



## United States Department of the Interior

NATIONAL PARK SERVICE  
Petrified Forest National Park  
P.O. Box 2217  
1 Park Road  
Petrified Forest, Arizona 86028



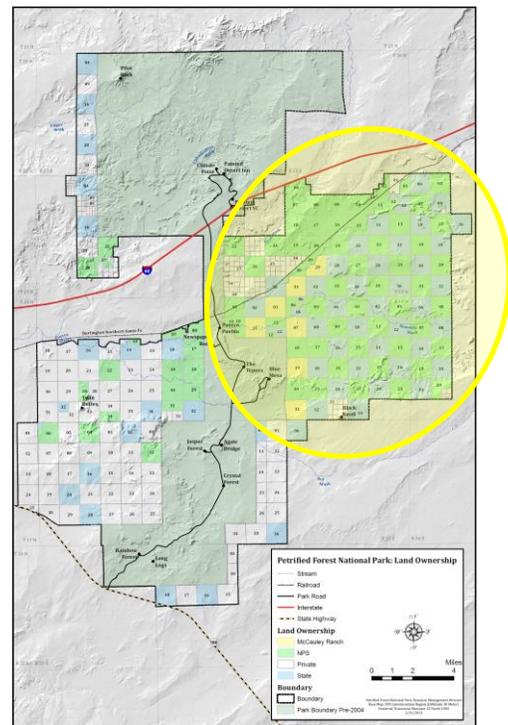
### **Subject: 2014 PETRIFIED FOREST NATIONAL PARK BIOBLITZ SUMMARY**

With the committed help of citizen scientist volunteers, Petrified Forest National Park (PEFO) recently conducted a BioBlitz in a 60,000 acre area of recently-acquired park land. On the weekend of August 29-31, 2014, a total 287 species of plants and animals were identified by a group of 57 professional scientists, naturalists, citizen scientists, volunteers, and park staff. The total number and diversity of the species documented were only limited by the number of taxonomic experts leading survey groups and a relatively abbreviated planning period. Volunteer interest level was high for such a small-scale BioBlitz event and comments of participants indicated it was an enjoyable and productive outing that yielded many stories of wildlife encounters and backcountry adventure.

### **Background**

A BioBlitz is a short-duration (usually 24-hour), high-intensity series of biological surveys in a specific area, designed to find and identify as many species of living organisms as possible, resulting in a “Snapshot of Diversity.” This type of biodiversity discovery event is an important way the Park Service involves citizen scientists and volunteers to gather data and provide resource stewardship activities.

Why at Petrified Forest. The park recently acquired approximately 60,000 acres of land that was projected to be rich in paleontological, archeological, and biological resources, but at the moment very little is actually known about the quantity and quality of those resources. The



Area of biological surveys within the eastern expansion lands of the Petrified Forest National Park.

lands came from Bureau of Land Management transfers and willing private land sales, only a portion of which is currently open to the public. The flora and fauna inventoried during the BioBlitz will be used as a benchmark for biodiversity and as a baseline dataset for future biological research projects in the expansion lands. Data from the event will also provide the basis for future ecological land management decisions.

The event also served as a catalyst for development of future research partnerships between the park and numerous individuals and organizations throughout the region. Furthermore, the newly-documented species within Petrified Forest could serve to attract additional wildlife enthusiasts to the park.

Biodiversity at Petrified Forest. At first glance, the semi-arid grasslands and rugged badlands of Petrified Forest might seem rather desolate and void of many forms of life. Upon closer examination, one can observe a tremendous web of biodiversity that spans a myriad of life-forms, from colorful insects to charismatic large mammals and from vibrant lichens to majestic cottonwoods. Most visitors have only experienced the grasslands from their vehicle. However, fully experiencing such a subtly diverse and beautiful ecosystem requires one to use all of their senses while taking the time to stop and walk through the various habitats that comprise the park. It is only at this level, if one observes diligently, that one can notice the incredible variety of insects feeding on the flowers of a single prickly-pear cactus, hear the howl of a lonely coyote, or witness the colorful palette of songbirds fluttering among the sagebrush and cottonwoods. A BioBlitz is a unique way to document much of this diversity with the trained-eyes of taxonomic experts and the energy of citizen scientists.

### **Project Origins**

On April 1, 2014 Superintendent Brad Traver received funding approval from the National Park Service Natural Resource Stewardship and Science (NRSS) Biological Resource Management Division for the following project request: “Petrified Forest National Park has added over 45,000 acres (48%) in recent years – lands which are not included in an existing I&M network and have not been inventoried. This project would use citizen scientists to inventory plants and animals on these new lands in two distinct vegetation types – high desert grassland, and high desert riparian. Led by biologists with knowledge of the environment, at least two groups of volunteers over several days would inventory pre-identified plots.”

On June 1, 2014, Biological Technician Andy Bridges arrived for seasonal herpetological monitoring work and was tasked with completing the project. One of the first tasks was to hire a second Biological Technician to assist with the planning and execution of the event. Writing the critical-hire paperwork, advertising the job, interviewing and hiring the candidate and completing the hiring process took until mid-September. The new Biotech, Clinton Helms arrived August 13, 2014. During the hiring process, the event evolved from the original idea of a team inventorying riparian habitat and a team inventorying grasslands to multiple teams, each focused on a specific taxonomic group, inventorying in both habitats, all in a single 24-hour period. This new approach was felt to be in line with the original project proposal as each habitat would have at least one team present and identifying species. The shorter duration would also facilitate more volunteer involvement than a multiple-day event.

### **Planning and Management of the Event**

The greatest challenge of the event was to obtain the services of people who were not only willing to volunteer, but had the knowledge and experience to accurately identify the multitude of potential species. Potential taxonomic experts were identified using personal contacts of Andy Bridges and other Petrified Forest NP staff. Ten individuals from five universities, 12 individuals from 11 different groups or clubs, 12 individuals from 6 different government agencies, and 14 private individuals from Arizona, New Mexico, Utah, and California were contacted by phone or e-mail. Over two dozen additional individuals were identified by those contacts. This effort led to 10 experts attending, specializing in birds, mammals, plants, and herpetofauna. Another 47 volunteers without specific expertise also volunteered and were matched with the experts to form 7 teams to complete the inventories.

#### 60+ days prior

- Critical-hire paperwork was drafted and a job description for a short-term Biological Technician was posted
- Subject-matter experts, groups, and individuals from the general public were solicited by personal contact, e-mail, and phone for participation as group leaders or group members

#### 30 days prior

- NRSS funding was used to purchase equipment to support each team's unique requirements

- Biology staff met with the Petrified Forest Housing Officer to determine available housing units and camping locations within the park
- Subject-matter experts and volunteer names were recorded along with preferences for teams and housing or camping

#### 2 weeks prior

- Petrified Forest Resource and Protection staff completes a Green Amber Red (GAR) Safety Review for the event
- All subject-matter experts were contacted to confirm participation
- Blank Volunteer Services Agreements were e-mailed to all participants

#### Week prior to the event

- Volunteers were assigned to seven teams that each specialized in a specific taxa (birds, mammals and bats, reptiles and amphibians, invertebrate animals, and plants)
- E-mails were sent to all participants with team assignments, an event schedule, directions to the park, and a suggested equipment list
- All participants were either assigned a space in a group house or a camping spot
- Volunteer information packets for each participant were created
- Field snacks and bottled water were purchased using Petrified Forest Museum Association (PFMA) funds.
- Collected safety equipment and keys for 5 vehicles borrowed from other divisions. Ensured first aid kits, tow straps, and shovels were in each vehicle
- Biological staff installed an acoustical recorder (SoniBat SM2) and four game cameras to be recovered and analyzed on the event day

#### Day prior to the event

- Almost 200 small mammal and reptile and amphibian traps were placed by the mammal crew and the biological technicians to be checked and recovered on the event day
- The Painted desert Complex Community Room was set up to accommodate meetings, displays, and a volunteer check-in table
- Volunteers began arriving in the afternoon and checked in. The following happened during the check-in:
  - Each person turned-in or completed a completed a Volunteer Services Agreement

- Each person received a volunteer packet:
  - Demographics Questionnaire
  - Staff contact information/radio use information
  - Schedule
  - Volunteer pin
  - Participant vehicle tag for admittance to the park
- Housing/camping area assignments, key(s), and parking map handed out
- Group leaders picked-up equipment for their group:
  - Clipboard with data sheets, backcountry road map with suggested route and stopping points, severe weather information, pencils, and collection permits (if appropriate)
  - Radio with spare battery, GPS unit with spare batteries, camera, and field guide to flora & fauna of Petrified Forest NP
- At 5:00pm the biological staff conducted an orientation for all volunteers to organize teams and disseminate important information:
  - How to use the data form to record species occurrence
  - How to use the GPS unit and record a waypoint
  - How to determine the photo number on the camera
  - How to use the handheld radio including when to check-in and check-out with dispatch and relaying traffic if another team is having trouble communicating with dispatch
  - Driving safety
    - Wear seatbelts at all times
    - No cell phone use while driving vehicles
    - Tow strap location
    - Locked gate instructions
    - Railroad tracks safety
    - Parking hazards – fire hazard when parking in tall grass
  - Protection of other resources (e.g., paleontological and archaeological) and reporting other finds
  - Instructions for returning equipment/supplies to community room

### Day of the Event

- All groups left for the field near sunrise

- At least one paid staff member and one staff volunteer were assigned to the community room the entire day to respond to or assist with volunteer emergencies and questions. These staff members also interacted with park visitors who were not part of the event, but who came in to look at the displays
- Staff conducted radio status-checks of each volunteer group every 2-3 hours
- All groups returned for a mid-afternoon break and for an update on the day's activities. Snacks and refreshments were available in the community room
- One law enforcement officer patrolled the eastern expansion land to ensure volunteer safety and to provide rapid response to any potential emergencies
- Park staff provided a BBQ meal at the picnic area, providing meat and vegetables and an opportunity for participants to share stories and pictures from the day's surveys
- Groups returned to the field about sunset to conduct evening and night surveys and trapping, most ending by 2300

One day after the event. Volunteers checked out before noon and returned completed data sheets, equipment, house keys, and comment forms.

### **Accomplishments**

- 287 species of plants and animals were identified. Thirty-two species of plants were documented in the park for the first time.
- Ten professional scientists and naturalists led or co-led groups. Group leaders for each taxonomic group: Birds – Jim Scarlett and Don Witter; Mammals – Iain Emmons and Scott and Tiffany Sprague; Herpetofauna – Erika Nowak and Andrew Holycross; Vascular Plants – Wendy Hodgson, Andrew Salywon, and Glenn Clifton.
- Fifty citizen scientists/volunteers participated
- Two student groups from Arizona State University (ASU) and Northern Arizona University (NAU)
  - Nineteen students from ASU
  - Six students from NAU
- Volunteers ranged from the ages of 6 to 82
- Careers of the volunteers included professors, research biologists, a biology teacher, a geologist, a computer programmer, a software consultant, an accountant, electrical and general engineers, writers and photographers, nurses, maintenance personnel, and business operators/managers. Eight retirees participated.

- Twenty-four of the volunteers visited Petrified Forest for the first time
- Twenty-eight of the participants were first-time volunteers with the National Park Service
- Students gained experience in field methods, field techniques, and species identification
- The participants put in a combined total of 816 volunteer hours throughout the weekend
- Created the potential for future research partnerships with individuals and organizations throughout the region

### **Taxonomic Breakdown**

<b>Group</b>	<b>Number of Species</b>	<b>Species</b>
Birds	49	Table 1, page 9
Mammals	20	Table 2, page 10
Reptiles	13	Table 3, page 10
Amphibians	4	Table 4, page 11
Invertebrates	20	Table 5, page 11
Vascular Plants	181 <sup>1</sup>	Table 6, pages 12-15

<sup>1</sup>Thirty-two of the identified plant species were documented in the park for the first time.

### **Project Support**

Funding was provided by the National Park Service Natural Resource Stewardship and Science (NRSS) Biological Resource Management Division. Integral to the success of the event was the participation and support of the Petrified Forest Procurement, Housing, Protection, and Resources staff.

### **Event Photography**

Photographs of the event were contributed by numerous citizen scientists and resource Management staff of the Petrified Forest NP. Representative photographs can be found on Flickr: <https://www.flickr.com/photos/127878500@N03/> (Album name: 2014 PEFO BioBlitz).

### **Suggestions for future or similar events**

- Get taxonomic experts for non-vascular plants, fungi, general aquatic ecologists, soil ecologists, and as many invertebrate taxa as possible

- More staff or volunteers needed to help out during orientation and check-in (possibly two more individuals)
- Backcountry road maps were good for most, but placing signs on landmarks such as cattle tanks and intersections would be helpful
- Emphasize the need for volunteers to keep their radio on them at all times (i.e., don't leave it in the vehicle while out surveying)
- Emphasize the need for handwriting legibility for datasheet recording
- Take a group photo of all event participants at the orientation or capstone meeting

### **Visitor Comments and Suggestions**

*“Thanks a lot for your efforts in making this an enjoyable event. I really had a great time. I can't think of anything I would recommend changing. It worked really well. If anything maybe a brief late afternoon summary meeting on Saturday for each of the teams to talk of the highlights of their surveys, would be enjoyable. Or maybe just a whiteboard in the meeting room to note highlights on. Due to the timing of when I learned of the event I did not have very much time to put together a larger team. If you do this again as it appears you may, I think I can get a few more very experienced birders to help us.”*

*“My thoughts on how it went, which are simple – I thought it was great, very well organized, accommodating and tremendous support generated from you all.”*

*“Staff was hospitable, quite concerned that we had a positive experience and that we would be safe at all times.”*

*“The park staff did a good job of planning the event. Should have a check-out at the South end. I had a very good time and hope to repeat. Thanks!”*

*“We enjoyed this event and hope you will do it again!”*

*“Very well done by all!”*

*“Liked the event. Plan on a meal together, charge a fee per person. Capstone event where everyone can review what has been done and what needs to be done.”*

*“This was a great event! Lots of fun and useful for volunteers/students. I have received thank-you's from both groups, but the thanks go to Andy, Clint, et al. for organizing us. Thanks to Kevin Dowell for providing home-grown veggies at the BBQ! Suggestions: Apparently my group would have benefitted from more detailed topo maps of the expansion lands and maybe signs indicating tank names, as we took a detour after missing a turn.”*

## 2014 MINI-BIOBLITZ SPECIES LIST

Table 1. Bird species documented during the 2014 Petrified Forest National Park BioBlitz.

<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
<i>Accipiter cooperii</i>	Cooper's hawk	<i>Sayornis nigricans</i>	Black phoebe
<i>Aeronautes saxatalis</i>	White-throated swift	<i>Sayornis saya</i>	Say's phoebe
<i>Agelaius phoeniceus</i>	Red-winged blackbird	<i>Setophaga coronata</i>	Yellow-rumped warbler
<i>Aimophila ruficeps</i>	Rufous-crowned sparrow	<i>Setophaga nigrescens</i>	Black-throated gray warbler
<i>Aquila chrysaetos</i>	Golden eagle	<i>Setophaga petechia</i>	Yellow warbler
<i>Ardea herodias</i>	Great blue heron	<i>Setophaga townsendi</i>	Townsend's warbler
<i>Bubo virginianus</i>	Great-horned owl	<i>Sitta carolinensis</i>	White-breasted nuthatch
<i>Buteo swainsoni</i>	Swainson's hawk	<i>Spizella breweri</i>	Brewer's sparrow
<i>Cardellina pusilla</i>	Wilson's warbler	<i>Thryomanes bewickii</i>	Bewick's wren
<i>Cathartes aura</i>	Turkey vulture	<i>Tyrannus verticalis</i>	Western kingbird
<i>Chordeiles minor</i>	Common nighthawk	<i>Zenaida macroura</i>	Mourning dove
<i>Circus cyaneus</i>	Northern harrier		
<i>Colaptes auratus</i>	Northern flicker		
<i>Contopus cooperi</i>	Olive-sided flycatcher		
<i>Contopus sordidulus</i>	Western wood-pewee		
<i>Corvus brachyrhynchos</i>	American crow		
<i>Corvus corax</i>	Common raven		
<i>Empidonax sp.</i>	Empidonax sp.		
<i>Empidonax sp.</i>	Empidonax sp.		
<i>Eremophila alpestris</i>	Horned lark		
<i>Falco sparverius</i>	American kestrel		
<i>Geococcyx californianus</i>	Greater roadrunner		
<i>Geothlypis tolmiei</i>	MacGillivray's warbler		
<i>Geothlypis trichas</i>	Common yellowthroat		
<i>Haemorhous mexicanus</i>	House finch		
<i>Lanius ludovicianus</i>	Loggerhead shrike		
<i>Melospiza melodia</i>	Song sparrow		
<i>Myiarchus cinerascens</i>	Ash-throated flycatcher		
<i>Oreoscoptes montanus</i>	Sage thrasher		
<i>Oreothlypis celata</i>	Orange-crowned warbler		
<i>Pheucticus melanocephalus</i>	Black-headed grosbeak		
<i>Pipilo chlorurus</i>	Green-tailed towhee		
<i>Piranga ludoviciana</i>	Western tanager		
<i>Piranga rubra</i>	Summer tanager		
<i>Polioptila caerulea</i>	Blue-gray gnatcatcher		
<i>Polioptila melanura</i>	Black-tailed gnatcatcher		
<i>Regulus calendula</i>	Ruby-crowned kinglet		
<i>Salpinctes obsoletus</i>	Rock wren		

Table 2. Mammal species documented during the 2014 Petrified Forest National Park BioBlitz.

<b>Scientific Name</b>	<b>Common Name</b>
<i>Ammospermophilus leucurus</i>	White-tailed antelope squirrel
<i>Anerozous pallidus</i>	Pallid bat
<i>Antilocapra americana</i>	American pronghorn
<i>Canis latrans</i>	Coyote
<i>Cervus elaphus</i>	Elk
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat
<i>Dipodomys ordii</i>	Ord's kangaroo rat
<i>Erethizon dorsatum</i>	North American porcupine
<i>Lepus californica</i>	Black-tailed jackrabbit
<i>Myotis thysanodes</i>	Fringed myotis
<i>Neotoma albigula</i>	White-throated wood rat
<i>Odocoileus hemionus</i>	Mule deer
<i>Onychomys leucogaster</i>	Northern grasshopper mouse
<i>Peromyscus boylii</i>	Brush mouse
<i>Peromyscus maniculatus</i>	American deer mouse
<i>Reithrodontomys megalotis</i>	Western harvest mouse
<i>Sylvilagus audubonii</i>	Desert cottontail
<i>Taxidea taxa</i>	American badger
<i>Urocyon cinereoargenteus</i>	Grey fox
<i>Vulpes macrotis</i>	Kit fox

Table 3. Reptile species documented during the 2014 Petrified Forest National Park BioBlitz.

<b>Scientific Name</b>	<b>Common Name</b>
<i>Arizona elegans</i>	Glossy snake
<i>Aspidoscelis velox</i>	Plateau striped whiptail
<i>Crotalus viridis nuntius</i>	Hopi rattlesnake
<i>Crotaphytus collaris</i>	Eastern collared lizard
<i>Gambella wislizenii</i>	Long-nosed leopard lizard
<i>Holbrookia maculata</i>	Lesser earless lizard
<i>Lampropeltis getula</i>	Common kingsnake
<i>Masticcophis taeniatus</i>	Striped whip snake
<i>Phrynosoma hernandesi</i>	Greater short-horned lizard
<i>Pituophus catenifer</i>	Gopher snake
<i>Sceloporus graciosus</i>	Common sagebrush lizard
<i>Sceloporus tristichus</i>	Plateau fence lizard
<i>Uta stansburiana</i>	Common side-blotched lizard

Table 4. Amphibian species documented during the 2014 Petrified Forest National Park BioBlitz.

<b>Scientific Name</b>	<b>Common Name</b>
<i>Anaxyrus cognatus</i>	Great Plains toad
<i>Anaxyrus punctatus</i>	Red-spotted toad
<i>Scaphiopus couchii</i>	Couch's spadefoot
<i>Spea multiplicata</i>	Mexican spadefoot

Table 5. Invertebrate species documented during the 2014 Petrified Forest National Park BioBlitz.

<b>Scientific Name</b>	<b>Common Name</b>
<i>Brephidium oxilis</i>	Pigmy blue butterfly
<i>Danaus plexippus</i>	Monarch butterfly
<i>Hemileuca hera</i>	Hera buckmoth
<i>Hogna carolinensis</i>	Carolina wolf spider
—	Tarantula hawk sp.
—	Mole cricket sp.
—	Shrimp sp.
—	Walking stick sp.
—	Dragonfly sp.
—	Jerusalem cricket sp.
—	Coleopteran sp.
—	Coleopteran sp.
—	Coleopteran sp.
—	Coleopteran sp.
—	Arachnid sp.
—	Arachnid sp.
—	Arachnid sp.
—	Scorpion sp.
—	Lepidopteran sp.
—	Isopteran sp.

Table 6. Vascular plant species documented during the 2014 Petrified Forest National Park BioBlitz. *U* = previously undocumented vascular plant species

Scientific Name	Common Name
<i>Achnatherum hymenoides</i>	Indian ricegrass
<i>Ailanthus altissima</i>	tree-of-heaven ( <i>U</i> )
<i>Allionia incarnata</i>	trailing windmills
<i>Amaranthus albus</i>	prostrate pigweed
<i>Amaranthus blitoides</i>	mat amaranth
<i>Amaranthus californicus</i>	California amaranth ( <i>U</i> )
<i>Ambrosia acanthicarpa</i>	flatspine butt ragweed
<i>Ambrosia ambrosioides</i>	canyon ragweed ( <i>U</i> )
<i>Ambrosia confertiflora</i>	weakleaf bur ragweed
<i>Aristida adscensionis</i>	sixweeks threeawn
<i>Aristida purpurea</i> var. <i>longiseta</i>	Fendler threeawn
<i>Artemisia bigelovii</i>	Bigelow sage
<i>Artemisia campestris</i> var. <i>scouleviana</i>	—
<i>Artemisia dracunculus</i>	tarragon
<i>Artemisia filifolia</i>	sand sagebrush
<i>Artemisia frigida</i>	prairie sagewort
<i>Artemisia ludoviciana</i> ssp. <i>albula</i>	white sagebrush
<i>Artemisia nova</i>	black sagebrush ( <i>U</i> )
<i>Asclepias involucrata</i>	dwarf milkweed
<i>Asclepias subverticillata</i>	horsetail milkweed
<i>Astragalus calycosus</i> var. <i>scaposus</i>	Torrey's milkvetch
<i>Astragalus mollissimus</i> var. <i>thompsoniae</i>	woolly locoweed
<i>Astragalus xiphoides</i>	gladiator milkvetch
<i>Atriplex canescens</i>	fourwing saltbush
<i>Atriplex confertifolia</i>	shadescale saltbush
<i>Atriplex obovata</i>	mound saltbush
<i>Atriplex powellii</i>	Powell's saltweed
<i>Atriplex rosea</i>	tumbling saltweed
<i>Atriplex saccaria</i>	sack saltbush
<i>Bassia scoparia</i>	burningbush ( <i>U</i> )
<i>Bolboschoenus maritimus</i> ssp. <i>paludosus</i>	alkali bulrush
<i>Bouteloua barbata</i>	sixweeks grama
<i>Bouteloua curtipendula</i>	sideoats grama
<i>Bouteloua eriopoda</i>	black grama
<i>Bouteloua gracilis</i>	blue grama
<i>Bouteloua hirsuta</i>	hairy grama
<i>Bouteloua simplex</i>	matted grama
<i>Carex</i> sp.	—
<i>Centaurea repens</i>	Russian knapweed ( <i>U</i> )
<i>Chaetopappa ericoides</i>	rose heath
<i>Chamaesaracha coronopus</i>	greenleaf five eyes
<i>Chamaesyce albomarginata</i>	whitemargin sandmat ( <i>U</i> )
<i>Chamaesyce fendleri</i>	Fendler's sandmat ( <i>U</i> )
<i>Chamaesyce serpyllifolia</i> ssp. <i>Serpyllifolia</i>	thymeleaf sandmat
<i>Chenopodium incanum</i>	mealy goosefoot

Scientific Name	Common Name
<i>Chenopodium leptophyllum</i>	narrowleaf goosefoot
<i>Chenopodium rubrum</i>	red goosefoot ( <i>U</i> )
<i>Chloris virgata</i>	feather fingergrass
<i>Chrysothamnus baileyi</i>	Bailey's rabbitbrush ( <i>U</i> )
<i>Chrysothamnus Greenei</i>	Greene's rabbitbrush
<i>Chrysothamnus viscidiflorus</i>	yellow rabbitbrush ( <i>U</i> )
<i>Cleome serrulata</i>	Rocky Mountain beeplant
<i>Comandra umbellata</i> ssp. <i>pallida</i>	pale bastard toadflax
<i>Convolvulus arvensis</i>	field bindweed
<i>Conyza canadensis</i>	Canadian horseweed
<i>Cordylanthus wrightii</i> ssp. <i>wrightii</i>	Wright's bird's beak
<i>Corispermum americanum</i> var. <i>rydbergii</i>	American bugseed
<i>Croton texensis</i>	Texas croton
<i>Cryptantha pterocarya</i> var. <i>cycloptera</i>	wingnut cryptantha
<i>Cycloloma atriplicifolium</i>	winged pigweed
<i>Cylindropuntia whipplei</i>	Whipple cholla
<i>Cymopterus</i> sp.	—
<i>Dalea candida</i> var. <i>oligophylla</i>	white prairie clover
<i>Dasyochloa pulchella</i>	low woollygrass
<i>Dieteria canescens</i> var. <i>canescens</i>	hoary tansyaster
<i>Dimorphocarpa wislizeni</i>	touristplant
<i>Distichlis spicata</i>	saltgrass
<i>Echinochloa colona</i>	jungle rice
<i>Elaeagnus angustifolia</i>	Russian olive
<i>Elymus elymoides</i> var. <i>brevifolia</i>	Barkworth squirreltail ( <i>U</i> )
<i>Ephedra nevadensis</i>	Nevada jointfir ( <i>U</i> )
<i>Ephedra viridis</i>	mormon tea
<i>Eremogone eastwoodiae</i> var. <i>adenophora</i>	Eastwood's sandwort
<i>Ericameria Greenei</i>	Greene's goldenbush ( <i>U</i> )
<i>Ericameria nauseosa</i> var. <i>bigelovii</i>	rubber rabbitbrush
<i>Erigeron concinnus</i>	Navajo fleabane
<i>Erigeron divergens</i>	spreading fleabane
<i>Eriogonum alatum</i> var. <i>alatum</i>	winged buckwheat
<i>Eriogonum deflexum</i>	flatcrown buckwheat
<i>Eriogonum divaricatum</i>	divergent buckwheat
<i>Eriogonum leptocladon</i> var. <i>ramosissimum</i>	sand buckwheat
<i>Eriogonum leptophyllum</i>	slenderleaf buckwheat
<i>Erodium cicutarium</i>	redstem stork's bill
<i>Euphorbia parryi</i>	Parry's sandmat
<i>Evolvulus nuttallianus</i>	shaggy dwarf morning-glory
<i>Frasera paniculata</i>	tufted frasera
<i>Gilia</i> sp.	—
<i>Glandularia bipinnatifida</i> var. <i>bipinnatifida</i>	Dakota mock vervain
<i>Grindella nuda</i> var. <i>aphanactis</i>	curlytop gumweed ( <i>U</i> )
<i>Gutierrezia sarothrae</i>	broom snakeweed
<i>Halogeton glomeratus</i>	saltlover ( <i>U</i> )
<i>Helianthus petiolaris</i>	prairie sunflower
<i>Heliomeris multiflora</i>	showy goldeneye

Scientific Name	Common Name
<i>Hesperostipa neomexicana</i>	New Mexico feathergrass
<i>Heterosperma pinnata</i>	wingpetal
<i>Heterotheca villosa</i> var. <i>villosa</i>	—
<i>Hilaria jamesii</i>	James' galleta
<i>Hordeum jubatum</i>	foxtail barley
<i>Houstonia rubra</i>	red bluet
<i>Hymenopappus filifolius</i> var. <i>pauciflorus</i>	fineleaf hymenopappus
<i>Hymenopappus flavescens</i> var. <i>canotomentosus</i>	collegeflower
<i>Ipomopsis longiflora</i>	flaxflowered ipomopsis
<i>Isocoma pluriflora</i>	southern goldenbush ( <i>U</i> )
<i>Isocoma rusbyi</i>	Rusby's goldenbush
<i>Juniperus monosperma</i>	oneseed juniper
<i>Kochia americana</i>	green molly
<i>Kochia scoparia</i>	mock cypress
<i>Krascheninnikovia lanata</i>	winterfat
<i>Lathyrus eucosmus</i>	bush vetchling ( <i>U</i> )
<i>Leptochloa univervia</i>	Mexican sprangletop ( <i>U</i> )
<i>Linum australe</i>	southern flax ( <i>U</i> )
<i>Lycium pallidum</i>	pale desert-thorn
<i>Machaeranthera canescens</i>	hoary aster
<i>Machaeranthera tanacetifolia</i>	tanseyleaf tanseyaster ( <i>U</i> )
<i>Machaeranthera asteroides</i>	fall tansyaster ( <i>U</i> )
<i>Medicago sativa</i>	alfalfa
<i>Menodora scabra</i>	rough menodora ( <i>U</i> )
<i>Mentzelia multiflora</i>	Adonis blazingstar
<i>Mirabilis linearis</i>	narrowleaf four o'clock
<i>Mirabilis multiflora</i>	Colorado four o'clock
<i>Muhlenbergia pungens</i>	sandhill muhly
<i>Muhlenbergia torreyi</i>	ring muhly
<i>Munroa squarrosa</i>	false buffalograss
<i>Oenothera pallida</i>	pale evening primrose
<i>Opuntia erinacea</i>	grizzlybear pricklypear
<i>Opuntia polyacantha</i>	plains pricklypear
<i>Panicum capillare</i>	witchgrass
<i>Panicum dichotomiflorum</i>	fall panicgrass ( <i>U</i> )
<i>Parryella filifolia</i>	common dunebroom
<i>Pascopyrum smithii</i>	western wheatgrass
<i>Pectis angustifolia</i>	lemonscent
<i>Pectis papposa</i>	manybristle chinchweed ( <i>U</i> )
<i>Petradoria pumila</i> ssp. <i>pumila</i>	grassy rock goldenrod
<i>Polygonum aviculare</i>	common knotgrass ( <i>U</i> )
<i>Polygonum monspeliensis</i>	annual rabbitsfoot grass
<i>Pomaria jamesii</i>	james rushpea
<i>Populus fremontii</i>	Fremont cottonwood
<i>Portulaca oleracea</i>	little hogweed
<i>Psoralidium lanceolatum</i>	lemon scurfpea
<i>Ranunculus sceleratus</i> var. <i>multifidus</i>	cursed buttercup ( <i>U</i> )
<i>Ratibida tagetes</i>	green prairie coneflower

Scientific Name	Common Name
<i>Rhus trilobata</i>	skunkbush sumac
<i>Rumex crispus</i>	curly dock
<i>Rumex salicifolius</i> var. <i>mexicanus</i>	Mexican dock ( <i>U</i> )
<i>Salix exigua</i>	narrowleaf willow
<i>Salsola paulsenii</i>	barbwire Russian thistle ( <i>U</i> )
<i>Salsola tragus</i>	prickly Russian thistle
<i>Salvia reflexa</i>	lanceleaf sage
<i>Sanvitalia abertii</i>	Albert's creeping zinnia
<i>Sarcobatus vermiculatus</i>	greasewood
<i>Scabrethia scabra</i>	badlands mule-ears
<i>Schizachyrium sanguineum</i> var. <i>hirtiflorum</i>	crimson bluestem ( <i>U</i> )
<i>Sclerocactus whipplei</i>	Whipple's fishhook cactus
<i>Senecio flaccidus</i> var. <i>flaccidus</i>	threadleaf ragwort
<i>Senecio spartioides</i> var. <i>multicapitatus</i>	broomlike ragwort
<i>Solanum elaeagnifolium</i>	silverleaf nightshade
<i>Solanum jamesii</i>	wild potato
<i>Solanum rostratum</i>	buffalobur nightshade
<i>Solidago velutina</i>	threenerve goldenrod ( <i>U</i> )
<i>Sphaeralcea fendleri</i>	Fendler's globemallow ( <i>U</i> )
<i>Sphaeralcea hastulata</i>	spear globemallow
<i>Sphaeralcea parvifolia</i>	smallflower globemallow
<i>Sporobolus airoides</i>	alkali sacaton
<i>Sporobolus contractus</i>	spike dropseed
<i>Sporobolus cryptandrus</i>	sand dropseed
<i>Sporobolus flexuosus</i>	mesa dropseed
<i>Sporobolus nealleyi</i>	gyp dropseed
<i>Sporobolus pyramidalis</i>	catstail dropseed
<i>Sporobolus giganteus</i>	giant dropseed
<i>Tamarix chinensis</i>	five-stamen tamarisk
<i>Thelesperma megapotamicum</i>	Hopi tea greenthread
<i>Townsendia annua</i>	annual Townsend daisy
<i>Tribulus terrestris</i>	puncturevine
<i>Typha domingensis</i>	southern cattail
<i>Verbena bracteata</i>	bigbract verbena
<i>Verbesina encelioides</i>	golden crownbeard
<i>Xanthisma spinulosum</i>	spiny haplopappus
<i>Xanthium strumarium</i>	rough cocklebur
<i>Yucca baileyi</i>	Navajo yucca
<i>Zannichellia palustris</i>	horned pondweed
<i>Zuckia brandegeae</i> var. <i>arizonica</i>	Arizona siltbush