

U.S. Fish & Wildlife Service

Biological Needs Assessment

*National Wildlife
Refuge System
Division of Refuges
July 1998*



Mission of the National Wildlife Refuge System

To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

*National Wildlife Refuge System Improvement Act of 1997
(Public Law 105-57, October 9, 1997)*



Forward

Significant anniversaries are opportunities for introspection and assessment. The approach of the National Wildlife Refuge System's 100th birthday is an ideal time to look back over the road thus traveled, yet forward to the road ahead. In 1997, the Refuge System received a very special centennial gift, the long-awaited National Wildlife Refuge System Improvement Act, which will shape the System during its second century of growth. It provides the clearest map of the road before us.

Fundamental to the Act is the concept of "Wildlife First!" This recognizes the wildlife resource as the underlying reason for developing and maintaining the Refuge System. So, it follows that the System's Biological Program—the core activities surrounding development, implementation, and evaluation of management objectives for the benefit of wildlife—should be at the heart of our efforts to guide the System into its next 100 years.

This is the context within which the Division of Refuges offers the present document, the "National Wildlife Refuge System Biological Needs Assessment." Almost two years of rewarding and sometimes painful self-analysis under the guidance of the Committee on Refuge Biology was necessary for this, the most comprehensive review of biological activities ever undertaken by the Refuge System. The results of that work—recommendations for 36 specific actions the Service should take to strengthen the Refuge Biological Program—were included here only after extensive review and comment by the Division of Refuges, the Assistant Regional Directors for Refuges and Wildlife in all seven Regions, and by a majority of field stations within the System.

Both the Division of Refuges and the Committee on Refuge Biology recognize the many biological strengths of the Refuge System: The dedicated staff which have produced many well-structured refuge programs, the productive research, the successful habitat restorations and fruitful efforts to restore endangered species. The "Biological Needs Assessment" is not about strengths, however, but about needs. It is about work yet to be done, work that should build on and emulate these successes. It is with a desire to improve, in the recognition that wildlife and good biology are the only foundation on which the Refuge System can continue to thrive, and in the recognition of standards set by the Refuge Improvement Act, that the Division presents the "Biological Needs Assessment." The Assessment is the baseline by which we will measure our progress as we take the Refuge System into the 21st Century.

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Introduction

"We will be leaders in applying the best science and technology . . ."
(The NWRS, Promises for a New Century, 1997)

Management of National Wildlife Refuges (NWR's) in the 1990's is complex—and increasingly non-biological. Good refuge biology often seems a luxury rather than the System's foundation. Yet refuges exist for wildlife, and biology must be woven throughout their management. Unfortunately, more immediate public demands and political agendas have intruded on refuge operations, weakening the System's connection to its biological roots. Wildlife should come first, but many stations today find that many nonbiological considerations drive refuge management. A strong biological program would assure the Service's compliance with the Refuge Improvement Act. It would assure wildlife remains a primary consideration in all decision-making, and that wise and defensible conservation decisions are articulated to a questioning public.

Refuge activities may often affect sensitive populations and habitats, sometimes irreversibly. Such actions should be taken with highly trained personnel, up-to-date equipment, and an understanding of the biological rationale and consequences. Focused inventory and monitoring efforts, reliable and management-oriented research, and properly stored and retrievable wildlife data would increase the probability that we make wise resource decisions.

In support of these arguments, the National Wildlife Refuge System Improvement Act of 1997 (Act) clearly puts wildlife first within the National Wildlife Refuge System. It specifically directs the Service to:

- provide for the conservation of fish, wildlife, and plants on refuges
- maintain the biological integrity, diversity, and environmental health of the System
- monitor the status and trends of fish, wildlife, and plants.

Moreover, the Act requires the Service to manage the NWRS as a "System," implying cohesion and consistency in programs across Regions. A strong, consistent, biological program, with wildlife at its core and with common elements throughout all Regions and administrative levels of the NWRS, is fundamental to meeting these mandates.

Pursuant to the Act, the present document articulates the vision of the Division of Refuges regarding the recognition of wildlife—and thus, the related NWRS Biological Program—as underlying all elements of the NWRS. Implementation of recommendations in this document would assure the Service meets the Act's mandates through the creation of a structured and comprehensive biological program. This would occur as the NWRS took actions in pursuit of six general goals:

- Address inadequate and inconsistent biological program staffing
- Focus biological program activities through goals and objectives

- Integrate evaluation and oversight into the biological program
- Increase amount and accountability of funding for the biological program
- Provide for career and professional needs of biological program staff
- Meet information needs of the biological program

The document recommends 36 specific actions the Service should undertake to attain these goals (Table 1). These actions could be accomplished over the next five years—in time for the NWRS 2003 Centennial—through: (1) changes in policy; (2) a questionnaire to field staff and review of NWRS data in the Refuge Management Information System; (3) various projects developed by special teams or work groups; and (4) enhanced focus on the NWRS biological program in the budget process (Table 2). Policy changes and many other actions would require no additional funds. Other actions—staffing, training, equipment, and data gathering—would require new funds and staff solicited through the Refuge Operating Needs System (RONS). The Division of Refuges expects these six goals—and the related recommended actions—will provide the foundation for all subsequent discussions related to refuge biological programs and Service implementation of the Refuge Improvement Act.

Definition of the Refuge Biological Program

The National Wildlife Refuge System biological program refers to the integration of sound principles of wildlife management into all levels of refuge operations (See figure). It entails the collection, analysis, and application of biological information to:

- Support development of goals and objectives
- Design and implement habitat and wildlife management actions

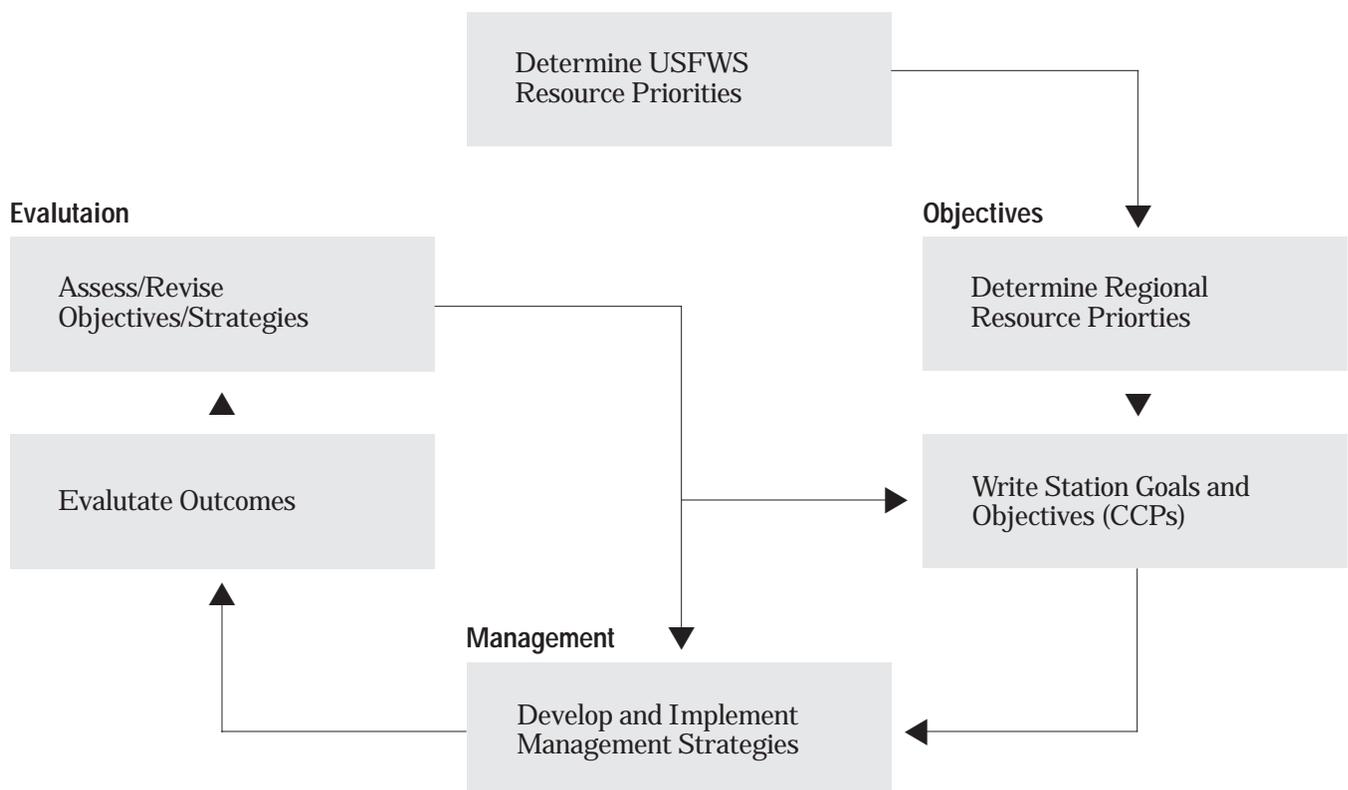
■ Assess through monitoring the outcome of actions taken to meet objectives

This sequence—information collection and analysis —> setting objective(s) —> development and application of management strategies—> evaluation of outcomes —> revision of management strategies— functions collectively as “adaptive management.” A strong, well-integrated biological program

ensures that each step is based on sound biological principles, reflects the best biological information available, and provides refuge managers with the best information possible to make appropriate resource decisions. The result is that sound professional judgement drives refuge management. The Service, the Refuge System, and individual refuges each make their highest and best contribution to wildlife conservation and to the biological integrity, diversity and health of the System.

Figure
Integration of the Biological Program into NWRS Administration

The National Wildlife Refuge System biological program refers to the collection, analysis, and application of biological information to: (1) develop goals and objectives; (2) design and implement management actions; and (3) evaluate results. Sound biological judgement is integrated throughout these three elements of refuge operations.



Goals and Recommended Actions

A comprehensive NWRS biological program would result as the Service takes actions to address six goals.

Table 1 lists the goals, as well as 36 specific recommended actions and strategies the Service might implement to achieve them.

Goal: Address inadequate and inconsistent biological program staffing

Over the last 25 years, refuge management has embraced much change: new technology; new statutory obligations; new emphases on endangered species, fire ecology, neotropical migrants, biodiversity, and nongame; and involvement of biological staff in multiple off-refuge initiatives. Additionally, the public and Congress have demanded more biological accountability, including a wildlife monitoring mandate cited in the Refuge Improvement Act. Administrative requirements have also increased considerably. Biological staffing has not kept pace, and Regions have addressed the issues differently. Currently, about 310 biological field staff are distributed across 92 million acres. There is little consistency among regions as to how field staff are distributed, and no assurance that biological staffing patterns overall reflect the most critical System needs. Technical support for field staff differs across Regions, but in general is sorely lacking.

Relatively fewer staff have been assigned greater responsibilities, leaving little time to carry out well-designed population surveys; monitor, assess and report impacts of management actions; or design, implement, and evaluate management plans and objectives. There is insufficient time for writing, training, applying new technologies, and networking within the greater professional community. While a dedicated cadre of refuge biologists accomplish a great deal of outstanding work in spite of these limitations, many critical needs are not being met, and we can do much better. Additionally, the lack of consistent regional organization impedes interregional communication among biological staff, makes career moves across regions difficult, and limits opportunities for cross-regional details and other exchanges.

Actions

The Service should:

- Identify existing regional NWRS staff and staffing organizations
- Assess refuge biological complexity relative to staff on stations
- Provide staff to adequately address biological complexity, with a goal of at least one PFT biologist per staffed station
- Establish a regional refuge biologist position in each Regional Office
- Create technical assistance teams to support refuge biological operations

Goal: Focus biological program activities through goals and objectives

Planning policy (602 FW 1-3, and *Writing Refuge Management Goals and Objectives: A Handbook*) directs that refuge management stem from clear goals and objectives. These goals and objectives are to be derived from broader statements for the landscapes within which stations are found, are to be consistent with other Service planning initiatives, and should derive in part from related Service documents. Unfortunately, the various larger scale planning documents in effect for the Service have not been translated into consistent and clearly articulated goals and objectives for the System, individual Regions, and many ecosystems. Thus, while Comprehensive Conservation Plans are mandated by the Refuge Improvement Act for all refuges by 2012, it remains for individual planning teams and/or refuge managers to decide how individual stations fit into the bigger System picture. Different planning teams may determine the highest and best use of a refuge from a local perspective, rather than in the context of ecosystem, regional, flyway, or national goals. Additionally, the current CCP initiative will not be completed for 15 years. In the interim, many stations may continue with critical planning documents or objective statements that are dated, incomplete, or even nonexistent.

The lack of clear and consistent goals and objectives at National and Regional levels makes it impossible to plan refuge activities across the System that consistently support critical resource needs of the larger landscape. Locally focused goals and objectives, or others that are out of date or lacking, make it difficult to direct and evaluate station biological activities for the greater good. Standards against which to evaluate station activities, measure progress, maintain accountability, or assess the currency and appropriateness of programs are inconsistent or lacking. Admirable, but possibly unfocused or misdirected activities not addressing the most critical resource needs may result. Funding and personnel, already limited, may not be utilized in the most effective or efficient manner. Too, without clearly articulated biological goals and objectives at all levels, it becomes difficult to defend controversial actions before a questioning public, defend budget requests, or to promote educated advocacy for the biological integrity of either the station or the System.

Actions

The Service should:

- Articulate consistent goals for the NWRS at National and Regional levels
- Consistently base developing station CCP's and other planning efforts on newly articulated National and Regional goal statements
- Develop interim goals and objectives on stations not scheduled for Comprehensive Conservation Planning before 2000

Goal: Integrate evaluation and oversight into the biological program

Where stations have completed CCP's or have functional interim management objectives in place, there is no Systemwide evaluation process to assure those plans or objectives are being followed. This, despite clear guidance in 602 FW 2 directing that evaluation occur and that Project Leaders and staff be held accountable for implementation through performance plans. Where evaluations do occur, there is no consistent mechanism to assure resulting recommendations are implemented. This lack of evaluation and/or follow-up also encourages pursuit of admirable but perhaps inappropriate projects, weakening the consistency and focus of biological activities within the System. Taken together, the lack of national and regional goals, of well-written station objectives, and of a functional evaluation process is also unfair to project leaders. They have neither a national vision, consistent standards for evaluations, an evaluation and feedback process, nor a mechanism to encourage implementation of recommendations where evaluations do occur.

Actions

The Service should:

- Ensure that data collection is consistent with station goals and objectives
- Develop and implement a process for station biological evaluations
- Ensure follow up on biological evaluations to establish accountability
- Update and implement Service Manual and related policies governing habitat management

Goal: Increase the amount and accountability of funding for the biological program

Current refuge budgets are inadequate to meet existing biological needs related to baseline data, routine monitoring, purchase and maintenance of equipment, and research. Additionally, most funds for refuge biological programs are wrapped up in the general operational (1260) account. While occasional non-1260 funding (such as 1230 monies) is sometimes allocated specifically to a biological activity, 1260 operational funds are not clearly earmarked for the biological program. Instead, biological activities compete with maintenance, public use, and general administrative needs and often are less pressing. On refuges where fixed expenses such as salaries and utilities may constitute more than 90% of the budget, monitoring, equipment, and habitat management frequently are lower priority than more immediate administrative needs.

The link between funding and accomplishment of a station's habitat and wildlife management objectives is a critical one. Until the recent implementation of the Refuge Comprehensive Accomplishment Reporting System (RCAR), managers could not track expenditures on biological program activities and report successes. This made it difficult to identify biological funding needs, evaluate progress towards meeting those needs, and document accomplishments. Yet, the System must remain accountable for commitments it makes towards these ends, particularly as we are now bound by law to put wildlife first in managing refuges. RCAR can resolve this, assuming specific biological commitments are identified in RONS and the Maintenance Management System (MMS), and subsequent accomplishments reviewed during station evaluations.

Actions

The Service should:

- Enhance funding for biological program needs using RONS and MMS
- Use RCAR to track biological program expenditures
- Incorporate review of biological program expenditures into station evaluations

Goal: Provide for career and professional needs of biological program staff

Continuing education and active involvement in the larger professional community is required for professional refuge biological program staff. Yet existing policy discourages attendance at professional meetings and largely assimilates training, career advancement, and other personnel needs of biological staff into those of other refuge staff. Regional efforts vary, but there are limited means for refuge biologists to communicate within and across regions, and opportunities for career advancement in the field beyond the GS-11 level are few. It is also difficult to implement new policies or handbook guidances (e.g., those relating to wildlife inventories or management objectives) without consistent, Systemwide training.

The professional isolation of many refuge biologists limits management perspectives and promotes a low profile for the NWRS within the larger scientific community. This costs the System new approaches to management issues, critical review of Service activities, and opportunities for research. Stability and long-term knowledge at field stations is lost as individuals leave seeking advancement and take with them personal insights and specialized expertise. Yet biologists work in an evolving field and a public forum, often risking professional integrity and public credibility in the work they do. The System cannot afford to base critical and controversial recommendations on superficial or out of date professional knowledge, sometimes without feedback from the larger Service and professional communities. By law, we are required to make sound professional judgements based on sound biology. To do otherwise will risk loss of public confidence and support.

Actions

The Service should:

- Provide advancement opportunities for biological positions at all levels
- Upgrade selected biological program positions to reflect current responsibilities
- Determine NWRS biological staff needs regarding education and career development
- Develop core competency training guidelines for biological program staff
- Adopt 40-hour minimum in-service training requirement for biological staff
- Develop core training module of biological program administrative material
- Develop mechanism to teach new core training module to biological program staff
- Facilitate opportunities for biological staff to pursue advanced degrees
- Facilitate opportunities for biological staff to engage in cross-regional and cross-program details or exchanges
- Revise as possible Service and Departmental policies governing official participation in professional organizations and attendance at technical meetings.
- Develop "refuge biological program forum" in conjunction with TWS meetings
- Promote publication of peer-reviewed articles by refuge biological program staff

Goal: Meet information needs of the biological program

The Refuge Improvement Act contains an explicit mandate for monitoring within the NWRS, yet a host of issues impede our ability to do that well. Existing baseline data on refuge biotic communities are inadequate for monitoring trends in those communities. Instead, we intensively manipulate refuge habitats without knowing the full complement of resources affected. Additionally, new data needs mandated by the Act are coupled with existing weaknesses in traditional data gathering. Resolving these issues will require funding to support new inventories and surveys, improved standards, technology, oversight, and training. While the Department of Interior has adopted the vegetative classification standards recently developed by the Federal Geographic Data Committee (FGDC), it remains for NWRS to implement that standard. Also, other protocols—such as those for shoreline and other types of earth cover—are not yet endorsed. Such GIS technology and protocol standards are critical to compatibly mapping resource data across refuges, regions, and other land management agencies. Until many of these needs are met, the Service cannot produce a reliable index to vegetation, biodiversity, and long-term change on Service lands. Finally, the System lacks a functional means of identifying research and other biological information needs to complement ongoing data gathering. This obstructs communication with research sources such as the U.S. Geological Survey's Biological Resources Division, other agencies, and universities.

The capability of effective electronic communication and access to various on-line information sources is still inadequate for many refuge biologists. These electronic tools—list servers, web-pages, or other means of information exchange—function best if each individual has a fully modern personal computer, personal e-mail, and Internet access. Yet, these basic tools are lacking for many biological staff.

Actions

The Service should:

- Design and adopt core baseline biotic data standards applicable to all refuges
- Determine stations' existing baseline biotic information
- Incorporate baseline data needs into RONS
- Implement Systemwide standards for GIS projects
- Provide and maintain equipment to gather, store, and analyze biological data
- Develop electronic formats for wildlife data storage and analysis
- Develop a Refuge Management Information System (RMIS) module to profile biological resources and current status on stations
- Provide personal cc:Mail and Internet access to all biological program staff
- Develop a biological information needs process

Financial Considerations, Priorities and Timetable

The recommendations made in this document are not amenable to simple ranking. Some low or no cost items could be implemented immediately, while others would await funding (Table 2). Many items are related and must occur in sequence. For example, a defensible assessment of staffing needs must derive from the analysis of station complexity and a review of current staff distribution. Other actions could occur simultaneously rather than in some ranked order. Some would have to await additional increases to NWRS base funding. Specific priorities, timetables, and funding initiatives would need to be developed as appropriate by working groups or individuals pursuing implementation of this document.

Implementation Proposal

This document provides a basis for all subsequent discussions or initiatives regarding the biological integrity of the NWRS. Immediate mechanisms to be considered are policy teams chartered under the Refuge Improvement Act Implementation Committee, as well as the various groups developing vision and strategy statements in preparation for the 1998 National Wildlife Refuge System Conference. As many recommended actions are complex and interrelated and somewhat conceptual at this point, considerable coordination and communication will be necessary among the various groups to assure that the recommendations presented here are adequately addressed. In the long term, however, the Service should develop a mechanism to provide continual oversight of the NWRS biological program, to assure that the biological integrity achieved through implementation of this document is maintained. That oversight may be provided by a permanent standing committee on refuge biology or any other group chartered to assure that wildlife, and thus biology, remains a fundamental concern of the NWRS.

Table 1

Recommended actions the U.S. Fish & Wildlife Service should take to address needs of the National Wildlife Refuge System biological program. Unranked.

Goal: Address inadequate and inconsistent biological program staffing	
Recommended Action	Strategy
Identify existing regional National Wildlife Refuge System (NWRS) staff and staffing organizations	Survey regional and field station biological staff to identify current staffing and biological effort relative to acres managed, program complexity, and numbers of field stations.
Assess refuge biological complexity relative to staff on stations	Develop standard criteria to assess biological complexity at field stations. Use results to determine biological staffing needs at each station.
Provide staff to adequately address biological complexity, with a goal of at least one PFT biologist per staffed station	Stations meeting certain complexity criteria will be staffed at recommended levels, with a preferred goal of one GS-9 or higher biologist on each staffed station.
Establish regional refuge biologist position in each Regional Office (RO)	Provide dedicated position in each RO as biological liaison between field stations, technical assistance teams, and refuge supervisors.
Create technical assistance teams to support refuge biological operations	Establish field support offices with dedicated positions, where biological specialists share expertise to assist field stations.

Goal: Focus biological program activities through goals and objectives	
Recommended Action	Strategy
Articulate consistent goals for the NWRS at National and Regional levels	Describe habitat and species priorities for NWRS using existing documents and policies. Derive goal and/or objective statements for the System and each Region from these priorities.
Consistently base developing station Comprehensive Conservation Plans (CCP's) and other planning efforts on newly articulated National and Regional goal statements.	CCP's or interim station objectives will step-down from National and Regional goals/objectives. All planning staff plan from these statements, rather than independently interpret various Service documents or plan from local perspectives.
Develop interim goals and objectives on stations not scheduled for CCP's before 2000	Use new National and Regional goal statements and "Writing Refuge Management Goals and Objectives" handbook to put interim management objectives in place on these stations.

Goal: Integrate evaluation and oversight into the biological program

Recommended Action

Strategy

Ensure that data collection is consistent with station goals and objectives

Create and follow a schedule to revise all station wildlife inventory plans according to 701 FW 2, ensuring data collection relates directly to station objectives.

Develop and implement process for station biological evaluations

Establish team to produce handbook that guides station biological evaluations. Once CCP'S or interim goals and objectives are in place, complete evaluation for all stations.

Ensure follow up on biological evaluations to establish accountability

Utilize existing accountability mechanisms to ensure implementation of recommendations from biological evaluations.

Update and implement Service Manual and related policies governing habitat management

Review, revise as necessary, and implement 620 FW 1 and supporting chapters or other guidelines related to habitat management on refuges.

Goal: Increase the amount and accountability of funding for the biological program

Recommended Action

Strategy

Enhance funding for biological program needs using the Refuge Operating Needs System (RONS) and Maintenance Management System (MMS)

Recognize the increased funding required to implement biological program needs, and include those needs in RONS and MMS.

Use Refuge Comprehensive Accomplishment Reporting (RCAR) system to track biological program expenditures

Use RCAR to identify and track expenditures and accomplishments for all elements of the NWRS biological program.

Incorporate review of biological program expenditures into station evaluations

As evaluations of station biological programs are implemented, assure that biological program expenditures proposed in RONS and MMS support station objectives, and biological projects identified are implemented.

Goal: Provide for career and professional needs of biological program staff

Recommended Action

Strategy

Provide advancement opportunities for biological positions at all levels

Working with the Personnel Office, develop mechanisms to upgrade ladders in all NWRS biological positions, adjusting maximum grade to position complexity and technical expertise. e.g., "7/9/11" and "9/11/12" at stations; "11/12/13" in zone or regional positions; and "12/13/14" in Washington Office.

Upgrade selected biological program positions to reflect current responsibilities

Examine existing positions for complexity and grade, integrate where appropriate into the career ladder concept, and pursue upgrades where merited.

Goal: Provide for career and professional needs of biological program staff (continued from previous page)

Recommended Action	Strategy
Determine NWRS biological staff needs regarding education and career development	With NCTC participation, survey biological staff to develop profiles of existing personnel. Survey would include: grade and position; years with Service; degrees; year obtained; training since graduation; current training needs; and interest in pursuing advanced degrees, technical exchanges, or other types of training.
Develop core competency training guidelines for biological program staff	Work with NCTC to develop policy outlining minimum training required at increasing grade levels (e.g., following National Park Service or other model)
Adopt 40-hour minimum in-service biological training requirement for biological staff	Require 40-hour minimum annual training, using "core competency" standards as guidance for choosing material. Training may come from NCTC, universities, other courses, details/exchanges, Refuge Academy, or other sources as negotiated with refuge manager.
Develop core training module of biological program administrative material	Work with NCTC to create module containing biology-related policy and administration training applicable throughout the System: writing management objectives and inventory plans; ESA and NEPA compliance; complying with NWRS data standards; using Refuge Management Information System (RMIS) modules; meeting baseline data needs; survey and study design; etc.
Develop mechanism to teach new core training module to biological program staff	Work with NCTC to create regional workshops, Refuge Academy "add-on," or other means to reach all biological staff with newly developed module of administrative material.
Facilitate opportunities for biological staff to pursue advanced degrees	Work with NCTC to establish process, with a range of work and leave options, to enable biological staff to obtain higher degrees.
Facilitate opportunities for biological staff to engage in cross-regional and cross-program details or exchanges	Work with NCTC to establish process to enable biologists to participate in exchanges or details across stations, regions, and programs.
Revise as possible Service and Departmental policies governing official participation in professional organizations and attendance at technical meetings.	Current policies restrict official participation in organizations, and generally require approval for meeting attendance by Regional Directors or higher. New policy would (1) facilitate employee participation in professional organizations and (2) delegate authority to approve meeting attendance to a lower level.
Develop forum on Refuge Biology in conjunction with TWS meeting	Implement a periodic technical meeting featuring papers and other presentations on NWRS biology, by and for biological staff to be held in conjunction with annual meeting of The Wildlife Society.
Promote publication of peer-reviewed articles by refuge biological program staff	Provide funding for costs of publications by field station staff. Establish policy of granting extended LWOP, administrative leave, modified work-at-home, or other policies to permit staff to prepare technical papers for peer review and publication.

Goal: Meet information needs of the biological program

Recommended Action

Strategy

Design and adopt core baseline biotic data needs applicable to all refuges

Develop standards outlining minimal baseline biotic data that each station needs (e.g., vegetation and community maps, soils maps, species lists, population estimates of key species).

Determine stations' existing baseline biotic information

Survey all field stations to determine gap between existing information and that needed to meet newly designed standards.

Incorporate baseline data needs into RONS

With standards in place and needs documented, implement funding initiative to bring all stations up to minimal standards.

Implement Systemwide standards for GIS projects

Work with Division of Information Resources Management, Federal Geographic Data Committee, Regional GIS coordinators, and others to adopt and implement software, hardware, training, and technical support, and data standards for GIS.

Provide and maintain equipment to gather, store, and analyze biological data

Identify and provide purchase, maintenance, and replacement funds for minimal biological equipment at each station, including computer and global positioning system hardware, specialized software, scopes, vehicles, and specialty items.

Develop electronic formats for wildlife data storage and analysis

Identify, develop, and adopt common databases or information modules to store and retrieve wildlife inventory and survey data on field stations. Establish national coordinator to maintain system, and develop training for its use. Implementation mechanisms include RMIS program or Region 5 model.

Develop Refuge Management Information System (RMIS) module to profile biological resources and current status on stations

Create a module in RMIS to make information on station inventories, management and monitoring programs, specialized staff, and other data available to others.

Provide personal cc:Mail and Internet access to all biological program staff

Assure each individual has personal computer with personal cc:Mail address and Net browsing software, including upgraded phone lines to stations where necessary.

Develop biological information needs process

Create electronic database to solicit and track NWRS needs related to baseline data, inventory, monitoring, research, or other biological information.

Table 2

Recommended actions the Fish & Wildlife Service should take to address needs of the National Wildlife Refuge System biological program, grouped by four implementation mechanisms. Actions in the first three groups are NO COST or LOW COST, and in many cases are prerequisite to going forward with funding requests. Only actions in the last group would require MAJOR NEW FUNDING OR FTE's. This table must be read in the context of the text and Table 1.

Implementation Mechanism: Policy change by directive or other means

Recommended Action	Ensure that data collection is consistent with station goals and objectives: Implement existing 701FW2 Systemwide. Develop training module around this chapter.
	<i>Implement process for biological station evaluations: After handbook guidance is developed, implement policy directing periodic evaluations.</i>
	<i>Ensure follow up on biological station evaluations to establish accountability: Develop performance standards requiring implementation of recommended changes once station evaluations begin. Use Refuge Operating Needs System (RONS) and Refuge Comprehensive Accomplishment Report (RCAR) system, where applicable, to commit stations to action.</i>
	<i>Implement Service Manual and related policies governing habitat management: Implement existing policy in 620FW and related existing policies or guidelines Systemwide.</i>
	<i>Use RCAR to track biological program expenditures: Track accomplishments through RCAR, and incorporate RCAR review into guidance for station biological program evaluations.</i>
	<i>Incorporate review of biological program expenditures into station evaluations: Add this element as guideline in new handbook to guide station biological evaluations.</i>
	<i>Provide advancement opportunities for biological positions at all levels: Incorporate biological positions into ongoing NWRS position review. Audit/upgrade selected positions, advertise new ones as ladders.</i>
	<i>Adopt 40-hour minimum in-service biological training requirement for biological staff: Implement via Service Manual Chapter or Directive.</i>
	<i>Revise as possible Service and Departmental policies governing official participation in professional organizations and attendance at technical meetings: Negotiate within the Department and Service to liberalize meeting attendance via Directive or changes in Departmental and/or Service Manuals.</i>
	<i>Promote publication of peer-reviewed articles: Develop supporting policies via Service Manual or Directive.</i>
	<i>Adopt core set of baseline biotic data needs applicable to all refuges: Once team agrees on core needs, adopt standard via Service Manual chapter or Directive.</i>
	<i>Implement Systemwide standards for GIS projects: Federal Geographic Data Committee (FGDC) standards have been adopted by Department of Interior. Implement for Service by Directive. Once hardware/software standards are developed with Division of Information Resources Management (IRM), adopt via Service Manual Chapter or Directive.</i>

Implementation Mechanism: Staff Questionnaire and Existing RMIS Documents

Recommended Action

Identify existing regional NWRS staff and staffing organizations: Use Refuge Management Information System (RMIS) data, interviews of Regional Office (RO) staff, and simple questionnaire to field staff.

Assess refuge biological complexity relative to staff on stations: Use RMIS data, similar or same questionnaire as above to field staff to score or otherwise rank stations relative to complexity.

Determine NWRS biological staff needs regarding education and career development: Staff questionnaire, perhaps same as above.

Determine stations' existing baseline biotic information: Questionnaire to field stations, perhaps same as above.

Implementation Mechanism: Work Groups or Teams

Recommended Action

Articulate consistent goals for the NWRS at national and regional levels: Use Government Improvement and Results Act statements, existing North American Waterfowl and Wetlands Management Plan, Partners in Flight plans, waterfowl goals, ecosystem goals, etc. to develop Systemwide and Regional goal statements. Possibly work with Comprehensive Conservation Plan (CCP) planning teams

Consistently base developing station CCP's and other planning efforts on newly articulated national and regional goal statements: Work with CCP planning teams to assure this, using goal statements developed above.

Develop interim goals and objectives on stations not scheduled for CCP's before 2000: Individual stations develop these statements with planners.

Develop and implement process for station biological evaluations: Write handbook to prepare for evaluations when funded.

Review and update as necessary Service Manual and related policies governing habitat management: Review and revise as necessary 620 FW 1 and supporting chapters or other guidelines related to habitat management on refuges.

Develop core competency training guidelines for biological program staff: With NCTC coordination, develop schedule of courses expected of biological staff at different grade levels.

Develop core training module of biological program administrative material: With NCTC coordination, develop a module of courses to teach consistent implementation of existing policy, statutory mandates, and other policy issues.

Design core set of baseline biotic data needs applicable to all refuges: Create set of required baseline data needs common to all stations.

Develop Systemwide standards for GIS projects: Develop hardware/ software standards with IRM.

Develop RMIS module to profile biological resources and current status on stations: Work within existing RMIS structure.

Develop biological information needs process: Create System to develop and track research and other needs, perhaps within RMIS structure.

Implementation Mechanism: Potential Funding Initiative *

Recommended Action

Provide staff to adequately address biological complexity, with goal of at least one PFT biologist per staffed station: Stations meeting certain complexity criteria will be staffed at recommended levels, with a desired target of one GS-9 or higher biologist on each staffed station.

Establish regional refuge biologist position in each Regional Office: Provide dedicated position in each RO as biological liaison between field stations, technical assistance teams, and refuge supervisors.

Create technical assistance teams to support refuge biological operations: Establish field support offices with dedicated positions, where biological specialists share expertise to assist field stations.

Implement process for station biological evaluations: Implement guidance when developed to assure periodic review of biological program on individual stations.

Upgrade selected biological program positions to reflect current responsibilities: Examine selected positions for complexity and grade, integrate where appropriate into the career ladder concept.

Develop mechanism to teach new core training module to biological program staff: Work with NCTC to create regional workshops, Refuge Academy sessions or other means to reach all biological staff with newly developed module of administrative material.

Facilitate opportunities for biological staff to pursue advanced degrees: Opportunities now exist. Assign coordination responsibilities to NCTC pending additional NCTC staff and funds.

Facilitate opportunities for biological staff to engage in cross-regional and cross-program details or exchanges: Opportunities now exist. Assign coordination responsibilities to NCTC, pending additional NCTC staff and funds.

Develop forum on refuge biology in conjunction with TWS meeting: Implement a periodic technical meeting featuring papers and other presentations on NWRS biology, by and for biological staff to be held in conjunction with annual meeting of The Wildlife Society.

Incorporate baseline data needs into RONS: With standards in place and needs documented, implement funding initiative to bring all stations up to minimal standards.

Provide and maintain equipment to gather, store, and analyze biological data: Provide funds for the purchase, maintenance, and replacement of fundamental biological equipment at each station, including computer and global positional system hardware, specialized software, scopes, vehicles, and specialty items.

Develop electronic formats for wildlife data storage and analysis: Identify, develop, and adopt common databases or information modules to store and retrieve wildlife inventory and survey data on field stations. Establish national coordinator to maintain system, and develop training for its use. Implementation mechanisms include RMIS program or Region 5 model.

Provide personal cc:Mail and Internet access to all biological program staff: Purchase necessary hardware and software to accomplish this, in some cases included upgraded phone lines.

* Actions in this last group would require MAJOR NEW FUNDING OR FTE's.

Appendix

Evolution of the “NWRS Biological Needs Assessment”

In 1996, Assistant Regional Directors for Refuges and Wildlife (ARD's), Regions 1-7, chartered a group to develop a budget initiative for the biological program of the National Wildlife Refuge System (NWRS). Eleven participants from all regions met in New Mexico in September, 1996. Collectively, the group represented 182 years of service within the U.S. Fish & Wildlife Service (FWS) and the National Wildlife Refuge System (NWRS), as well as many additional years with other land management agencies. Several had significant experience as wildlife biologists at station, zone, regional, or national levels; at least five had been or are currently refuge managers; and one is a regional migratory bird coordinator.

The group reviewed refuge biological issues and explored resolutions to long-recognized concerns. They determined that many of the most fundamental, longstanding concerns were unrelated—or only peripherally related—to funding. Instead, it appeared the issue of refuge biology was best addressed through a comprehensive assessment of all elements related to administration of the NWRS biological program. They proceeded by listing historical concerns, appending new ones, and proposing specific resolutions. Some were related to funding, but many were not. They completed an initial document “Biological Needs Assessment, Final Draft”, in March, 1997.

The present document is the result of extensive Regional ARW and field station reviews. The original draft was submitted to the ARW Program ARD's and circulated widely among field station managers and biological staff throughout the Refuge System for comment. Comments from that review were compiled by the ARD's and forwarded back to the Committee. In October, 1997, they were recorded in a second document, “NWRS Biological Needs Assessment, Final Draft: Compilation of Comments.” Based on those comments, the Committee convened again in Oregon in October, 1997, to modify the draft document by incorporating ARD and field station concerns. Significant changes were made to the original document. Ultimately, the group consolidated Tables 1, 2, and 3 of the original draft document into a single Table of specific recommendations, and circulated it for review among ARD's in November, 1997. Their comments led to further changes. Specific regional concerns were resolved through individual dialogues with ARD's or their staff in those regions. The results of this process were incorporated into Table 1 of the present document.

Relationship to the National Wildlife Refuge System Improvement Act of 1997: Development of the present document was overtaken by passage in October, 1997, of the Refuge Improvement Act. While originally unrelated, the biological needs assessment effort so complemented the Act that the Committee immediately employed the Act to strengthen the present document. The Division of Refuges now views the final “Biological Needs Assessment” as a clear baseline from which to measure progress at implementing the biological mandates of the Act.

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