, the fence would

have a negligible, adverse, long-term impact on visitor experience.

The implementation of user capacity indicators and standards to guide visitor use management in the park and increased monitoring of certain visitor activities (e.g., hiker-horseback rider conflicts, incidents of graffiti) would reduce the potential for visitor impacts compared to alternative 1, and thus result in a long-term, minor, beneficial impact to visitor experience in the park. Specific actions that may be taken if standards identified in this plan were to be approached or exceeded would be evaluated under the requirements of the National Environmental Policy Act, the National Historic Preservation Act, and other applicable laws and policies.

Interpretation

Under alternative 2, cultural demonstrations would be expanded and may include the addition of livestock and farming in the agricultural lands at the Tumacácori unit. Interpreting how people once lived at the mission by presenting cultural demonstrations would result in impacts that are beneficial, moderate, and long term due to the increase in visitor understanding of the mission's history.

By increasing staffing to include additional interpretive rangers, new interpretive exhibits and programs would be created to describe to visitors how the Santa Cruz River has changed over time and how those changes impacted resources in and around the park. The expansion of interpretive programming would result in impacts to interpretation that are moderate, beneficial, and long term due to the increase in visitor understanding of the river's significance to the mission systems' history.

The park would develop an outreach program for local youth to increase their understanding and awareness of preservation techniques the National Park Service uses on its adobe historic structures.

Along similar lines, the park would expand school programs to include opportunities for students to have a hands-on experience learning adobe preservation techniques in the park. The park would increase the number of interpretive signs in the mission complex at the Tumacácori unit to explain to visitors the different historic preservation techniques used to maintain the structures. These interpretive programs and signs would result in impacts that are beneficial, moderate, and long term due to the increase of knowledge visitors would receive about preserving the mission structures.

Community Connections

Discussion forums focusing on topics involving resources inside park boundaries would be developed to provide for scholarly discussion and the sharing of different perspectives. Topics discussed may include historic preservation techniques, the history of the park and region, and restoration of the riparian area in the Tumacácori unit. These forums would involve participation from community members and result in impacts that are moderate, beneficial, and long term due to the improvement in community relations.

Interpretation of the park would be improved through the expansion of the living history program to include more community involvement and through tribal participation in the development of interpretive materials and programs. The impacts from these improvements would be beneficial, minor to moderate, and long term due to the improvement in relations with community and tribal members.

The park would establish a mentoring program for youth to learn from elders the different cultural demonstrations presented in the park. The impact to community connections would be moderate, beneficial, and long term from the increased involvement of community members in the interpretation of the park.

Acknowledging the importance of natural resources to the community, the park would invite communities to participate in natural resource management activities such as river cleanup or invasive plant removal. The impacts to community connections would be minor to moderate, beneficial, and long term due to the increased involvement of community members in the protection of natural resources in the park.

From a parkwide perspective, alternative 2 would have beneficial, minor to moderate, long-term impacts to visitor use and experience from the enhanced visitor experiences involving trails, the expansion of interpretive materials and programs for visitors and school groups, and the increase in opportunities for communities to participate in activities at the park like discussion forums and cultural demonstrations.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail within the mission complex would provide visitors with a better designated trail that is also accessible. Impacts to visitor use and experience from the improved trail would be beneficial, minor, and long term. The completion of the Anza Trail from the southern boundary of the Tumacácori unit to the Calabazas unit would result in impacts that are beneficial, moderate, and long term due to greater visitor access to the park and an enhanced visitor experience. The possible future establishment of the Santa Cruz Valley National Heritage Area would result in beneficial, minor, and long-term impacts to visitor use and experience due to the additional interpretation of the historical significance of the valley, including the three units of the national historical park, which would be available to visitors. When all of the effects of future actions are added to the long-term, minor to moderate, beneficial impacts of alternative 2, there would be long-term, moderate, beneficial cumulative impacts to visitor use and experience at the park. Alternative 2 would add a large

beneficial increment to the overall beneficial cumulative impact.

Conclusion. Alternative 2 would result in beneficial impacts to visitor use and experience for all three units of the park. Overall the impacts would be minor to moderate, long term, and beneficial due to enhanced, expanded, and inclusive visitor experiences, the interpretation of cultural resources, the sponsorship of special events in the park that involve culturally associated groups of people, the application of user capacity indicators and standards, and enhanced community connections. When all of the effects of future actions are added to the long-term, minor to moderate, beneficial impacts of alternative 2, there would be long-term, moderate, beneficial cumulative impacts to visitor use and experience at the park. Alternative 2 would add a large beneficial increment to the overall beneficial cumulative impact.

Alternative 3

Analysis. In addition to the actions described in alternative 1, actions proposed in alternative 3 would have mostly beneficial and some adverse impacts.

Visitor Use and Experience

Under alternative 3 and similar to alternative 2, the proposed changes to uses and experiences would mostly be desirable to visitors. The Anza Trail would have better trailhead and wayfinding signage along with wayside exhibits along the trail. Impacts to visitor experience would be beneficial, minor to moderate, and long term due to better trail signage helping visitors find their way. In addition, the establishment of the Mission Trail linking the Calabazas and Guevavi units would result in impacts to visitor use and experience that are beneficial, moderate, and long term due to the additional opportunity for visitors to experience the park.

The Anza Trail in the Tumacácori unit and the Mission Trail would be for hikers and horseback riders. For visitors who encounter a horse(s) on either of the trails, the impacts to visitor use and experience would be adverse, negligible to minor, and short term for some visitors, if they are not expecting and/or wanting to see horses on the trail. The continued presence of horses on the trail would result in negligible to minor, adverse, long-term impacts for visitors not expecting and/or wanting to see them there.

Horse hitching post areas and possibly bike racks would be provided in areas outside the major concentration of historic structures and/or archeological resources at all three park units. Visitors on horses and bicycles would leave them safely behind and enter the mission complex at the Tumacácori unit on foot, and the Calabazas and Guevavi units on foot but with a ranger guide or authorized volunteer. The addition of the horse hitching posts and possibly bike racks would result in impacts to visitor use and experience that are beneficial, minor to moderate, and long term due to the opportunity to experience the park using multiple transportation methods.

One to two picnic areas would be provided in the mesquite bosque along the Anza Trail in the Tumacácori unit. The creation of these picnic areas would result in impacts to visitor use and experience that are beneficial, minor to moderate, and long term due to the additional opportunity to experience the park.

In the Calabazas unit, new trail segments would be established. In addition, in both the Calabazas and Guevavi units, overlooks would be provided and interpretive wayside exhibits would be installed at the overlooks and along the trails within each unit. Providing additional opportunities to see part of the Calabazas unit and enhancing the visitor experience by increasing the presence of interpretive information in both park units would result in impacts that are

beneficial, minor to moderate, and long term.

The park would develop virtual tours viewable through the park website that would connect the history of all three park units as well as connect the park's history and resources to the larger community. A virtual tour of the Calabazas and Guevavi units would also be created. The virtual tours would result in impacts to visitor use and experience that are beneficial, moderate, and long term because visitors would have the opportunity to experience these park units year round, without physically being at the park, and without going on a ranger-guided tour. Along a similar line, the park would develop an auto tour of the Santa Cruz River valley that would connect the three park units to the larger community around it. The auto tour would result in impacts to visitor use and experience that are moderate, beneficial, and long term due to the opportunity to learn more about the three units and how they fit into the history of the valley.

Fencing the Calabazas unit boundary would not be expected to affect most visitor experience. Assuming the fence is well designed to fit in with the local environment and is not visually obtrusive, the fence would have a negligible, adverse, long-term impact on visitor experience.

The implementation of user capacity indicators and standards to guide visitor use management in the park and increased monitoring of certain visitor activities (e.g., hiker-horseback rider conflicts, incidents of graffiti) would help reduce the potential for visitor impacts compared to alternative 1, and thus result in a long-term, minor, beneficial impact to visitor experience in the park. Specific actions that may be taken if standards identified in this plan were to be approached or exceeded would be evaluated under the requirements of the National Environmental Policy Act, the National Historic Preservation Act, and other applicable laws and policies.

Interpretation

By increasing staffing to include additional interpretive rangers, new interpretive exhibits and programs would be created to describe the connections between the natural resources, settlement in the valley, and the cultural resources in the park and related sites in the valley. Visitors would also learn how the Santa Cruz River has changed over time and how those changes impacted resources in and around the park. Overall, interpretation would be on a broader scale to show how the park and its resources fit into the larger historic context of the Santa Cruz River valley. The expansion of interpretive programming would result in impacts to interpretation that are negligible to minor, beneficial, and long term due to the increase in visitor understanding.

The park would develop interpretive opportunities for visitors related to natural and cultural resource management techniques. These interpretive opportunities would result in impacts that are beneficial, negligible to minor, and long term due to the increase of knowledge visitors would receive about resource management techniques.

Community Connections

The park would emphasize through visitor programs and communications the community's traditional ties to the park and its resources and how this instills a sense of pride and ownership among community members. Impacts would be beneficial, moderate, and long term due to the increased interpretation of the community connection.

Special events such as historic reenactment Mass, La Fiesta de Tumacácori, and Luminarias, would continue in the park while the potential exists to introduce new events outside of the park. Impacts to visitor use and experience would be beneficial, minor to moderate, and long term due to the park's continued involvement in special

events and interaction with community members.

Under this alternative, the park would consider offering all three units of the park as venues for community events since the park is directly tied to the greater ecosystem of the valley through the Santa Cruz River. This action would result in impacts to visitor use and experience that are minor to moderate, beneficial, and long term due to the increase in opportunity for the community to be involved in the park.

Interpretation of the park would be improved through the expansion of tribal participation in the development of interpretive materials and programs about their traditional uses of the Santa Cruz River. The impacts from these improved relations and interpretation would be beneficial, moderate, and long term due to the improvement in relations with tribal members.

The park would expand opportunities to work outside the park boundary with the community on large-scale natural resource issues along and in the river itself. Collaborative work would include restoration of the Santa Cruz River during multi-day projects, educational programs, volunteer opportunities, and special events to celebrate the river. Impacts from this increase community involvement would be beneficial, minor to moderate, and long term from the increased involvement of community members in the protection of a park resource.

From a parkwide perspective, alternative 3 would have beneficial, minor to moderate, long-term impacts to visitor use and experience because of the increase in opportunities to access additional trails, expansion of interpretive materials and programs for visitors and school groups, and increase in opportunities for communities to participate in activities at the park. The benefits of alternative 3 would not be as much as alternative 2.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail within the mission complex would provide visitors with a better designated trail that is also accessible. Impacts to visitor use and experience from the improved trail would be beneficial, minor, and long term. The completion of the Anza Trail from the southern boundary of the Tumacácori unit to the Calabazas unit would result in impacts that are beneficial, moderate, and long term due to greater visitor access to the park and an enhanced visitor experience. The possible future establishment of the Santa Cruz Valley National Heritage Area would result in beneficial, minor, and long-term impacts to visitor use and experience due to the additional interpretation of the historical significance of the valley, including the three units of the national historical park, which would be available to visitors. When all of the effects of future actions are added to the long-term, minor to moderate, beneficial impacts of alternative 3, there would be long-term, moderate, beneficial cumulative impacts to visitor use and experience at the park. Alternative 3 would add a modest beneficial increment to the overall beneficial cumulative impact.

Conclusion. Alternative 3 would result in beneficial impacts to visitor use and experience for all three units of the park. Overall the impacts would be minor to moderate, long term, and beneficial due to enhanced, expanded, and inclusive visitor experiences, interpretation, the application of user capacity indicators and standards, and community connections. When all of the effects of future actions are added to the long-term, minor to moderate, beneficial impacts of alternative 3, there would be long-term, moderate, beneficial cumulative impacts to visitor use and experience at the park. Alternative 3 would add a modest beneficial increment to the overall beneficial cumulative impact.

IMPACTS TO THE SOCIOECONOMIC ENVIRONMENT

SOCIOECONOMIC ENVIRONMENT METHODOLOGY AND DEFINITIONS

The National Park Service applied logic, experience, and professional judgment to analyze the impacts on the social and economic situation that would result from each alternative. Economic data, historical visitor use data, expected future visitor use, and future developments in and around the park were all considered in identifying and evaluating expected impacts.

- ***Negligible:*** The effects on socioeconomic conditions would be below or at a level of detection.
- ***Minor:*** The effects on socioeconomic conditions would be slight but detectable, and only affect a small portion of the surrounding population. The impact would not be detectable outside the affected area.
- ***Moderate:*** The effects on socioeconomic conditions would be readily apparent. Any effects would result in changes to socioeconomic conditions on a local scale in the affected area.
- ***Major:*** The effects on socioeconomic conditions would be readily apparent. Measurable changes in social or economic conditions would be apparent beyond the county level. The impact is severely adverse or exceptionally beneficial.

Alternative 1: Continuation of Current Management

Analysis. Under the no-action alternative, management and operations of Tumacácori National Historical Park would continue as

they are now. Implementing this alternative would continue the input of federal dollars into the region in the forms of employee wages and the purchase of supplies and materials.

In addition to the ongoing input of dollars, implementing alternative 1 would include estimated one-time expenditures of \$632,600 according to the NPS Project Management Information System. This would be an input of federal dollars into the region in the form of purchases of materials for the Tumacácori interpretive trail improvement project, native species restoration, and structure rehabilitation. This would result in short-term, negligible, beneficial impacts as government expenditures enter the local economy.

The average length of time of a visit or length of stay in the area is not anticipated to change under this alternative. Visitors would likely continue to visit the national historical park in the same manner and experience the same social conditions. The NPS Public Use Statistics Office forecasts that visitation at the park will decrease slightly in coming years. The direct and indirect effects of visitor spending may be reduced slightly under this alternative but would continue to be a minor, long-term, beneficial impact on the local economy.

Cumulative Impacts. A feasibility study has been completed for the Santa Cruz Valley National Heritage Area, which would span from the Mexico border to the Santa Catalina Mountains north of Tucson. If this area were to become designated, it could draw more visitors to the valley, which would result in a beneficial impact from increased spending.

The total socioeconomic value of public lands that provide recreational opportunities

includes two sets of values (1) the user benefit that people receive from their visit and (2) the values capitalized in land near the recreation area. Economic studies have shown that the value of land can increase with the number of outdoor recreation opportunities and the proximity to outdoor recreation space (Clawson and Knetsch 1966). This is another way the presence of the national historical park provides a beneficial contribution to the local economy.

The no-action alternative would contribute short-term, negligible, beneficial impacts and ongoing long-term, minor, beneficial impacts to the above beneficial impacts of past, present, and future actions on socioeconomic conditions and, when considered in combination with other actions, would result in a minor, beneficial cumulative effect. This contribution of this alternative would be slight.

Conclusion. Implementing the no-action alternative would result in short-term, negligible, beneficial impacts and ongoing long-term, minor, beneficial impacts as government expenditures and visitor spending enter the local economy. The cumulative effect would be minor and beneficial.

Alternative 2: NPS Preferred Alternative

Analysis. Implementing alternative 2 would result in a 33% increase in the annual flow of federal dollars generated by the national historical park into the area in the forms of employee wages and the purchase of utilities, supplies, and materials. This would be a long-term, minor, beneficial impact as government expenditures enter the local economy. Included in this increase would be an additional 6.5 full-time equivalent employees to the park staff, which has far-reaching and long-term beneficial impacts such as housing, utilities, services, and grocery purchases.

Alternative 2 would have estimated one-time costs of \$1,321,600. This would be an input of federal dollars into the region in the form of purchases of construction contracts and/or materials to construct the assets identified in this alternative. This would result in short-term, minor, beneficial impacts on the local economy.

Management and operations of Tumacácori National Historical Park would change to provide a greater variety of visitor experience opportunities. Therefore, the number of visitors and the average length of time of a visit could increase under this alternative. For example, if the number of visitors were to increase by 10%, the resulting increase in total effects of visitor spending in the county would be \$137,000.

The direct and indirect effects of the anticipated increases in park operation spending and visitor spending would be a short-term, minor, beneficial impact and a long-term, minor, beneficial impact on the local economy.

Cumulative Impacts. The social and economic situation in Santa Cruz County is affected by a combination of many factors, including the presence of a unit of the National Park Service. Some of the \$380,000 in total federal spending in the county is generated by Tumacácori National Historical Park in the forms of employee wages and purchases of supplies and services—a long-term, beneficial impact. The livelihoods of service-related businesses in the region, such as restaurants and motels, rely to some degree on the inflow of tourist dollars. Although tourism is not the most important driving factor in the regional economy, a downward trend in national park visitation could adversely affect tourism-dependent businesses.

A feasibility study has been completed for the Santa Cruz Valley National Heritage Area, which would span from the Mexico border to the Santa Catalina Mountains north of Tucson. If this area were to become

designated, it could draw more visitors to the valley, which would result in a beneficial impact from increased spending.

The total socioeconomic value of public lands that provide recreational opportunities includes two sets of values (1) the user benefit that people receive from their visit and (2) the values capitalized in land near the recreation area. Economic studies have shown that the value of land can increase with the number of outdoor recreation opportunities and the proximity to outdoor recreation space (Clawson and Knetsch 1966). This is another way the presence of the national historical park provides a beneficial contribution to the local economy.

Alternative 2 would contribute short-term, minor, beneficial impacts and long-term, minor, beneficial impacts to the above beneficial impacts of past, present, and future actions on socioeconomic conditions and, when considered in combination with other actions, would result in a minor, beneficial cumulative effect. This contribution of this alternative would be modest.

Conclusion. Implementing alternative 2 would result in short-term, minor, beneficial impacts and long-term, minor, beneficial impacts as government expenditures enter the local economy. An anticipated increase in visitor spending would result in a long-term, minor, beneficial impact. The cumulative effect would be minor and beneficial.

Alternative 3

Analysis. Implementing alternative 3 would result in a 24% increase in the annual flow of federal dollars generated by Tumacácori National Historical Park into the area in the forms of employee wages and the purchase of utilities, supplies, and materials. Included in this increase would be an additional 4.5 full-time equivalent employees to the park staff, which has far-reaching effects such as housing, utilities, services, and grocery

purchases. This would be a long-term, minor, beneficial impact as government and personal expenditures enter the local economy.

Alternative 3 would have estimated one-time costs of \$1,215,600. This would be an input of federal dollars into the region in the form of purchases of construction contracts and/or materials to construct the assets identified in this alternative. This would result in short-term, minor, beneficial impacts on the local economy.

Tumacácori National Historical Park would provide diverse interpretive and recreational opportunities under this alternative. This could result in a slight increase in the number of visitors and the average length of time of a visit. For example, for every 1% of increase in the number of visitors, the resulting increase in total effects of visitor spending in the county would be \$13,700.

The direct and indirect effects of the proposed increases in park operation spending would be a short-term, minor, beneficial impact and a long-term, minor, beneficial impact on the local economy. The anticipated increase in visitor spending would have a long-term, negligible, beneficial impact.

Cumulative Impacts. A feasibility study has been completed for the Santa Cruz Valley National Heritage Area, which would span from the Mexico border to the Santa Catalina Mountains north of Tucson. If this area were to become designated, it could draw more visitors to the valley, which would result in a beneficial impact from increased spending.

The total socioeconomic value of public lands that provide recreational opportunities includes two sets of values (1) the user benefit that people receive from their visit and (2) the values capitalized in land near the recreation area. Economic studies have shown that the value of land can increase with the number of outdoor recreation

opportunities and the proximity to outdoor recreation space (Clawson and Knetsch 1966). This is another way the presence of the national historical park provides a beneficial contribution to the local economy. Alternative 3 would contribute short-term, minor, beneficial impacts and long-term, minor, beneficial impacts to the above beneficial impacts of past, present, and future actions on socioeconomic conditions and, when considered in combination with other actions, would result in a minor, beneficial cumulative effect. This

contribution of this alternative would be modest.

Conclusion. Implementing alternative 3 would result in short-term, minor, beneficial impacts and long-term, minor, beneficial impacts as government expenditures enter the local economy. A slight increase in visitor spending would result in a long-term, negligible, beneficial impact. The cumulative effect would be minor and beneficial.

IMPACTS TO PARK OPERATIONS AND FACILITIES

PARK OPERATIONS AND FACILITIES METHODOLOGY AND DEFINITIONS

The impacts of the alternatives on park operations and facilities were determined by examining the effects and changes on staffing, infrastructure, visitor facilities, and services.

This impact analysis considers aspects of park operations including the effects of each alternative on the number of staff required to conduct park operations, modifications to operating procedures, additional facilities required to implement an alternative, and the relative cost and effort to maintain additional facilities. The analysis is primarily qualitative rather than quantitative because of the conceptual nature of the alternatives.

- **Negligible:** Any changes would be at low levels of detection and would have a minimal effect on park operations.
- **Minor:** Changes would be detectable but would be of a magnitude that would not have an appreciable effect on park operations.
- **Moderate:** Changes in park operations would be noticeable to the staff and possibly to the public in terms of visitor experience.
- **Major:** There would be a substantial change in park operations, readily apparent to staff and the public.

Beneficial impacts would improve NPS operations and/or facilities.

Adverse impacts would put pressure on NPS operations and/or facilities and could hinder NPS staff's ability to provide adequate services and facilities to visitors and staff.

Alternative 1: Continuation of Current Management

Analysis. Under alternative 1, the management of park operations and facilities at Tumacácori National Historical Park would continue as they are now. Park staff would continue to maintain existing facilities to current standards, such as, but not limited to, repairing/repaving the parking lot, repairing buildings, regularly cleaning interior public and administrative spaces, maintaining trails, and repairing fences.

These routine park operations, as well as managing resources in three disjunctive units, providing interpretive and educational services, and continuing neighbor and community outreach, would continue to challenge park operations. Current funding levels have caused some staff positions to remain vacant, which has had an effect on the park's organizational capacity.

The upgrading of the two existing RV/trailer pads near the NPS employee residence to include sewer hookups and building small shade ramadas next to the pads would eliminate a deferred maintenance need and improve the lives of volunteers who live there. This would result in a long-term, negligible, beneficial impact on park operations and facilities.

From a parkwide perspective, assuming current funding trends continue and staffing levels remain at present levels, the park staff would continue to be challenged to fully achieve desired conditions in program areas such as resource protection and visitor services. Thus, alternative 1 would have long-term, moderate, adverse impact on park operations and facilities.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori

interpretive trail in the mission complex would require park staff to routinely maintain and monitor resources around the improved trail. This would require additional time of park employees, increasing their workload, resulting in an adverse, long-term, minor impact to park operations.

The possible future establishment of the Santa Cruz Valley National Heritage Area would require time and effort from national historical park employees to help manage the area. This would result in impacts to park operations that are adverse, minor to moderate, and long term. When the impacts of these NPS actions are added to the long-term, moderate, adverse impacts of alternative 1, there would be an adverse, long-term, minor to moderate cumulative impact to park operations and facilities primarily associated with increased coordination efforts. The contribution of alternative 1 to the overall cumulative impact would be substantial.

Conclusion. Overall, alternative 1 would have long-term, moderate, adverse impacts on park operations and facilities as a result of continuing high demands on the park's limited staff. There would be the potential for a long-term, minor to moderate, adverse cumulative impact when NPS actions independent of alternative 1 are added to the impacts of alternative 1 because of increased operational requirements. Alternative 1 would add a substantial increment to the overall adverse cumulative impact.

Alternative 2: NPS Preferred Alternative

Analysis. Alternative 2 includes the actions described in alternative 1 plus additional actions that would have both beneficial and adverse impacts to park operations and facilities. Under alternative 2, the park staff would develop and implement criteria to determine the appropriateness (e.g., consistency with the management concept of the park) of special event requests

submitted by the public and this would result in impacts to park operations that are beneficial, minor, long-term due to the formalized and efficient process being in place. Similarly, the park staff would develop, document, and implement management approaches to minimize impacts to park resources, operations, and visitor experiences during special events. This would result in impacts to park operations that are beneficial, minor to moderate, and long term because the implementation of the management approaches would positively change the way park employees manage the protection of resources before, during, and after special events. In this alternative, a cohesive and consistent "look and feel" for all three park units would be created through the same style of wayfinding signs for each unit, which would result in efficiencies for park operations and facilities, a beneficial, minor to moderate, long-term impact.

Implementation of the user capacity standards and management strategies would help lessen the number of graffiti incidents in the Tumacácori and Calabazas units, as well as other resource impacts. Although more staff time would be needed to monitor the user capacity indicators, park staff would be more effective and targeted in addressing visitor impacts that occur. Overall, this would result in a long-term, minor beneficial impact in park operations.

As in alternative 1, the upgrading of the two existing RV/trailer pads near the NPS employee residence in the Tumacácori unit would eliminate a deferred maintenance need and improve the lives of volunteers who live there. This would result in a long-term, negligible, beneficial impact on park operations and facilities.

With additional employees, the park staff would be able to better achieve desired conditions in program areas, such as resource protection and visitor services. Remodeling/reconfiguring office space to house the new employees would result in

some disruptions in operations, which would be a short-term, negligible to minor adverse impact. Overall, adding new staff would have a long-term, moderate, beneficial impact on park operations and facilities.

While some of the actions proposed in alternative 2 would be beneficial, others would adversely impact park operations and facilities. The construction of a new sustainable shade ramada at the Guevavi unit; the construction of an open-air ramada with interpretive information at the Calabazas unit; the construction of overlooks and the installation of wayside exhibits along trails at Calabazas and Guevavi; the establishment of new trail segments in the Calabazas and Guevavi units; and the installation of horse hitching post areas (and possibly bike racks) at all three units would result in impacts to park operations that are minor, adverse, and long term due to the additional effort associated with monitoring the structures for vandalism as well as routine maintenance. The expansion of special events to include one or two more events a year would have an adverse, minor to moderate, long-term impact to park associated with preparing, working, and cleaning up after the events.

In the Tumacácori unit, the creation of a loop trail with wayside exhibits; the establishment of three to five picnic areas in the mesquite bosque along the Anza Trail; and the establishment of two to four access points to the Santa Cruz River and construction of a footbridge across the river would result in impacts to park operations that are minor, adverse, and long term due to the additional staff time associated with monitoring the structures for vandalism as well as routine maintenance.

The erection and maintenance of a boundary fence around the Calabazas unit would require additional staff time to oversee and monitor for vandalism. Even with the addition of staff and community outreach, this would be a long-term, minor

to moderate, adverse impact on park operations.

The potential expansion of cultural demonstrations to include livestock and farming at the Tumacácori unit, several new planning efforts (e.g., preparing a parkwide trail plan), and efforts to work with partners to create the Mission Trail, would result in impacts to park operations that are adverse, moderate, and long term due to the increase in workload for park staff.

Several new planning efforts (e.g., preparing a parkwide trail plan) and efforts to work with partners to create the Mission Trail would require more time from park staff. This would result in impacts to park operations that are adverse, minor to moderate, and long term due to the increase in workload for park staff.

From a parkwide perspective, alternative 2 would result in the largest increase in staff activities of all the alternatives considered—the park's maintenance and operational activities would be increased by the addition of several new visitor facilities, undertaking additional efforts to revegetate selected landscapes, and expanding interpretive and outreach efforts. Overall, compared to alternative 1, alternative 2 would result in a long-term, minor, adverse impact—a reduction in the level of adverse impacts on park operations and facilities.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would require park staff to routinely maintain and monitor resources around the improved trail. This would require additional time of park employees, increasing their workload, resulting in adverse, long-term, minor impacts to park operations. The possible future establishment of the Santa Cruz Valley National Heritage Area would require time and effort from park employees to help manage the area. This would result in impacts to park operations that are adverse, minor to

moderate, and long term. When the impacts of the above NPS actions are added to the long-term, minor adverse impacts of alternative 2, there would be an adverse, long-term, minor cumulative impact to park operations and facilities primarily due to the increase in coordination activities. Alternative 2 would add a large increment to the overall adverse cumulative impact.

Conclusion. Overall, compared to alternative 1, alternative 2 would have long-term, minor, adverse impacts on park operations and facilities primarily due to the increase in proposed new facilities and operational activities the park will manage. There would be the potential for a long-term, minor, adverse cumulative impact when NPS actions independent of this plan are added to the impacts of alternative 2 primarily due to the need for increased coordination alternative 2 would add a large increment to the overall adverse cumulative impact.

Alternative 3

Analysis. Alternative 3 includes the actions described in alternative 1, plus additional actions that would have both beneficial and adverse impacts to park operations and facilities. Under alternative 3, the park staff would develop and implement criteria to determine the appropriateness (e.g., consistency with the management concept of the park) of special event requests submitted by the public and this would result in impacts to park operations that are beneficial, minor, long term due to the formalized and efficient process being in place. Similarly, the park staff would develop, document, and implement management approaches to minimize impacts to park resources, operations, and visitor experiences during special events. This would result in impacts to park operations that are beneficial, minor to moderate, and long term because the implementation of the management approaches would positively change the way park employees manage the protection of

resources before, during, and after special events. In this alternative a cohesive and consistent “look and feel” for all three park units would be created through the same style of wayfinding signs for each unit, which would result in efficiencies for park operations and facilities, and a beneficial, minor to moderate, long-term impact.

As in alternative 2, the implementation of the user capacity standards and management strategies in alternative 3 would help lessen the number of graffiti incidents in the Tumacácori and Calabazas units, as well as other resource impacts. Although more staff time would be needed to monitor the user capacity indicators, park staff would be more effective and targeted in addressing visitor impacts that occur. Overall, this would result in a long-term, minor beneficial impact in park operations.

As in the previous alternatives, the upgrading of the two existing RV/trailer pads near the NPS employee residence in the Tumacácori unit would eliminate a deferred maintenance need and improve the lives of volunteers who live there. This would result in a long-term, negligible, beneficial impact on park operations and facilities.

With additional employees, the park staff would be able to better achieve desired conditions in program areas, such as resource protection and visitor services. Remodeling/reconfiguring office space to house the new employees would result in some disruptions in operations, which would be a short-term, negligible to minor adverse impact. Overall, adding additional staff would have a long-term, moderate, beneficial impact on park operations.

Although some of the actions proposed in alternative 3 would be beneficial, others would adversely impact park operations and facilities. The establishment of one to two picnic areas in the mesquite bosque along the Anza Trail in the Tumacácori unit, the construction of a new sustainable shade ramada at the Guevavi unit; the construction

of an open-air ramada at the Calabazas unit; the construction of overlooks and the installation of wayside exhibits along trails at Calabazas and Guevavi; the establishment of new trail segments in the Calabazas unit; and the installation of horse hitching post areas (and possibly bike racks) at all three units would result in impacts to park operations that are minor, adverse, and long term due to the additional effort associated with monitoring the structures for vandalism as well as routine maintenance.

The erection and maintenance of a boundary fence around the Calabazas unit would require additional staff time to oversee and monitor for vandalism. Even with the addition of staff and community outreach, this would be a long-term, minor to moderate, adverse impact on park operations.

Several new planning efforts (e.g., preparing a parkwide trail plan) and efforts to work with partners to create the Mission Trail would require more time from park staff. This would result in impacts to park operations that are adverse, minor to moderate, and long term due to the increase in workload for park staff.

From a parkwide perspective, under alternative 3 the park's maintenance and operational activities would be increased by the addition of a few new visitor facilities, undertaking additional efforts to revegetate selected landscapes, and expanding interpretive and outreach efforts. Although increased staffing and additional partnerships would help improve park operations, the increased workload also would spread out the park staff and increase the potential for inefficiencies in completing all the tasks facing the park staff. Overall, compared to

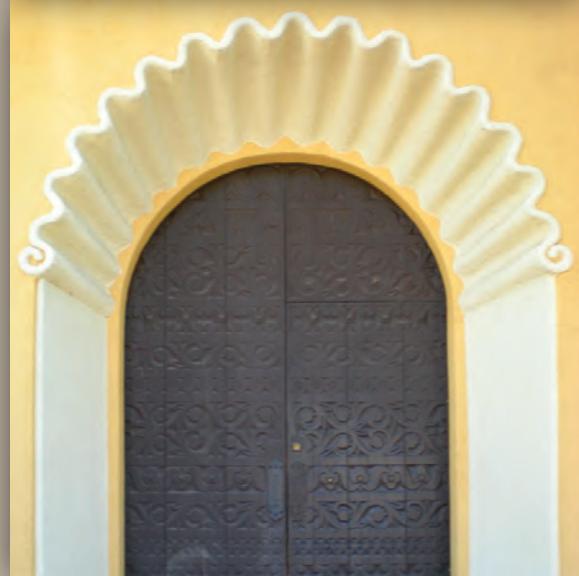
alternative 1, alternative 3 would result in a long-term, minor adverse impact—a reduction in the level of adverse impacts on park operations and facilities.

Cumulative Impacts. The recent expansion and resurfacing of the Tumacácori interpretive trail in the mission complex would require the park staff to routinely maintain and monitor resources around the improved trail. This would require additional time of park employees, increasing their workload, resulting in an adverse, long term, minor impact to park operations.

The possible future establishment of the Santa Cruz Valley National Heritage Area would require time and effort from park employees to help manage the area. This would result in impacts to park operations that are adverse, minor to moderate. When the effects of the above NPS actions are added to the long-term, minor, adverse impacts of alternative 3, there would be an adverse, long-term, minor cumulative impact to park operations and facilities primarily due to the increased coordination with partners. Alternative 3 would add a large increment to the overall adverse cumulative impact.

Conclusion. Overall, compared to alternative 1, alternative 3 would have a long-term, minor, adverse impact, primarily due to the increase proposed new facilities and operational activities for the park to manage. There would be the potential for a long-term, minor adverse cumulative impact when NPS actions independent of this plan are added to the impacts of alternative 3 due to the increased coordination requirements. Alternative 3 would add a large increment of the overall adverse cumulative impact.

CHAPTER 5 ◈ CONSULTATION AND COORDINATION



PUBLIC AND AGENCY INVOLVEMENT

The *General Management Plan / Environmental Assessment* for Tumacácori National Historical Park represents thoughts of the National Park Service, other agencies, American Indian tribes traditionally associated with the park, and the public. Consultation and coordination among these groups were vitally important throughout the planning process.

The public had three primary avenues through which to participate during the development of the plan. These included participating in public meetings, responding to newsletters, and submitting comments on the NPS planning website.

PUBLIC MEETINGS AND NEWSLETTERS

Public meetings and two newsletters were used to keep the public informed and involved in the planning process for Tumacácori National Historical Park. A mailing list was compiled that consisted of members of government agencies, nongovernment groups, businesses, legislators, local governments, and interested citizens.

Initially this planning process started out as a *Draft General Management Plan / Environmental Impact Statement*. The notice of intent to prepare an environmental impact statement was published in the *Federal Register* on January 9, 2009. The National Park Service determined that an environmental assessment rather than an environmental impact statement was the appropriate level of environmental documentation for the plan. The notice of termination of the environmental impact statement was published in the *Federal Register* on July 1, 2011.

Several people responded to scoping for this management plan. The first newsletter (September 2009) received 15 comments and the second newsletter (October 2010) received 19 comments. In October 2009, three open houses were held at the Tubac Community Center in Tubac, Arizona, so the public could learn more about the general management planning process. In October 2010, two open houses were held in the Tubac Community Center so the public could learn about the draft alternatives. About 20 people, in total, attended these meetings.

A general management plan alternatives workshop was held in Rio Rico, Arizona in January 2010. A total of 15 National Park Service employees from the park, Montezuma Castle National Monument, Denver Service Center, and several Intermountain Regional offices attended.

Through these various venues, a variety of points of view about future visions for the park and park management issues were offered from park neighbors, American Indian tribes traditionally associated with the park, community leaders, government agencies, conservation groups, local citizens, and other interested groups. Although each commenter may have had a different vision of the park, everyone had a common interest in its valuable resources.

Public comments received during the planning process covered a wide range of views, with a few consistent themes:

- Most people wanted to see the existing programs and special events continue while working to protect the fragile resources of the historical park.
- People would like to see Tumacácori National Historical Park expand the

- opportunities and activities for visitors through new programs, special events, and venues for visitors to interact with park staff and the resources of the park.
- Commenters voiced concerns about protecting the park's resources. Concerns were expressed about improving the park's preservation of historic structures and archeological sites. Questions were raised about how to protect the park's scenery and soundscape from the effects of surrounding land uses and development.
- Access to and within the park was a concern that was raised by several people. There was interest in having more formal trails developed, especially in the riparian area and between the different mission sites that make up Tumacácori National Historical Park. There was also a desire to have improved access to the sites of Guevavi and Calabazas.
- Several suggestions were made regarding management of the new lands, which include additional mission-related elements and features such as the mission orchard, more of the *acequia*, and some historic fields that were part of a historic cultural landscape.
- People wanted to see Tumacácori National Historical Park continue to be an active and engaged part of the immediate and larger community.
- A range of comments were received on the preliminary alternatives, which are reflected in the alternatives in this document.

CONSULTATION WITH OTHER AGENCIES, OFFICIALS, AND ORGANIZATIONS

U.S. Fish and Wildlife Service, Section 7 Consultation

The Endangered Species Act of 1973, as amended, requires in section 7(a)(2) that each federal agency, in consultation with the Secretary of the Interior, ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. During the preparation of this plan, NPS staff coordinated informally with the U.S. Fish and Wildlife Service's Ecological Services Tucson sub-office. A letter was sent to the Fish and Wildlife Service on April 28, 2010 informing the agency of the planning effort and requesting information on federal-listed threatened and endangered species and designated critical habitats in the park and its vicinity (a copy of this letter is included in appendix C.) The National Park Service did not receive a written response to this letter from the U.S. Fish and Wildlife Service. A list of threatened and endangered species for Santa Cruz County was compiled using the U.S. Fish and Wildlife Service's website that can be accessed at http://www.fws.gov/southwest/es/arizona/T_hreatened.htm#CountyList.

In accordance with the Endangered Species Act and relevant regulations at 50 CFR Part 402, the National Park Service determined that this *General Management Plan / Environmental Assessment* is not likely to adversely affect any federal threatened or endangered species, and sent a copy of the plan to the U.S. Fish and Wildlife Service with a request for written concurrence with that determination.

Section 106 Consultation

Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 270, et seq.) to take into account the effect of any undertaking on properties eligible for listing or listed in the National Register of Historic Places. To meet the requirements of 36 CFR 800, the National Park Service sent letters to the Arizona State Historic Preservation Office and the Advisory Council on Historic Preservation on April 28, 2010, inviting their participation in this planning process. The Arizona State Historic Preservation Office did not send a response letter and the Advisory Council on Historic Preservation sent a response letter dated July 2, 2010, asking the National Park Service to inform them if any adverse effects to cultural resources were identified during this planning process. No actions proposed in this general management plan are expected to result in adverse effects to cultural resources. Both offices were sent the two scoping newsletters as well.

Before implementation of any actions in this general management plan involving cultural resources, Tumacácori National Historical Park will continue to consult with the Arizona State Historic Preservation Office and the Advisory Council on Historic Preservation, as needed, to meet their section 106 requirements.

Consultations with Traditionally Associated American Indian Tribes

Through ethnographic and ethnohistorical evidence, park staff identified nine tribes that at one time maintained territory within what is now Tumacácori National Historical Park or in the vicinity of the park. The tribes are as follows:

- Ak-Chin Indian Community

- Ak-Chin Indian Community of the Maricopa (Ak-Chin) Indian Reservation, Arizona
- Gila River Indian Community of the Gila River Indian Reservation, Arizona
- Hopi Tribe of Arizona
- Mescalero Apache Tribe of the Mescalero Reservation, New Mexico (San Carlos and Mescalero)
- Pascua Yaqui Tribe of Arizona
- Salt River Indian Community of the Salt River Indian Reservation, Arizona
- San Carlos Apache Tribe of the San Carlos Reservation, Arizona
- Tohono O'odham Nation of Arizona
- Zuni Tribe of the Zuni Reservation, New Mexico

The park staff conducts government-to-government relations with the Pascua Yaqui, Tohono O'odham, and Mescalero Apache tribes on a fairly regular basis regarding a full range of issues and activities. Park staff aims for effective communication and the sharing of information and knowledge about mutual interests in the park, including concerns about park planning and operations and the management of cultural and natural resources.

Representatives from Salt River Pima Maricopa Indian Community, Mescalero Apache Tribe, Tohono O'odham Nation, and Gila River Indian Community participated in a general management plan foundation workshop in March 2009.

On April 28, 2010, the park superintendent sent letters of invitation to consult about the ongoing general management planning process. The park did not receive any written or telephonic replies to this letter from any of the tribes. The park superintendent also sent copies of the alternatives newsletter to the tribes. The park did not

receive any written or telephonic replies from the tribes regarding the newsletter. The park will continue to consult with the

traditionally associated tribes on the general management plan and park issues.

FUTURE COMPLIANCE REQUIREMENTS

Table 16 identifies the specific undertakings of the preferred alternative that will require additional cultural or natural resource

compliance before the action can be implemented.

TABLE 16: FUTURE COMPLIANCE REQUIRED FOR IMPLEMENTATION OF SPECIFIC ACTIONS, PREFERRED ALTERNATIVE

Action in Preferred Alternative	Compliance Requirement
Cultural Resources. All actions requiring any ground disturbance such as formalizing trails, installation of wayside exhibits, construction of the open-air ramada, etc.	Further consultation with the Arizona state historic preservation officer
Cultural Resources. Expanded special events in the Tumacácori mission complex.	Further consultation with the Arizona state historic preservation officer
Natural and Cultural Resources. Preparation of plant restoration plans for the Calabazas and Guevavi units.	Preparation of a NEPA environmental compliance document and further consultation with the Arizona state historic preservation officer
Parkwide Trails Plan. Preparation of plan covering trails in the park and potentially a regulation allowing bicycle use on the Anza Trail in the Tumacácori unit.	Preparation of a NEPA environmental compliance document and further consultation with the Arizona state historic preservation officer
Boundary Study. Examination of approaches to protecting cultural resources adjacent to the Guevavi unit.	Preparation of a NEPA environmental compliance document and further consultation with the Arizona state historic preservation officer

AGENCIES, ORGANIZATIONS, AND INDIVIDUALS RECEIVING A COPY OF THIS DOCUMENT

FEDERAL AGENCIES

Department of the Interior, National Park Service
Casa Grande National Monument
Chiricahua National Monument
Coronado National Monument
Desert Southwest Cooperative Ecosystems Study Unit
Flagstaff Area National Monuments
Fort Bowie National Historic Site
Juan Bautista de Anza National Historic Trail
Montezuma Castle National Monument
Organ Pipe Cactus National Monument
Park Flight Migratory Bird Program
Rivers & Trails Program
Saguaro National Park
Tonto National Monument
Western Archeological Conservation Center

Department of Homeland Security

U.S. Fish and Wildlife Service
Southwest Regional Office
Tucson Ecological Services Office

U.S. Forest Service
Coronado National Forest
Nogales District Office

U.S. SENATORS AND REPRESENTATIVES

Rep. Ron Barber
Rep. Raul M. Grijalva
Rep. Ed Pastor
Sen. Jon Kyl
Sen. John McCain

STATE AGENCIES

Arizona Department of Fish and Game

Arizona Department of Transportation
Arizona State Historic Preservation Office
Arizona State Parks
Executive Director
Patagonia Lake State Park
San Rafael State Natural Area
Sonoita Creek State Natural Area
Tubac State Park

STATE AND LOCAL ELECTED OFFICIALS

Mayor, City of Nogales
Santa Cruz County Commissioner
Santa Cruz County Board of Supervisors

LOCAL AND REGIONAL GOVERNMENT AGENCIES

Nogales City Manager and Deputy City Manager
Nogales Police Department
Nogales Utilities
Pima County Cultural Resources
Santa Cruz County Assessor
Santa Cruz County Community Development
Santa Cruz County Sheriff
Tubac Fire Department
Tucson Cultural Resources and Historic Preservation Office
City of Tucson Parks and Recreation

AMERICAN INDIAN TRIBES TRADITIONALLY ASSOCIATED WITH PARK LANDS

Ak-Chin Indian Community
Apache (San Carlos and Mescalero)
Gila River Indian Community
Hopi Tribe

Pascua Yaqui Tribe of Arizona
Salt River Pima Maricopa Indian
Community
Tohono O'odham Nation of Arizona
Zuni Tribe

LOCAL LIBRARIES

Santa Cruz County Library, Pima County
Tubac Community Library

ORGANIZATIONS AND BUSINESSES

Amerind Foundation
Anza Trail Coalition
Arizona Office of Tourism
Arizona Sonora Desert Museum
Arizona State Museum, University of
Arizona
Center for Desert Archeology
Desert Archaeology, Inc.
Desert Survivors Nursery
Farmers Investment Company
Friends of the Santa Cruz River
Global Community Communications
Alliance
Hacienda de Corona de Guevavi
Kino Springs and Rio Development
Metro Tucson Convention and Visitors
Bureau
National Park Foundation
National Parks and Conservation
Association
Native Seeds/SEARCH
Old Tumacácori Bar
Pima Community College

Pimeria Alta Historical Society
Santa Cruz Valley Citizen Council
Santa Cruz Valley Heritage Alliance
Santa Cruz Spice Factory
Santa Fe Ranch
Sonoran Institute
Tubac Chamber of Commerce
Tubac Historical Society
Tucson Audubon Society
Tumacácori Mesquite
Tumacácori Mission Restaurant
University of Arizona – College of
Agriculture and Life Science
University of Arizona – Santa Cruz County
Extension Office, Nogales
Western National Parks Association
WestWord Vision
Wisdom's Café

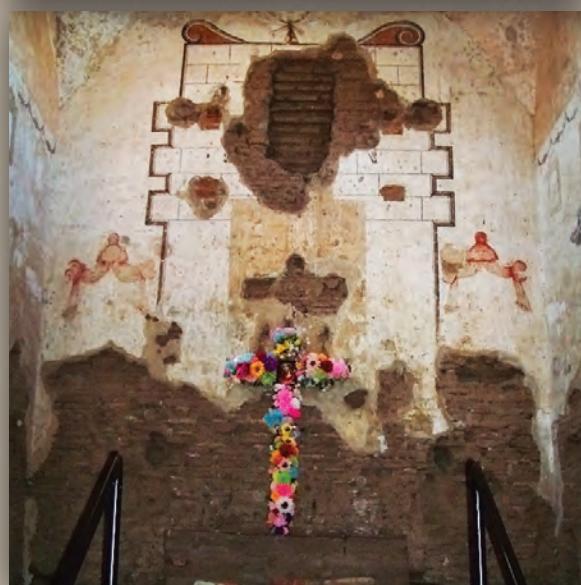
MEDIA

Newspapers: Arizona Daily Star, Green
Valley News, Nogales International, Santa
Cruz Valley Sun
Tucson TV Stations: 4-NBC, 6-PBS, 9-ABC,
11-FOX, 13-CBS
Radio stations: Tucson NPR

INDIVIDUALS

The list is available at park headquarters. A
notice was sent to determine who wanted a
printed copy of this document or a compact
disk version, or who would be willing to
look at the document on the Internet.

INDEX ◆ APPENDIXES, SELECTED REFERENCES, PREPARERS AND CONSULTANTS



APPENDIX A: LEGISLATION

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA,

September 15, 1906.

A PROCLAMATION.

WHEREAS, the Tumacacori Mission, an ancient Spanish ruin, which is one of the oldest mission ruins in the southwest, erected probably in the latter part of the sixteenth century, being largely of burned brick and cement mortar instead of adobe, and in remarkable repair, considering its great age, and of great historical interest, and it appears that the public interests would be promoted by reserving this ruin with as much land as may be necessary for the protection thereof, and WHEREAS:

Under the terms of the Act entitled "An Act for the Preservation of American Antiquities", approved June 8, 1906, one Carmen Mendez, whose homestead entry is No. 3085, has relinquished to the United States ten acres of ground thereof upon which said mission ruin is located, and the Secretary of the Interior has accepted such relinquishment for the purposes specified in said Act:

Now, therefore, I, THEODORE ROOSEVELT, President of the United States of America, by virtue of the power in me vested by section two of the Act above referred to, do hereby set aside as the Tumacacori National Monument, the Tumacacori Mission ruins and ten acres of land upon which the same are located, situated in Santa Cruz County, Arizona, more particularly described as follows, to wit:

The east half of northwest quarter of southwest quarter of southeast quarter and the west half of northeast quarter of southwest quarter of southeast quarter of section thirty, township twenty-one south, range thirteen east of Gila and Salt River Meridian, Arizona.

Tumacacori
National Monu-
ment, Ariz.
Preamble.

Vol. 34, p. 225.

National Monu-
ment, Arizona.

Description.

Reserved from
settlement, etc.

Warning is hereby expressly given to all unauthorized persons not to appropriate, excavate, injure or destroy any of the ruins or relics hereby declared to be a National Monument or to locate or settle upon any of the lands reserved and made a part of said monument by this Proclamation.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done at the City of Washington this 15 day of September in the year of our Lord one thousand nine hundred and eight, [SEAL.] and of the Independence of the United States the one hundred and thirty-third.

THEODORE ROOSEVELT

By the President:

ALVEY A. ADEE

Acting Secretary of State.

ENLARGING THE TUMACACORI NATIONAL MONUMENT, ARIZONA

March 28, 1958
(No. 3223)

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

35 Stat. 2205.

Tumacacori National Monument,
Ariz.
Inclusion of land.

WHEREAS the Tumacacori National Monument in Santa Cruz County, Arizona, established by Proclamation No. 821 of September 15, 1908, contains the ruins of the Tumacacori Mission, built largely of burned brick and cement mortar and one of the oldest Spanish missions in the Southwest; and

WHEREAS the Southwestern Monuments Association has offered to donate to the United States, for inclusion in such monument, a tract of land adjacent thereto containing the ruins of a lime kiln which was a part of the original mission establishment and which is likewise of historic interest; and

WHEREAS it appears that it would be in the public interest to include such tract of land, hereinafter described by metes and bounds, and the ruins thereon in the Tumacacori National Monument:

NOW, THEREFORE, I, DWIGHT D. EISENHOWER, President of the United States of America, by virtue of the authority vested in me by section 2 of the act of June 8, 1906, 34 Stat. 225 (16 U.S.C. 431), do proclaim that, subject to valid existing rights, the following-described tract of land shall, upon acquisition of title thereto by the United States, be added to, and become a part of the Tumacacori National Monument:

Being a part of the southeast quarter, section 30, Township 21 South, Range 13 East, Gila and Salt River Meridian, and beginning at a point on the north boundary line of Tumacacori National Monument as established by Proclamation No. 821 of September 15, 1908, from which the northwest corner of the said monument bears west 125 feet; thence, east, 70 feet, along the said boundary line; north, 92 feet; west, 70 feet; and south, 92 feet, to the point of beginning; containing 0.15 acres, more or less.

Warning is hereby expressly given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument, and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the City of Washington this 28th day of March in the year of our Lord nineteen hundred and fifty-eight, and of [SEAL] the Independence of the United States of America the one hundred and eighty-second.

DWIGHT D. EISENHOWER

By the President:

JOHN FOSTER DULLES,
The Secretary of State.

TITLE III—BOUNDARY CHANGES

SEC. 301. The boundaries of the following units of the National Park System are revised as follows, and there are authorized to be appropriated such sums as may be necessary, but not to exceed the amounts specified in the following paragraphs for acquisitions of lands and interests in lands within areas added by reason of such revisions:

* * * * *

(17) Tumacacori National Monument, Arizona: To add approximately seven acres, and delete approximately eleven-hundredths of an acre as generally depicted on the map entitled "Boundary Map, Tumacacori National Monument, Arizona", numbered 311-80,009-A, and dated March 1978: \$24,000.

SEC. 302. Within twelve months after the date of the enactment of this Act, the Secretary shall publish in the Federal Register a detailed map or other detailed description of the lands added or excluded from any area pursuant to section 301.

SEC. 303. (a) Within the boundaries of the areas as revised in accordance with section 301, the Secretary is authorized to acquire lands and interests therein by donation, purchase with donated or appropriated funds, exchange, or transfer from any other Federal agency. Lands and interests therein so acquired shall become part of the area to which they are added, and shall be subjected to all laws, rules, and regulations applicable thereto. When acquiring any land pursuant to this title, the Secretary may acquire any such land subject to the retention of a right of use and occupancy for a term not to exceed twenty-five years or for the life of the owner or owners. Lands owned by a State or political subdivision thereof may be acquired only by donation.

(b)(1) Lands and interests therein deleted from any area pursuant to section 301 may be exchanged for non-Federal lands within the revised boundaries of such area, or transferred to the jurisdiction of any other Federal agency or to a State or political subdivision thereof, without monetary consideration, or be administered as public lands by the Secretary, as the Secretary may deem appropriate.

(2) In exercising the authority contained in this section with respect to lands and interests therein deleted from any such area which were acquired from a State, the Secretary may, on behalf of the United States, transfer to such State exclusive or concurrent legislative jurisdiction over such lands, subject to such terms and conditions as he may deem appropriate, to be effective upon acceptance thereof by the State.

PUBLIC LAW 101-344 [H.R. 2843]; August 6, 1990

TUMACACORI NATIONAL HISTORICAL PARK,
ARIZONA

An Act to establish the Tumacacori National Historical Park in the State of Arizona.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Public lands.

SECTION 1. TUMACACORI NATIONAL HISTORICAL PARK.

(a) ESTABLISHMENT.—In order to protect and interpret, for the education and benefit of the public, sites in the State of Arizona associated with the early Spanish missionaries and explorers of the 17th and 18th centuries, there is hereby established the Tumacacori National Historical Park (hereinafter in this Act referred to as the "park").

16 USC 410ss

(b) AREA INCLUDED.—The park shall consist of the existing Tumacacori National Monument, together with (1) the ruins of Los Santos Angeles de Guevavi, the first mission in Arizona (consisting of approximately 8 acres) and (2) the Kino visita and rancheria ruins of Calabazas (consisting of approximately 22 acres), each as generally depicted on the map entitled "Boundary Map, Tumacacori National Historical Park", numbered 311/80018, and dated February 1990. The map shall be on file and available for public inspection in the offices of the National Park Service, Department of the Interior.

16 USC 431 note.

(c) ABOLITION OF MONUMENT.—The Tumacacori National Monument is hereby abolished and any funds available for purposes of the monument shall be available for purposes of the park.

SEC. 2. ADMINISTRATION.

16 USC 410ss-1.

(a) IN GENERAL.—The Secretary of the Interior (hereinafter referred to as the "Secretary") shall administer the park in accordance with this Act and with the provisions of law generally applicable to units of the national park system, including the Act entitled "An Act to establish a National Park Service, and for other purposes", approved August 25, 1916 (39 Stat. 535; 16 U.S.C. 1-4) and the Act of August 21, 1935 (49 Stat. 666; 16 U.S.C. 461-467). The Secretary may acquire lands or interests in land within the boundaries of the park by donation, purchase with donated or appropriated funds, or exchange.

(b) DONATIONS.—Notwithstanding any other provision of law, the Secretary may accept and retain donations of funds, property, or services from individuals, foundations, corporations, or public entities for the purpose of providing services and facilities which he deems consistent with the purposes of this Act.

(c) SEPARATE UNITS.—The Secretary shall provide for the identification of the Guevavi, Calabazas, and Turnacacori sites as 3 separate units of the park.

(d) RECOGNITION OF FATHER EUSEBIO FRANCISCO KINO'S ROLE.—In administering the park, the Secretary shall utilize such interpretative materials and other devices as may be necessary to give appropriate recognition to the role of the Jesuit Missionary Priest, Father Eusebio Francisco Kino, in the development of the mission sites and the settlement of the region.

Approved August 6, 1990.

116 STAT. 1328

PUBLIC LAW 107-218—AUG. 21, 2002

**Public Law 107-218
107th Congress**

An Act

Aug. 21, 2002
[H.R. 2234]

Tumacacori
National
Historical Park
Boundary
Revision Act of
2002.
16 USC 410ss
note.
16 USC 410ss
note.

To revise the boundary of the Tumacacori National Historical Park in the State of Arizona.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the “Tumacacori National Historical Park Boundary Revision Act of 2002”.

SEC. 2. FINDINGS AND PURPOSES.

(a) FINDINGS.—The Congress finds the following:

(1) Tumacacori Mission in southern Arizona was declared a National Monument in 1908 in recognition of its great historical significance as “one of the oldest mission ruins in the southwest”.

(2) In establishing Tumacacori National Historical Park in 1990 to include the Tumacacori Mission and the ruins of the mission of Los Santos Angeles de Guevavi and the Kino visita and rancheria of Calabazas, Congress recognized the importance of these sites “to protect and interpret, for the education and benefit of the public, sites in the State of Arizona associated with the early Spanish missionaries and explorers of the 17th and 18th centuries”.

(3) Tumacacori National Historical Park plays a major role in interpreting the Spanish colonial heritage of the United States.

(b) PURPOSES.—The purposes of this Act are—

(1) to protect and interpret the resources associated with the Tumacacori Mission by revising the boundary of Tumacacori National Historical Park to include approximately 310 acres of land adjacent to the park; and

(2) to enhance the visitor experience at Tumacacori by developing access to these associated mission resources.

SEC. 3. BOUNDARY REVISION, TUMACACORI NATIONAL HISTORICAL PARK, ARIZONA.

Section 1(b) of Public Law 101-344 (16 U.S.C. 410ss(b)) is amended—

(1) by inserting after the first sentence the following new sentence: “The park shall also consist of approximately 310 acres of land adjacent to the original Tumacacori unit of the park and generally depicted on the map entitled ‘Tumacacori National Historical Park, Arizona Proposed Boundary Revision 2001’, numbered 310/80,044, and dated July 2001.”; and

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- (2) in the last sentence—
 (A) by striking “The map” and inserting “The maps”;
and
 (B) by striking “the offices” and inserting “the appropriate offices”.

Approved August 21, 2002.

LEGISLATIVE HISTORY—H.R. 2234:
HOUSE REPORTS: No. 107–327 (Comm. on Resources).
SENATE REPORTS: No. 107–185 (Comm. on Energy and Natural Resources).
CONGRESSIONAL RECORD, Vol. 148 (2002):
 Jan. 23, considered and passed House.
 Aug. 1, considered and passed Senate.



APPENDIX B: DESIRED CONDITIONS

The desired conditions to be achieved at Tumacácori National Historical Park are based on servicewide mandates and policies.

Development of this plan has proceeded within a complex legal framework. This section identifies what must be done at Tumacácori National Historical Park to comply with federal laws and policies of the National Park Service. Many management directives are specified in laws and policies guiding the National Park Service and are, therefore, not subject to alternative approaches. For example, there are laws and policies about managing environmental quality (such as the Clean Air Act, the Endangered Species Act, and Executive Order 11990, “Protection of Wetlands”); laws governing the preservation of cultural resources (such as the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act); and laws about providing public services (such as the Americans with Disabilities Act and the Architectural Barriers Act)—to name only a few. A general management plan is not needed to decide, for instance, that it is appropriate to protect endangered species, control nonnative species, protect archeological sites, conserve artifacts, or provide access for visitors with disabilities. Laws and NPS policies have already decided those and many other things.

This appendix discusses some of the most pertinent servicewide laws and policies related to planning and managing Tumacácori National Historical Park that the park must comply with regardless of this planning effort. The table in this appendix shows the desired conditions and strategies based on these laws and policies the park must strive to meet. It is important to note, regardless of which alternative is chosen to implement from this general management plan / environmental assessment,

Tumacácori National Historical Park must comply with all of these laws and policies. The alternatives in this general management plan address the desired future conditions that are not mandated by law and policy and must be determined through a planning process.

The table is broken down by topic, such as air quality, archeological resources, visitor use and experience, etc. Under each topic there is a (1) description of the desired conditions based on laws and policies that park staff strive to achieve for that topic; (2) list of the strategies for achieving the desired conditions; and (3) the pertinent servicewide laws and policies the National Park Service complies with that particular topic.

Desired conditions articulate the ideal conditions the National Park Service is striving to attain. The term desired conditions is used interchangeably with goals. Desired conditions provide guidance for fulfilling the park’s purpose and for protecting the park’s fundamental resources and values.

The strategies describe actions that could be used by the National Park Service to achieve the desired conditions. Most of these strategies are already being implemented. Those not already being implemented are consistent with NPS policy, are not believed to be controversial, and require no analysis and documentation under the National Environmental Policy Act of 1969 (or analysis and documentation would be completed separately from this general management plan / environmental assessment). This is not an exhaustive list of management strategies. As new ideas, technologies, and opportunities arise, they would be considered if they further support the desired condition.

The desired conditions and management strategies in this appendix, combined with the management actions that are specific to the management alternative ultimately

selected for implementation (see chapter 2), will form the complete general management plan for the park.

NATURAL RESOURCE MANAGEMENT

ECOSYSTEM MANAGEMENT	
Desired Conditions	Pertinent Servicewide Laws and Policies
Tumacácori National Historical Park is managed holistically as part of a greater ecological, social, economic, and cultural system. Natural resources are managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities. The Park Service demonstrates leadership in resource stewardship and conservation of ecosystem values within and outside the park. Tumacácori National Historical Park is managed from an ecosystem perspective, where internal and external factors affecting environmental quality and resource stewardship goals are considered at a scale appropriate to their impact on affected resources. Natural processes and population fluctuations occur with as little human intervention as possible. The park continues to service as a corridor for wildlife movements in the region. Park resources are managed considering the ecological and social conditions of the park and surrounding area. Park managers adapt to changing ecological and social conditions within and external to the park and continue as partners in regional planning and land and water management. The park is managed proactively to resolve external issues and concerns to ensure park values are not compromised.	<i>NPS Management Policies 2006</i> Reference Manual 77: Natural Resource Management
Management Strategies	
<p>Science-based, adaptive, decision making would be followed, with the results of resource monitoring and research incorporated into all aspects of park operations.</p> <p>Park staff would apply ecological principles to ensure that natural resources are maintained and not impaired. Integrated pest management procedures will be used when necessary to control nonnative organisms or other pests.</p> <p>Park staff would continue to participate in the Sonoran Desert Inventory and Monitoring Network and work with partners and collaborators to inventory resources and monitor vital components of the ecosystem. Park staff and other scientists will continue the long-term systematic monitoring of resources and processes to discern natural and anthropogenically induced trends, document changes in species or communities, evaluate the effectiveness of management actions taken to protect and restore resources, and to mitigate impacts on resources.</p> <p>Park staff would expand monitoring programs to include geographic areas and resources that are not currently monitored. Partnerships with institutions, agencies, and scientists will be an important component of this endeavor.</p> <p>Inventory and monitoring efforts would emphasize recording the finding(s) and leaving natural and cultural resources in situ rather than collecting and adding them to the national historical park's museum collection.</p> <p>Park staff would work with state agency partners manage for healthy fish and wildlife populations.</p>	

ECOSYSTEM MANAGEMENT	
Management Strategies (continued)	
<p>Future facilities would be built in previously disturbed areas or in carefully selected sites with as small a construction footprint as possible. Park staff will also apply mitigation techniques to minimize the impacts of construction and other activities on park resources.</p> <p>Scientific research would be encouraged. Cooperative basic and applied research will be encouraged through various partnerships and agreements to increase the understanding of park resources, natural processes, and human interactions with the environment, or to answer specific management questions.</p> <p>A natural resource condition assessment would be prepared to document the current status of natural resource conditions.</p> <p>A resource stewardship strategy would be prepared to identify resource management priorities, consider sequencing of projects, and link on-the-ground projects to higher-tier management goals and objectives.</p> <p>The park staff would continue to expand the data management system, including a geographic information system (GIS), a research database, and a literature database, for analyzing, modeling, predicting, and testing trends in resource conditions.</p> <p>NPS staff would work with other federal, state, and local agencies, organizations, and landowners to establish a linkage for wildlife movements between the Santa Rita and Tumacácori Mountains, as described in "Arizona's Missing Linkages" (Beier et al. 2006).</p> <p>Visitors would be educated about the importance and fragility of park resources, threats to them, and mitigation to lessen impact.</p> <p>The National Park Service would continue to seek agreements with the Arizona State Parks, Arizona Game and Fish, American Indian tribes, and other owners of adjacent property to protect and enhance the ecosystem.</p> <p>Park staff would work cooperatively to manage nonnative species in the region.</p> <p>Park staff would continue to partner with the research community to further the knowledge of ecosystem processes that affect the park.</p> <p>Park staff would continue to work with partners to protect species of concern and reintroduce extirpated native species when practical.</p>	

ECOSYSTEM RESTORATION	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>The Tumacácori unit is a model of successful ecological restoration efforts. Altered ecosystems in the bosque and riparian areas are restored as nearly as possible to conditions they would be in today had natural ecological processes not been disturbed. Vegetation is in a condition reminiscent of the period before Europeans began altering the area. All federally and state threatened and endangered species are no longer in danger of extinction and are at least stable in the park.</p>	<p><i>NPS Management Policies 2006</i> Reference Manual 77: Natural Resource Management</p>
Management Strategies	
<p>Active restoration efforts would continue in the Tumacácori unit, primarily focusing on eradication of nonnative wildlife species, weed control, revegetation of native plants, and restoration of native plants and animals.</p> <p>Additional research and treatments in test plots would be conducted as identified in the "Vegetation Restoration Plan" (Herrera Environmental Consultants 2011), so park managers gain a better understanding of stream channel and bank stability, geomorphic analysis, groundwater, and how to control invasive species in the mesquite forest.</p>	

ECOSYSTEM RESTORATION	
Management Strategies (continued)	
<p>Efforts would continue, in cooperation with the U.S. Fish and Wildlife Service, Arizona Game and Fish Department, and other public and private institutions, to survey, restore and recover all listed federal threatened and endangered species. Listed species and their habitats would be inventoried and monitored to determine population status and trends, and to evaluate the effectiveness of efforts being taken to reduce threats and recover the species. Efforts would be undertaken to preserve the genetic diversity of these species.</p> <p>Inventories and monitoring of invasive nonnative plant species would continue in the entire park. Efforts would continue to control or eradicate nonnative plants that are particularly invasive and destructive pests, or have the potential to rapidly spread and dominate plant communities, such as Bermudagrass, tree tobacco, and carelessweed, provided control is prudent and feasible. Areas along the margins of developed areas, such as walls and fences, native species would be planted to enhance native plant and wildlife populations and educate park visitors about the value of native plants.</p> <p>Park managers would restore disturbed lands as much as possible and determine on a site-by-site basis whether passive or active restoration is necessary. Active restoration of previously or newly disturbed areas would be done using native genetic materials to regain maximum habitat value. Under some circumstances, primarily in frontcountry developed areas, it may be appropriate and within policy to use nonnative plants in restoration efforts. Only plants that are noninvasive and will remain within developed areas would be used.</p> <p>Extirpated native species would be restored where suitable habitat exists and restoration is compatible with social, political, and ecological conditions.</p>	

NATIVE VEGETATION AND ANIMALS	
Desired Conditions	Pertinent Servicewide Laws and Policies
The National Park Service strives to maintain, as part of the natural ecosystem, native plants and animals in the Tumacácori unit. Populations of native plant and animal species function in as natural condition as possible except where special considerations are warranted. Native species populations that have been severely reduced in or extirpated from the Tumacácori unit are restored where feasible and sustainable.	<i>NPS Management Policies 2006</i> Reference Manual 77: Natural Resource Management
Management Strategies	
<p>Park staff would continue to monitor and update the park's vegetation and wildlife inventory.</p> <p>A resources stewardship strategy (RSS) would be prepared and implemented.</p> <p>Whenever possible, natural processes would be relied upon to maintain native plant and animal species, and to influence natural fluctuations in populations of these species.</p> <p>Park staff would work with the Arizona Game and Fish Department to implement its "Wildlife Friendly Guidelines" (2009) in the Tumacácori unit as appropriate.</p> <p>NPS staff would cooperate with other agencies and organizations to enhance the preservation of the populations and habitats of migratory species outside the park.</p> <p>Educational programs would be developed to inform visitors and the general public about wildlife issues and concerns.</p>	

THREATENED OR ENDANGERED SPECIES	
Desired Conditions	Pertinent Servicewide Laws and Policies
Federal-listed threatened and endangered species and their habitats are protected and sustained. Native threatened and endangered species populations that have been severely reduced in or extirpated from the park are restored where feasible and sustainable. Essential habitats that support these species are all protected.	Endangered Species Act NPS Management Policies 2006 Reference Manual 77: Natural Resource Management
Management Strategies	
<p>Park staff would continue to work with the U.S. Fish and Wildlife Service and Arizona Game and Fish to ensure that the National Park Service's actions help special status species to recover. If any state- or federal-listed or proposed threatened or endangered species are found in areas that would be affected by construction, visitor use, or restoration activities proposed under any of the alternatives in this plan, the National Park Service will consult with the above agencies and will then try to avoid or mitigate any potential adverse impacts.</p> <p>Park staff would cooperate with the above agencies to inventory, monitor, protect, and perpetuate the natural distribution and abundance of all special status species and their essential habitats in Tumacácori National Historical Park. Periodic inventories would be conducted for special status species. These species and their habitats would be specifically considered in ongoing planning and management activities.</p> <p>The National Park Service would support research that contributes to management knowledge of federal- and state-listed species and their habitat.</p> <p>A resources stewardship strategy that addresses special status species would be prepared and implemented.</p> <p>Park staff would participate in the recovery planning process when appropriate.</p>	

FIRE MANAGEMENT	
Desired Conditions	Pertinent Servicewide Laws and Policies
Fire management programs are designed to meet resource management objectives prescribed for the park's three units. All wildland fires are effectively managed, considering resource values to be protected and firefighter and public safety, using the full range of strategic and tactical operations as described in an approved fire management plan.	NPS Management Policies 2006 Director's Order 18: Wildland Fire Management and its accompanying Reference Manual 18: Wildland Fire Management
Management Strategies	
<p>The park's fire management plan would be maintained to reflect changes in wildland fire policy, fire use applications, and the body of knowledge on fire effects within the park's vegetation types.</p> <p>The National Park Service would maintain a cooperative agreement for fire suppression with appropriate federal, tribal, state, and local agencies and organizations.</p> <p>Where appropriate, fire would be used as a management tool to maintain native plant communities and control nonnative species.</p> <p>Visitors would be provided information so that they can learn the role of fire in the ecosystem.</p>	

SOILS	
Desired Conditions	Pertinent Servicewide Laws and Policies
The park's soils are preserved and to the extent possible the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources, is prevented. Natural soil resources and processes function in as natural a condition as possible, except where special considerations are allowable under policy. When soil excavation is an unavoidable part of an approved facility development project, the National Park Service will minimize soil excavation, erosion, and off-site soil migration during and after any ground-disturbing activity.	<i>NPS Management Policies 2006</i> Reference Manual 77: Natural Resource Management
Management Strategies	
Soil conservation practices will be followed to reduce impacts as appropriate. Effective best management practices would be applied to problem soil erosion and compaction areas in a manner that stops or minimizes erosion, restores soil productivity, and reestablishes or sustains a self-perpetuating vegetation cover. When use of a soil fertilizer or other soil amendment is an unavoidable part of restoring a natural landscape or maintaining an altered plant community, use would be guided by a written prescription. The prescription ensures that such use of soil fertilizer or soil amendment does not unacceptably alter the physical, chemical, or biological characteristics of the soil, biological community, or surface or ground waters. Efforts will continue to maintain fences and work with adjacent landowners to prevent trespass of cattle, which cause soil erosion along the river banks. Whenever possible, NPS staff would educate visitors about soils.	

WATER RESOURCES	
Desired Conditions	Pertinent Servicewide Laws and Policies
Surface water and groundwater are protected and water quality meets or exceeds all applicable water quality standards. The Santa Cruz River's water quality reflects natural conditions and supports native plant and animal communities, and administrative and recreational uses. NPS and NPS-permitted programs and facilities are maintained and operated to avoid pollution of surface water and groundwater.	Clean Water Act Executive Order (EO) 11514, "Protection and Enhancement of Environmental Quality" <i>NPS Management Policies 2006</i> Reference Manual 77: Natural Resource Management
Management Strategies	
NPS staff would work with state and regional water quality agencies and other appropriate governmental bodies to obtain the highest possible water quality standards available under the Clean Water Act. Park staff would cooperate with other government agencies to maintain and/or restore the quality and quantity of park surface and ground water resources. Park staff would pursue methods to preserve and protect acceptable stream flows and ground water levels to sustain aquatic and terrestrial life and provide recreational opportunities. A water resources information and issues overview report and a water resources stewardship report would be completed for the park. Water conservation would be promoted by the National Park Service, visitors, and park neighbors.	

WATER RESOURCES	
Management Strategies	
<p>Best management practices would be applied to all pollution-generating activities and facilities in the park, such as NPS maintenance and storage facilities and parking areas.</p> <p>The use of pesticides, fertilizers, and other chemicals would be minimized and managed in keeping with NPS policy and federal regulations.</p> <p>Monitoring water quality of the Santa Cruz River would continue. If degraded water quality and/or flows occur, attempts would be made to locate and mitigate source.</p> <p>Visitors would be informed and educated about the park's water resources and their values.</p>	

WETLANDS	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>The natural values of wetlands are maintained and protected. When practicable, natural wetland cultural values are enhanced by using them for educational, recreational, scientific, and similar purposes that do not disrupt natural wetland functions. Natural wetlands that have been degraded due to past human actions, including the introduction of nonnative species, are restored to pre-disturbance conditions whenever feasible. The National Park Service avoids to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and avoids direct or indirect support of new construction in wetlands wherever there is a practicable alternative.</p>	<p>Clean Water Act Rivers and Harbors Act Executive Order 11514, "Protection and Enhancement of Environmental Quality" Executive Order 11990, "Protection of Wetlands" <i>NPS Management Policies 2006</i> Director's Order 77-1: <i>Wetland Protection</i> and its accompanying <i>Wetland Protection Procedural Manual</i></p>
Management Strategies	
<p>A wetland inventory, condition assessment, and functional evaluation would be done in the Tumacácori unit to help ensure proper management and protection of wetland resources. If human activities or developments are proposed that may result in wetland degradation or loss, then more detailed wetland mapping would be done.</p> <p>All facilities would be located to avoid wetlands if feasible. If avoiding wetlands was not feasible, other actions would be taken to comply with Executive Order 11990, "Protection of Wetlands", the Clean Water Act, and Director's Order 77-1: <i>Wetland Protection</i>.</p> <p>A "Statement of Findings" for wetlands will be prepared if the NPS actions would result in adverse impacts on wetlands. The "Statement of Findings" would include an analysis of the alternatives, delineation of the wetland, a wetland restoration plan to identify mitigation, and a wetland functional analysis of the impact site and restoration site.</p> <p>If natural wetland functions have been degraded or lost due to human action, the National Park Service would work to restore wetlands to pre-disturbance conditions, to the extent practicable.</p>	

FLOODPLAINS	
Desired Conditions	Pertinent Servicewide Laws and Policies
Natural floodplain values of the Santa Cruz River are preserved or restored. Long-term and short-term environmental effects associated with the occupancy and modification of the floodplain is avoided.	Rivers and Harbors Act Executive Order 11988, "Floodplain Management" <i>NPS Management Policies 2006</i> <i>Director's Order 77-2: Floodplain Management</i>
Management Strategies	<p>Whenever possible, new developments would be located on sites outside of floodplains. If it is not possible to avoid locating a new development on a floodplain or to avoid a management action that would affect a floodplain, the Park Service would</p> <p>prepare and approve a statement of findings in accordance with Director's Order 77-2</p> <p>use nonstructural measures as much as practicable to reduce hazards to human life and property while minimizing impacts on the natural resources of floodplains</p> <p>ensure that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR 60)</p> <p>Mitigation measures would be required as part of construction to avoid any potential indirect effects to floodplains. Before initiating any ground-disturbing projects, further investigation will be conducted to determine if floodplain resources would be affected. Floodplains will be addressed at the project level to ensure that projects are consistent with NPS policy and Executive Order 11988.</p> <p>Visitors would be informed about the values of natural floodplains.</p>

AIR QUALITY	
Desired Conditions	Pertinent Servicewide Laws and Policies
Good to excellent air quality is maintained. Scenic views, both day and night, are protected and unimpaired for the enjoyment of current and future park visitors. Indoor air quality at NPS facilities also is healthy.	Clean Air Act <i>NPS Management Policies 2006</i> Reference Manual 77: Natural Resource Management
Management Strategies	<p>Air quality and air quality-related values in the park would be monitored to gain baseline information and to measure any significant changes to the park's airshed. Air pollution impacts would be identified and evaluated.</p> <p>Air quality pollution emissions associated with park operations and recreational use would be reduced when possible (e.g., the use of zero and low emission vehicles will be encouraged). Park operations would be conducted in compliance with appropriate federal, state, and local air quality regulations.</p> <p>Although the National Park Service has very little direct control over air quality in the park's airshed, NPS managers would continue to cooperate with the Arizona Department of Environmental Quality and the U.S. Environmental Protection Agency on air quality issues.</p> <p>Park staff would participate in federal, regional, and local air pollution control plans and drafting of regulations and review permit applications for major new air pollution sources.</p> <p>Educational programs would be developed to inform visitors and regional residents about the threats of air pollution.</p>

NIGHT SKY	
Desired Conditions	Pertinent Servicewide Laws and Policies
Excellent opportunities to see the night sky are available. Artificial light sources both within and outside the park do not unacceptably adversely affect native populations or visitor's opportunities to see the night sky.	<i>NPS Management Policies 2006</i>
Management Strategies	
<p>The National Park Service would cooperate with park visitors, neighbors, and local government agencies to find ways to prevent or minimize the intrusion of artificial light into the night scene in the park.</p> <p>In natural areas, artificial outdoor lighting would be limited to basic safety requirements and will be shielded when possible.</p> <p>The NPS staff would evaluate the impacts on the night sky caused by park facilities. If light sources in the park are affecting night skies, the staff will study alternatives such as shielding lights, changing lamp types, or eliminating unnecessary sources.</p>	

NATURAL SOUNDSCAPES	
Desired Conditions	Pertinent Servicewide Laws and Policies
The National Park Service preserves the natural ambient soundscapes, restores degraded soundscapes to the natural ambient condition wherever possible, and protects natural soundscapes from degradation due to human-caused noise. Natural sounds predominate outside of developed areas—the sounds of civilization are generally confined to developed areas. Visitors have opportunities throughout much of the park to experience natural sounds in an unimpaired condition.	<i>NPS Management Policies 2006</i> <i>Director's Order 47: Sound Preservation and Noise Management</i>
Management Strategies	
<p>Actions would be taken to monitor and minimize or prevent or minimize unnatural sounds that adversely affect park resources or values or visitor enjoyment of them.</p> <p>Tour bus companies would be required to reduce noise levels (e.g., turning off engines when buses are parked). Noise generated by NPS management activities would be minimized by regulating administrative functions such as the use of motorized equipment where appropriate. Noise would be a consideration in the procurement and use of equipment by the park staff.</p> <p>Visitors would be encouraged to avoid unnecessary noise, particularly in the mission sites.</p> <p>NPS staff would work with adjacent landowners, local governments, and other partners to reduce/avoid noise sources that affect the park's soundscape.</p>	

VIEWSHED AND VISTAS	
Desired Conditions	Pertinent Servicewide Laws and Policies
Natural vistas and cultural landscapes provide visitors with an immediate and lasting sensory experience that strongly conveys the character of the national historical park. Key scenic vistas are protected.	<i>NPS Management Policies 2006</i>
Management Strategies	
<p>Key vistas and viewpoints in the park would be identified.</p> <p>NPS staff would work with neighboring landowners, communities, conservancy groups, management agencies, and other partners to develop preservation goals for identified viewsheds; identify potential threats; and establish a sense of stewardship by these groups for important visual resources.</p> <p>NPS staff would work with adjacent landowners, partners, and others to preserve the scenic character of park entrance areas and corridors, and complement the park's key viewpoints and vistas.</p>	

CULTURAL RESOURCE MANAGEMENT

ARCHEOLOGICAL RESOURCES	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>Prehistoric and historic archeological sites are identified, inventoried, documented, their significance evaluated, and, if appropriate, nominated to the National Register of Historic Places (National Register). Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. When disturbance or deterioration is unavoidable, the site is professionally documented and excavated and the resulting artifacts, materials, and records are curated and conserved in consultation with the appropriate SHPO and American Indian tribes. Some archeological sites that can be adequately protected may be interpreted to the visitor.</p>	<p>National Historic Preservation Act of 1966, as amended (16 USC 470) Executive Order 11593: "Protection and Enhancement of the Cultural Environment" Archeological and Historic Preservation Act Archeological Resources Protection Act Native American Graves Protection and Repatriation Act 36 CFR 79 – Curation of Archaeological Collections <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers <i>NPS Management Policies 2006</i> Director's Order 28: <i>Cultural Resource Management Guideline</i>(1998) Director's Order 28A: <i>Archeology</i> (2004)</p>
Management Strategies	<p>Continue to survey and inventory archeological sites parkwide; determine and document their significance. The most critical area for study is park land where development or visitor activity is planned. If determined significant, sites would be nominated to the National Register of Historic Places. Inventory and monitoring efforts would emphasize recording the finding(s) and leaving it in situ rather than collecting it and adding it to the national historical park's museum collection. Add significant archeological sites to the NPS Archeological Sites Management Information System (ASMIS) database. Educate visitors on regulations governing archeological resources and their removal and transport. Monitor and assess condition of known archeological sites. Develop and implement stabilization strategies for sites being threatened or destroyed. Treat all archeological resources as eligible for listing on the National Register of Historic Places pending a formal determination of their significance by the National Park Service, the Arizona State Historic Preservation Office, and associated American Indian tribes. Protect all archeological resources eligible for listing or listed on the National Register; if disturbance to such resources is unavoidable, conduct formal consultation with the Advisory Council on Historic Preservation, as appropriate, and the Arizona State Historic Preservation Office and traditionally associated American Indian tribes in accordance with the National Historic Preservation Act and implementing regulations. As appropriate, archeological surveys and/or monitoring would precede any ground disturbance activities. Known archeological resources would be avoided to the greatest extent possible. If National Register eligible or listed archeological resources could not be avoided, or if during construction previously unknown archeological resources were discovered and the resources could not be preserved in situ, an appropriate mitigation strategy would be developed in consultation with the Arizona State Historic Preservation Officer and, if necessary, traditionally associated American Indian tribes.</p>

PREHISTORIC AND HISTORIC STRUCTURES	
Desired Conditions	Pertinent Servicewide Laws and Policies
Prehistoric and historic structures are identified, inventoried, documented, their significance evaluated, and, if appropriate, nominated to the National Register of Historic Places (National Register). The qualities that contribute to the listing or eligibility for listing of prehistoric and historic structures on the National Register are protected in accordance with <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> (unless it is determined through a formal process that disturbance or natural deterioration is unavoidable).	National Historic Preservation Act of 1966, as amended (16 USC 470) Executive Order 11593, "Protection and Enhancement of the Cultural Environment" Archeological and Historic Preservation Act 36 CFR 800 "Advisory Council on Historic Preservation Regulations for the Protection of Historic Properties" <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties</i> 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers <i>NPS Management Policies 2006</i> Director's Order 28: <i>Cultural Resource Management Guideline</i> (1998)
Management Strategies	
<p>Update and certify the NPS List of Classified Structures (LCS) database.</p> <p>Determine, implement, and maintain the appropriate level of preservation for each historic structure formally determined or eligible for listing in the National Register of Historic Places (subject to <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i>).</p> <p>Implement and maintain the appropriate level of preservation for such structures.</p> <p>Analyze the design elements (e.g., materials, colors, shape, massing, scale, architectural details) and site details of historic structures in the park (e.g., placement within a mission complex, roads, and trails) to guide the preservation and stabilization of sites and structures.</p> <p>Survey, inventory, evaluate historic structures not already determined eligible for or listed on the National Register of Historic Places. Complete and submit a National Register nomination for historic structures determine eligible for listing; send the nominations to the Arizona State Historic Preservation Office for review and comment; send the final nomination to the Keeper of the National Register for formal listing.</p> <p>Implement and maintain the appropriate level of preservation for such structures.</p> <p>Monitor and evaluate condition of historic structures and develop and implement stabilization strategies for buildings and structures being threatened.</p> <p>Before modifying any historic structure eligible for listing or listed in the National Register of Historic Places, the National Park Service will consult with the Arizona State Historic Preservation Office and the Advisory Council for Historic Preservation, as required.</p> <p>If disturbance to historic structures is unavoidable, conduct formal consultation with the Advisory Council on Historic Preservation as appropriate, and the Arizona State Historic Preservation Office and associated American Indian tribes in accordance with the National Historic Preservation Act and the 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.</p>	

MUSEUM COLLECTIONS	
Desired Conditions	Pertinent Servicewide Laws and Policies
All museum collections (objects, specimens, and archival collections) are identified and inventoried, catalogued, documented, preserved, and protected, and provisions are made for their access to and use for exhibits, research, and interpretation, excepting irreplaceable items that will not be displayed or stored at Tumacácori National Historical Park. The qualities that contribute to the significance of collections are protected in accordance with established standards.	National Historic Preservation Act of 1966, as amended (16 USC 470) Museum Properties Management Act of 1955, as amended American Indian Religious Freedom Act Archeological and Historic Preservation Act Archeological Resources Protection Act Native American Graves Protection and Repatriation Act 36 CFR 79 "Curation of Archaeological Collections" 36 CFR 800 "Advisory Council on Historic Preservation Regulations for the Protection of Historic Properties" <i>NPS Management Policies 2006</i> <i>Director's Order 24: NPS Museum Collections Management (2008)</i> <i>Director's Order 28: Cultural Resource Management Guideline (1998)</i> NPS Museum Handbook, Parts I, II and III 2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers ICMS User Manual
Management Strategies	
Inventory and catalog all park museum collections in accordance with standards in the NPS <i>Museum Handbook</i> . In accord with NPS standards, develop or update a collections management plan for the park which will guide the protection, conservation, and research use of museum objects. Use NPS standards and guidelines on the display and care of artifacts to plan for exhibit areas facilities sufficient to meet current curation standards. Collections generated by research, including permitted research and NPS Inventory and Monitoring research will be properly catalogued, documented, preserved, and protected following NPS museum collection management guidelines.	

CULTURAL LANDSCAPES	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>Cultural landscape reports are complete for all three park units that will describe the site history and existing conditions; conduct analysis and evaluation; discuss and analyze treatment; and describe preservation strategy. The cultural landscape reports will assist in future management decisions for landscapes and associated resources, both cultural and natural.</p> <p>The management of cultural landscapes focuses on preserving the landscape's physical attributes, biotic systems, and uses when those uses contribute to its historical significance.</p> <p>The preservation, rehabilitation, or restoration of cultural landscapes would be undertaken in accordance with <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>.</p>	<p>National Historic Preservation Act of 1966, as amended (16 USC 470)</p> <p>Advisory Council on Historic Preservation's implementing regulations regarding the "Protection of Historic Properties" (36 CFR 800)</p> <p>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes (1996)</p> <p><i>NPS Management Policies 2006</i></p> <p>Director's Order 28: <i>Cultural Resource Management Guideline</i> (1998)</p> <p>2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers</p>
Management Strategies	
<p>Complete cultural landscape inventories and cultural landscape reports for Tumacácori, Calabazas, and Guevavi units. Send the inventory reports to the Arizona State Historic Preservation Office and traditionally associated tribes for review and comment.</p> <p>If needed, write National Register of Historic Places nominations for eligible cultural landscapes. Send the nominations to the Arizona State Historic Preservation Office and traditionally associated tribes for review and comment. Send the final nomination to the Keeper of the National Register for review and formal listing.</p> <p>Determine and implement the appropriate level of treatment, in accordance with the Secretary of the Interior's standards, for each landscape listed in or eligible to be listed in the National Register.</p>	

ETHNOGRAPHIC RESOURCES	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>Appropriate cultural anthropological research is conducted in cooperation with groups traditionally associated with the park.</p> <p>To the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, the National Park Service accommodates access to and ceremonial use of American Indian sacred sites by American Indian religious practitioners and avoids adversely affecting the physical integrity of these sacred sites.</p> <p>NPS general regulations on access to and use of natural and cultural resources in the park are applied in an informed and balanced manner that is consistent with park purposes and does not unreasonably interfere with American Indian use of traditional areas or sacred resources and does not result in the degradation of park resources.</p> <p>All ethnographic resources determined eligible for listing or listed on the National Register of Historic Places are protected. If disturbance of such resources is unavoidable, formal consultation with the Arizona state historic preservation officer and the Advisory Council on Historic Preservation, and with traditionally associated American Indian tribes as appropriate, is conducted.</p>	<p>National Historic Preservation Act of 1966, as amended (16 USC 470)</p> <p>American Indian Religious Freedom Act</p> <p>Native American Graves Protection and Repatriation Act</p> <p>Archeological Resources Protection Act</p> <p>Executive Order 13007, "Indian Sacred Sites"</p> <p>Presidential Memorandum of April 29, 1994, on Government-to-Government Relations with Tribal Governments</p> <p>36 CFR 800 Advisory Council on Historic Preservation Regulations for the Protection of Historic Properties</p> <p><i>NPS Management Policies 2006</i></p> <p>Director's Order 28: <i>Cultural Resource Management Guideline</i> (1998)</p> <p>2008 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers</p>
Management Strategies	
<p>Complete an ethnographic overview and assessment of the park.</p> <p>Consult in writing and in person, when possible, with traditionally associated American Indian tribes about proposed undertakings in the park that may affect ethnographic resources. Receive input from the tribes about potential impacts.</p> <p>Continue to provide access to sacred sites when the use is consistent with park purposes and the protection of resources.</p> <p>Treat all ethnographic resources as eligible for listing in the National Register of Historic Places pending a formal determination by the park with concurrence from the Arizona State Historic Preservation Office.</p> <p>Protect all ethnographic resources determined eligible for listing in, or listed in, the National Register; if disturbance to such resources is unavoidable, conduct formal consultation with the associated American Indian tribes, Arizona State Historic Preservation Office, and the Advisory Council on Historic Preservation, as needed, in accordance with the provisions of the National Historic Preservation Act.</p> <p>Conduct regular consultations with associated American Indian tribes to continue to improve communications between the tribes and the park.</p> <p>Continue to provide access to, and use of, natural and cultural resources in the park that are consistent with park purposes, do not unreasonably interfere with American Indian use of traditional areas or sacred resources, and do not degrade park resources.</p>	

VISITOR USE MANAGEMENT

VISITOR USE AND EXPERIENCE (GENERAL)	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>Park resources are conserved unimpaired for the enjoyment of future generations. Visitors have opportunities for forms of enjoyment that are uniquely suited and appropriate to the natural and cultural resources found in the park. No activities occur that would cause derogation of the values and purposes for which Tumacácori National Historical Park was established.</p> <p>For all zones within the park, the types and levels of visitor use are consistent with the desired resource and visitor experience conditions prescribed for those areas within the park's purpose.</p> <p>Tumacácori National Historical Park's buildings..., All new and renovated buildings....</p> <p>Tumacácori National Historical Park's buildings, facilities, programs, and services are accessible to and useable by all people, including those with disabilities, to the highest level that is reasonable. All new and renovated buildings and facilities are designed and constructed to provide access to people with disabilities. All services and programs, including those offered by volunteers, interpreters, and cultural demonstrators also are designed to be accessible by people with disabilities.</p>	<p>NPS Organic Act National Park System General Authorities Act <i>NPS Management Policies 2006</i> Architectural Barriers Act of 1968 Rehabilitation Act of 1973 Americans with Disabilities Act of 1990 <i>Director's Order 42: Accessibility for Visitors with Disabilities in National Park Service Programs and Services</i> 28 CFR Part 36 43 CFR Part 17 "Nondiscrimination in Federally Assisted Programs of the Department of the Interior. Subpart B: Nondiscrimination on the Basis of Handicap" Title 36 CFR Americans with Disabilities Act Accessibility Guidelines (2004) Draft Final Accessibility Guidelines for Outdoor Developed Areas (2009)</p>
Management Strategies	
<p>Park staff would stay informed of the park's existing and changing visitor demographics and psychographics to better tailor programs and media to meet diverse needs and desires. All media and programs would reflect the park's purpose, mission, resources significance, and desired visitor conditions (including the primary interpretive themes).</p> <p>To meet the requirements of the 1978 National Parks and Recreation Act and NPS management policies, NPS staff would continue to monitor visitor comments on issues such as crowding and availability of parking spaces at busy times of the year, and would monitor for resource impacts caused by visitors. Should any of the trends increase to levels unacceptable to managers, NPS staff will consider what actions to take.</p> <p>Visitors would be provided with the tools and information they need for self-management and how to enjoy the park in a safe, low-impact manner.</p> <p>Park staff would ensure accessibility of opportunities for visitors to form their own intellectual and emotional connections to resource meaning for as many audiences as practical and possible by providing a variety of both personal and nonpersonal services.</p> <p>Existing buildings and facilities would be evaluated on a regular basis to determine the degree to which they are accessible to and useable by people with disabilities, and to identify barriers that limit access. Action plans would be developed identifying if barriers could be removed and then the plan would be implemented.</p> <p>Similarly, existing programs, activities, and services (including interpretation, telecommunications, media, and web pages) would be regularly evaluated to determine the degree to which they are accessible to and useable by people with disabilities, and to identify barriers to access. Action plans would be developed identified how barriers would be removed and then the plan would be implemented.</p>	

VISITOR INFORMATION, ORIENTATION, INTERPRETATION AND EDUCATION	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>Visitors to Tumacácori National Historical Park have opportunities for a safe and satisfying visit, with opportunities to get information about the park (in multiple languages) before leaving home</p> <p>get on-site information and an overview of the park (in multiple languages)</p> <p>choose from a variety of recreational, interpretive, and educational experiences geared to diverse needs, interests, and abilities</p> <p>easily find park facilities</p> <p>learn about other theme-related sites and programs in the region</p> <p>escape the routines and stresses of the urban environment</p> <p>Visitors have opportunities to understand and appreciate the significance of the park and its resources, to make connections between park resources and their meanings, and to develop a personal stewardship ethic by directly relating to the resources. This may occur when visitors</p> <p>understand elements of each of the primary interpretive themes (See "Planning Background" section)</p> <p>experience key elements of the park's history</p> <p>appreciate the range of plant and animal species in the park</p> <p>interact with park staff</p> <p>witness resource preservation in action</p> <p>contribute to the support of park programs and preservation efforts</p> <p>create personal and family memories from their park experiences</p> <p>engage in forms of cultural demonstrations</p> <p>explore and discover the park alone or with others</p>	<p>NPS Organic Act</p> <p>National Park System General Authorities Act</p> <p>NPS Management Policies 2006</p> <p>Director's Order 6: <i>Interpretation and Education</i></p>
Management Strategies	
<p>Park managers would complete a comprehensive interpretive plan. This plan would emphasize providing information, orientation, and interpretive services through the most effective means. The comprehensive interpretive plan would also provide the foundation and overall concept for the park's education plan, a plan that would be developed by the park staff in partnership with area educators.</p> <p>The park staff would seek new ways to increase awareness of the park, its resources, and themes. This would include reaching out to segments of the population that do not use the park or know of its significance. Park staff would work with local communities and other theme-related sites to tell aspects of the Tumacácori stories in a coordinated and comprehensive fashion. Partnerships with other state, regional, and national parks, educational institutions, American Indian tribes, and other organizations would be sought to enrich interpretation and education opportunities about the park's themes.</p> <p>Appropriate techniques and technologies would be used to make people aware of issues facing the park.</p> <p>Interpretive and educational programs would include key resource issues, management priorities, public safety, and demonstrate standards for interpretive competencies identified and outlined by the NPS Interpretive Development Program.</p> <p>Cooperative efforts and partnerships with local communities, public and private agencies, organizations, stakeholders, and land managers in the region would be enhanced so that visitors can better learn about the abundance, variety, and availability of the region's cultural, recreational, and interpretive opportunities. This would orient visitors about what to do and which attractions to see.</p> <p>Partnerships with state parks, national parks, educational institutions, and other organizations would be enhanced to enrich interpretive and educational opportunities regionally and nationally.</p>	

PUBLIC HEALTH AND SAFETY	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>While recognizing that there are limitations on its capability and constraints imposed by the NPS Organic Act to not impair resources, the National Park Service and its contractors and cooperators will seek to provide a safe and healthful environment for visitors and employees.</p> <p>The park staff strives to identify recognizable threats to safety and health and protect property by applying nationally accepted standards. The park is a safe workplace—no preventable workplace accidents, spills, or lost time injuries occur in the park. The park staff reduces or removes known hazards and/or applies appropriate mitigating measures, such as closures, guarding, gating, education, and other actions.</p>	<p>OSHA 29 CFR <i>NPS Management Policies 2006</i> Director's Order 50 and Reference Manual 50: <i>Safety and Health</i> Director's Order 58 and Reference Manual 58: <i>Structural Fire Management</i> Director's Order 83 and Reference Manual 83: <i>Public Health</i> Director's Order 51 and Reference Manual 51: <i>Emergency Medical Services</i> Director's Order 30 and Reference Manual 30: <i>Hazard and Solid Waste Management</i></p>
Management Strategies	
<p>NPS staff would ensure that all potable water systems and waste water systems in the park meet state and federal requirements.</p> <p>An emergency preparedness program would be developed to maximize visitor and employee safety and protection of resources and property.</p> <p>Emergency operations/safety plans, including a hazardous spill response plan to plan for and respond to spills, would be maintained.</p> <p>Interpretive signs and materials would be provided as appropriate to notify visitors of potential safety concerns/hazards and procedures to help provide for a safe visit to the park and to ensure that visitors are aware of the possible risks of certain activities.</p> <p>Park equipment would be maintained in a safe and environmentally sound condition.</p> <p>Routine safety and environmental checks would be conducted of employees, contractors, and business partner operations.</p> <p>NPS staff would continue to work with local emergency and public health officials to make reasonable efforts to search for lost persons and rescue sick, injured, or stranded persons.</p> <p>NPS staff would make reasonable efforts to provide appropriate emergency medical services for a person who becomes ill or is injured.</p>	
COMMERCIAL VISITOR SERVICES	
<p>A commercial activity is defined as any activity for which compensation is exchanged. It includes activities by for-profit and nonprofit operators. Commercial services are more than just concessions. They include concession contracts, commercial use authorizations, leases, cooperative agreements, rights of way, and special use permits. All commercial services must be managed. All commercial services must be necessary and/or appropriate by achieving the resource protection and visitor use goals for the park.</p>	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>Commercial services are an important element of the visitor experience and the management of Tumacácori National Historical Park. These services add to visitor enjoyment of the park, enable many people to see parts of the park they might not otherwise see, and help protect park resources. All commercial services are safe and sustainable.</p>	<p><i>NPS Management Policies 2006</i> NPS Concessions Management Improvement Act of 1998 Same as Visitor Experience and Use</p>
Management Strategies	
<p>Ensure that all necessary and/or appropriate commercial activities in the park are authorized in writing by the superintendent.</p> <p>Establish levels of commercial use that are consistent with resource protection and visitor experience goals for the park.</p> <p>Businesses would continue to be managed through commercial use authorizations; commercial filming would continue to be managed through special use permits.</p> <p>Ensure that before commercial use authorizations are renewed or readvertised, the types of authorized uses are still necessary and/or appropriate, the levels of use are consistent with resource protection and quality visitor experiences, and the commercial services can be managed in an effective and efficient manner.</p>	

RELATIONS WITH LANDOWNERS, AGENCIES, TRIBES, AND OTHER ENTITIES

RELATIONS WITH PRIVATE AND PUBLIC ORGANIZATIONS, ADJACENT LANDOWNERS, GOVERNMENT AGENCIES AND VOLUNTEERS	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>Tumacácori National Historical Park is managed as part of a greater ecological, social, economic, and cultural system.</p> <p>Good relations are maintained with adjacent landowners, surrounding communities, and private and public groups that affect, and are affected by, the park. Tumacácori National Historical Park is managed proactively to resolve external issues and concerns and ensure that park resources are not compromised.</p> <p>Because the park is an integral part of larger regional environment, the National Park Service works cooperatively with others to anticipate, avoid, and resolve potential conflicts, protect park resources, and address mutual interests in the quality of life for community residents. Regional cooperation involves federal, state, and local agencies, Indian tribes, neighboring landowners, and all other concerned parties.</p>	<i>NPS Management Policies 2006</i>
Management Strategies	
<p>Park staff would continue to establish and foster partnerships with public and private organizations to achieve the purpose of the park. Partnerships would continue to be sought for resource protection, research, education, and visitor enjoyment.</p> <p>NPS staff would keep landowners, land managers, local governments, and the general public informed about park management activities. The National Park Service would work closely with local, state, and federal agencies and tribal governments whose programs affect or are affected by activities in the park. Regular consultations would occur with such groups as Santa Cruz County, Arizona State Historic Preservation Office, Arizona State Parks, Arizona Game and Fish, Arizona State Police, City of Nogales, U.S. Department of Homeland Security, and Juan Baustista de Anza National Historic Trail.</p> <p>Periodic consultations would occur with landowners and communities who are affected by, or potentially affected by park visitors and management actions. NPS staff would respond promptly to conflicts that arise over their activities, visitor access, and proposed activities and developments on adjacent lands that may affect the park. NPS managers would seek agreements with landowners to encourage their lands to be managed in a manner compatible with park purposes. Park staff also would seek ways to provide landowners with technical and management assistance to address issues of mutual interest.</p> <p>NPS staff would continue to work closely with local, state, and federal agencies and tribal governments to foster interagency training, cooperation, and mutual assistance that affords the highest level of protection and security for visitors and park resources.</p> <p>Park managers would pursue cooperative regional planning whenever possible to integrate the park into issues of regional concern.</p> <p>NPS staff would continue to support and encourage volunteers who contribute to park programs.</p>	

**GOVERNMENT-TO-GOVERNMENT RELATIONS BETWEEN NATIVE AMERICAN TRIBES
AND TUMACÁCORI NATIONAL HISTORICAL PARK**

Desired Conditions	Pertinent Servicewide Laws and Policies
The National Park Service and tribes traditionally associated with the park maintain positive, productive, government-to-government relationships. NPS staff respect the viewpoints and needs of the tribes, continue to promptly address conflicts that occur, and consider American Indian values in park management and operation. Traditional American Indian activities occur in the park to the extent allowed by applicable laws and regulations.	National Historic Preservation Act of 1966, as amended (16 USC 470) Archeological Resources Protection Act Native American Graves Protection and Repatriation Act American Indian Religious Freedom Act Executive Order 13007, "Sacred Sites" <i>NPS Management Policies 2006</i> NPS Organic Act National Environmental Policy Act
Management Strategies	
Park staff would continue to cooperate with tribes in conducting ethnographic studies to identify culturally significant resources. Regular consultations with associated tribes would continue to improve communications and resolve any problems or misunderstandings. NPS staff would continue to identify and deepen the understanding of the significance of the park's resources and landscapes to American Indians through cooperative research and sharing. The participation of tribes would be encouraged in protecting the park's natural and cultural resources of interest and concern to them. The employment of American Indians on the park staff would be encouraged to improve communications and working relationships, and encourage cultural diversity in the workplace. NPS staff would consider traditionally associated tribal values in efforts to improve overall management and park interpretation. Tribes would be involved in the park's interpretation program to promote accuracy of information about American Indian cultural values and enhance public appreciation of those values.	

OTHER MANAGEMENT TOPICS

CLIMATE CHANGE	
Desired Conditions	Pertinent Servicewide Laws and Policies
<p>Tumacácori National Historical Park is a leader in its efforts to address climate change, reducing its greenhouse gas emissions, increasing its use of renewable energy and other sustainable practices so it is a carbon neutral park; and preparing for and mitigating climate change impacts. Park staff proactively monitor, plan, and adapt to the effects of climate change on natural and cultural resources and visitor amenities by using the best information as it becomes available. Park staff promote innovation, best practices, adaptive management, and partnerships to respond to the challenges of climate change and its effects on park resources. Education and interpretive programs help visitors understand the process of climate change, its threats to the park and the wider environment, and how they can respond to climate change.</p>	<p>NPS Organic Act Executive Order 13423 (includes requirements for energy and water conservation measures) Executive Order 13514 (sets requirements for federal greenhouse gas emissions) Department of the Interior Secretarial Order 3226 (ensures that climate change impacts be taken into account in connection with departmental planning and decision making) NPS <i>Management Policies 2006</i> (including sections on environmental leadership [1.8], sustainable energy design [9.1.1.6], and energy management [9.1.7]) NPS <i>Climate Change Response Strategy</i> (2010) NPS Environmental Quality Division's "Draft Interim Guidance: Considering Climate Change in NEPA Analysis"</p>
Management Strategies	<p>Key natural and cultural resources and visitor amenities that are most vulnerable from climate change would be identified. Baseline resource conditions would be established, thresholds identified, and conditions monitored. Key resources in various management zones would be identified that may require different management responses to climate change impacts.</p> <p>Tumacácori National Historical Park would become a member of the Climate Friendly Parks program, measuring park-based greenhouse emissions, developing sustainable strategies to mitigate these emissions and adapt to climate change impacts, educating the public about these efforts, and developing future action plans.</p> <p>Stressors on key ecosystem features and process and key cultural resources would continue to be mitigated to increase resiliency to a changing climate.</p> <p>Scientific studies and inventories would be encouraged to identify and document changes caused by climate change, to predict potential changes, and to assist in identifying potential responses to climate change. Key natural and cultural resources and visitor amenities that are at risk from climate change would be identified and monitored.</p> <p>Since emissions from all motorized vehicles contribute to the park's emissions, options to improve transportation efficiencies would be explored, including NPS and visitor activities. Opportunities for alternative transportation options, as well as effective carbon offset strategies, would be explored. Use of low-emission vehicles for NPS operations would be used when possible.</p> <p>Opportunities would be pursued in park operations and visitor services to use and promote "green" technologies and products and reduce overall energy and resource consumption.</p> <p>Park education and interpretive efforts would engage park employees, partners, visitors, and the public on climate change, providing the latest park research and monitoring data and trends, informing the public about what responses are being taken at the park, and inspiring visitors to reduce their carbon footprint.</p> <p>NPS staff would work with partners to plan for climate change, and identify actions that can be taken to respond to these changes. Cooperative efforts also would be pursued to maintain regional habitat connectivity and refugia that allow species dependent on park resources to better adapt to changing conditions.</p> <p>Concessioners and other partners would be encouraged to provide or use low-emission vehicles in their activities, both within and outside the park.</p> <p>Anticipated climate change impacts, such as changes in vegetation, would be incorporated into future management plans.</p> <p>(See also the following strategies identified under "Sustainability.")</p>

SUSTAINABILITY

Sustainability can be described as doing things in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices consider local and global consequences to minimize the short- and long-term environmental impacts of human actions and developments through alternative energy sources, resource conservation, recycling, waste minimization, and the use of energy efficient and ecologically responsible materials and techniques.

Desired Conditions	Pertinent Servicewide Laws and Policies
The park is a leader in sustainable practices. All decisions regarding park operations, facilities management, and development in Tumacácori National Historical Park—from the initial concept through design and construction—reflect principles of resource conservation. Thus, all park developments and park operations are sustainable to the maximum degree possible and practical. New developments and existing facilities are located, built, and modified according to the <i>Guiding Principles of Sustainable Design</i> (NPS 1993) or other similar guidelines. The park has state-of-the-art water systems for conserving water, and energy conservation technologies and renewable energy sources whenever possible. Biodegradable, nontoxic, and durable materials are used in the park whenever possible. The reduction, use, and recycling of materials is promoted, while materials that are nondurable, environmentally detrimental, or that require transportation from great distances are avoided as much as possible.	Energy Policy and Conservation Act of 2005 Energy Independence and Security Act of 2007 Executive Order 13423 (strengthens federal environmental, energy and transportation management) Executive Order 13423 (strengthens goals for federal environmental, energy, water conservation, and transportation management) Executive Order 13514 (sets requirements for federal greenhouse gas emissions, water conservation, building performance, and other sustainable practices) <i>NPS Management Policies 2006</i> <i>NPS Guiding Principles of Sustainable Design</i> (1993) Leadership in Energy & Environmental Design (LEED) <i>NPS Green Parks Plan</i>
Management Strategies	
<p>The NPS <i>Guiding Principles of Sustainable Design</i> (1993b) directs NPS management philosophy. It provides a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook articulates principles to be used in the design and management of tourist facilities that emphasize environmental sensitivity in construction, the use of nontoxic materials, resource conservation, recycling, and integrating visitors with natural and cultural settings. Sustainability principles have been developed and are followed for interpretation, natural resources, cultural resources, site design, building design, energy management, water supply, waste prevention, and facility maintenance and operations. The NPS <i>Green Parks Plan</i> further advances the agency's commitment to reducing environmental impacts and greenhouse gas emissions across all levels of the organization. In addition to following these principles, the following also will be accomplished:</p> <p>NPS staff would work with experts both inside and outside agency to make the park's facilities and programs sustainable. Partnerships would be sought to implement sustainable practices in the park. NPS staff also would work with stakeholders and business partners to augment NPS environmental leadership and sustainability efforts.</p> <p>Park managers would perform value analysis and value engineering, including life cycle analysis, to examine the energy, environmental, and economic implications of proposed park developments.</p> <p>NPS staff would support and encourage the service of suppliers and contractors that follow sustainable practices. Concessioners would be encouraged to embrace principles of environmental stewardship that enhance the protection, conservation, and preservation of resources.</p> <p>Energy-efficient practices and renewable energy sources such as solar and wind energy and alternative fuel sources would be implemented wherever possible for both operational facilities and visitor facilities and amenities.</p> <p>Park interpretive programs would address sustainable and unsustainable practices. Visitors would be educated on the principles of environmental leadership, alternative energy, and sustainability through exhibits, media, and printed material.</p> <p>Park employees would be educated to have a comprehensive understanding of their relationship to environmental leadership and sustainability.</p> <p>Park managers would measure and track environmental compliance and performance. Audits would ensure environmental compliance, emphasize best management practices, and educate employees at all levels about environmental management responsibilities.</p>	

UTILITY AND COMMUNICATION FACILITIES	
The Telecommunications Act of 1996 directs all federal agencies to assist in the national goal of achieving a seamless telecommunications system throughout the United States by accommodating requests by telecommunication companies for the use of property, rights-of-way, and easements to the extent allowable under each agency's mission. The National Park Service is legally obligated to permit telecommunication infrastructure in the park if such facilities can be structured to avoid interference with park purposes.	
Desired Conditions	Pertinent Servicewide Laws and Policies
Park resources or public enjoyment of the park are not denigrated by nonconforming uses. Telecommunication structures are permitted in the park to the extent that they do not jeopardize the park's mission and resources. No new nonconforming use or rights-of-way are permitted through the park without specific statutory authority and approval by the director of the National Park Service or his representative, and are permitted only if there is no practicable alternative to such use of NPS lands.	Telecommunications Act; 16 USC 79; 23 USC 317; 36 CFR 14 <i>NPS Management Policies 2006</i> Director's Order 53 and Reference Manual 53: <i>Special Park Uses</i>
Management Strategies	
NPS staff would work with service companies, local communities, and the public to locate new utility lines so that there is minimal effect on park resources. If necessary, and there are no other options, new or reconstructed utilities and communications infrastructure would be placed in association with existing structures and along roadways or other established corridors in developed areas. Companies would be urged to place utility lines underground to the maximum extent possible. Park staff would follow NPS policies (Reference Manual 53) and National Environmental Policy Act guidelines in processing applications for commercial telecommunications applications.	

APPENDIX C: CORRESPONDENCE

APPENDIXES, SELECTED REFERENCES, AND PREPARERS AND CONSULTANTS



United States Department of the Interior

NATIONAL PARK SERVICE

Tumacácori National Historical Park

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TUMA (108614A)

April 28, 2010

U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021

Subject: General Management Plan for Tumacácori National Historical Park

The National Park Service is developing a new General Management Plan (GMP) for Tumacácori National Historical Park in Santa Cruz County, Arizona. The purpose of this long-term, comprehensive plan is to define the overall management direction for the entire park, including 310 acres along the Santa Cruz River that were acquired in 2002. Because these lands were not part of the park in 1996 when the last management plan was completed, we are developing a new plan to include these lands in context with the rest of the park. This letter serves as a record that the National Park Service is initiating consultation with your agency on this planning effort, pursuant to the requirements of the Endangered Species Act and National Park Service management policies.

We are currently seeking a waiver to complete an environmental assessment instead of an environmental impact statement for this project. Consistent with the purpose, significance, and legislative mandates regarding this NPS unit, the plan will identify strategies for achieving desired resource conditions, visitor experiences, and the appropriate types and locations of any potential future development for visitor services and park operations. The environmental assessment will present a reasonable range of management alternatives for addressing these issues, and will analyze the environmental impacts of each alternative.

To ensure this planning effort results in the protection of threatened and endangered species, I am requesting a list of federally-listed plants and animals that might occur within the park and their designated critical habitats. I have enclosed a copy of the scoping newsletter, which includes maps of the park for your convenience. Please note, the park includes three separate units—Tumacácori, Calabazas, and Guevavi—all of which will be addressed as part of this planning effort.

If you have any questions please call me at 520-398-2341, e-mail me at lisa_carrico@nps.gov, or write to me at the address above. I appreciate your attention to this request and look forward to working with your office throughout this planning effort.



APPENDIXES, SELECTED REFERENCES, AND PREPARERS AND CONSULTANTS

Sincerely,



Lisa Carrico
Superintendent

Enclosure

cc: Erin Flanagan, Project Manager
 National Park Service, Denver Service Center
 P.O. Box 25287
 Denver, Colorado 80225-0287



United States Department of the Interior

NATIONAL PARK SERVICE

Tumacácori National Historical Park

Post Office Box 8067

Tumacácori, AZ 85640



TUMA (108614A)

April 28, 2010

Arizona Game and Fish Department
WMHB – Project Evaluation Program
5000 W. Carefree Highway
Phoenix, AZ 85086-5000

Subject: General Management Plan for Tumacácori National Historical Park

The National Park Service is developing a new General Management Plan (GMP) for Tumacácori National Historical Park in Santa Cruz County, Arizona. The purpose of this long-term, comprehensive plan is to define the overall management direction for the entire park, including 310 acres along the Santa Cruz River that were acquired in 2002. Because these lands were not part of the park in 1996 when the last management plan was completed, we are developing a new plan to include these lands in context with the rest of the park. This letter serves as a record that the park is consulting with your agency on this planning effort, pursuant to National Park Service management policies.

We are currently seeking a waiver to complete an environmental assessment instead of an environmental impact statement for this project. Consistent with the purpose, significance, and legislative mandates regarding this NPS unit, the plan will identify strategies for achieving desired resource conditions, visitor experiences, and the appropriate types and locations of any potential future development for visitor services and park operations. The environmental assessment will present a reasonable range of management alternatives for addressing these issues, and will analyze the environmental impacts of each alternative.

To ensure this planning effort results in the protection of rare species, I am requesting a list of state-listed or other special status plants and animals that might occur within the park. I have enclosed a copy of the scoping newsletter, which includes maps of the park for your convenience. Please note, the park includes three separate units—Tumacácori, Calabazas, and Guevavi—all of which will be addressed as part of this planning effort.

If you have any questions please call me at 520-398-2341, e-mail me at lisa_carrico@nps.gov, or write to me at the address above. I appreciate your attention to this request and look forward to working with your office throughout this planning effort.



APPENDIXES, SELECTED REFERENCES, AND PREPARERS AND CONSULTANTS

Sincerely,



Lisa Carrico
Superintendent

Enclosure

cc: Erin Flanagan, Project Manager
 National Park Service, Denver Service Center
 P.O. Box 25287
 Denver, Colorado 80225-0287



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

5000 W. CAREFREE HIGHWAY
 PHOENIX, AZ 85086-5000
 (602) 942-3000 • WWW.AZGFD.GOV

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DIRECTOR
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 GARY R. HOWATTER
 BOB BROSCHEID



May 19, 2010

Lisa Carrico
 U.S. Department of the Interior
 National Park Service
 Tumacacori National Historical Park
 Post Office Box 8067
 Tumacacori, AZ, 85640

Re: General Management Plan for Tumacacori National Historical Park

Dear Ms. Carrico:

The Arizona Game and Fish Department (Department) has received and reviewed your letter dated April 28, 2010 requesting a list of special status species that might occur within the park. Attached you will find a list of such species with reported observations within 3 miles of the Park. The list was obtained from the Department's Heritage Data Management System.

The list identifies a significant number of Listed and Candidate species as well as Designated Critical Habitat (DCH) for the Mexican Spotted Owl. (Note that the DCH occurs outside the park boundary, but is close enough that actions in the park may have an impact on the DCH). **The Department recommends you contact the U.S. Fish and Wildlife Service to determine how these species can best be considered in your planning efforts.**

Also, portions of the park are within the Santa Rita-Tumacacori Linkage Design. The design is a wildlife corridor connecting the Santa Rita Mountains to the Tumacacori Mountains and allows animals to move between mountain ranges. The corridor is critical to maintaining healthy populations of wildlife in both mountain ranges. The Department would welcome the opportunity to discuss how the park plans can accommodate the movement needs of wildlife. I have forwarded a copy of your letter to John Windes, the Department's Habitat Program Manager in our Tucson Regional Office. Please feel free to contact John (520 388-4442) to discuss how The Department can assist in your planning efforts.

If you have questions or concerns regarding this letter, please contact me at 623 236-7513. Thank you for the opportunity to participate early in this planning effort.

APPENDIXES, SELECTED REFERENCES, AND PREPARERS AND CONSULTANTS

Sincerely,



Daniel E. Nelson
Project Evaluation Specialist

CC: John Windes
M10.05110905

**Special Status Species 3 Mile Buffer
Tumacacori National Historical Park**

			SC	S					
<i>Metastelma mexicanum</i>	Wiggins Milkweed Vine		SC	S					
<i>Muhlenbergia xerophila</i>	Weeping Muhly		SC	S					
<i>Myotis velifer</i>	Cave Myotis		SC	S					
<i>Pachyramphus aglaiae</i>	Rose-throated Becard		S	S					WSC
<i>Passiflora arizonica</i>	Arizona Passionflower		S	S					
Patagonia - Santa Rita Linkage Design	Wildlife Corridor		S	S					
<i>Pectis imberbis</i>	Beardless Chinch Weed		SC	S					
<i>Physalis latiflhoa</i>	Broad-leaf Ground-cherry		S	S					
<i>Plestiodon callicephalus</i>	Mountain Skink		S	S					
<i>Poeciliopsis occidentalis occidentalis</i>	Gila Topminnow		LE	SC					WSC
<i>Poliopelta nigiceps</i>	Black-capped Gnatcatcher		LT	SC					WSC
<i>Rana chiricahuensis</i>	Chiricahua Leopard Frog		LT	SC					WSC
<i>Reithrodontomys fulvescens</i>	Fulvous Harvest Mouse		S	S					
<i>Reithrodontomys montanus</i>	Plains Harvest Mouse		S	S					
<i>Rhinichthys osculus</i>	Speckled Dace		SC	S					
Santa Rita - Tumacacori Linkage Design	Wildlife Corridor		S	S					
<i>Senticolis triaspis intermedia</i>	Northern Green Ratsnake		S	S					
<i>Sigmodon ochrogaster</i>	Yellow-nosed Cotton Rat		SC	S					
<i>Strix occidentalis lucida</i>	Mexican Spotted Owl		LT	SC					WSC
Tantilla yaquia	Yaqui Black-headed Snake		S	S					
<i>Thamnophis eques megalops</i>	Northern Mexican Gartersnake		C	S					WSC
<i>Tragia laciniata</i>	Sonoran Noseburn		S	S					
<i>Tyrannus crassirostris</i>	Thick-billed Kingbird		S	S					WSC
<i>Tyrannus melancholicus</i>	Tropical Kingbird		S	S					WSC

Special Status Species 3 Mile Buffer
Tumacocari National Historical Park

NAME	COMMON NAME	FWS	USFS	BLM	STATE
<i>Abutilon parviflui</i>	Pima Indian Mallow	SC	S	S	SR
<i>Agave parviflora</i> ssp. <i>parviflora</i>	Santa Cruz Striped Agave	SC	S	S	HS
<i>Agosia chrysogaster</i> <i>chrysogaster</i>	Gila Longfin Dace	SC	S	S	
<i>Amazilia viridiceps</i>	Violet-crowned Hummingbird	S			WSC
<i>Ammodramus savannarum</i> <i>ammoleucus</i>	Arizona grasshopper sparrow	S			
<i>Amsonia grandiflora</i>	Large-flowered Blue Star	SC	S	S	
<i>Aspidoscelis burti</i> <i>stictogrammus</i>	Giant Spotted Whiptail	SC	S	S	
<i>Baionymys taylori</i>	Northern Pygmy Mouse	S			
Bat Colony					
<i>Buteo albonotatus</i>	Zone-tailed Hawk	S			
<i>Buteo nitidus</i> <i>maxima</i>	Northern Grey Hawk	SC	S	S	WSC
<i>Buteogallus anthracinus</i>	Common Black-Hawk	S	S	S	WSC
<i>Campostoma imberbe</i>	Northern Beardless-Tyrannulet	S			
<i>Capsicum annuum</i> var. <i>glabriusculum</i>	Chiltchipin	S			
<i>Catostomus clarkii</i>	Desert Sucker	SC	S	S	
<i>Catostomus insignis</i>	Sonoran Sucker	SC	S	S	
CH for <i>Strix occidentalis</i> <i>lucida</i>	Designated Critical Habitat for Mexican spotted owl				
<i>Choeronycterus mexicana</i>	Mexican Long-tongued Bat	SC	S	S	WSC
<i>Choisya mollis</i>	Santa Cruz Star Leaf	SC	S	S	
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo (Western U.S. DPS)	C	S	S	WSC
<i>Coryphantha recurvata</i>	Santa Cruz Beehive Cactus		S	S	HS
<i>Coryphantha schaeeri</i> var. <i>robustispina</i>	Pima Pineapple Cactus	LE		S	HS
<i>Crotalus willardi</i> <i>willardi</i>	Arizona Ridge-nosed Rattlesnake			S	WSC
Dendrocygna autumnalis	Black-bellied Whistling-Duck				WSC
<i>Empidonax traillii</i> <i>extimus</i>	Southwestern Willow Flycatcher	LE		S	WSC
<i>Gastrophryne olivacea</i>	Western Narrow-mouthed Toad			S	WSC
<i>Glaucidium brasiliense</i> <i>cactorum</i>	Cactus Ferruginous Pygmy-owl	SC	S	S	WSC
<i>Gopherus agassizii</i> (Sonoran Population)	Sonoran Desert Tortoise	SC	S	S	WSC
<i>Gyalopion quadrangulare</i>	Thornscrub Hook-nosed Snake		S	S	WSC
<i>Haliaeetus leucocephalus</i> (wintering pop.)	Bald Eagle - Winter Population	SC, BGA	S	S	WSC
<i>Leptonycterus curasoae</i> <i>yerbabuenae</i>	Lesser Long-nosed Bat	LE			WSC
<i>Macropitilium supinum</i>	Supine Bean	SC	S	S	SR
<i>Mammillaria wrightii</i> var. <i>wilcoxii</i>	Wilcox Fishhook Cactus				SR

AGID #M10-05110895
 AGFD HDMS, May 19, 2010
 Project Evaluation Program



United States Department of the Interior

NATIONAL PARK SERVICE
Tumacácori National Historical Park
Post Office Box 8067
Tumacácori, AZ 85640



TUMA (108614A)

April 28, 2010

James Garrison
State Historic Preservation Officer
State Historic Preservation Office
Arizona State Parks
1300 W. Washington
Phoenix, Arizona 85007

Subject: General Management Plan/Environmental Impact Statement for Tumacácori National Historical Park

Dear Mr. Garrison:

In accordance with Section 106 of the National Historic Preservation Act of 1966, amended, and the Advisory Council's regulations, 36 CFR Part 800, we seek your comments and formal consultation regarding a proposed undertaking to write a new General Management Plan (GMP) for Tumacácori National Historical Park in Santa Cruz County, Arizona. The purpose of this long-term, comprehensive plan is to define the overall management direction for lands located within the park's expanded boundary for the next fifteen to twenty years.

In 2002 the Tumacácori unit of the park was expanded to include an additional 310 acres, including cultural and natural resources associated with the Mission *San José de Tumacácori*. These resources include the mission orchard and *acequia* as well as farmlands, and a one-mile reach of the Santa Cruz River. Because these new lands were not part of the park in 1996 when the last management plan was completed we must develop a new management plan to address these lands and the opportunities they present as well as challenges not considered in the previous plan.

As noted in previous correspondence with your office, the park has begun the process of public scoping and is currently seeking a waiver to complete an environmental assessment instead of an environmental impact statement for this project.

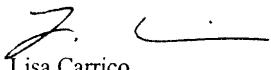
I look forward to your comments. If you wish to make a site visit we would be happy to show you the lands added to the park. As we continue the scoping process our next public meetings will present the draft alternatives. As we begin writing the plan and environmental compliance document we will seek additional comments. I have enclosed a copy of the scoping newsletter,



APPENDICES, SELECTED REFERENCES, AND PREPARERS AND CONSULTANTS

Calabazas, and Guevavi—all of which will be addressed as part of this planning effort. I look forward to your comments. If you have any questions please call me at 520-398-2341, or e-mail me at lisa_carrico@nps.gov, or write to me at the address above.

Sincerely,



Lisa Carrico
Superintendent, Tumacácori National Historical Park.

enclosure

cc: Erin Flanagan, NPS-DSC-P



"Managing and conserving Arizona's natural, cultural and recreational resources"

In reply refer to SHPO-2010-0636
General comments

May 28, 2010

Lisa Carrico, Superintendent
National Park Service
Tumacácori National Historic Park
P.O. Box 8067
Tumacácori, AZ 85640

Janice K. Brewer
Governor

State Parks Board Members

Chair
Reese Woodling
Tucson

Tracey Westerhausen
Phoenix

Larry Landry
Phoenix

Walter D. Armer, Jr.
Vail

Arlan Colton
Tucson

William C. Scalzo
Phoenix

Maria Baier
State Land Commissioner

Renée E. Bahl
Executive Director

Arizona State Parks
1300 W. Washington
Phoenix, AZ 85007

Tel & TTY: 602.542.4174
AZStateParks.com

800.285.3703 from
(520 & 928) area codes

General Fax:
602.542.4180

Director's Office Fax:
602.542.4188

RE: General Management Plan/Environmental Impact Statement for Tumacácori National Historical Park; NPS
SHPO-2010-0636 (84766)

Dear Ms. Carrico:

Thank you for your April 28, 2010 letter initiating consultation with our office about the development of a new General Management Plan/environmental document for Tumacácori National Historical Park. SHPO staff would be pleased to assist the Park in any way that we can.

We appreciate your continuing cooperation with our office in complying with the requirements of historic preservation.

Sincerely,


Jo Anne Medley
Compliance Specialist/Archaeologist
State Historic Preservation Office

Arizona  **State Parks**





United States Department of the Interior

NATIONAL PARK SERVICE

Tumacácori National Historical Park

Post Office Box 8067

Tumacácori, AZ 85640



TUMA (108614A)

April 28, 2010

Mr. John M. Fowler
Executive Director
Advisory Council on Historic Preservation,
Old Post Office Building
1100 Pennsylvania Avenue, NW, Suite 809,
Washington, District of Columbia 20004

Dear Mr. Fowler:

The National Park Service (NPS) will be preparing a General Management Plan (GMP), and an accompanying environmental impact statement (EIS), for Tumacácori National Historical Park. In 2002 the Tumacácori unit of the park was expanded to include an additional 310 acres, including cultural and natural resources associated with the Mission *San José de Tumacácori*. These resources include the mission orchard and *acequia* as well as farmlands, and a one-mile reach of the Santa Cruz River. Because these new lands were not part of the park in 1996 when the last management plan was completed we must develop a new management plan to address these lands and the opportunities they present as well as challenges not considered in the previous plan.

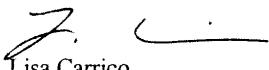
The GMP will involve a comprehensive planning effort to define overall management goals and identify resources for protection and preservation for the national historical park for the next 15 to 20 years. Consistent with the purpose, significance, and legislative mandates regarding this NPS unit, the plan will identify strategies for achieving desired resource conditions, visitor experiences, and the appropriate types and locations of any potential future development for visitor services and park operations. The GMP EIS will present a reasonable range of management alternatives for addressing these issues, and will analyze the environmental impacts of each alternative on natural and cultural resources and other impact topics.

We invite your participation in the GMP planning process and will keep you informed as the planning effort progresses and of public meetings in case you or any representatives from your office wish to attend. At the appropriate time, we will also invite you to review and comment upon the draft plan. I have enclosed a copy of the scoping newsletter, which includes maps of the park for your convenience. Please note, the park includes three separate units—Tumacácori,

TAKE PRIDE
IN AMERICA A stylized graphic of a hand holding a torch, with the words "TAKE PRIDE IN AMERICA" written above it.

Calabazas, and Guevavi— all of which will be addressed as part of this planning effort. I look forward to your comments. If you have any questions please call me at 520-398-2341, or e-mail me at lisa_carrico@nps.gov, or write to me at the address above.

Sincerely,



Lisa Carrico
Superintendent, Tumacácori National Historical Park.

enclosure

cc: Erin Flanagan, NPS-DSC-P



Preserving America's Heritage

July 2, 2010

Ms. Lisa Carrico
Superintendent, Tumacácori National Historic Park
National Park Service
P.O. Box 8067
Tumacácori, AZ 85640

Ref: *Proposed General Management Plan
TUMA (108614A)
Tumacácori, Pima and Santa Cruz Counties, Arizona*

Dear Ms. Carrico:

Thank you for notifying us of your plan to prepare a General Management Plan (GMP) and an accompanying environmental impact statement (EIS) for Tumacácori National Historic Park. We appreciate your consulting with us at the early stages of project planning, as is consistent with our regulations.

As you note, the GMP may identify types and locations of potential future development for visitor services and park operations and the EIS will analyze the environmental impacts of each alternative, including effects on cultural resources. Per 36 CFR 800.3 of our regulations, the agency should coordinate the steps of the section 106 process, as appropriate, with the overall planning schedule and any reviews required under other authorities, including the National Environmental Policy Act (NEPA).

If any specific undertakings or programs are evaluated as to their effects on cultural resources within this GMP/EIS, even at the conceptual level, such evaluation would benefit from the consultation that the Section 106 process affords. Consultation with parties having an interest in the effects of the undertakings or programs on historic properties will ensure consideration of the full range of alternatives to avoid, minimize and mitigate adverse effects, without duplication of effort.

Should you choose to coordinate Section 106 compliance with NEPA compliance activities, please provide documentation per 36 CFR 800.11(e) to all consulting parties so that you can reach concurrence on your preliminary findings in accordance with our regulations. Please keep us informed as to any adverse effects that might be identified for any of the undertakings identified during your planning process.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

1100 Pennsylvania Avenue NW, Suite 803 • Washington, DC 20004
Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

If you have any questions or require our further assistance, please contact Louise Dunford Brodnitz at 202-606-8527 or via e-mail at lbrodnitz@achp.gov.

Sincerely,



Caroline D. Hall
Assistant Director
Office of Federal Agency Programs
Federal Property Management Section



United States Department of the Interior

NATIONAL PARK SERVICE

Tumacácori National Historical Park

Post Office Box 8067

Tumacácori, AZ 85640



TUMA (108614A), (D-18)

April 28, 2010

Norman Cooeyate, Governor
Pueblo of Zuni
P.O. Box 339
Zuni, NM 87327

Subject: General Management Plan/Environmental Impact Statement for Tumacácori National Historical Park

Dear Governor Cooeyate:

In accordance with Section 106 of the National Historic Preservation Act of 1966, amended, and the Advisory Council's regulations, 36 CFR Part 800, we seek your comments and formal consultation regarding a proposed undertaking to write a new General Management Plan (GMP) for Tumacácori National Historical Park in Santa Cruz County, Arizona. The purpose of this long-term, comprehensive plan is to define the overall management direction for lands located within the park's expanded boundary for the next 15 to 20 years.

In 2002 the Tumacácori unit of the park was expanded to include an additional 310 acres, including cultural and natural resources associated with the Mission San José de Tumacácori. These resources include the mission orchard and acequia as well as farmlands, and a one-mile reach of the Santa Cruz River. Because these new lands were not part of the park in 1996 when the last management plan was completed we must develop a new management plan to address these lands and the opportunities they present as well as challenges not considered in the previous plan.

As noted in previous correspondence with your office, the park has begun the process of public scoping and is currently seeking a waiver to complete an environmental assessment instead of an environmental impact statement for this project.

I look forward to your comments. If you wish to make a site visit we would be happy to show you the lands added to the park. As we continue the scoping process our next meetings will present the draft alternatives to the public. As we begin writing the plan and environmental compliance document we will seek additional comments. I have enclosed a copy of the scoping



newsletter, which includes maps of the park for your convenience. Please note, the park includes three separate units—Tumacácori, Calabazas, and Guevavi—all of which will be addressed as part of this planning effort.

If you have any questions please call me at 520-398-2341, or e-mail me at lisa_carrico@nps.gov, or write to me at the address above.

Sincerely,



Lisa Carrico
Superintendent

enclosure

cc: Kurt Dongske, Archaeologist
Cultural Resource Enterprise
Pueblo of Zuni
P.O. Box 1149
Zuni, NM 87327

cc: Erin Flanagan, NPS-DSC-P

APPENDIX D: GLOSSARY

Spanish Terms

acequia – canal; used to describe an irrigation ditch in the mission system. What Tumacácori has remaining is actually an “*acequia madre*,” or main irrigation canal, without evidence of the smaller, lateral ditches.

convento – An open square of rooms beside and connected to the church, which included rooms in which the priest lived, along with other rooms used by the community.

visita – a mission in every sense of the word; however, it was one in which the priest was not in residence but instead visited on a regular basis.

cabecera – from “*cabeza*” (head), meaning “head *misión*” or “mission headquarters.” This is the mission where the priest actually resided and from which he visited other missions (*visitas*) in his jurisdiction

ranchería – hamlet or *villaje*; used to describe native villages that had not attained the status of “mission.”

ganadera – cattle ranch or livestock operation.

Pimería Alta – used to describe the region where the northern O’odham Indians lived; literally “Land of the Upper Pimas.” When the Spanish first arrived in this area, they called the O’odham Indians “Pimas.”

Planning Terms

fundamental resources – those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management because they are critical to achieving the park’s purpose and maintaining its significance.

fundamental values – unlike tangible resources, values refer to processes, forces, stories, experiences (such as an island experience), the ancestral homeland, wilderness values, key viewsheds adjacent to a park boundary, relationships among people, or oral histories.

other important resources and values are those other resources and values that are determined to be important to park planning and management, but are not related to the park’s purpose and significance.

APPENDIX E: SCIENTIFIC NAMES OF SPECIES REFERENCED IN THE TEXT

Common Name	Scientific Name
<i>Vegetation</i>	
Acacias	<i>Acacia greggii, A. constricta</i>
Arizona walnut	<i>Juglans major</i>
Bermudagrass	<i>Cynodon dactylon</i>
Bufflegrass	<i>Pennisetum ciliare</i>
Carelessweed	<i>Amaranthus palmeri</i>
Cheatgrass	<i>Bromus tectorum</i>
Desert broom	<i>Baccharis sarothroides</i>
Field bind weed	<i>Convolvulus arvensis</i>
Fountain grass	<i>Pennisetum setaceum</i>
Fremont Cottonwood	<i>Populus fremontii</i>
Gooding's willow	<i>Salix gooddingii</i>
Graythorn	<i>Ziziphus obtusifolia</i>
Huachua water umbrel	<i>Lilaeopsis schaffneriana</i> spp. <i>recurva</i>
Lehmann's lovegrass	<i>Eragrostis lehmanniana</i>
Malta starthistle	<i>Centaurea melitensis</i>
Mediterranean grass	<i>Schismus</i> spp.
Mexican elderberry	<i>Sambucus nigra</i>
Netleaf hackberry	<i>Celtis laevigata</i> var. <i>reticulata</i>
Pima pineapple cactus	<i>Coryphantha scheeri</i> var. <i>robustispina</i>
Poison hemlock	<i>Conium maculatum</i>
Red brome	<i>Bromus rubens</i>
Russian thistle	<i>Salsola tragus, S. kali</i>
Siberian elm	<i>Ulmus pumila</i>
Spiny hackberry	<i>Celtis pallida</i>
Stink grass	<i>Eragrostis cilianensis</i>
Tamarisk	<i>Tamarix</i>
Tree of heaven	<i>Ailanthus altissima</i>
Tree tobacco	<i>Nicotiana glauca</i>
Velvet ash	<i>Fraxinus velutina</i>
Velvet mesquite	<i>Prosopis velutina</i>
Wild oats	<i>Avena fatua</i>
Wolfberry	<i>Lycium</i> spp.
Yellow starthistle	<i>Centaurea solstitialis</i>

Common Name	Scientific Name
Fishes	
Gila chub	<i>Gila intermedia</i>
Gila topminnow	<i>Poeciliopsis occidentalis occidentalis</i>
Longfin dace	<i>Agosia chrysogaster</i>
Mosquito fish	<i>Gambusia affinis</i>
Reptiles and Amphibians	
American bullfrog	<i>Rana catesbeiana</i>
Chiricahua leopard frog	<i>Rana chiricahuensis</i>
Couch's spadefoot	<i>Scaphiopus couchii</i>
Desert grassland whiptail	<i>Aspedoscelis uniparens</i>
Desert tortoise	<i>Gopherus agassizii</i>
Diamond-backed rattlesnake	<i>Crotalus atrox</i>
Eastern fence lizard	<i>Sceloporus undulatus</i>
Great plains toad	<i>Anaxyrus cognatus</i>
Mexican garter snake	<i>Thamnophis eques megalops</i>
Ornate box turtle	<i>Terrapene ornata</i>
Ornate tree lizard	<i>Urosaurus ornatus</i>
Sonoran coralsnake	<i>Micruroides euryxanthus</i>
Sonoran mud turtle	<i>Kinosternon sonoriense</i>
Sonoran spotted whiptail	<i>Aspedoscelis sonorae</i>
Western narrow-mouthed toad	<i>Gastrophryne olivacea</i>
Woodhouse's toad	<i>Anaxyrus woodhousii</i>
Birds	
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>
Broad-billed hummingbird	<i>Cyanthus latirostris</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Common yellowthroat	<i>Geothlypis trichas</i>
House sparrow	<i>Passer domesticus</i>
Killdeer	<i>Charadrius vociferous</i>
Mexican spotted owl	<i>Strix occidentalis lucida</i>
Mourning dove	<i>Zenaida macroura</i>
Northern raven	<i>Corvus corax</i>
Peregrine falcon	<i>Falco peregrines</i>
Phainopepla	<i>Phainopepla nitens</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Song sparrow	<i>Melospiza melodia</i>
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>
Starling	<i>Sturnus vulgaris</i>
Turkey vulture	<i>Cathartes aura</i>

Common Name	Scientific Name
Birds	
Vermillion flycatcher	<i>Pyrocephalus rubinus</i>
Violet-green swallow	<i>Tachycineta thalassina</i>
Western Bell's vireo	<i>Vireo bellii</i>
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Yellow-breasted chat	<i>Icteria virens</i>
Yellow warbler	<i>Dendroica petechia</i>
Mammals	
Bighorn sheep	<i>Ovis canadensis</i>
Black bear	<i>Ursus americanus</i>
Bobcat	<i>Lynx rufus</i>
Cactus mouse	<i>Peromyscus eremicus</i>
Coyote	<i>Canis Latrans</i>
Grizzly bear	<i>Ursus arctos</i>
Jaguar	<i>Panthera onca</i>
Lesser long-nosed bat	<i>Leptonycteris yerbabuenae</i>
Mexican gray wolf	<i>Canis lupus baileyi</i>
Ocelot	<i>Leopardus pardalis</i>
Skunk	<i>Mephitis</i> sp.
Sonoran desert pocket mouse	<i>Chaetodipus penicillatus</i>
Virginia opossum	<i>Didelphis virginiana</i>

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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