

VEGETATION SURVEY ON HUBBELL TRADING POST, NATIONAL HISTORIC SITE,  
GANADO, ARIZONA

Kancheepuram N. Gandhi  
S. M. Tracy Herbarium, Range Science, Texas A&M University,  
College Station, TX 77843.

The "Hubbell Trading Post" is a historical site in Ganado, Apache County, Northeast Arizona. This trading post is active and administered by the National Park Service. On a request from the Park Service, the vascular vegetation (native, introduced but naturalized, and cultivated) of this site was surveyed between June 20 and July 12, 1986.

The historical site area comprises 160 acres. It is part of the Defiance Plateau. The elevation is ca. 6300 feet. The Pueblo Colorado Wash runs through the northern part of this site. On the extreme northern side, "Hubbell Hill", a hillock is found. Owing to the low precipitation (ca. 12 inches per annum), the relative humidity low.

Following Kearney and Peebles (1964), the vegetation of this area is classified as "Great Basin Microphyll Desert". Salt tolerating bushes such as Rabbit-brush (Chrysothamnus nauseosus) and Snake-weed (Gutierrezia sarothrae) along with salt bush (Atriplex canescens and A. confertifolia) occupy a large area. The ground cover mainly consists of Field-bindweed (Convolvulus arvensis). Members of Asteraceae, Boraginaceae, Brassicaceae, Fabaceae, and Malvaceae are commonly seen. Along the Pueblo Colorado Wash, Russian Olive (Elaeagnus angustifolia), cottonwood (Populus fremontii), and Salt cedar (Tamarix chinensis) are dominant. On the sand, Prostrate Pigweed (Amaranthus graecizans), Sand Verbena (Tripterocalyx carnea var. wootonii), Spectaclepod (Dimorphoca-

rpa wislizenii), Showy Primrose (Oenothera speciosa), and Nama retrorsum are frequently found. Along the marshes, Buttercups (Ranunculus cymbalaria var. saximontanus), Common Plantain (Plantago major), and Sedges (Scirpus americanus) are commonly seen. On the slopes of Hubbell Hill, Desert Plume (Stanleya pinnata) and Twinpod (Physaria chambersii) are common. On the top of Hubbell Hill, Big Sagebrush (Artemisia tridentata), Jointfir (Ephedra torreyana), and Menodora scabra are abundant. Due to federal administration, grazing on this site is none or rare. Hence, on waste ground, Alfalfa (Medicago sativa) and Clovers (Melilotus alba and M. officinalis) are common. Succulents such as Prickly Pears (Opuntia spp.) and Spanish Bayonet (Yucca angustissima) are uncommon.

The seed plants of Apache County are covered in "Seed Plants of Northern Arizona" (McDougall 1973); McDougall's work is based on the book "Arizona Flora" (Kearney and Peebles 1960). Several taxa have been added and several nomenclatural corrections made by Lehr (1978) in "A Catalogue of the Flora of Arizona" and by Lehr and Pinkava (1980 and 1982) in subsequent supplements to the catalogue.

As indicated in the title, this is only a preliminary list; further collections could increase the total number of taxa. In this list, the plants that were introduced and naturalized are indicated by an asterisk mark (\*) preceding their names; two asterisk marks (\*\*) precede the names of plants that are cultivated. Scientific names are followed by common names that are mentioned in parentheses.

- Between Structures 1 & 2 : \*\*Parthenocissus quinquefolia (Virginia Creeper).
- Along the Wall North of 1 : \*Lactuca serriola (Prickly Lettuce), \*\*Rosa woodsii var. fendleri (Fendler Rose), \*Sisymbrium altissimum (Tumble Mustard), \*\*Ulmus pumila (Siberian Elm), and \*\*Yucca sp. (Spanish Bayonet).
- Structure 2 (Out Front) : \*\*Iris germanica (German Iris), \*\*Parthenocissus quinquefolia (Virginia Creeper), and \*\*Syringa vulgaris (Lilac; State Flower of New Hampshire).
- Structure 6 Wall to North : \*Elaeagnus angustifolia (Russian Olive) and \*\*Ulmus pumila (Siberian Elm).
- In Back : \*\*Prunus gracilis & \*\*P. reverchonii (Plums), \*Marrubium vulgare (Horehound), \*\*Ulmus pumila (Siberian Elm).
- On Ground : Physalis virginiana var. sonorae (Longleaf ground Cherry), \*Sisymbrium altissimum (Tumbleweed), \*Taraxacum officinale (Common Dandelion), and \*Tragopogon dubius (Goats Beard).
- Structure 6a : \*\*Rosa woodsonii var. fendleri (Fendler Rose) and \*\*Yucca sp.
- On Ground : Sphaeralcea spp. (Mallow).
- Structure 6b : \*\*Polygonum sp.
- To Side : \*\*Prunus gracilis & \*\*P. reverchonii (plum).
- Along Wall behind 6 : Atriplex canescens (Four-wing Saltbush) & A. confertifolia (Shade Scale), \*\*Prunus gracilis &

\*\*P. reverchonii (Plum), and \*Syringa vulgaris (Lilac).

- Structure 8  
SE Corner : \*\*Juniperus osteosperma (Juniper).
- Structure 5 : \*\*Juniperus osteosperma (Juniper), \*\*Malus soulardii (Crab Apple), and Populus fremontii (Cottonwood).
- Fence to SW : \*\*Parthenocissus quinquefolia (Virginia Creeper).
- Structure 10  
Shed : \*Erodium cicutarium (Filaree), \*Lactuca serriola (Prickly Lettuce), \*Malva neglecta (Common Mallow), \*Sisymbrium altissimum (Tumble Mustard), Sphaeralcea spp. (Mallow), \*Taraxacum officinale (Common Dandelion).
- Corrals : Amaranthus wrightii (Pigweed), Dracocephalum parviflorum (Dragon's Head), Grindelia aphanactis (Gumweed), \*Polygonum aviculare (Prostrate Knotweed), and \*Tribulus terrestris (Puncture vine).
- Yard : Atriplex canescens (Four-wing Saltbush) & A. confertifolia (Shade Scale), \*Convolvulus arvensis (Field Bindweed), \*Erodium cicutarium (Filaree), Grindelia aphanactis (Gumweed), \*Malva neglecta (Common Mallow), \*Melilotus alba (White Sweet Clover) & \*M. officinalis (Yellow Sweet Clover), Rumex mexicana (Duckweed), and \*Salsola iberica (Russian thistle, Tumbleweed).
- Yard Near Barn : Amaranthus wrightii (Pigweed), \*Polygonum aviculare (Prostrate Pigweed), and \*Tribulus terrestris

(Puncture Vine).

Around Structure  
11 & 12

W Side

: **\*\*Populus alba** (White Cottonwood), and **\*\*Ulmus pumila** (Siberian Elm).

Visitor Center  
Front

: **\*\*Ribes aureum** (Golden Currant), and **\*\*Ulmus pumila** (Siberian Elm).

Behind W Side

: Populus fremontii (Fremont Cottonwood).

Structure 18

: Atriplex canescens (Four-wing Saltbush) & A. confertifolia (Shade Scale), \*Convolvulus arvensis (Field Bindweed), Chrysothamnus nauseosus var. graveolens (Rayless Goldenrod), Grindelia aphanactis (Gumweed), Gutierrezia sarothrae (Snakeweed), **\*\*Malus sylvestris** (Apple), \*Malva neglecta (Common Mallow), Mirabilis multiflora (Colorado Four O' Clock), Oenothera speciosa (Showy Primrose), Opuntia macrocentra (Prickly Pear), Populus fremontii (Fremont Cottonwood), \*Salsola iberica (Russian thistle, Tumbleweed), \*Sisymbrium altissimum (Tumble Mustard), Sphaeralcea spp. (Mallow), and **\*\*Ulmus pumila** (Siberian Elm).

North Fence

: Heterotheca villosa (Hairy Goldenaster), **\*\*Juniperus osteosperma** (Juniper), and **\*\*Ulmus pumila** (Siberian Elm).

North W Fence

: Ambrosia sp. (Ragweed), Helianthus ciliaris (Blueweed), **\*\*Juniperus osteosperma** (Juniper), and **\*\*Ulmus pumila** (Siberian Elm).

- South W Fence : Carduus nutans (Plumeless thistle), Cirsium spp. (Plumed thistle), \*\*Malus sylvestris (Apple), \*Medicago sativa (Alfalfa), and Senecio sp. (Groundsel).
- Structure 11 : Essentially similar to the structure 18 as far herbs and shrubs are concerned.
- Structure 19  
W Side : \*\*Malus sylvestris (Apple), Populus fremontii (Fremont Cottonwood), and \*\*Ulmus pumila (Siberian Elm).
- Along Both Sides of  
the Entrance Road : \*\*Convolvulus arvensis (Field Bindweed), Croton texensis (Doveweed), \*Medicago sativa (Alfalfa), Sphaeralcea spp. (Mallow).
- Left(Facing the  
Entrance Road) : Chrysothamnus nauseosus var. graveolens (Rayless Goldenrod), Cryptantha barbiger & C. jamesii, Grindelia aphanactis (Gumweed), \*\*Juniperus osteosperma (Juniper), Lappula redowskii var. cupulata, Leucelene ericoides (White Aster), Machaeranthera linearis (Blue Aster), Oenothera speciosa (Showy Primrose), Oxytropis lambertii (Lambert Locoweed), Plantago patagonica var. gnaphaloides, and Salsola iberica (Russian thistle, Tumbleweed).
- Right (Facing  
Entrance Road) : Cleome serrulata (Spider Flower), \*\*Juglans cinerea (Butternut), \*\*Morus alba (Mulberry), and Opuntia macrocentra (Prickly Pear).

- Highway  
Left Side : Asclepias subverticillata (Milkweed), Atriplex canescens (Four-wing Saltbush) & A. confertifolia (Shade Scale), Chrysothamnus nauseosus var. graveolens (Rayless Goldenrod), Gutierrezia sarothrae (Snakeweed), \*\*Juniperus osteosperma (Juniper), Opuntia macrocentra (Prickly Pear), and Senecio sp. (Groundsel).
- Right Side : Populus fremontii (Fremont Cottonwood).
- Scenic Basement : Chrysothamnus nauseosus var. graveolens (Rayless Goldenrod), \*Elaeagnus angustifolia (Russian Olive), Paryella filifolia, \*\*Populus alba & P. fremontii (Cottonwood).
- Along Wash : Amaranthus graecizans (Prostrate Pigweed) & A. wrightii, Astragalus castaneiformis, Artemisia carruthii, Cirsium spp. (Plumed Thistle), Croton texensis, Dimorphocarpa wislizenii (Spectaclepod), Erigeron divergens (Spreading Fleabane), \*Erodium cicutarium (Filaree), Equisetum arvense (Horse Tail), Grindelia aphanactis, Heterotheca villosa (Hairy Golden Aster), \*Lactuca serriola (Prickly Lettuce), \*Melilotus alba (White Sweet Clover) & \*M. officinalis (Yellow Sweet Clover), Mentha arvensis var. villosa (Mint), Mentzelia pumila (Blazing Star, Stickleaf), Nama retrorsum, Oenothera speciosa (Showy Primrose), Opuntia macrocentra (Prickly Pear), \*Plantago major

(Plantain), \*Polygonum aviculare (Prostrate Knotweed) & P. lapathifolium (Willow Smartweed), Portulaca oleracea (Parslane), Ranunculus cymbalaria var. saximontanus (Buttercup), \*Salsola iberica (Russian thistle, Tumbleweed), Senecio douglasii var. longilobus (Threadleaf Groundsel), Scirpus americanus (Sedge), \*Sisymbrium altissimum (Tumble Mustard), Solanum retrorsum (Buffalobur), Sphaeralcea sp. (Mallow), \*Tamarix chinensis (Saltceder), \*Taraxacum officinale (Common Dandelion), \*Tribulus terrestris (Puncture Vine), Tripterocalyx carnea var. wootonii (Sand Verbena), and Verbena bracteata (Prostrate Vervain).

Hubbell Hill  
Slope & Top

: Atriplex canescens (Four-wing Saltbush) & A. confertifolia (Shade Scale), Artemisia tridentata (Big Sagebrush), Calochortus nuttallii (Sego-lily), Chrysothamnus nauseosus var. graveolens (Rayless Goldenrod), \*Elaeagnus angustifolia (Russian Olive), Ephedra torreyana (Jointfir), Grindelia aphanactis (Gumweed), Juniperus monosperma (One-seed Juniper), \*Melilotus alba (White Sweet Clover) & \*M. officinalis (Yellow Sweet Clover), Monarda scabra, Opuntia macrocentra (Prickly Pear) & O. whipplei (Cholla), Paryella filifolia, Physaria chambersii (Twinpod), Pinus edulis (Pinyon Pine), Senecio sp. (Groundsel), Sphaeralcea sp. (Mallow), Stanleya pinnata (Desert Plume), and \*Tamarix chinensis (Salt Ceder).



Trailer Court : Amaranthus wrightii (Pigweed), \*Bassia hyssopifolia (Smootherweed), \*Camelina microcarpa (Littlepod), Chamaesaracha coronopus (Small Ground-cherry), \*Chenopodium album (Common Lambs-Quarters), Chrysothamnus nauseosus var. graveolens (Rayless Golden Aster), \*Convolvulus arvensis (Field Bindweed), Conyza canadensis (Horseweed), \*Elaeagnus angustifolia (Russian Olive), \*Erodium cicutarium (Filaree), Gaura parviflora (Lizard Tail), Helianthus petiolaris ((Plains Sunflower), \*Lactuca serriola (Prickly Lettuce), \*Malva negelecta (Common Mallow), \*Medicago alba (White Sweet Clover) & \*M. officinalis (Yellow Sweet Clover), \*Melilotus sativa (Alfalfa), Mirabilis multiflora (Colorado Four O' Clock), Argemone munita (Prickly Poppy), Populus fremontii (Fremont Cottonwood), \*Polygonum aviculare (Prostrate Knotweed), \*Sisymbrium altissimum (Tumble Mustard), Sphaeralcea sp. (Mallow), \*Tragopogon dubius (Goats Beard), and Xanthium strumarium (Cocklebur).

## REFERENCES

- BAILEY, L. H. 1949. MANUAL OF CULTIVATED PLANTS. THE MACMILLAN COMPANY. NEW YORK.
- KEARNEY, T. H. AND R. H. PEEBLES. 1960. ARIZONA FLORA, ED. 2, WITH SUPPLEMENTS. UNIVERSITY OF CALIFORNIA PRESS, BERKELEY, CA.
- LEHR, J. H. 1978. A CATALOGUE OF THE FLORA OF ARIZONA. DESERT BOTANICAL GARDEN, PHOENIX, AZ.
- LEHR, J. H. AND D. J. PINKAVA. 1980. A CATALOGUE OF THE FLORA OF ARIZONA. SUPPLEMENT I. J. ARIZONA-NEVADA ACAD. SCI. 15:17-32.
- AND ----- . 1982. A CATALOGUE OF THE FLORA OF ARIZONA. SUPPLEMENT II. J. ARIZONA-NEVADA ACAD. SCI. 17:19-26.
- MCDUGALL, W. B. 1973. SEED PLANTS OF NORTHERN ARIZONA. THE MUSEUM OF NORTHERN ARIZONA, FLAGSTAFF, AZ.

SYMBOLS USED FOR SHRUBS AND TREES

A1: *Artemisia tridentata*; A2: *Atriplex canescens*; A3: *Atriplex confertifolia*

C1: *Chrysothamnus nauseosus* var. *graveolens*

E1: *Elaeagnus angustifolia*; E2: *Ephedra torreyana*

G1: *Gutierrezia sarothrae*

I1: *Iris germanica*

J1: *Juglans cinerea*; J2: *Juniperus monosperma*; J3: *Juniperus osteosperma*

M1: *Malus soulardii*; M2: *Malus sylvestris*; M3: *Marrubium vulgare*;  
M4: *Morus alba*

O1: *Opuntia macrocentra*; O2: *Opuntia whipplei*

P1: *Partheocissus quinquefolia*; P2: *Paryella filifolia*; P3: *Pinus edulis*;  
P4: *Populus alba*; P5: *Populus fremontii*; P6: *Prunus gracilis* & *Prunus reverchonii*

R1: *Rosa woodsii* var. *fendleri*; R2: *Ribes aureum*

S1: *Syringa vulgaris*

T1: *Tamarix chinensis*

U1: *Ulmus pumila*

X1: *Xanthium strumarium*

Y1: *Yucca* sp.; Y2: *Yucca angustissima*