



US Army Corps of Engineers
Walla Walla District



BUILDING STRONG®

PEST MANAGEMENT PROGRAM

**U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
MANAGED LANDS**

Implementation Instructions

U.S. Army Corps of Engineers
Walla Walla District

Date: August 22, 2017

ACRONYMS	III
1. INTRODUCTION	- 1 -
2. ROLES AND RESPONSIBILITIES.....	- 1 -
3. CURRENT TARGET SPECIES	- 2 -
3.1. VEGETATION.....	- 2 -
3.2. MAMMALS, BIRDS, AND ARTHROPODS	- 4 -
3.3. EARLY DETECTION RAPID RESPONSE (EDRR)	- 5 -
4. CHEMICAL APPLICATION METHODS.....	- 6 -
4.1. HAND/SELECT	- 6 -
4.2. SPOT.....	- 6 -
4.3. BROADCAST	- 6 -
4.4. AERIAL	- 6 -
5. HERBICIDES & CHEMICALS	- 7 -
6. BIOLOGICAL CONTROL	- 10 -
7. MAMMAL AND BIRD CONTROL.....	- 11 -
8. ARTHROPOD CONTROL.....	- 11 -
9. BEST MANAGEMENT PRACTICES	- 11 -
10. RESEEDING/SITE RESTORATION	- 14 -
11. ANTICIPATED USE AND ACTUAL USE RECORDS AND DATA	- 15 -
<i>Purpose</i>	- 15 -
<i>Flow of information</i>	- 15 -
INSTRUCTIONS	- 18 -
<i>Instructions for Realty Specialists</i>	- 18 -
<i>Instructions for Applicators (Grantees/Construction Contractors): PDF Records</i>	- 18 -
<i>Instructions for Applicators (Operations): PDF Records</i>	- 21 -
<i>Instructions for Applicators (OPS): Geodatabase</i>	- 24 -
<i>Instructions for Applicators (Grantees / Contractors): Geodatabase</i>	- 24 -
<i>Instructions for Project and District Pest Managers</i>	- 24 -
<i>Instructions for NWW HQ GIS Staff</i>	- 25 -
ATTACHMENT 1: SAVE AND EMAIL DATA AS AN XML FILE FROM A PDF RECORD USING THE RECORD'S 'EMAIL DATA' BUTTON (ACROBAT XI READER).....	- 25 -
ATTACHMENT 2: PERFORMING QA OF XML DATA (ACROBAT X PRO)	- 28 -
ATTACHMENT 3: GPS COORDINATE AND RADIUS DATA.....	- 35 -
12. ESA PLANTS LISTED IN THE DISTRICT	- 41 -
13. IDAHO'S SPECIAL STATUS VASCULAR AND NONVASCULAR PLANTS.....	- 55 -

Acronyms

APHIS	Animal Plant and Health Inspection Service, USDA
BMP	Best Management Practice
Corps	U.S. Army Corps of Engineers
db	Database
EDRR	Early Detection and Rapid Response
ESA	Endangered Species Act
GIS	Geographic Information System
GPS	Global Positioning System
IDFG	Idaho Department of Fish and Game
mph	Miles per Hour
ODFW	Oregon Department of Fish and Wildlife
OHWM	Ordinary High Water Mark
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WS	Wildlife Services, Animal and Plant Health Inspection Services (APHIS), USDA

1. Introduction

The purpose of this document is to provide implementation instructions for pest management activities on the U.S. Army Corps of Engineers (Corps) Walla Walla District (District) federal administered lands. These instructions outline biological and chemical control methods and record keeping for managing animal and vegetation pests on Corps federal administered lands within the District. The requirements set forth in this document are in addition to all other applicable laws, rules, and regulations. The District is issuing these instructions to ensure that pesticide applications comply with those additional requirements and ensure consistent record keeping and reporting in all areas of the District. Pest management activities are ongoing and shall continue as long as there are pest problems on Corps federal administered lands within the District.

2. Roles and Responsibilities

U.S. Army Corps of Engineers, Walla Walla District will:

- Issue implementation instructions.
- Perform quality control and data management on application records submitted by grantees and data submitted by contractors and Corps employees.
- Provide contractors historic use data. All information shall be compiled into a geographic information system (GIS) database in the District.
- Compile anticipated use and annual use reports for reporting requirements under the Endangered Species Act (ESA).
- Annual reports for grantees shall be generated by the Corps using data collected in the GIS database from actual use records.
- Provide anticipated and actual use record training materials to grantees, contractors, and Corps employees.
- Provide database training materials to contractors and Corps employees.

Grantees & Contractors:

- Perform pest management activities in accordance with all applicable laws, rules, and regulations, and these implementation instructions.
- Provide accurate anticipated use data.
- Provide accurate actual use data.

3. Current Target Species

3.1. Vegetation

Vegetation control and pest management activities may be implemented at any time of the year, with the exception of chemical use for vegetation control. Chemical use for vegetation control shall occur only from March 1st through October 31st. Vegetation control shall target all Class A, B, and C weeds for the State of Washington¹, Idaho², and Oregon³ listed weeds, as well as some nuisance native plants in landscaped or wildlife areas identified by Corps biologists. The plants on all of these lists (current as of the date of this document) are listed in the following table (Table 1) for reference purposes. Those highlighted in orange were identified in Idaho's Special Status Vascular and Nonvascular Plants⁴ (see Section 13 of this document for the complete list).

All broadleaf species found in manicured and managed recreation area lawns and landscaping around buildings are also treated. Vegetation treatments shall include manual and mechanical, biological, and chemical control methods to control or eradicate nuisance and noxious weeds. Any weed population found as a monoculture stand, greater than 2,500 square feet shall be brought to the attention of the District Pesticide Coordinator as soon as possible.

The following table lists the most common vegetation targets in the District by common and scientific name. Scientific names are used to ensure that the same species is not duplicated because of varying common names used in various areas. This table should help with consistent record keeping and reporting throughout the District. "Bare ground" will allow for flexibility when making bare ground treatments, and "Other" can be used when treating a species not found on the states' lists.

¹ http://www.nwcb.wa.gov/siteFiles/2012%20State%20Weed%20List_Scientific_Name.pdf

² <http://www.agri.state.id.us/Categories/PlantsInsects/NoxiousWeeds/watchlist.php>

³ <http://www.oregon.gov/ODA/PLANT/WEEDS/pages/statelist2.aspx>

⁴ https://fishandgame.idaho.gov/ifwis/portal/sites/ifwis/files/user/idfg-jstrickland/INHP_Tracked_Plant_Species--2012-10.pdf

Table 1 Vegetation list from the States' weed lists and from Corps target species.

Vegetation Target Species			
Common Name	Scientific Name	Common Name	Scientific Name
Bare Ground		Morning Glory	<i>Ipomoea eriocarpa</i>
Black Locust	<i>Robinia pseudoacacia</i>	Nodding Plumeless Thistle	<i>Carduus nutans</i>
Blackberry	<i>Rubus</i>	North Idaho Monkeyflower	<i>Mimulus clivicola</i>
Broadfruit Mariposa Lily	<i>Calochortus nitidus</i>	Orange Hawkweed	<i>Hieracium aurantiacum</i>
Bull Thistle	<i>Cirsium vulgare</i>	Orthotrichum Moss	<i>Orthotrichum</i>
California amphidium moss	<i>Amphidium californicum</i>	Other	
Camel Thorn	<i>Acacia erioloba E.</i>	Oxeye Daisy	<i>Leucanthemum vulgare</i>
Canada Thistle	<i>Cirsium arvense</i>	Palouse Thistle	<i>Cirsium brevifolium</i>
Cheatgrass	<i>Bromus tectorum</i>	Perennial Pepperweed	<i>Lepidium latifolium</i>
Chicory	<i>Cichorium</i>	Phantom Orchid	<i>Cephalanthera austinae</i>
Clustered Lady's Slipper	<i>Cypripedium fasciculatum</i>	Poison Hemlock	<i>Conium maculatum</i>
Common Cocklebur	<i>Xanthium strumarium</i>	Puncturevine	<i>Tribulus terrestris</i>
Common Duckweed	<i>Lemna minor</i>	Purple Loosestrife	<i>Lythrum salicaria</i>
Common Mullein	<i>Verbascum thapsus</i>	Rabbitfoot Clover	<i>Trifolium arvense</i>
Common Reed	<i>Phragmites australis</i>	Racomitrium Moss	<i>Racomitrium</i>
Common St. Johnswort	<i>Hypericum perforatum</i>	Rush Skeletonweed	<i>Chondrilla juncea</i>
Conifer Broomrape	<i>Orobanche pinorum</i>	Russian Olive	<i>Elaeagnus angustifolia</i>
Constance's bittercress	<i>Cardamine constancei</i>	Russian Thistle	<i>Salsola</i>
Dalmatian Toadflax	<i>Linaria dalmatica</i>	Scapania Bolanderi	<i>Scapania bolanderi</i>
Dalmation Toadflax	<i>Linaria dalmatica ssp. Dalmatica</i>	Scotch Broom	<i>Cytisus scoparius</i>
Dandelion	<i>Taraxacum officinale</i>	Scotch Thistle	<i>Onopordum acanthium</i>
Deer Fern	<i>Blechnum spicant</i>	Sierra Fumewort	<i>Corydalis caseana</i>
Devilscub	<i>Oplopanax horridus</i>	Spotted Knapweed	<i>Centaurea stoebe</i>
Diffuse Knapweed	<i>Centaurea diffusa</i>	Spruce	<i>Scapania apiculata</i>
Dyer's Woad	<i>Isatis tinctoria</i>	Sulphur Cinquefoil	<i>Potentilla recta</i>
False Indigo Bush	<i>Amorpha fruticosa</i>	Tree-of-heaven	<i>Ailanthus altissima</i>
Fernleaf Biscuitroot	<i>Lomatium dissectum</i>	Tripterocladium Moss	<i>Tripterocladium</i>
Field Bindweed	<i>Convolvulaceae arvensis</i>	Water Hemlock	<i>Cicuta</i>
Flowering Rush	<i>Butomus umbellatus</i>	Western Brackenfern	<i>Pteridium aquilinum</i>
Honey Locust	<i>Gleditsia triacanthos</i>	White Shootingstar	<i>Dodecatheon dentatum</i>
Hounds Tongue	<i>Hieracium cynoglossoides</i>	Whitetop	<i>Cardaria draba</i>
Houndstongue	<i>Cynoglossum officinale</i>	Yellow Hawkweed	<i>Hieracium caespitosum</i>
Jessica's aster	<i>Symphotrichum jessicae</i>	Yellow Starthistle	<i>Centaurea solstitialis</i>
Kochia	<i>Kochia scoparia</i>	Yellow Sweetclover	<i>Melilotus altissimus</i>
Meadow Hawkweed	<i>Hieracium caespitosum</i>	Yellowflag Iris	<i>Iris psudocorus</i>
Meadow Knapweed	<i>Centaurea debeauxii</i>		

3.2.Mammals, Birds, and Arthropods

The need for small mammal control usually occurs along levees, in or around recreational facilities, in shrub/tree plots within intensively managed (irrigated) habitat management units, and on leased land, where nuisance mammal species may cause damage to, or safety hazards in: parks, campgrounds, habitat management units, levees, etc. on Corps federal lands. Treatments shall target marmots and other burrowing mammals found in levees and dams, small rodents located in recently planted tree and shrub areas, nuisance animals such as skunks and opossums when found in developed recreation areas and near buildings and facilities, and feral (released and or breeding) cats, dogs, rabbits, ducks and geese, and other animals.

The need for arthropod control of nuisance arthropods, such as spiders and hornets, arises from a safety threat to the public and Corps employees in and on facilities on Corps managed lands. Treatments shall include manual and mechanical, and chemical control methods. Insects and arthropods shall be treated in and near developed recreation areas, buildings and structures, and vehicles and equipment. The following table lists the most common mammal, bird, and arthropod targets in the District. This table should help with consistent record keeping and reporting throughout the District. “Other” will allow for flexibility when treating a species not found on the states’ lists.

Treatment of mammals is done with rodenticides. Treatments, other than the use of rodenticides identified in Table 2 are done by the Corps (see Section 7 of this document).

Table 2 Mammal, Bird, Arthropod list

Mammal Target Species	Bird Target Species	Arthropod Target Species
Beaver	Canada Goose	Ants
Deer	Mallard	Hornets
Domestic Cat	Trumpeter Swan	Spiders
Feral Cat	Unidentified Duck	Wasps
Gopher	Wood Duck	Yellow Jackets
Ground Squirrel	Other	Other
Marmot		
Striped Skunk		
Muskrat		
Other		
Pocket Gopher		
Raccoon		
Vole		

3.3.Early Detection Rapid Response (EDRR)

It is reasonable to assume not all invasive plants sites have been located and that new sites will emerge throughout Corps lands in the District. New detections in all areas of the District shall be subject to the EDRR process described in this section. The EDRR treatments shall be conducted under the same guidance and criteria established for the District. Newly discovered infestations or sites shall receive a high priority for treatment to eradicate the invasive plants while the infestation is small and easily treatable. No aerial treatment is authorized under EDRR. The following is adapted from the USFS' EDRR and shall be implemented in order to have some adaptive management capability within any given treatment season:

1. EDRR Herbicide Use Decision Process

- **Yes (use herbicides):** List approved herbicide choices available and integrated prescription. Review label directions and project design criteria. Consider non-target vegetation surrounding treatment sites and use selective herbicides as appropriate. Consider soil conditions at the treatment site. Consider previous treatments that have occurred on the site. Were they effective? Would another herbicide or combination of methods be more effective? Go to 2.
 - **No:** Use non-herbicide methods.
2. Do the size, density, and/or distribution of invasive plants warrant the broadcast application method?
- **Yes:** Is the treatment site within the riparian zone and/or on a road that has high potential to deliver herbicide to surface waters? Is the site in an area that has specific restrictions to broadcasting? Go to 3.
 - **No:** Go to 4.
3. Apply buffers as appropriate. Is this site within an area where broadcasting is prohibited?
- **Yes:** Do not broadcast. Go to 5.
 - **No:** Go to 5.
4. Are there ESA-listed plant species or suitable habitat within 300 feet of the treatment site?
- **Yes:** Survey as needed within suitable habitats. Apply botanical buffers as appropriate. Go to 5.
 - **No:** Broadcasting is an acceptable treatment method for herbicides as described in the instructions. Use lowest effective label rates for each given situation. Do not exceed typical label rates. Consider wildlife habitats in the area and implement seasonal restrictions if required.
5. Will spot and/or selective methods be reasonably effective in this situation?
- **Yes:** Apply spot/selective buffers and use aquatic labeled herbicides as appropriate.
 - **No:** Seek guidance from the District Pesticide Coordinator.

4. Chemical Application Methods

- Hand/select
- Spot
- Broadcast
- Aerial

4.1.Hand/Select

Any of the following hand/select methods may be employed:

- Wicking and wiping
- Basal bark
- Frill or hack and squirt
- Stem injection
- Cut-stump

4.2.Spot

Chemical applications are made by either ground-based sprayers (mounted to small all-terrain vehicles (ATVs), trucks or tractors), or with backpack sprayers. These applicators range from motorized vehicles with spray hoses, to backpack sprayers, to hand-pumped spray or squirt bottles. Hand-pumped spray and squirt bottles can target very small plants or parts of plants.

4.3.Broadcast

A boom (a long horizontal tube with multiple spray heads) is mounted or attached to a helicopter, airplane, tractor, ATV, or other vehicle. Nozzles control the droplet size and the area being covered. Boomless nozzles and backpack sprayers may also be used as a broadcast tool.

4.4.Aerial

Helicopters may be used for aerial application of sprays or granules for rapid broadcast coverage of large or inaccessible areas. Aerial application of chemicals has been used only on larger tracts of steep, rugged land with no road or trail access, but shall not be employed within 300 feet of water. The Corps must provide notification to, and coordinate with, the regulatory agencies prior to a large-scale aerial application.

5. Herbicides & Chemicals

The following table (Table 3) lists the active ingredients allowed for use in the District⁵ and identifies some common trade (label) names, although these labels are not the only ones that are allowed for use for each of the active ingredients.

Table 3 Active ingredients allowed for use in the District, with some example trade names.

Chemical	Example Trade Names
2,4-D	Weedone
	Weedar 64
Aminopyralid	Milestone
Chlorsulfuron	Telar
	Glean
Clopyralid	Transline
	Stinger
Dicamba	Banvel
	Vanquish
Glyphosate	Roundup
	Rodeo
Imazapic	Plateau
Imazapyr	Habitat
Metsulfuron-methyl	Escort
	Ally XP
Picloram	Tordon 22K
Sethoxydim	Poast
Sulfometuron-methyl	Oust
Triclopyr	Garlon 4
Pyrethrins, Piperonyl Butoxide, Butane, and Propane	Skidoo
Chlorpyrifos	Dursban Pro
Beta-cyfluthrin	Tempo SC ultra
Zinc Phosphide	Grant's Mole Bait
Strychnine alkaloid	Strychnine treated oats

Any of these chemicals may be used during the spraying season, and applied by the application methods, with buffers and wind speeds, described in the following table. The following table (Table 4) lists the adjuvants allowed for use in the District.







Table 4 Adjuvants allowed for use in the District.

Adjuvants	Purpose
AgriDex	Surfactant
M-90	Surfactant
Grounded	Drift Control
Methylated Seed Oil	Surfactant
Spreader 90	Surfactant
Highlight	Dye

The following table (Table 5) illustrates specific buffer distances and wind speeds by application method for chemical applications in the District.

⁵ Another form of vegetation control that does not necessarily fit into any of the other categories will be environmentally friendly products such as ordinary vinegar.

Table 5 Buffer distances and wind speeds by application method for chemical applications in the District.

	Application Method			
	Hand/Select	Spot	Broadcast	Aerial
Max Wind Speed	WATER (PESTICIDE APPLICATIONS SHALL NOT BE MADE IN OR TO THE WATER, OR ALLOWED TO GET INTO THE WATER)			
NA = No Application				
<5 mph				
<10 mph				
Application Buffer (Distance from Water)	   ORDINARY HIGH WATER MARK   			
0-15 ft (ONLY AQUATIC LABELED HERBICIDES)	2,4-D	2,4-D	NA	NA
	Aminopyralid	NA		
	Chlorsulfuron	NA		
	Clopyralid	Clopyralid		
	Dicamba	NA		
	Glyphosate	Glyphosate		
	Herbicide Mixtures	NA		
	Imazapic	NA		
	Imazapyr	Imazapyr		
	Metasulfuron-methy	Metasulfuron-methy		
	Sulfometuron methyl	NA		
	Triclopyr	NA		
15-50 ft	2,4-D	2,4-D	NA	NA
	Aminopyralid	Aminopyralid		
	Chlorsulfuron	Chlorsulfuron		
	Clopyralid	Clopyralid		
	Dicamba	Dicamba		
	Glyphosate	Glyphosate		
	Herbicide Mixtures	Herbicide Mixtures		
	Imazapic	Imazapic		
	Imazapyr	Imazapyr		
	Metasulfuron-methyl	Metasulfuron-methyl		
	Triclopyr	Triclopyr		
	Pyrethrins, Piperonyl butoxide, Butane, and Propane (Skidoo)	Pyrethrins, Piperonyl butoxide, Butane, and Propane (Skidoo)		
	Chlorpyrifos (Dursban Pro)	Chlorpyrifos (Dursban Pro)		
	Beta-cyfluthrin (Tempo SC ultra	Beta-cyfluthrin (Tempo SC ultra		
50-100 ft	2,4-D	2,4-D	2,4-D	NA
	Aminopyralid	Aminopyralid	NA	
	Chlorsulfuron	Chlorsulfuron	NA	
	Clopyralid	Clopyralid	Clopyralid	
	Dicamba	Dicamba	NA	
	Glyphosate	Glyphosate	Glyphosate	
	Herbicide Mixtures	Herbicide Mixtures	NA	
	Imazapic	Imazapic	NA	
	Imazapyr	Imazapyr	NA	
	Metasulfuron-methyl	Metasulfuron-methyl	NA	
	Sethoxydim	Sethoxydim	NA	
	Sulfometuron methyl	Sulfometuron methyl	NA	
	Triclopyr	Triclopyr	NA	
	Pyrethrins, Piperonyl butoxide, Butane, and Propane (Skidoo)	Pyrethrins, Piperonyl butoxide, Butane, and Propane (Skidoo)	NA	
	Chlorpyrifos (Dursban Pro)	Chlorpyrifos (Dursban Pro)	NA	
	Beta-cyfluthrin (Tempo SC ultra	Beta-cyfluthrin (Tempo SC ultra	NA	

Through ESA consultation, the Corps has identified specific controls for some of the active ingredients:

- Only aquatic labeled herbicides and surfactants shall be used for use within 15 feet of “live” waters or areas with shallow water tables.
- Picloram shall not be applied within 100 feet of water or be sprayed in roadside ditches (dry or wet) that drain to fish-bearing streams.
- The buffer is measured from the ordinary high water mark (OHWM).
- Applications shall not occur when the wind direction is in the direction of the adjacent water body during applications made less than 300 feet from water.
- Marker dyes shall be used to assist in determining proper coverage and targeting of treated species.

Applications shall utilize nozzles and pressures that produce droplets in the 177 to 428 micron range (medium, coarse, very coarse) to reduce the possibility of drift. Nozzles and pressures, which create droplet sizes of 176 microns or less, shall not be used. Droplet sizes of 429 microns or larger (extremely coarse and ultra coarse) are acceptable and encouraged, provided that the volume of the spray solution is not so great as to cause runoff and leaching problems.

6. Biological Control

Biological control is used when invasive plant populations have become so large that eradication or control is no longer deemed possible. Biological control could include targeted and controlled grazing where site conditions are appropriate. Targeted grazing would require controls that would prevent damage to desirable vegetation communities, such as timing or herding.

Table 6 Biological control methods currently employed in the District.

Biological Control Methods
Blunt Knapweed Flower Weevil (<i>Larinus obtusus</i>)
Canada Thistle Stem Weevil (<i>Ceutorhynchus litura</i>)
Chrysolina Leaf Beetle
Competition: Restoration of vegetation with native or naturalized species.
Grazing
Insects
Klamath Weed Beetle (<i>Chrysolina quadrigemina</i>)
Knapweed Root Weevil (<i>Cyphocleonus achates</i>)
Lesser Flowerhead Weevil (<i>Larinus minutus</i>)
Mold
Other
Rush Skeletonweed Gall Mite (<i>Eriophyes chondrillae</i>)
St. Johnswort Inchworm (<i>Aplocera plagiata</i>)
Stem Boring Weevil (<i>Meccinus janthinus</i>)
Thistle Stem Gall Fly (<i>Urophora cardui</i>)
Virus
Yellow Starthistle Bud Weevil (<i>Bangerasternus orientalis</i>)
Yellow Starthistle Flower Weevil (<i>Larinus curtus</i>)
Yellowstar Thistle Hairy Weevil

7. Mammal and Bird Control

Small mammal control is conducted at many locations in the District through contract with the U.S. Department of Agriculture (USDA), Animal Plant and Health Inspection Service (APHIS), and Wildlife Services (WS). Some small mammal control is also performed at Dworshak with project personnel who are certified in vertebrate control.

Chemical mammal control shall include the use of EPA-approved rodenticides (Zinc Phosphide [e.g. Grant's Mole Bait] and strychnine alkaloid [strychnine treated oats]). Surveys for Washington ground squirrel shall be conducted in treatment areas where rodenticides shall be used in Columbia, Franklin, Walla Walla, and Umatilla counties prior to treatment to determine if the species is present. The Corps shall coordinate with a qualified state (WDFW/ODFW/IDFG) biologist trained in identification of Washington ground squirrels and their habitat for the surveys, using approved state procedures and protocols. Rodenticides shall only be used in areas where Washington ground squirrel may occur after surveys for the species have confirmed no presence, or if suitable habitat does not exist in the treatment area.

Rodenticides (baits) have no restrictions on use for wind speed or any buffers from the OHWM, although rodenticides shall not be used in the water.

8. Arthropod Control

Spot spray for arthropods shall be no closer than 15 feet from the water's edge using Skidoo (butane and propane), Dursban Pro (chlorpyrifos), or Tempo SC ultra (beta-cyfluthrin). Usage of insecticides shall occur inside and outside of structures and facilities, and in park and leased areas. Insecticides shall not be applied using broadcast methods.

9. Best Management Practices

The following best management practices (BMPs) shall be implemented and adhered to in addition to label requirements and other State or Federal law:

1. All applicators shall be state licensed or certified.
2. All application equipment (e.g. booms, back packs, etc.) shall be properly calibrated according to the chemical manufacturer's suggested application rates printed on the chemical label prior to use. Equipment and settings shall be properly maintained for the duration of the application period.
3. Dyes shall be used to reduce the potential for over-application.
4. Appropriate sized nozzles shall be used to maximize droplet size and reduce the potential for drift.
5. All concentrated or mixed solution pesticides shall be placed in locked storage in closed containers with watertight lids, placed in secondary containment vessels of 125% when not in use on site or on Corps federal property.
6. All mixing for spray bottles, and backpack sprayers shall be done within secondary containment of 125% capacity of the liquid.
7. Wind speeds identified in Section 5 by chemical shall be adhered to.

8. Buffers from water identified in Section 5 shall be adhered to.
9. All applications shall be made in temperatures of 90 degrees Fahrenheit or less, unless the label conditions are more restrictive.
10. Applications shall not be made 24 hours prior to, a predicted precipitation event sufficient to cause runoff (using NOAA's National Weather Service⁷ to determine probability of a major precipitation event).
11. All applications shall be recorded on Corps Pest Control Application Record in accordance with the instructions in this document. Annual reports for grantees shall be generated by the Corps using data collected in the GIS database from actual use records.
12. ATV storage tanks shall be limited to 30 gallons.
13. A spill kit shall be available to all persons making applications within 150 feet from the site of the application.
14. Refueling of equipment in areas not designed for refueling (i.e. in HMUs) shall not occur within 100 feet of open water. This includes ATVs, trucks, tractors, aircraft, etc.
15. All applicators shall develop and carry a Spill Prevention and Control Plan, or detailed requirements shall be explicitly spelled out in contract specifications by the Corps prior to contractor personnel or equipment operation near any stream drainage. The Plan shall provide detailed descriptions on how to prevent a spill or ensure effective and timely containment of any chemical spill. The Spill Prevention and Control Plan shall include spill control, containment, clean up, and reporting procedures.
 - a. Each Contractor vehicle carrying herbicides shall be equipped with a spill cleanup kit. The cleanup kit shall be capable of containing and holding at least 125% of the total mixture and concentrate that are present on the work site. The Contractor shall report all details of herbicide spills, exposure incidents, or accidents and/or worker health complaints, if any occur, to the Corps as soon as practicable. Contractor vehicles already equipped with secondary containment must have this spill cleanup kit available within a 5-minute response time.
 - b. No herbicide mixing shall be authorized within 100 feet from any body of water or stream channels. Equipment will have either an anti-back siphon valve or an air break on tank fill connections or openings to prevent contamination of on-site water sources.
 - c. Mixing (other than that of equipment that mixes internally as applications are being made) shall be performed within a temporary structure made of impermeable material such as plastic that is capable of containing at least 125% of the capacity of the spray tank that is being used, or on appropriate absorbent materials of sufficient capacity to absorb the entirety of that volume of the tank being mixed. Examples of the temporary mixing structure shall be a wooden frame lined with plastic sheeting or a child's wading pool.
 - d. Equipment shall be inspected for leaks and cleaned prior to crossing any stream. Any detected leaks shall be repaired before the equipment crosses the stream or near open water when not on an existing road.
 - e. Equipment shall be inspected and cleaned prior to any application of herbicides within 150 feet of open water.
16. Application equipment shall be maintained to ensure proper application rates, to minimize leakage potential, reduce the potential for drift, and ensure applicator safety.

⁷ <http://www.weather.gov> is suggested, but other similar sources may be used.

Equipment shall be maintained, and visually inspected prior to each application includes, but is not limited to: hoses, nozzles, backpacks, and booms.

17. All applicators shall comply with all applicable federal, state (OR, ID, and WA) and herbicide manufacturer's directions and requirements for handling herbicides and insecticides, including storage, transportation, application, container disposal, and cleanup of spills.
18. Herbicide treatments to foliage of weed species shall be according to the chemical manufacturer's recommendations for best results, unless this document identifies more stringent requirements that must be followed. Applicators shall use caution to minimize the application of herbicides to non-target species and structures within the application areas.
19. Any ESA-listed plant that is found shall be inventoried, and its location captured either in GIS or by GPS, or both, and put into the District's inventory for future avoidance and planning purposes. Herbicides shall not be applied with aircraft within 300 feet, broadcast within 100 feet, or spot sprayed within 15 feet of ESA-listed plant locations identified during applications. Spraying of targeted species is limited to vinegar or similar within 300 feet or closer to known ESA-listed plant locations. See Attachment 3 for ESA-listed plants that are listed in counties within the treatment areas within the District.
20. Crossing any open water body with spray equipment (i.e., floating vessels or land vehicles) or chemicals shall be avoided if there is any land access (e.g., road or ATV trail) to the treatment areas. If land access is not available or inaccessible due to steep terrain, all concentrated or mixed chemicals shall be transported within floating secondary containment vessels of 125% capacity of the liquid.
21. Disposal of waste materials shall be in accordance with the label and in accordance with all applicable federal, state, and county laws regulations, as well as label restrictions and instructions.
22. All invasive, non-native riparian vegetation that is treated with herbicides shall be monitored for 2 years following treatment. If desirable vegetation does not reestablish itself naturally, the Corps may plant or seed new native riparian vegetation in order to reduce the need for future chemical application in the area, and to improve shade and cover for listed fish and their habitat.
23. Motorized herbicide application equipment shall not be operated on slopes greater than 25 percent (if not on existing roads) in order to minimize risk of soil erosion, spills, or chemical runoff, as well as for safety reasons.
24. No more than one application of picloram shall be made on an area in any given year to reduce the potential for picloram accumulation in the soil.
25. No spraying of picloram shall be authorized within 100 feet of any flowing waters or areas with shallow water tables. Avoid application of picloram within dry ephemeral stream channels and dry roadside ditches that drain directly into fish bearing streams.
26. Applicators shall not spray if snow or ice covers the target foliage.
27. Nozzles and pressures which create droplet sizes of 176 microns or less shall not be used.
28. All aerial applications shall be done on the contour. No turns would be allowed over "live" waters (e.g., flowing ditches, streams, ponds, springs, etc.) even though the booms are turned off at the end of each run.

29. Only aquatic labeled herbicides and surfactants shall be used within 15 feet of “live” waters or areas with shallow water tables. For example, only the aquatic formulations of 2,4-D and glyphosate shall be used within 15 feet of water.
30. Only non-ester forms of 2,4-D shall be used (no use of 2,4-D ester formulations shall be used).
31. Skidoo (pyrethrins, piperonyl butoxide, butane, and propane) and Tempo SC ultra (beta-cyfluthrin) (insecticide) applications shall be limited to spot spraying no closer than 15 feet from the water’s edge. Applications shall not be made when the wind is blowing toward the water, or when the insecticide has the potential to enter the water through drift or run-off.
32. Surveys for Washington ground squirrel shall occur prior to using rodenticides in those areas where they are listed as candidates for listing under the ESA. Rodenticides shall only be used in areas where Washington ground squirrel may occur after surveys for the species have confirmed no presence, or if suitable habitat does not exist in the treatment area. If the species is confirmed in an area, the Corps shall work with the USFWS and local state wildlife agencies to minimize the potential impacts to Washington ground squirrel.

10. Reseeding/Site Restoration

If a site were to be cleared for some reason, replanting would occur to enhance the native vegetation’s ability to revegetate the site. Because of the forested conditions at Dworshak, reseedling does not typically occur, and native vegetation is allowed to recolonize any treated areas. The following actions shall be taken to prevent erosion, restore native vegetation, and stop the proliferation of noxious weeds.

1. The geographic relief shall be returned to pre-work state, to include removal of ruts, mounding and any access road(s) deemed unacceptable to remain on site by the Corps. The area shall be shallowly disked or harrowed (approximately 2 inches deep), and hand-raked or hand-pulled to remove all large weeds and skeletons from last year's weeds. The soil surface should have furrows approximately 1-2 inches deep after this activity. The entire impacted area shall be immediately seeded with seed mix using a seeder. All ground preparation and seeding shall be initiated no earlier than February 1 and completed no later than March 1.
2. Anyone performing reseedling shall use native seed appropriate to the area, with the greatest potential habitat value. Plantings could include trees, shrubs, and forbs. Examples of selected species and seeding lbs per acre include:
 - Great basin Wildrye - *Leymus cinerius*; 4 lbs per acre
 - Idaho Fescue - *Festuca idahoensis*; 4 lbs per acre
 - Indian Rice Grass - *Anchnatherum hymendides*; 4 lbs per acre
 - Needle and Thread - *Hesperostipa comate*; 6 lbs per acre
 - Sherman Big Blue - *Poa secunda*; 2 lbs per acre
 - Secar Bluebunch Wheatgrass - *Pseudoregneria spicata*; 4 lbs per acre
 - Sand Dropseed - *Sporobolus cryptandrus*; ½ lbs per acre
3. Herbicidal control for the following noxious weeds shall be completed for 2 consecutive

years following site restoration: Canada thistle, scotch thistle, bull thistle, yellow star, knapweed species, rush skeletonweed, field bindweed, dalmation toadflax, camethorn, water hemlock, kochia, purple loosestrife, and puncture vine. Application of herbicides shall occur during spring and early summer when weeds are in the rosette stage of growth. After final application of herbicide, the absence of noxious weeds on affected grounds to be commensurate with that on surrounding un-impacted grounds.

4. All invasive, non-native riparian vegetation that is treated with herbicides shall be monitored for 2 years following treatment. If desirable vegetation does not reestablish itself naturally, managers shall plant or seed new native riparian vegetation in order to reduce the need for future chemical application in the area, and to improve shade and cover for listed fish and their habitat.

11. Anticipated Use and Actual Use Records and Data

Grantees, contractors, and Corps employees shall perform work planning and annual reporting by submission of records (anticipated and actual use) or by GIS data. All of this information shall be compiled into a GIS database.

Notification as early as practical is required for large-scale aerial applications of herbicides (or other pesticides) that are intended to prevent large weed infestations or damage to native vegetation following a wildfire or other natural disaster.

Overview of IPMP GIS

Purpose

The purpose of the Integrated Pest Management Plan (IPMP) database (db) is to comply with legal requirements, maintain District data regarding animal and vegetation pest control, to supply information to managers and planners, and to support planning and execution of the program.

Specifically, the objectives of the IPMP db are to:

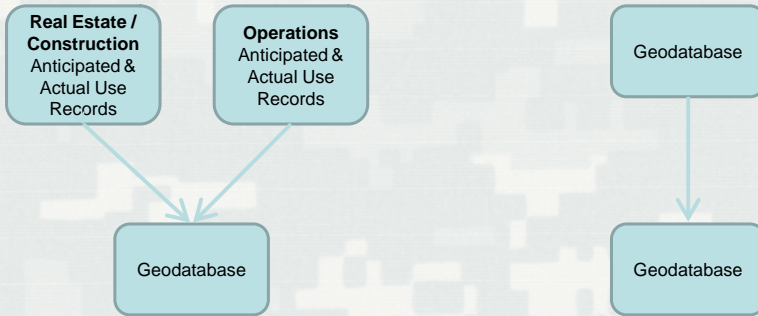
- Maintain records of actual pest management actions
- Maintain records on anticipated pest management actions
- Screen Outgrant applications by proposed pest management actions
- Produce annual plan of proposed pest management actions
- Produce annual reports of actual pest management actions

Flow of information

Data collection occurs via one of two options. For applicators that are not-GIS capable, PDF records are used to collect both anticipated and actual pest control information. Applicators that possess GIS capabilities can populate a template geodatabase with pest control data. See Figure1.

General Data Flow

- Non-GIS capable
 - Real Estate (Grantees, etc.), Construction
 - Operations
- GIS capable
 - Large contractors, USACE

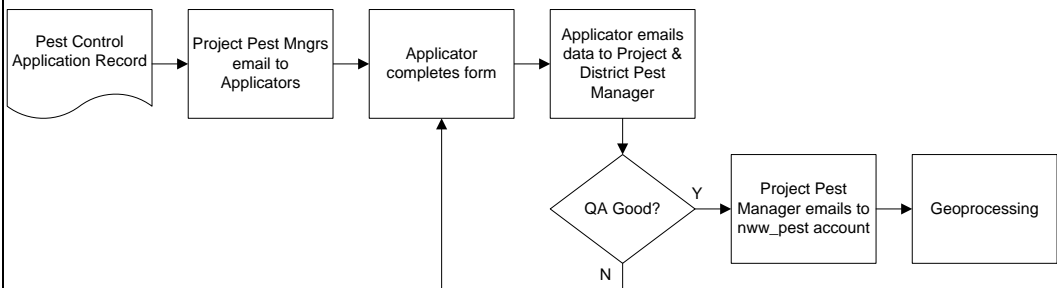
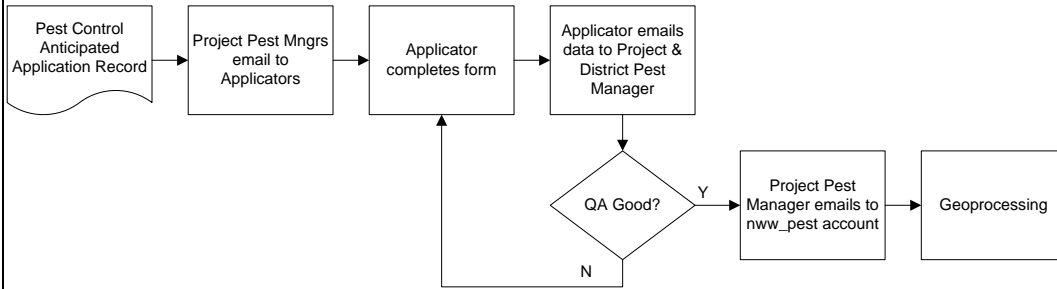


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Figure 1

Two data collection forms are used a Pest Control Anticipated Application Record, and a Pest Control Application Record. Each record has four varieties: a Real Estate / Construction version, an Operations version, a USDA version, and Quality Assurance version. Training materials and blank PDF records will be provided to applicators via email or may be accessed on the internet at: <http://www.nww.usace.army.mil/Missions/Projects/Pest-Management/> See Figure 2. Copies of a blank geodatabase and training materials will be provided to GIS-capable applicators by Project Pest Managers. See Figure 3.

Non-GIS data flow: Operations



Non-GIS data flow: Real Estate

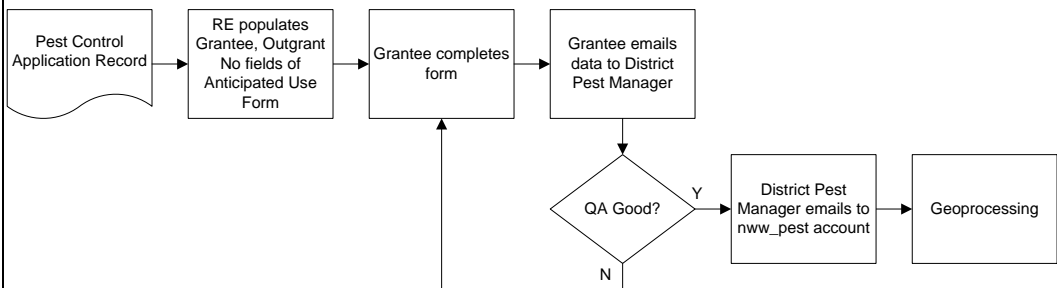
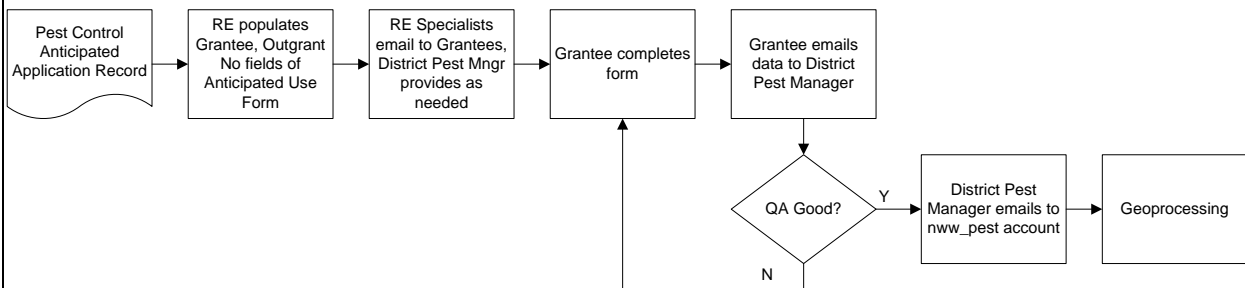


Figure 2

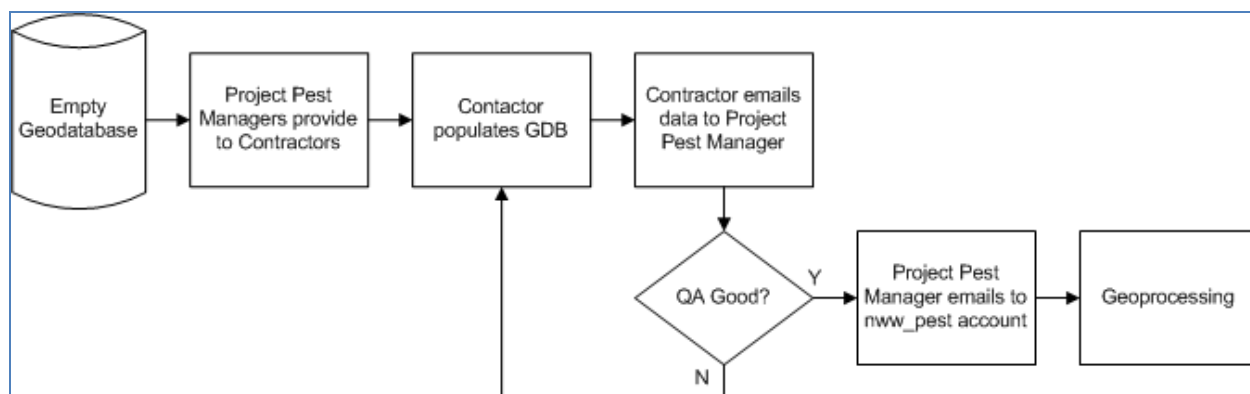


Figure 3

Instructions

Detailed instructions by functional area follow.

Instructions for Realty Specialists

Pest Control Anticipated Application Record (Real Estate / Construction): Grantees are required to provide information about their anticipated use of pest controls to the Corps of Engineers by **February 15th** of the application year. Because the report is an estimate of total pest control use for a year, detailed geographic information about application locations is not required. Instead, anticipated use data in the record is matched by the contents of the 'Outgrant No' field to the 'SDSFEATURENAME' field of the Outgrant_A featureclass in the NWW enterprise geodatabase. It is therefore vital that these fields match. To reduce the burden on Grantees, Realty Specialists will populate the 'Grantee', 'Outgrant No', and 'For year' fields as appropriate prior to emailing the Pest Control Anticipated Application Record (Real Estate / Construction) to the Grantee. The Record will be provided by Real Estate to the grantee by December 15th, prior to the application year.

The Grantee returns the data to the District Pest Manager. Upon a successful QA review, it will be ingested into the enterprise geodatabase. The assigned Realty Specialist will query the geodatabase and record compliance by the Grantee with the requirement to provide anticipated pest control information.

Pest Control Application Record (Real Estate / Construction): Grantees are required to provide detailed information about a pest control application within 7 days of an application. This is accomplished by completing the Pest Control Application Record PDF record. Realty Specialists will email this record to Grantees by November 15th, prior to the application year.

Instructions for Applicants (Grantees/Construction Contractors): PDF Records

Pest Control Anticipated Application Record (Real Estate / Construction): This record must be completed and returned by **February 15th** of the application year. A separate record must be completed for each pest control category or change in chemical formulation. Once completed, data is sent to the District Pest Manager (NWW.DistrictPestManager@usace.army.mil). The

preferred format for the data is an xml attachment. If this is not possible, the data may be returned saved in a PDF file. For instructions on how email data as an xml file from a PDF record using the record's 'Email Data' button, see Attachment 1.

-Pesticide Application Sponsor block: This block of fields contains information about the person or agency for which the pesticide was applied; the beneficiary of the pest management action. The fields 'Grantee', 'Outgrant No', and 'For year' should be filled out when you receive the record. If not, contact the assigned Realty Specialist.

-Pesticide Control Medium: This block contains information on the type of application, is it Terrestrial application (Above OHWM or Water's edge to OHWM) or an Aquatic application. Walla Walla District has two separate ESA consultation covering the type of application and these consultations dictate the types of chemicals, biological, and mechanical methods that can be used. Walla Walla District has to track these applications separately to meet reporting requirements under the district's Environmental Protection Agency (EPA) National Pollution Discharge Elimination System Pest General Permit.

-Treatment Control: This block of fields contains information about the type of pest control proposed, categorized into one of four options: Chemical, Biological, Manual, and Mechanical

--Chemical: Enter the **aquatic registered** product's label name in the 'Trade Name' field. The chemical must have an Active Ingredient from the approved list in the 'Active Ingredient (AI)' field. Enter the amount of Active Ingredient, in pounds in the 'Pounds of AI' field. Note that this is not the amount of chemical product as sold, but only the weight of the active ingredient. Add additional lines to the Pest Control Category Chemical table as needed to report each Active Ingredient proposed.

--Biological: Select the Biological control from the approved list. If a selection of Other is made, enter additional information in the 'Comments' block. Add additional lines to the Pest Control Category Biological table as needed to report each Biological control proposed.

--Mechanical: Select the Mechanical control from the approved list. If a selection of Other is made, enter additional information in the 'Comments' block. Add additional lines to the Pest Control Category Mechanical table as needed to report each Mechanical control proposed.

--Manual: Select the Manual control from the approved list. If a selection of Other is made, enter additional information in the "Comments" Block. Add additional lines to the Pest Control Category Manual table as needed to report each Manual control proposed.

-Target Species block: First select from the 'Pest Category' field the class of pest to be controlled per the entry in the Pest Control Category block. Then select from the options in the 'Pest Name' field. Add additional lines to the Target Species table as needed to report each

Target Species to be controlled. If a selection of Other is made, enter additional information in the 'Comments' block.

Pest Control Application Record (Real Estate / Construction): This record must be completed and returned by email within 7 days of a pest control application to the assigned District Pest Manager. The preferred format for the data is an xml attachment. If this is not possible, the data may be returned saved in a PDF file. For instructions on how email data as an xml file from a PDF record using the record's 'Email Data' button, see Attachment 1.

-Pesticide Application Sponsor block: This block of fields contains information about the person or agency for which the pesticide was applied; the beneficiary of the pest management action. For Construction projects the Grantee and Outgrant No. can be populated with "NA".

-Licensed Pest Applicator block: This block of fields contains information about the person who performed pesticide application, if different from the Application Sponsor. Also includes an alternate applicator, if applicable.

-Pesticide Control Medium: This block contains information on the type of application, is it Terrestrial application (Above OHWM or Water's edge to OHWM) or an Aquatic application. Walla Walla District has two separate ESA consultation covering the type of application and these consultations dictate the types of chemicals, biological, and mechanical methods that can be used. Walla Walla District has to track these applications separately to meet reporting requirements under the district's Environmental Protection Agency (EPA) National Pollution Discharge Elimination System Pest General Permit.

-Treatment Control: This block of fields contains information about the type of pest control proposed, categorized into one of four options: Chemical, Biological, Manual, and Mechanical.

--Chemical: Enter the aquatic registered product's label name in the 'Trade Name' field. The chemical must have an Active Ingredient from the aquatic approved list in the 'Active Ingredient (AI)' field. Enter the amount of Active Ingredient, in pounds in the 'Pounds of AI' field. Note that this is not the amount of chemical product as sold, but only the weight of the active ingredient. In the 'Pesticide Classification' field, show if the Active Ingredient is designated for General or Restricted-use by either the Environmental Protection Agency or state. Add additional lines to the Pest Control Category Chemical table as needed to report each Active Ingredient proposed.

--Biological: Select the Biological control from the approved list. If a selection of Other is made, enter additional information in the 'Comments' block. Add additional lines to the Pest Control Category Biological table as needed to report each Biological control proposed.

[Currently no Biological controls are approved in the Walla Walla District Aquatic Pest Management program.](#)

--Mechanical: Select the Mechanical control from the approved list. **If a selection of Other is made, enter additional information in the 'Comments' block.** Add additional lines to the Pest Control Category Mechanical table as needed to report each Biological control proposed.

--Manual: Select the Manual control from the approved list. If a selection of Other is made, enter additional information in the "Comments" Block. Add additional lines to the Pest Control Category Manual table as needed to report each Manual control proposed.

-Aquatic Application Situation: This box appears when an aquatic pest control medium is selected. Walla Walla District is limited in the amount of acres that can be treated per area type or situation. The pest control situations provided in Table 3 and the limits of acres allowed to be treated per year. See table 3 above on page 7 in section 6

-Pest Management Application block: This block of fields contains information about the environmental conditions during the application, and the method of application. Date of Application, Start Time and Stop Time, Acres treated, Wind direction and speed (mph), Temperature at time of application, Application Method, Platform used, Medium applied to, and Comments. Use comments to provide additional description of the location of the site and why performing the application (Ex: parking lot on west side of Charbonneau park to treat weeds growing through asphalt and around vegetation islands). This box can help the QA process if GPS etc. are off.

-GPS Coordinates (WGS84, Decimal Degrees) of Application block: This block of fields contains information about the location of the application. All areas reported with the Pest Control Application Record are described as a point with a single longitude and latitude pair. The longitude and latitude must be in the WGS84 coordinate system, and recorded as decimal degrees. Enter position information to at least the forth decimal place (46.0001). From this point, a radius is estimated in feet that will result in a circular area approximately equal to the application area. See Attachment 4 for additional information about this method. Add additional lines to the GPS Coordinates table as needed to report each application area.

-Target Species block: First select from the 'Pest Category' field the class of pest to be controlled per the entry in the Pest Control Category block. Then select from the options in the 'Pest Name' field. Add additional lines to the Target Species table as needed to report each Target Species to be controlled. If a selection of Other is made, enter additional information in the 'Comments' block.

Instructions for Applicators (Operations): PDF Records

Pest Control Anticipated Application Record (OPS): The instructions are the same as for Grantee use of the Pest Control Anticipated Application Record (Real Estate / Construction), with the following exceptions: that there is no 'Grantee' field , no 'Outgrant No' field and there is a 'Pest Mgmt AOR'. The 'Pest Mgmt AOR' field is populated with the name of one of the following six Pest Manager Areas of Responsibility: McNary (McNary Dam to Wallula Gap),

Snake River West (Wallula Gap to Richland WA; up Snake River to Joso Bridge), Snake River East (Joso Bridge up Snake River to Lewiston, ID), Dworshak, Lucky Peak, and Mill Creek (including the district HQ and airport annex buildings). This is determined by the predominant area of the anticipated application. For example, if 90% of reported anticipated applications occur in the Snake River West area, enter Snake River West into the 'Pest Mgmt AOR' field. See Figures 4 – 9.

Pest Control Application Record: The instructions are the same as for Grantee use of the Pest Control Application Record with the same exceptions noted in the preceding paragraph.

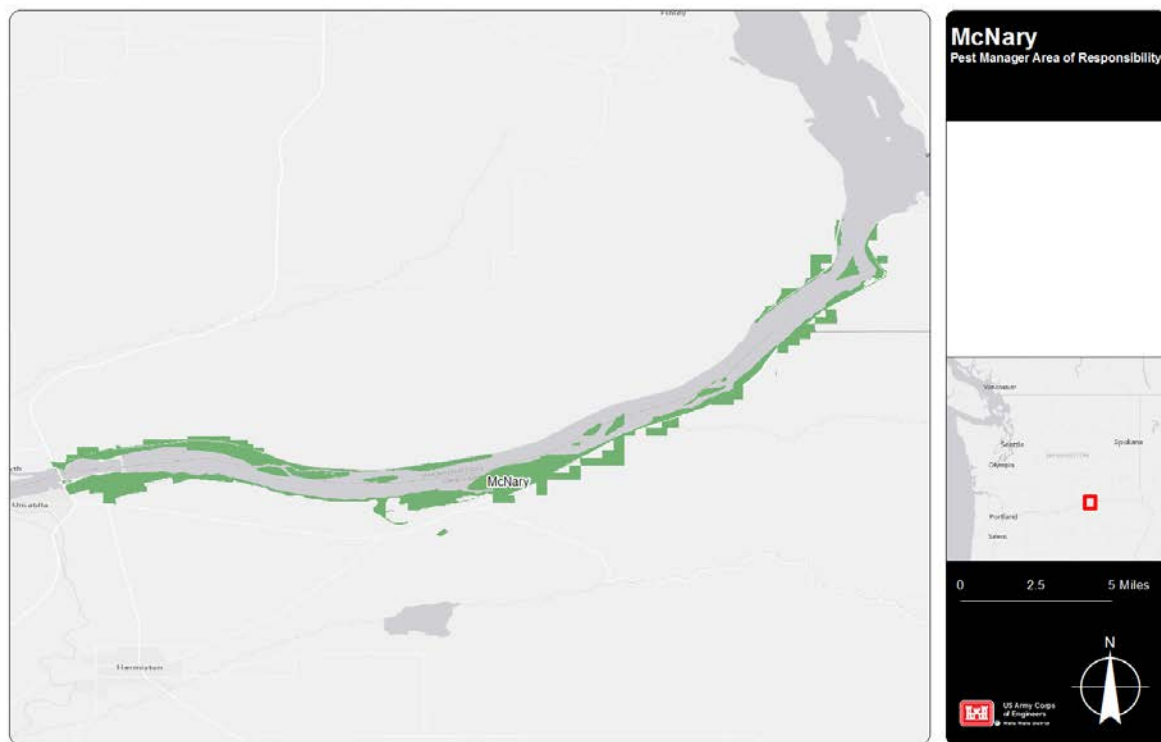


Figure 4



Figure 5

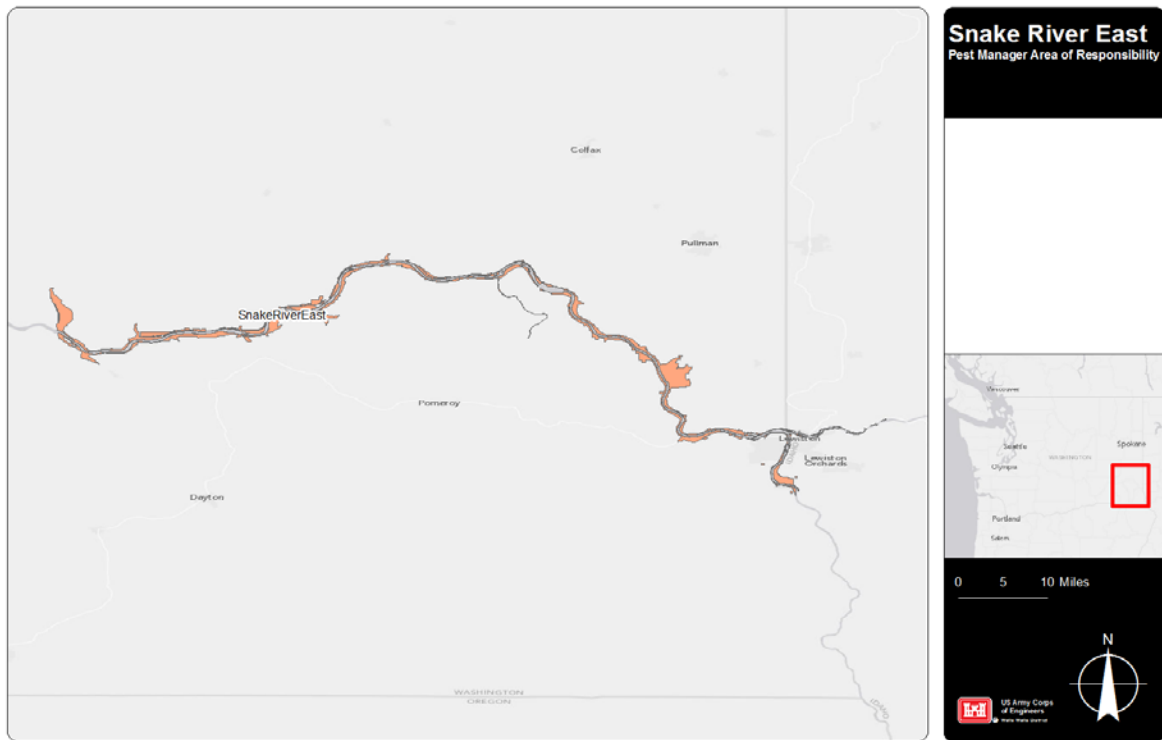


Figure 6

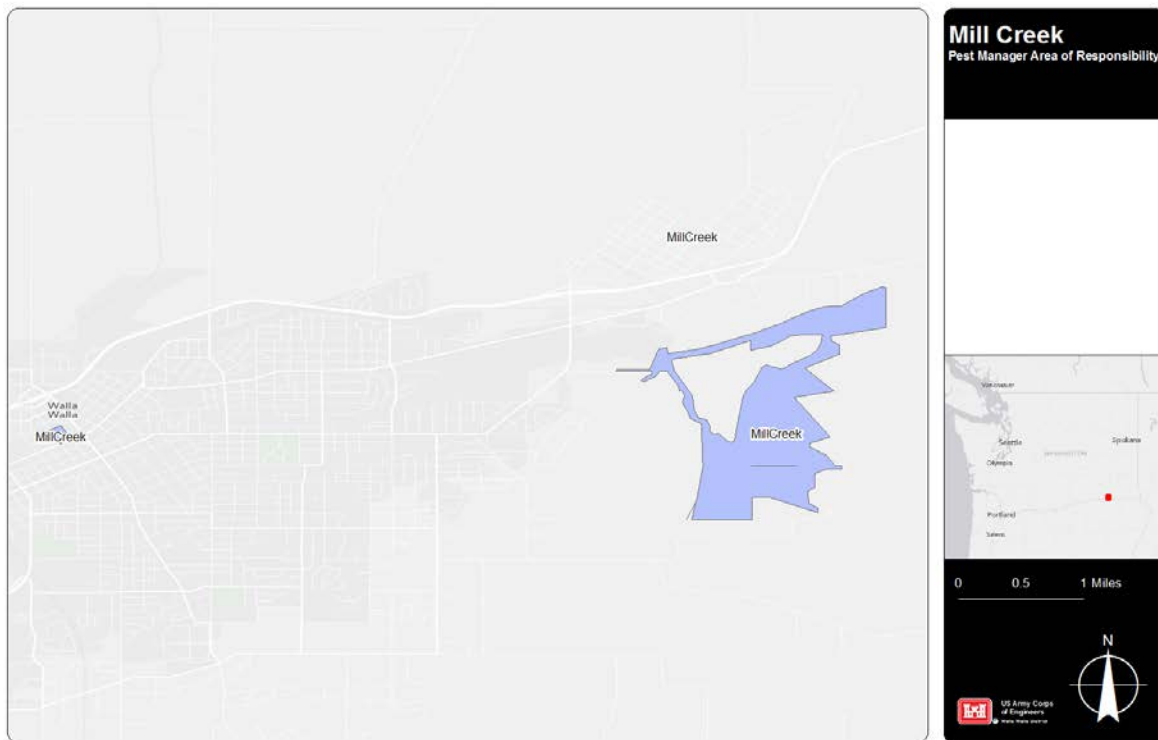


Figure 7

Instructions for Applicators (OPS): Geodatabase

File Geodatabase: The IPMP db is a relational database containing seven non-spatial and one spatial tables. See the IPMP Database Data Dictionary for a detailed explanation of all tables, fields, and domains used in the db. See the IPMP Database Schematic for a visual representation of the relationships between tables. Use the example featureclass' primary keys as a starting point, and submit the populated database to the assigned Project Pest Manager.

Instructions for Applicators (Grantees / Contractors): Geodatabase

File Geodatabase: The IPMP db is a relational database containing seven non-spatial and one spatial tables. See the IPMP Database Data Dictionary for a detailed explanation of all tables, fields, and domains used in the db. See the IPMP Database Schematic for a visual representation of the relationships between tables. Use the example featureclass' primary keys as a starting point, and submit the populated database to the District Pest Manager.

Instructions for Project and District Pest Managers

Pest Control Application Record, Pest Control Anticipated Application Record and QA versions: When the Grantee or Contractor returns the data to the Project or District Pest

Manager, it will arrive as an email attachment in one of two formats: an xml file, or a pdf file. The Project or District Pest Manager will perform a quality assurance check of the data for completeness. If the data is not sufficient, coordinate with the applicator for revision. If the data is complete, only one format is permitted, transmit the data *as an xml attachment* to the NWW_pest_mgmt_reports@usace.army.mil inbox. For instructions on how to examine xml data using the QA record, see Attachment 2.

File Geodatabase: When an applicator submits a populated file geodatabase, the Project or District Pest Manager will perform a quality assurance check of the data for completeness. If the data is not sufficient, coordinate with applicator for revision. If the data is complete, transmit the data to the NWW_pest_mgmt_reports@usace.army.mil inbox as a zip file.

Instructions for NWW HQ GIS Staff

Record Data (xml): Non-GIS capable applicators will submit data in xml via email to Project or District Pest Managers inbox for QA. After the data is verified, it will be forwarded to the NWW_pest_mgmt_reports@usace.army.mil inbox. Scripting copies xml attachments to the IPMP\Data\Incoming folder, and moves the email to the Processed folder of the inbox. Additional scripting processes the xml data in the IPMP\Data\Incoming folder, inserting it into the enterprise geodatabase. To read xml, this script requires the elementtree. ElementTree module to be installed in C:\Python27\ArcGIS10.1\Lib\site-packages. The source is available at <http://effbot.org/zone/element-index.htm> and a copy is on the network at \nww_egis\GeoTools\Software\Python\elementtree-1.2.7-20070827-preview.win32.exe.

File Geodatabase: Receive zip files of geodatabases from District or Project Pest Managers, and store in the egis folder structure under the appropriate year and project. The GIS-capable applicators will populate a template geodatabase that is empty except for a seed feature in each table and featureclass. The seed features will all have IDPK Project ID and Applicator ID equal to zero. GIS staff will de-conflict and assign Project ID and Applicator ID numbers, and communicate them to GIS users. Use the 'Update IDPKs In Applicator GDB' script tool to insert the required Project ID and Applicator ID into all IDPKs. Check for sequence number duplication in the IDPKs, reassign if required, then use the 'Append Applicator GDB to SDE' script tool to add the data to the enterprise database.

Attachment 1: Save and email data as an xml file from a PDF record using the record's 'Email Data' button (Acrobat XI Reader)


To save and email xml data using the 'Email Data' button (shown with green rectangle below):

1. Fill out the record, and then click the button. If a required field is not filled in, an announcement is made:

PestControlAnticipatedApplicationRecord - RE.pdf (SECURED) - Adobe Reader

File Edit View Window Help

1 / 2 72.5% Tools Sign Comment Extended

 **PEST CONTROL ANTICIPATED APPLICATION RECORD - Real Estate / Construction**

US Army Corps of Engineers
Walla Walla District

ATTENTION: This record must be completed prior to January 1st, and a separate record completed for each pest control category or change in formulation. It must be forwarded electronically via email to the assigned Corps of Engineers Pest Manager.

OMB NUMBER: Pending
EXPIRES (MM/DD/YYYY):

Email Data

Reset all but Applicator Data

1. Pesticide Application Sponsor

*Grantee *Outgrant No *For year

*Firm Name *First Name *Last Name

*Street Address

2. Pest Control Category **0. Chemical**

Add Row Trade Name

Delete Row name

Comments comment

3. Target Species

Add Row

Delete Row Vegetation Bare Ground

Warning: JavaScript Window -

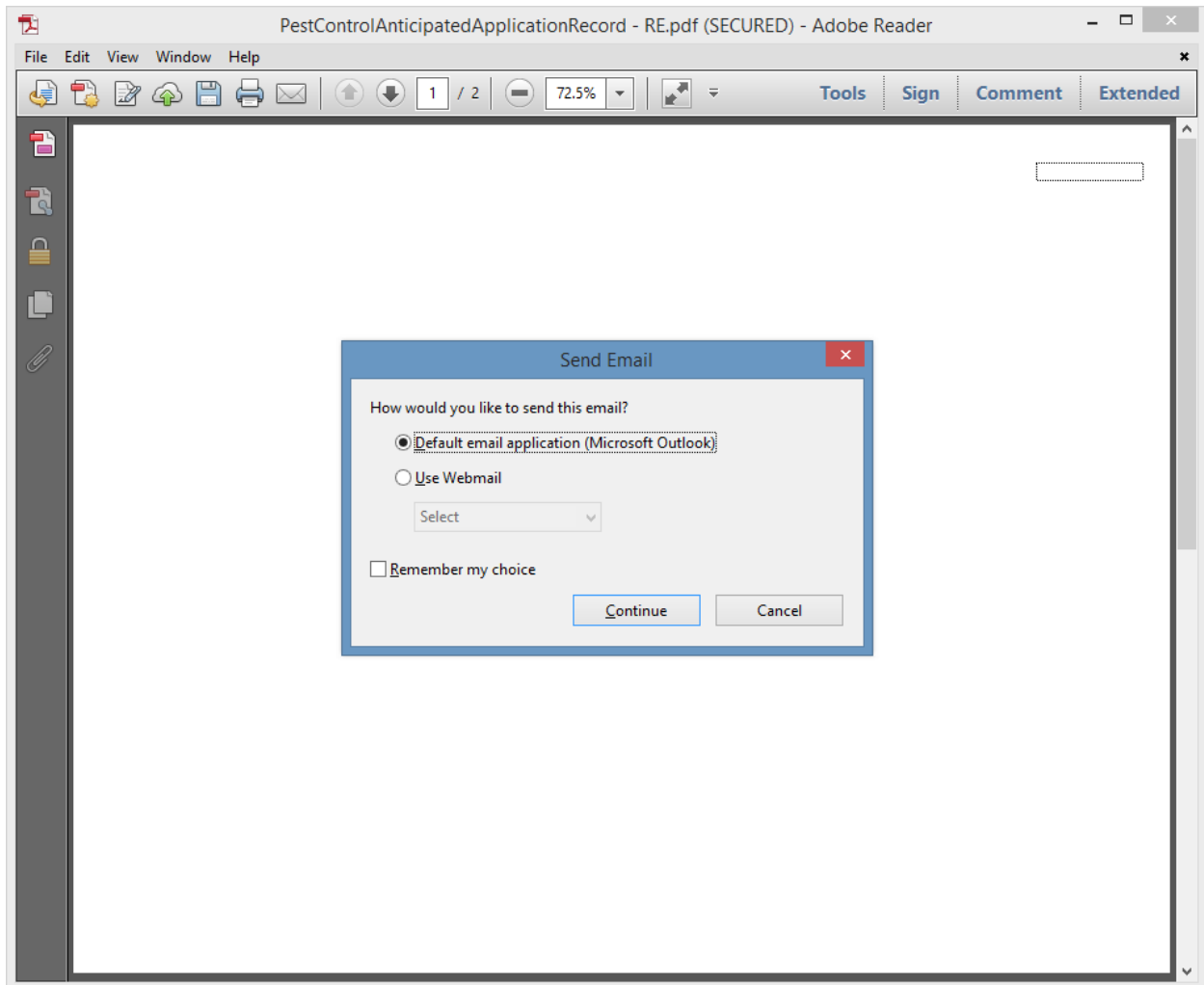
Please fill in Pesticide Application Sponsor Last Name.

OK

NWW Form 1000-d, Feb 2014

Page 1 of 2

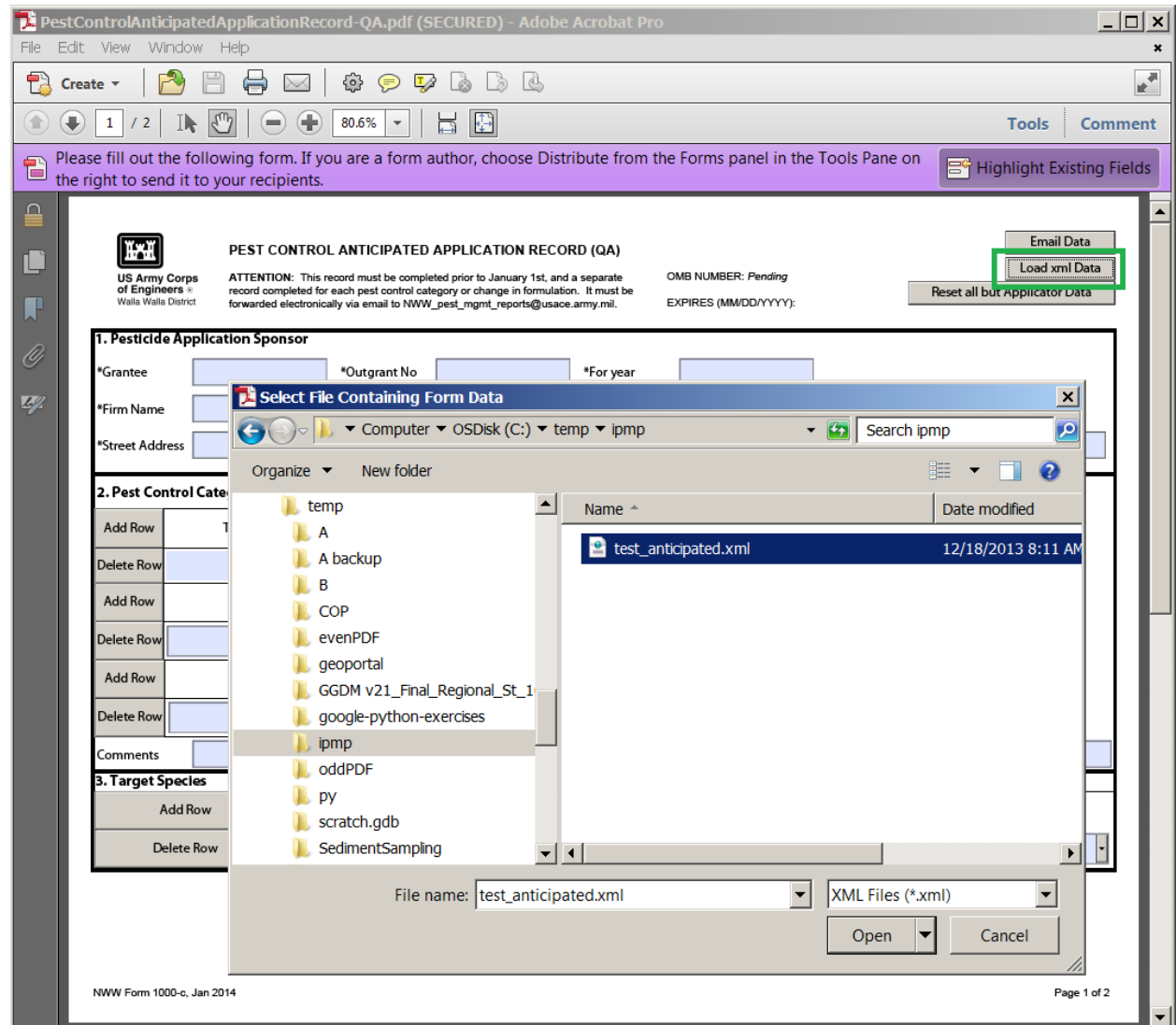
2. Once validation passes, the Select Email Client dialogue presents two options: Default Email Application or Webmail. Selecting Default Email Application will look for an email program such as Microsoft Outlook, open a new, preaddressed email, and attach the record data as an xml file. **We Recommend adding to the xml file the date and site location, like 2-5-2017-HoodPark.** The Webmail option will prompt for information about your webmail account. **Do not chose remember my choice; because if you ever change email servers or webemail you will have problems with emailing the PDFs in the future.**



Attachment 2: Performing QA of xml data (Acrobat X Pro)

To load an xml file into a PDF record for viewing by using the QA form's "Load xml Data" button:

1. Click the "Load xml Data" button on the form, then navigate to the desired xml file.



To load an xml file into a PDF record for viewing by using the toolbar:

1. Click "Tools" as shown in the green rectangle to open the toolbar, then Forms, More Form Options, Manage Form Data, Import Data, then navigate to the desired xml file.

PestControlAnticipatedApplicationRecord-QA.pdf (SECURED) - Adobe Acrobat Pro

File Edit View Window Help

Create [Icons] 1 / 2 [Icons] 62.5% [Icons] **Tools** Comment

Please fill out the following form. If you are a form author, choose Distribute from the Forms panel in the Tools Pane on the right to send it to your recipients.

Highlight Existing Fields

Forms

Create

Edit in Designer

Distribute

Track

Highlight Existing Fields

Clear Form

More Form Options

Compile Returned Forms...

Manage Form Data

QuickBooks

Sign & Certify

PEST CONTROL ANTICIPATED APPLICATION RECORD (QA)

US Army Corps of Engineers - Walla Walla District

ATTENTION: This record must be completed prior to January 1st, and a separate record completed for each pest control category or change in formulation. It must be forwarded electronically via email to NWW_pest_mgmt_reports@usace.army.mil.

OMB NUMBER: Pending

EXPIRES (MM/DD/YYYY):

Email Data

Load xml Data

Reset all but Applicator Data

1. Pesticide Application Sponsor

*Grantee test *Outgrant No DACW68-2-88-25 *For year 1999

*Firm Name firmName *First Name firstName *Last Name lastName

*Street Address streetAddress *City city State Washington *ZIP 99999 *Telephone (999) 999-9999

2. Pest Control Category 0. Chemical

Add Row	Trade Name	Active Ingredient (AI)	Pounds of AI
Delete Row	test	AgriDex (Surfactant)	999
Add Row	Biological Control		
Delete Row			
Add Row	Mechanical Control		
Delete Row			

Comments

3. Target Species

Add Row	Pest Category	Pest Name
Delete Row	Vegetation	Bare Ground

NWW Form 1000-c, Jan 2014

Page 1 of 2

- The record populates with data from the xml file:

PestControlAnticipatedApplicationRecord-QA.pdf (SECURED) - Adobe Acrobat Pro

File Edit View Window Help

Create [Icons]

1 / 2 [Icons] 51.5% [Icons] Tools Comment

PEST CONTROL ANTICIPATED APPLICATION RECORD (QA)

US Army Corps of Engineers
Walla Walla District

ATTENTION: This record must be completed prior to January 1st, and a separate record completed for each pest control category or change in formulation. It must be forwarded electronically via email to NWW_pest_mgmt_reports@usace.army.mil.

OMB NUMBER: Pending
EXPIRES (MM/DD/YYYY):

Email Data
Load xml Data
Reset all but Applicator Data

1. Pesticide Application Sponsor

*Grantee: test *Outgrant No: DACW68-2-88-25 *For year: 1999

*Firm Name: firmName *First Name: firstName *Last Name: lastName

*Street Address: streetAddress *City: city State: Washington *ZIP: 99999 *Telephone: (999) 999-9999

2. Pest Control Category 0. Chemical

Add Row	Trade Name	Active Ingredient (AI)	Pounds of AI
Delete Row	test	AgriDex (Surfactant)	999
Add Row	Biological Control		
Delete Row			
Add Row	Mechanical Control		
Delete Row			

Comments

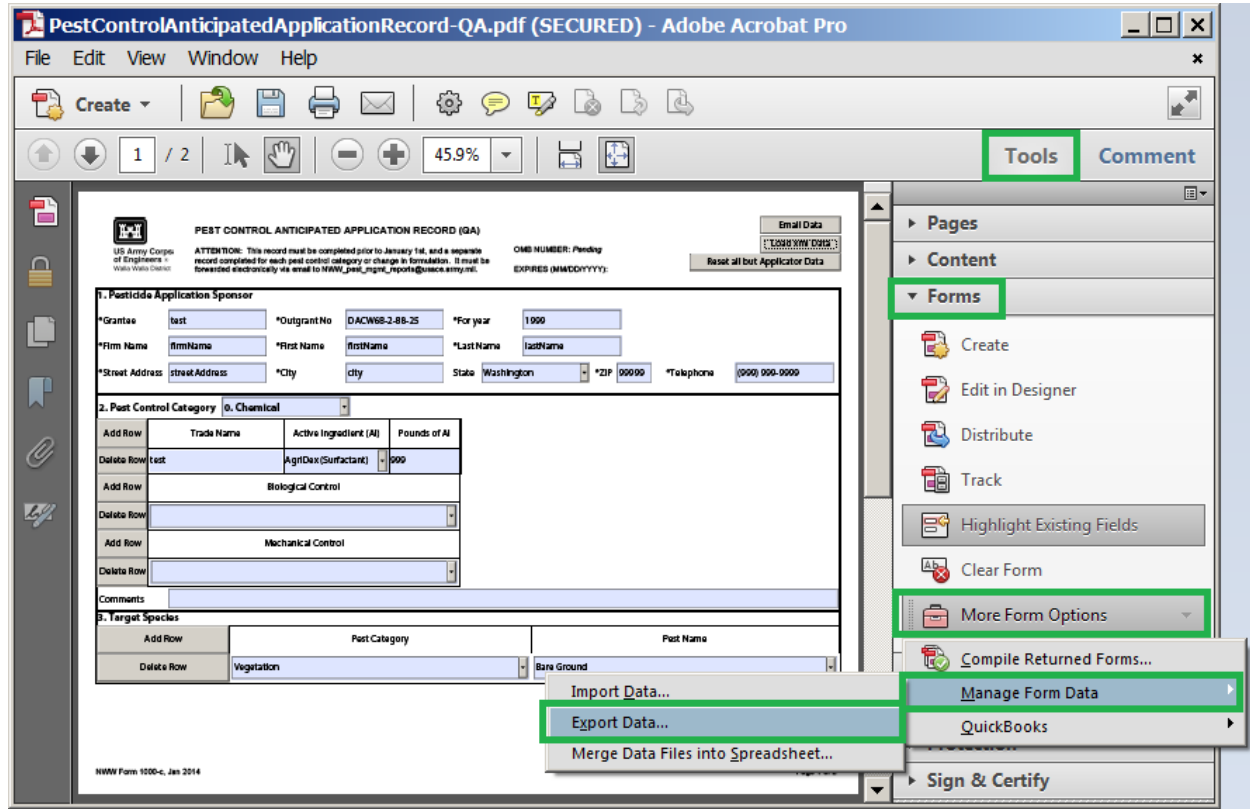
3. Target Species

Add Row	Pest Category	Pest Name
Delete Row	Vegetation	Bare Ground

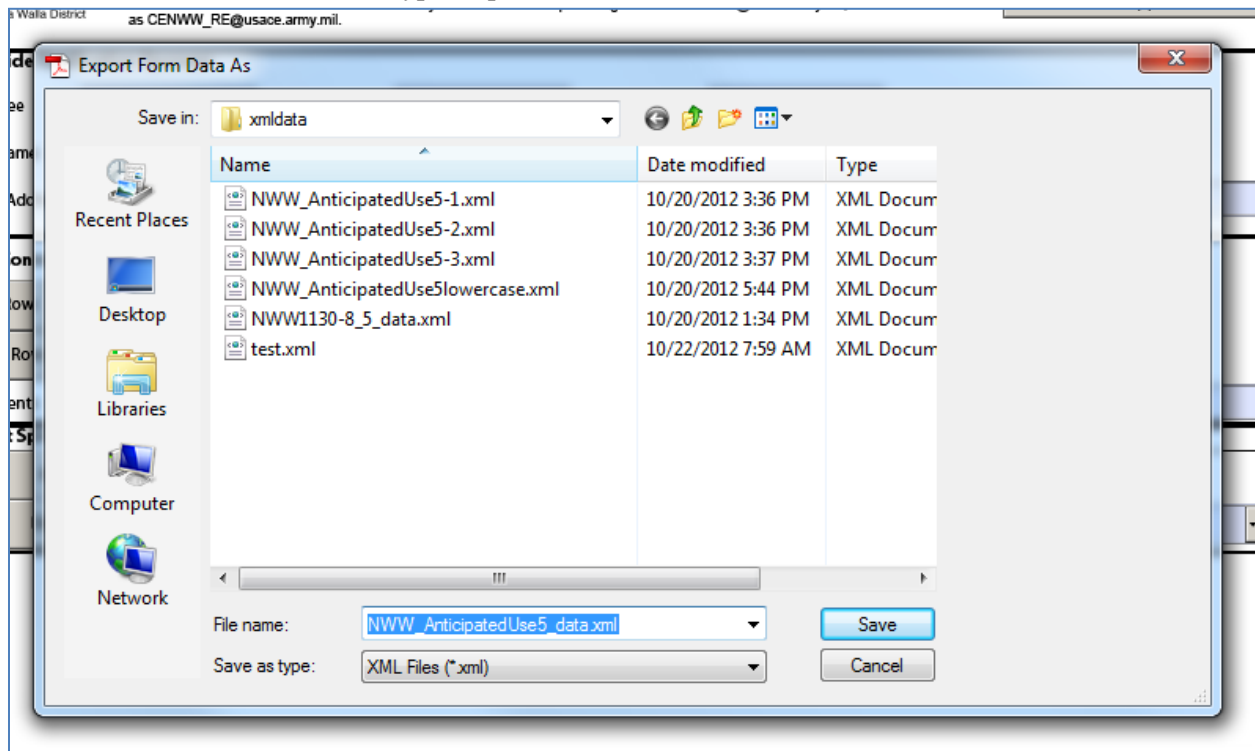
NWW Form 1000-0, Jan 2014 Page 1 of 2

To save data from a PDF record to an xml file:

1. Open the matching PDF record. Open the Tools toolbar if required, then select Forms, More Form Options, Manage Form Data, Export Data, and navigate to the desired location.

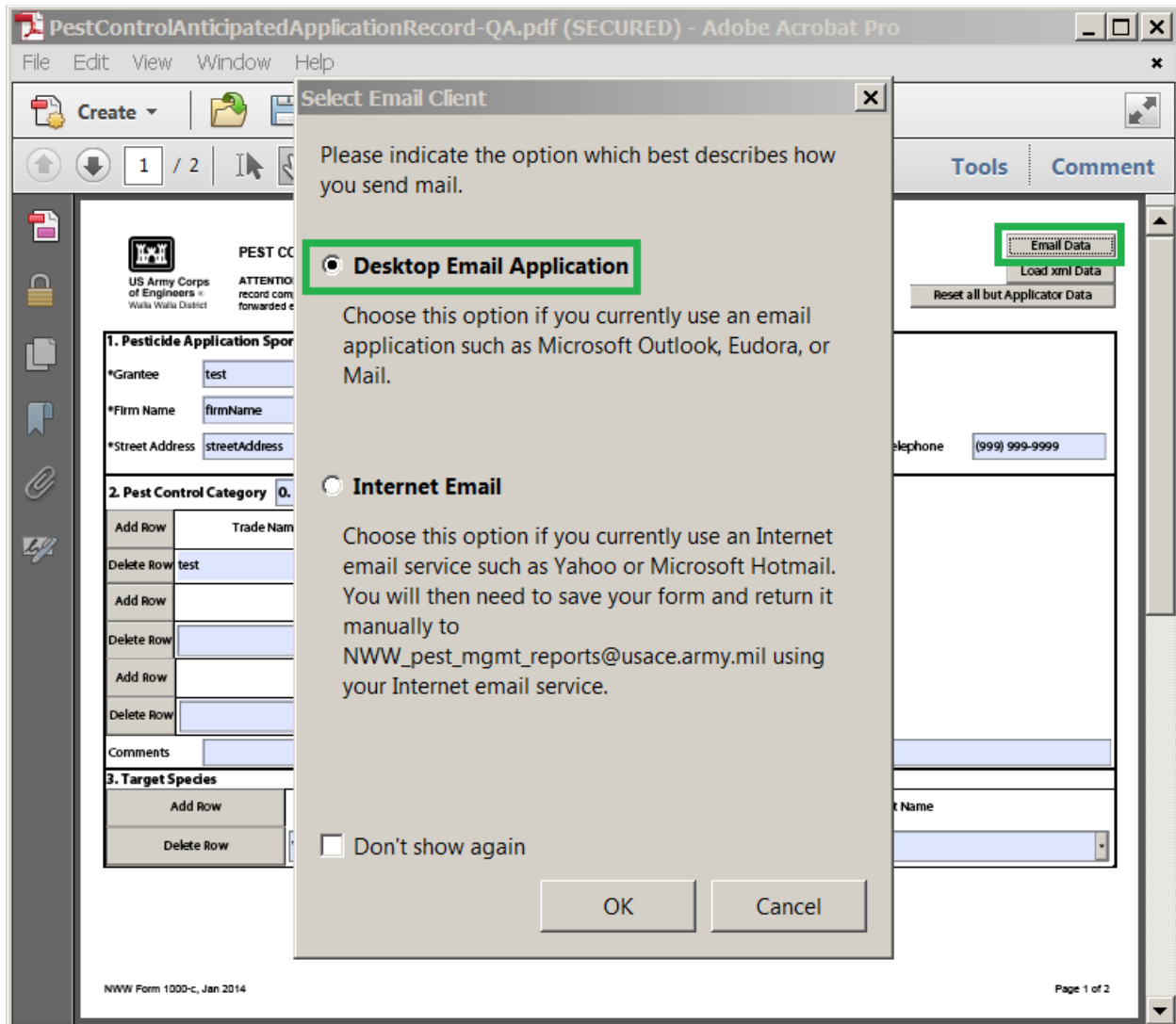


2. Ensure that the “Save as type:” option is set to “XML Files (*.xml)”:

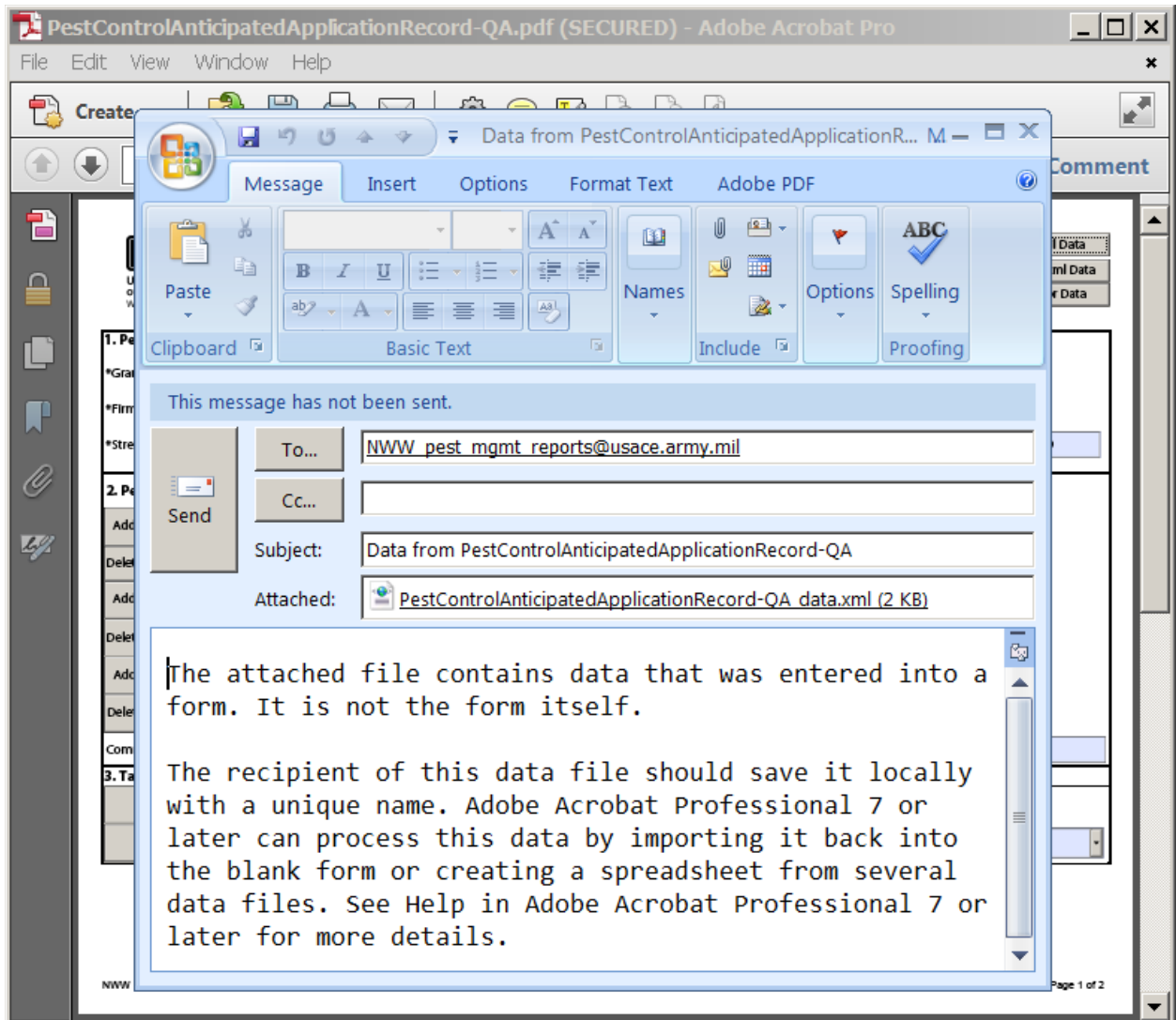


Forwarding data after QA:

1. Use the QA form’s “Email Data” button and select Desktop Email Application.



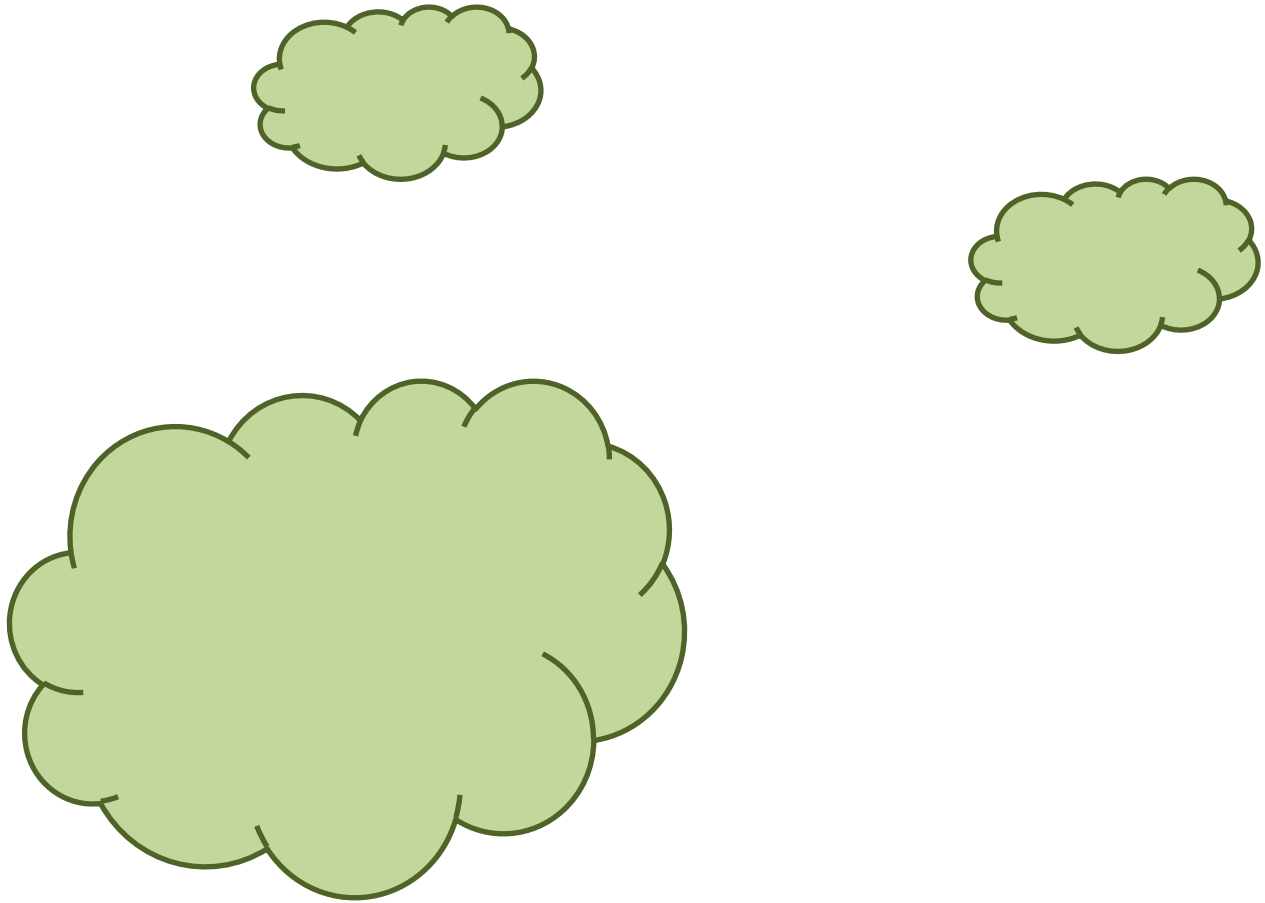
2. The program will open a new, preaddressed email, and attach the record data as an xml file.



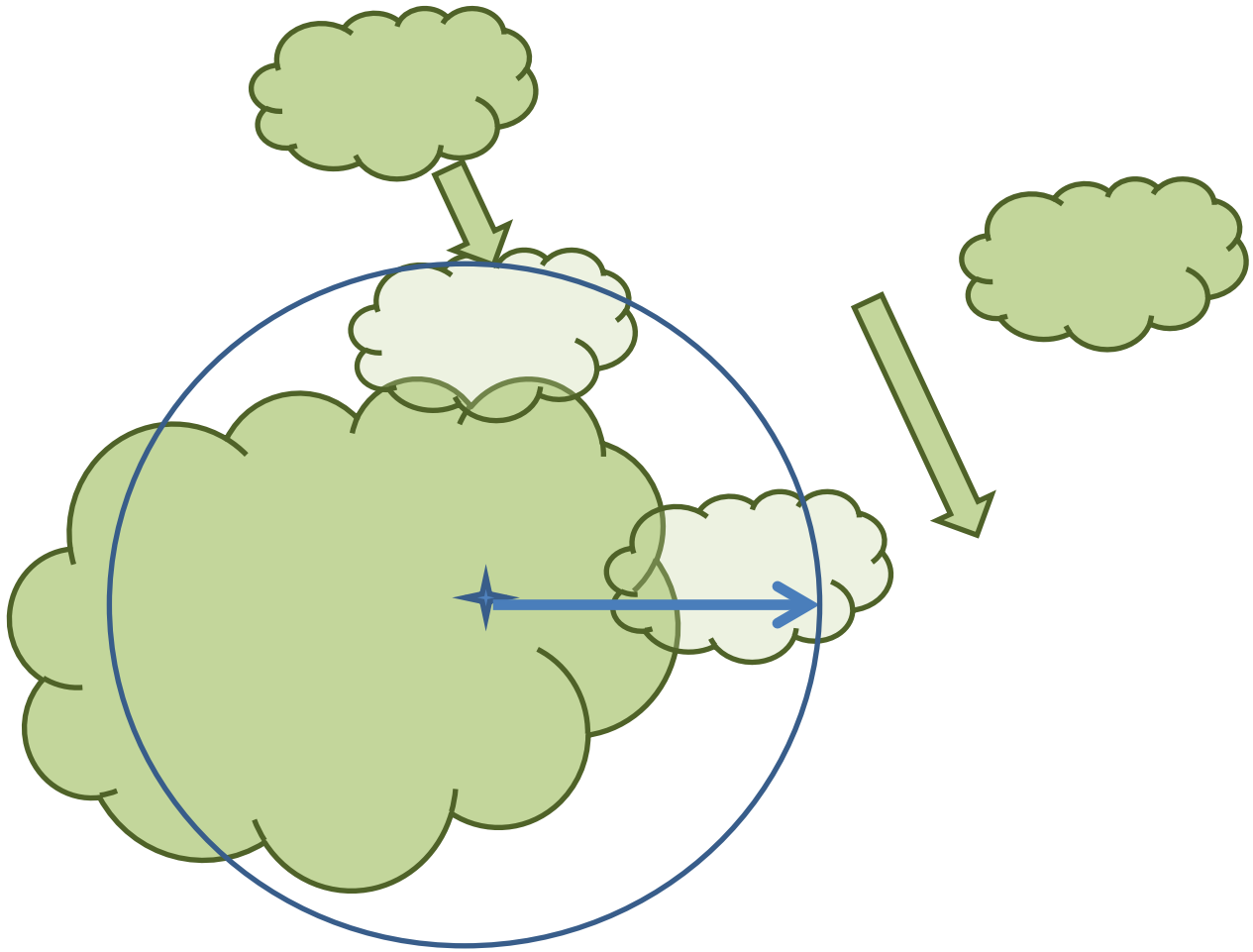
Attachment 3: GPS coordinate and radius data

The Pest Control Application Record provides a means to record the geographic location and estimated size of an application. Although an actual application may occur in a point, line, or polygon shape, applications will be reported only as points with a radius value. The radius should be estimated; but as precise as possible, so that when a circle is drawn around the point, the resulting area is approximately equal to the application area being reported.

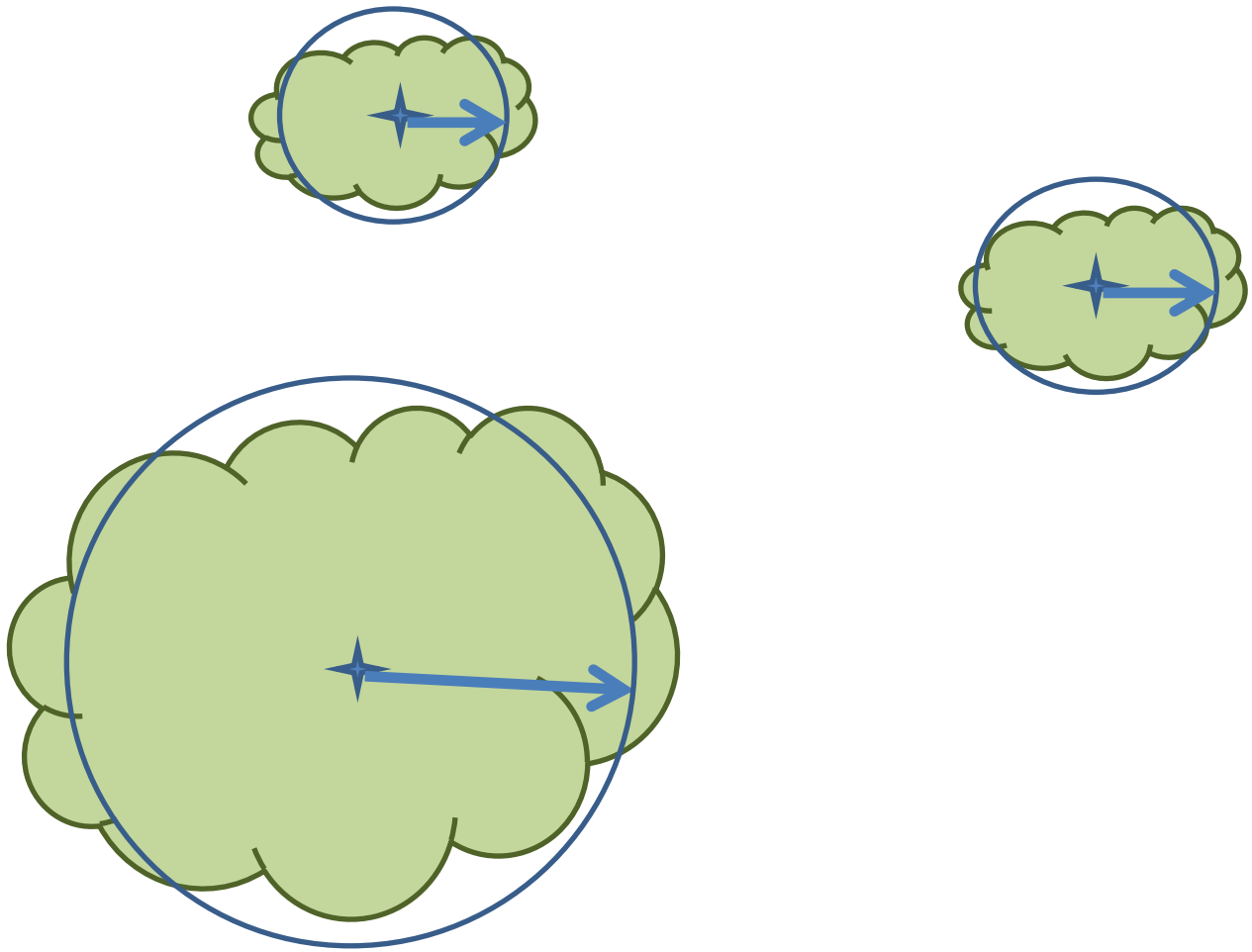
Assume that a vegetation pest is to be controlled as shown below.



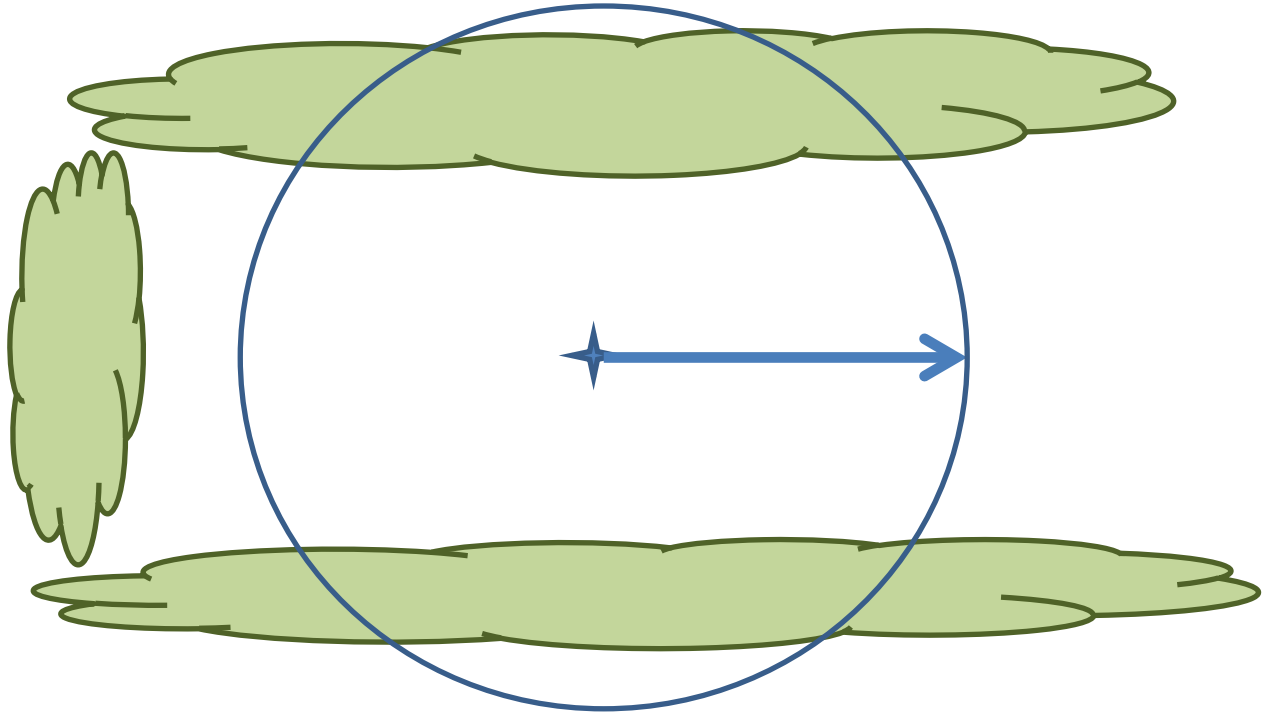
One option for reporting would be to record a point at the center of the application. Estimate the total area of the application and a radius that would approximate a circular area of equal area.



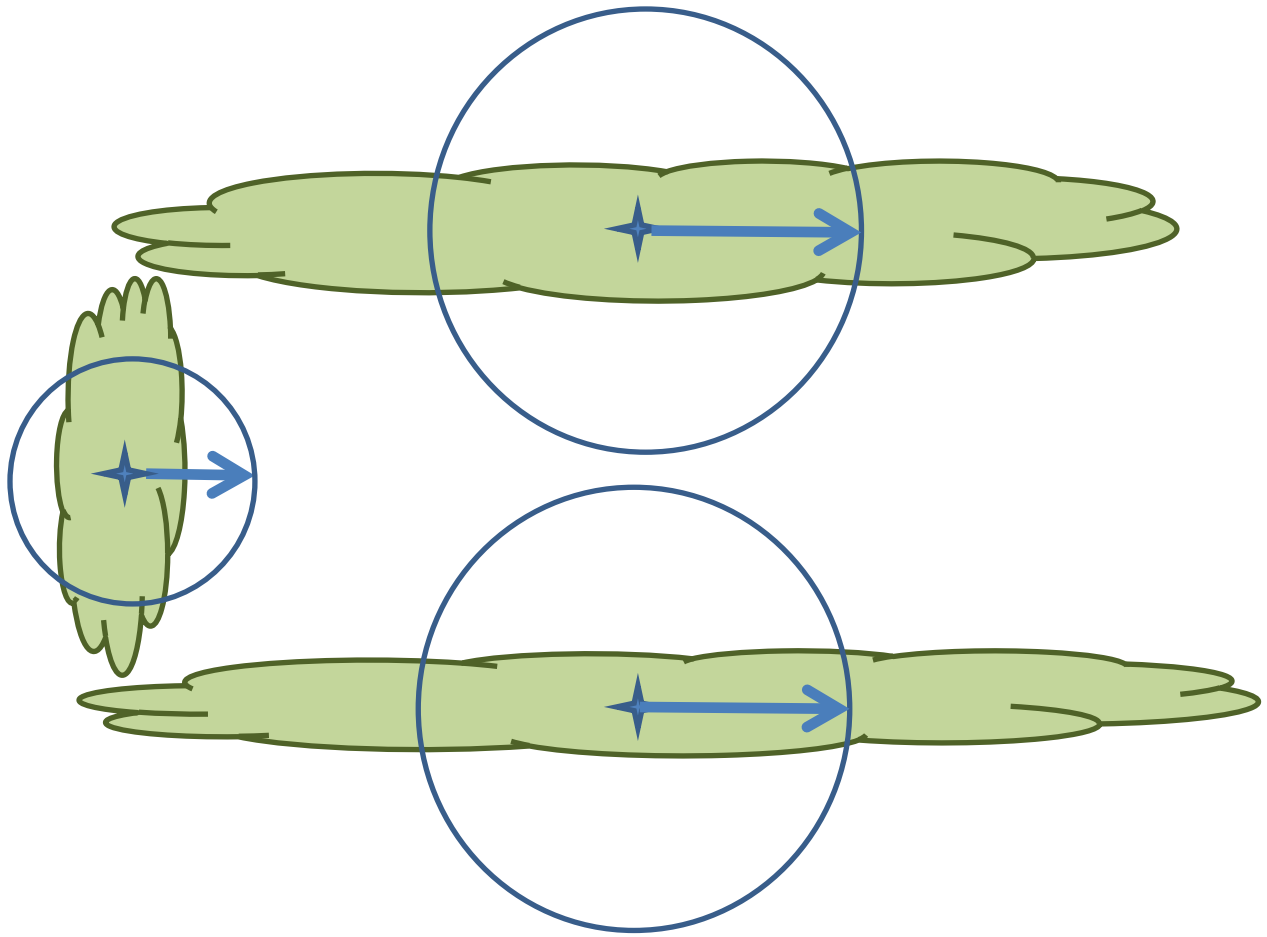
Another option is to record a point and radius for each application.



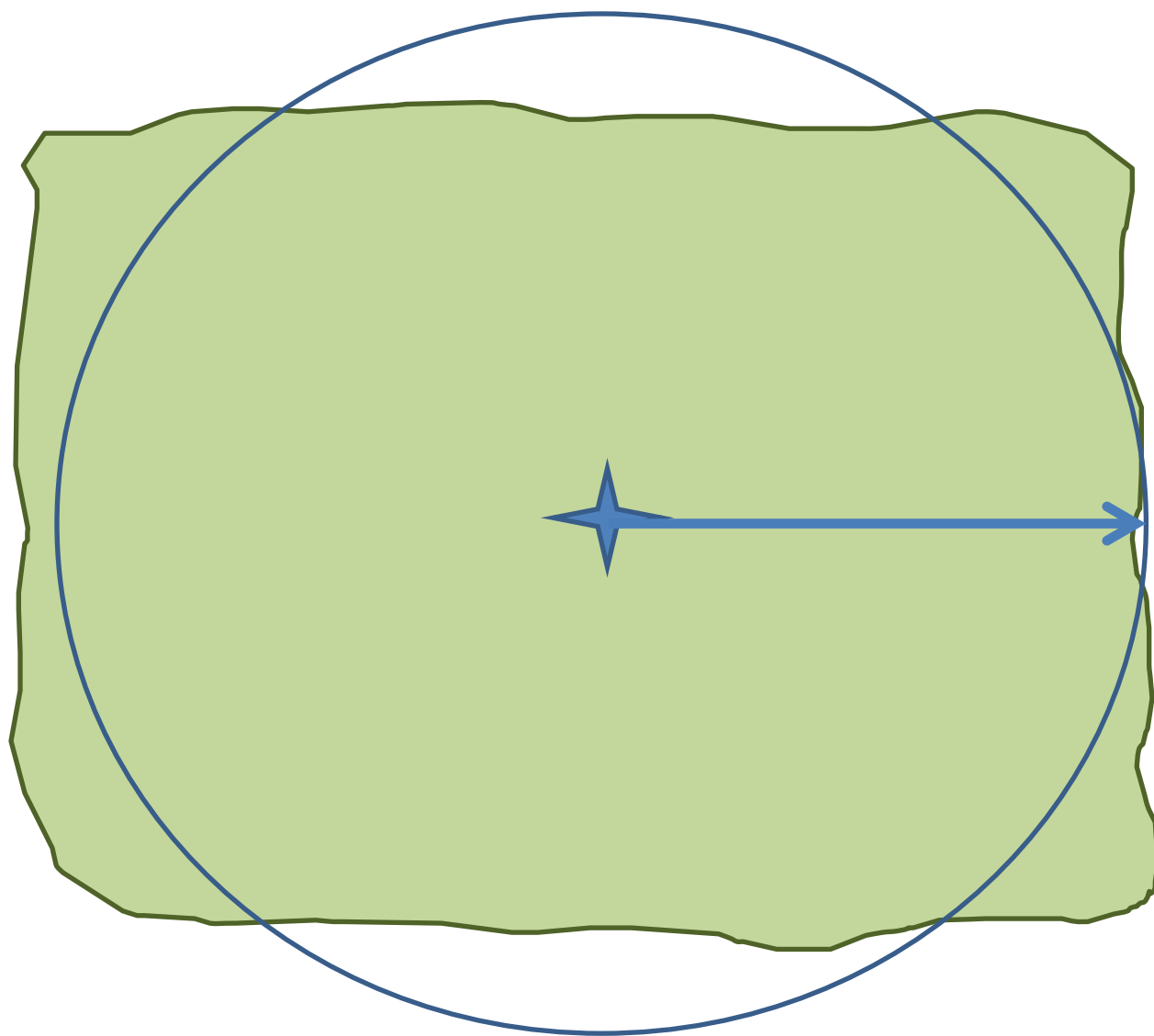
The same concept is applied to linear applications. Assume that the next picture represents an application around the edge of a parking lot being represented as a single feature.



The linear applications could also be reported individually.



Polygon features require the least amount of estimation.



12. ESA Plants Listed in the District

The following table shows the plant species that are listed under the ESA by county in the District. The list also shows where Washington ground squirrel may occur.

	Idaho					Washington							Oregon
	Ada	Boise	Elmore	Clearwater	Nez Perce	Asotin	Garfield	Whitman	Columbia	Franklin	Walla Walla	Benton	Umatilla
	Lucky Peak		Dworshak		Lower Granite			Lower Monumental					
							Little Goose		McNary				
											Mill Creek		
	Species												
Slickspot Peppergrass	X		X										
Spalding's' catchfly					X	X		X					
Umtanum desert buckwheat												X	
Ute ladies'-tresses						X	X	X	X	X	X	X	
White Bluffs Bladderpod										X			
Washington ground squirrel									X	X	X		X

Plant guides are provided below for ESA-listed plant identification.

SLICKSPOT PEPPERGRASS

Lepidium papilliferum (L.F.
Hend.) A. Nelson & J.F. Macbr.
Plant Symbol = LEPA17

Contributed by: USDA NRCS Idaho Plant Materials Program



Sheri Hagwood, USDI Bureau of Land Management

Alternate Names

Idaho pepperweed.

Lepidium montanum Nutt. Var. *papilliferum* (L.F. Hend.) C.L. Hitchc.

Uses

Slickspot peppergrass is a small, flowering plant in the mustard family which grows in unique microsites known as slick spots within the semiarid sagebrush-steppe of the Snake River Plain of southwestern Idaho. No large ungulates, either domestic or wild use the plant (USDI, 2009). This species has no known agricultural, economic, or other human uses at this time. This species may have scientific significance due to its evolutionary isolation which is an important subject in conservation biology research.

Status

The U.S Fish and Wildlife Service determined that slickspot peppergrass is a threatened species under the Endangered Species Act of 1973. The ruling became effective December 7, 2009.

Description

General: Slickspot peppergrass is an intricately branched, tap-rooted plant, averaging 2 to 8 inches tall, but

occasionally reaching up to 16 inches in height. Leaves and stems are covered with fine, soft hairs, and the leaves are divided into linear segments. Flowers are numerous, 0.1 inches in diameter, white, and have four petals. Fruits (siliques) are 0.1 inch across, round in outline, flattened and two-seeded (Moseley, 1994). Plants can be annual or biennial. The annual form reproduces by flowering and setting seed in its first year, and dies within one growing season. The biennial form initiates growth in the first year as a vegetative rosette and flowers and sets seed the second year (Meyer, 2005). A third, but uncommon flowering pattern involves two episodes of reproduction, one late in the first year and one in the second year (White, 2009).

Distribution: For current distribution, consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: Slickspot peppergrass is specialized to occupy a specific microhabitat within the sagebrush steppe vegetation of the Snake River Plains of southwestern Idaho. This specific microhabitat is referred to as "slick spots" which are small-scale sites of water accumulation in the gently undulating landscape. Dominant perennial species of the sagebrush steppe are usually excluded from slick spots, presumably because of their inability to tolerate winter flooding even though the climatic regime of this region is characterized by low and variable winter and spring precipitation and dry summers with a mean annual precipitation under 10 inches (Meyer, 2005).

Slick spots are visually distinct small-scale (mostly between 10 to 20 square feet) depressions in the soil that collect water. These sparsely vegetated microsites are created by unusual edaphic conditions. Drainage swales commonly bisect the landscape and often contain the slick spots with ponded water. Slick spot soils are silt to clay in texture and mostly devoid of vegetation. Below the surface layer is a vesicular layer (defined as a structure probably caused by capillary pressure within air-filled voids surrounded by water) that is partially impermeable to water infiltration and can cause water ponding. The soil profile below the vesicular layer is dominated by a clay layer. Chemical properties indicate that soils are sodic and/or saline (high electrical conductivity, EC), have very low levels of C and N, and P and K levels are variable. The compositions of humic acids within slick spots fall within the range of values commonly reported for other soils (Palazzo 2008).

Slick spots have a common visual appearance. The first visual cue is the smooth pan-like surface. Typically, the slick spot follows the general slope of prevailing landforms with a slight leveling or break on steeper

slopes. On mostly level surfaces, slick spots are very shallow but rarely are closed depressions. They sometimes include smaller areas where remnants of thin soil-algal crusts indicate surface ponding of water (Fisher, 1996).

Slick spots contain no perennial grasses or shrubs. Other than slickspot peppergrass, a wide variety of moss and lichen species cover 10 to 90 percent of the surface. Weedy invasions of cheatgrass, *Bromus tectorum* and burr buttercup *Ceratocephala falcata* (*Ranunculus testiculatus*) rooted in surface cracks and in surface crusts are common (Fisher, 1996).



Slickspot. Photo by Dana Quinney, Idaho Army National Guard.

Adaptation

Slickspot peppergrass is found almost exclusively in the slick spots of southwestern Idaho. It has been infrequently documented to occur on disturbed soils along graded dirt roads and badger mounds but these observations are rare. In adapting to the environment of the lower Snake River Plains, slickspot peppergrass has undergone modifications in its adaptive strategy relative to a closely related and possible ancestor *Lepidium montanum*, a widely distributed species (biennial to perennial growth form) that is found in a variety of open habitats in arid to semiarid regions of the southern Intermountain area. The most obvious adaptation is the shift from biennial to summer annual. The dry summers in southwest Idaho have apparently applied strong selection pressure to the annual habit. Even in years when biennial forms are successful, their contribution to seed production may be small (Meyer, 2005). A third, but uncommon flowering pattern which involves two episodes of reproduction, one late in the first year and one in the second year is also an adaptive strategy to maintain gene flow within the species (White 2000). Another major adaptive feature is the evolution of seed dormancy that permits seeds to persist in the seed bank (Meyer, 2005).

Establishment

Slickspot peppergrass reproduces by seed. Seed germinates in the spring. Annual types are single-stemmed with few flowers and seeds. Biennial types

overwinter as rosettes, blooming and setting seed the following spring or summer. The biennial types have multiple stems with hundreds of flowers and seeds. Flowering usually takes place in late April and May, fruit set occurs in June and seed is ripe in late June to early July. Based on a 4 year demography study, survivorship of the annual form was demonstrated to be higher than survivorship of biennial forms and the number of plants can vary widely from year to year depending on seasonal precipitation patterns (Meyer, 2005).

Laboratory seed germination studies with various combinations of temperatures, moist chilling, and gibberlic acid treatments resulted in low germination percentages. Highest laboratory germination percentages (10 %) are obtained with 6 weeks of dry after-ripening at 50° C followed by 8 weeks of moist chilling. Tetrazolium viability studies in combination with seed bank retrieval studies consistently showed seed viability to be very high (95 %+) (Meyer, 2005). Seed located near the soil surface show higher rates of germination and viability and the greatest seedling emergence rate. Deep burial of seed (greater than 5.5 inches) may preserve them beyond the 12 year period of viability (USDI 2009).

Slickspot peppergrass relies primarily on cross pollination for successful seed production (Robertson, 2004). Through hand pollination experiments, it was determined that individual plants receiving pollen from distant sources had significantly higher percent fruit set than those relying on pollen from neighboring plants. Self pollinated plants produced little or no fruit.

Twenty five insect families from 5 orders have been observed and collected from slickspot peppergrass at 2 study sites in southwestern Idaho. The diversity of insects encountered on flowers differed between the study sites. The insects most likely responsible for pollinating slickspot peppergrass include members of the Apidae, Colletidae and Halitidae families of the Hymenoptera order (bees, ants, and wasps) (Robertson 2003).

Management

Conservation management plans have been implemented to address the need to: maintain and enhance habitat; reduce intensity, frequency, and size of natural- and human-caused wildfires; minimize loss of habitat associated with wildfire-suppression activities; reduce the potential for invasion of nonnative plant species from wildfire; minimize the loss of habitat associated with rehabilitation and restoration techniques; minimize the establishment of invasive non-native species; minimize the degradation or loss of habitat from off road vehicle use; mitigate the negative effects of military training and other associated activities; and minimize the impact of ground disturbances caused by livestock trampling during periods when soils are saturated (USDI, 2009).

Pests and Potential Problems

The most abundant insect herbivore of slickspot peppergrass is a chrysomelid beetle, *Phyllotreta* sp. which chews holes in the petals of the flower. This herbivory reduces the effectiveness of insect pollination, but does not physically inhibit pollination or seed production (Leavitt, 2006). The U.S. Fish and Wildlife Service does not consider herbivory by the chrysomelid beetle to be a significant threat at this time (USDI, 2009).

The Owyhee harvester ant was recently identified as a potentially important seed predator of slickspot peppergrass but there is no information indicating what the actual magnitude or severity of this threat may be (USDI, 2009).

Environmental Concerns

The U.S. Fish and Wildlife Service determined that slickspot peppergrass is a threatened species under the Endangered Species Act of 1973. The ruling became effective December 7, 2009. The primary threat to slickspot peppergrass is the present or threatened destruction, modification, or curtailment of its habitat and range due to the increased frequency and extent of wildfires under a fire regime modified and exacerbated by the spread of invasive plants, particularly nonnative annual grasses such as cheatgrass. Other threats to slickspot peppergrass include human development, potential seed predation by harvester ants, and habitat fragmentation and isolation of small populations (USDI 2009).

Seeds and Plant Production

No commercial or restoration known.

Cultivars, Improved, and Selected Materials (and area of origin)

None

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Citation

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Published December, 2009

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For more information about this and other plants, please contact your local NRCS field office or Conservation District at <http://www.nrcs.usda.gov/> and visit the PLANTS Web site at <http://plants.usda.gov/> or the Plant Materials Program Web site <http://plant-materials.nrcs.usda.gov>.

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USDA IS AN EQUAL OPPORTUNITY PROVIDER AND EMPLOYER

SPALDING'S CATCHFLY *Silene spaldingii* S. Watson Plant Symbol = SIS2

Contributed by: USDA NRCS Idaho Plant Materials Program



Figure 1. Spalding's catchfly. Photo by C. Menke.

Alternate Names

Spalding's campion, Spalding's silene

Status

Spalding's catchfly was listed as threatened by the US Department of the Interior, Fish and Wildlife Service in 2001. It is listed in Idaho as threatened (State of Idaho, 2009) and endangered in Oregon (Oregon Department of Agriculture, 2009). In Washington state it is considered threatened with a status of S2 (Washington State, 2010), and in Montana it has a rank of S1 (Montana Natural Heritage Program, 2010). Natureserve ranks it G2, Globally imperiled, with a US national status of N2, and Canada national status N1 (Natureserve, 2010). It is listed as endangered in Canada (Government of Canada, 2010).

Description

General: Carnation or pink family (Caryophyllaceae). Spalding's catchfly is a long-lived perennial forb that emerges in spring from a woody root crown and dies back to below ground level each fall. Plants range from 8 to 30

inches tall with generally one to few yellow-green stems per plant. Each stem bears four to seven (up to 12) pairs of 2- 3 inch long, lance-shaped leaves (Hitchcock et al., 1964). It has swollen nodes where the leaves attach to the stem. The plant is covered in dense sticky hairs that frequently trap dust and insects, hence the common name catchfly. Flowers have a tubular calyx approximately 0.6 inches long; the pale white petals extend slightly beyond the sepals. Flowers bloom from mid-July through August and sometimes into September. It may remain dormant for 3- 6 consecutive years without emerging. The plant has a very large taproot (3 ft or longer).

Distribution:

Spalding's catchfly is native to portions of Idaho, Montana, Oregon, Washington, and British Columbia, Canada. It occupies five physiographic regions: the Palouse Grasslands in west-central Idaho and southeastern Washington; the Channeled Scablands in eastern Washington; the Blue Mountain Basins in northeastern Oregon; the Canyon Grasslands of the Snake River and its tributaries in Idaho, Oregon, and Washington; and the intermountain valleys of northwestern Montana. There are currently 99 known populations of Spalding's catchfly, 66 populations are composed of fewer than 100 individuals each. Twenty-three populations contain 100 or more individuals apiece, and the 10 largest populations are each made up of more than 500 plants (USDI Fish and Wildlife Service, 2007). For current distribution, consult the Plant Profile page for this species on the PLANTS Web site.

Habitat:

The species occurs in dry to moist grasslands in bunchgrass and sagebrush-steppe habitats with Idaho fescue and bluebunch wheatgrass being the dominant components. Occasionally plants can be found in open pine habitats. (USDI Fish and Wildlife Service, 2007).

Adaptation

Plants can be found from 1900 to 3600 ft in elevation. Spalding's catchfly grows on all aspects but is most often encountered on north facing slopes.

The plants prefer sites with deep silt-loam soils (Natureserve, 2010).

Establishment

Spalding's catchfly reproduces solely by seed. It does not spread by rhizomes or other asexual means. It is partially self-compatible (Lesica & Heidel 1996), but its offspring are more fit if cross-pollinated (Lesica 1993). Bumblebees appear to be the primary pollinator (Lesica and Heidel, 1996).

Seedlings germinate in the spring, form rosettes the first year, and occasionally flower the second year. Generally flowering does not occur until the third or subsequent growing seasons. Adult plants emerge from the caudex in spring as either a stemmed plant, a rosette, or occasionally as a plant with both rosette(s) and stem(s). Stemmed plants may remain vegetative or may become reproductive in July or August. Plants senesce or wither in fall (September or October), reappearing the next spring (USDI Fish and Wildlife Service, 2007).

Laboratory studies have shown that seed germination increases following a four to eight week cold stratification period (Lesica, 1993).

Spalding's catchfly arises from a very large tap root which may be up to 3 feet deep. This greatly reduces the potential for transplanting.

Pests and Potential Problems

Threats to Spalding's catchfly primarily involve loss of habitat. This includes habitat loss due to human development, habitat degradation associated with domestic livestock and wildlife grazing, changes in fire frequency and seasonality, and invasions of aggressive non-native plants. Plants are also susceptible to herbicide spray drift and off-road vehicle use. The species may also suffer loss of genetic fitness from population fragmentation (USDA Forest Service, 2009).

Management

Recovery strategies for Spalding's catchfly involve reducing identified threats to catchfly habitat. Measures include limiting adverse grazing and off-road vehicle use, protecting pollinators, incorporating integrated pest management strategies, and appropriate fire management (USDI Fish and Wildlife Service, 2010).

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Citation

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Eriogonum codium Reveal, Beck & Caplow
Umtanum desert buckwheat
Polygonaceae (Buckwheat Family)

Status: State Endangered, USFWS Candidate
Rank: G1S1

General Description: Low, caespitose (tufted), herbaceous perennial, the aboveground woody stem forming highly branched mats 8-28 inches across, arising from a stout, woody taproot; leaves basal, persistent, oblanceolate to elliptic, 1/4 to 1/2 inch long, 1/8 to 1/4 inch wide, densely white-tomentose on both surfaces; flowering stems scapose, erect 3/4 to 3 1/2 inches long, tomentose, often brittle; flowers are lemon-yellow with greenish midribs and yellowish-green bases, 1/16 to 1/8 inch long.

Identification Tips: The growth habit (low, matted, caespitose perennial) and its tomentose flowers and achenes readily distinguish the new species from other members of the genus within its range.

Phenology: The species flowers from May through late August, at least during wet years.

Range: The species is endemic to a very narrow range in Benton County in southcentral Washington. It is currently only known from one ridgeline in the Columbia Basin physiographic province.

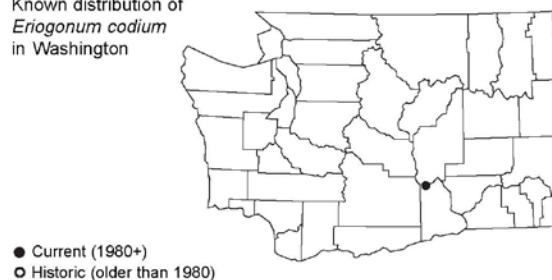
Habitat: The only known population of this species occurs at elevations ranging between 1100 to 1320 feet on flat to gently sloping microsites near the top of the steep, north-facing basalt cliffs overlooking the Columbia River. It is apparently restricted to the exposed top of one particular basalt flow (the Lolo Flow). Associated species include spiny hopsage (*Grayia spinosa*), grayball sage (*Salvia dorrii*), threadleaf scorpionweed (*Phacelia linearis*), winged cryptantha (*Cryptantha pterocarya*), small eveningprimrose (*Camissonia minor*), and cheat grass (*Bromus tectorum*).

Eriogonum codium
Umtanum desert buckwheat



©1995 Rhodora, Vol. 97, No. 692. Illustration by Dolly Baker.

Known distribution of
Eriogonum codium
in Washington



Eriogonum codium
Umtanum desert buckwheat



Jonathan Solt



Katy Beck

1997 Produced as part of a cooperative project between the Washington Department of Natural Resources, Washington Natural Heritage Program, and the U.S.D. Bureau of Land Management. Persons needing the information in an alternate format may call (206)202-1940 or TTY (206)202-1125.

Eriogonum codium
Umtanum desert buckwheat

Ecology: The species' restriction to exposures of one particular basalt flow may suggest a dependent relationship with the chemical composition of that flow. The relatively high water-holding capacity of the substrate has also been suggested as an important factor. The overall vegetation cover is quite low. A recent fire resulted in a decrease in the population.

State Status Comments: The species is known from only one site, most of which recently burned in a wildfire.

Inventory Needs: Ridge systems along the Columbia River in southcentral Washington should be inventoried for this species.

Threats and Management Concerns: Although not currently threatened by human activity, the area is being considered for a change in ownership and/or management responsibility. Public access could accompany such a change. ORV use and livestock grazing represent two potential significant threats. The effects of a recent fire are presently being studied.

References:

Reveal, J.L., F. Caplow, and K. Beck. 1995. *Eriogonum codium* (Polygonaceae: Eriogonoideae), A new species from southcentral Washington. *Rhodora* 97 (892): 350-355.

1997 Produced as part of a cooperative project between the Washington Department of Natural Resources, Washington Natural Heritage Program, and the U.S.D. Bureau of Land Management. Persons needing the information in an alternate format may call (206)202-1940 or TTY (206)202-1125.

UTE LADYS' TRESSES

Spiranthes diluvialis Sheviak

Plant Symbol = SPD16

Contributed by: USDA NRCS Idaho Plant Materials Program



Teresa Prendusi, USDA Forest Service

Uses

Ute Ladies'-Tresses is a showy, perennial flowering orchid that has not been successfully propagated. It was first described by C.J. Sheviak in 1984. Ute Ladies'-Tresses are found in open wetland and riparian areas and is pollinated mostly by bumblebees (*Bombus spp.*). This species has scientific significance in studies addressing its evolutionary isolation, which has been an important subject in conservation biology research. It has no known agricultural, economic, or other human uses at this time.

Status

Consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g. threatened or endangered species, state noxious status, and wetland indicator values). In 1992, it was designated as Threatened in its Entire Range by the U.S. Fish and Wildlife Service.

Description

Ute Ladies'-Tresses is a perennial, terrestrial orchid with mainly 1 stem 12-50 cm tall, arising from tuberously thickened roots. Its linear-lanceolate (1cm wide) leaves can reach 28 cm long and persist during flowering. Basal leaves are the longest and become reduced in size up the stem. The inflorescence consists of few to many white or ivory flowers clustered in a spike of 3-ranked spirals at the top of the stem. The sepals and petals are oriented perpendicular to the stem, the lateral sepals often spreading abruptly from the base of the flower and all sepals are free to the base. The lip petal is somewhat constricted at the median. Flowering occurs in early August and may persist into early September barring frost or drought. Flowers are faintly fragrant with the scent of coumarin. The seed is ellipsoidal and dust-like, very well adapted to being carried by the wind.

Adaptation and Distribution

Ute Ladies'-Tresses occurs along riparian edges, gravel bars, old oxbows, high flow channels, and moist to wet meadows along perennial streams. It typically occurs in stable wetland and seep areas associated with old landscape features within historical floodplains of major rivers. It also is found in wetland and seep areas near freshwater lakes and springs



Teresa Prendusi, USDA Forest Service

Populations of Ute Ladies'-Tresses are known from three broad general areas of the interior western United States. Near the base of the eastern slope of the Rocky Mountains in southeastern Wyoming and adjacent Nebraska and north central and central Colorado; in the upper Colorado River Basin, particularly the Uinta Basin; and in the Bonneville Basin along the Wasatch Front and westward in the eastern Great Basin, in north-central and western Utah, extreme eastern Nevada and southeastern Idaho. It has also been discovered in southwestern Montana and in the Okanogan area and along the Columbia River in

north-central Washington. Many populations have less than 100 individuals, though a couple of populations have over 500 plants.

Ute Ladies'-Tresses are restricted to a small, sporadic microhabitat represented by calcareous, wet-mesic, temporarily-inundated meadow in shallow wetlands. The shallow meandered wetlands are in alluvial fans that correspond with two uncommon soils series. They are part of broad, flat, arid, open, low-elevation valley bottoms. The meandered wetlands include narrow channels and broader swales, both of which parallel the existing river courses, and most are set back over a mile from the river and without surface-water connections to the river. The microhabitat is temporarily inundated in the spring, often located right below the outer wetland margin. Subsurface hydrological conditions are ameliorated by high organic content at the surface, and coarse alluvial cobble directly below. Water chemistry as inferred from soils data is moderately alkaline and high in calcium carbonate. Soils are loamy calcareous wetland soils with gley features, generally high in micronutrients and organic matter, but are low in phosphorus compared to average values for agricultural soils. The range of pH values for these types of sites in Colorado and Utah are 6.6-8.1 and at sites in Nebraska, Wyoming and Montana 7.6-8.2. Most locations of Ute Ladies'-Tresses are classified as subirrigated ecological sites.

Establishment

Ute Ladies'-Tresses is a showy flowering orchid that has not been successfully propagated. Efforts are underway by the Denver Botanic Gardens and the Red Buttes Gardens of Salt Lake City to determine if Ute Ladies'-Tresses can be propagated. The plant can produce as many as 7,300 tiny seeds per fruit. Seedlings may persist for up to 8 years as subterranean saprophytes dependent on mycorrhizal fungi. Small inconspicuous leaf rosettes may emerge at the end of the growing season and overwinter. Individual plants may flower in consecutive years or under adverse environmental conditions and may persist below ground with their mycorrhizal symbionts. Reproduction is sexual in the strictest sense, though each year's plant comes from a separate lateral bud. Most orchids produce new tubers every year by lateral buds. There is no evidence that lateral buds produce underground shoots, but in collecting voucher specimens, it was observed that the multiple, tuberously-thickened roots have high turgidity and snap easily. Although the majority of plants are single-stemmed, a small number of multi-stemmed plants or small clumps have been noted in sites that were trampled by livestock that may indicate vegetative reproduction.

Ute Ladies'-Tresses exhibits a mixed-mating system. The degree of selfing depends in part upon the abundance of pollinators visiting the flowers. Outcrossing is promoted by male flowers maturing before female flowers and the movement of long-tongued bees on inflorescences. No

self-fertile fruit set has been observed, indicating that a pollen vector is required for reproduction. The only pollinator visits observed have been late afternoon visits by bumblebees (*Bombus spp.*). Bees are provided nectar rewards but the pollen are in masses that are not available to them for food. The distinctive odor of coumarin from the flowers may indicate that there are other rewards to the bumblebee such as critical chemicals for producing pheromones. Other suspected pollinators are anthophorid bees and hawkmoths. Seeds are very short-lived and have a limited time span for germination after seeds dehisce and are generally considered to require endomycorrhizae to germinate in the field. Seeds are very small and require a narrow range of moisture and temperature conditions to germinate and it is likely they require direct contact with mineral soil.

Management

Modeling of monitored populations in Colorado and Utah project population extinction for almost all of the populations under most agricultural practices except the "grazed only" population and to a lesser extent the "twice clipped" population in modeling studies. Species' longevity and the primary causes of mortality are unknown. At most observation sites, leaves of Ute Ladies'-Tresses showed signs of browse by herbivores. Even plants represented by immature rosette leaves under a continuous canopy cover of grass had browse on one or more leaves, though sometimes only the tip of the leaf. Some of the browsing may be caused by whitetail deer because their numbers were high in the general area of observation. Livestock grazing takes place at many sites though it tends to be earlier in the growing season when the uplands are still green rather than during flowering when only the wetlands and riparian areas are green. Clear signs of trampled plants were found at one monitoring site where livestock grazing overlapped with the flowering period in part of one season. Vole herbivory of inflorescences at a Colorado site was identified as a significant threat. Land managers should include pollinators and pollen producing plants in their plans to preserve this rare orchid. The effects of pest management programs on bumblebees and the availability of suitable bee nesting habitat should be considered.

Pests and Potential Problems

Besides herbivory, the only other noted observations of pests were weevils browsing some inflorescences in Montana.

Environmental Concerns

In 1992, Ute Ladies'-Tresses was designated as Threatened in its Entire Range by the U.S. Fish and Wildlife Service. Modeling of monitored populations in Colorado and Utah project population extinction for almost all of the populations under most agricultural practices. The effects of pest management programs on bumblebees and the availability of suitable bee nesting habitat should be considered.

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Lesquerella tuplashensis Rollins, Beck & Caplow
Whitebluffs bladderpod
Cruciferae (Mustard Family)

Status: State Threatened, USFWS Candidate
Rank: G2QS2

General Description: A perennial, grayish-pubescent herb with an undivided caudex, a well-developed taproot, and a dense, many-leaved rosette of gradually reduced leaves. The dense inflorescences of yellow flowers are born on numerous decumbent-ascending stems with broad cauline leaves at anthesis

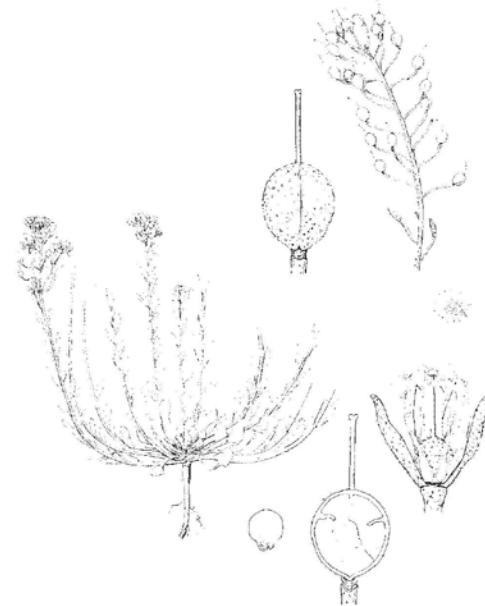
Identification Tips: *L. tuplashensis* differs from *L. douglasii* in a number of characteristics, including the presence of dense rosettes of basal leaves that are extremely broad and are often spatulate. The short flowering stems are usually densely covered with relatively broad cauline leaves. It also blooms during the later summer months, well after *L. douglasii* has set fruit and become dormant.

Phenology: Flowers late June through July.

Range: This narrow endemic species is restricted to a very small area in Franklin County adjacent to the Columbia River in southcentral WA. It is currently known from an area of a few meters wide by approximately 17 km (10 miles) long. It occurs in the Columbia Basin physiographic province.

Habitat: The species is restricted to a very small area along the Columbia River in the big sagebrush/bluebunch wheatgrass association of Daubenmire (1970). The species is restricted to dry, barren, nearly vertical exposures of calcium carbonate paleosol (a "caliche" soil). The substrate is extremely alkaline and highly calcareous. Elevation ranges between 780 and 890 feet. Associated species include big sagebrush, buckwheat milkvetch (*Astragalus caricinus*), slender buckwheat (*Eriogonum microthecum*), Snake River cryptantha (*Cryptantha spiculifera*), and Sandberg's bluegrass (*Poa sandbergii*).

Lesquerella tuplashensis
Whitebluffs bladderpod



©1995 Rhodora, Vol. 97, No. 691. Illustration by Dolly Baker.

Known distribution of
Lesquerella
tuplashensis
in Washington



Lesquerella tuplashensis

Whitebluffs bladderpod



Kathy Beck



Kathy Beck

1997 Produced as part of a cooperative project between the Washington Department of Natural Resources, Washington Natural Heritage Program, and the U.S.D.I. Bureau of Land Management. Persons needing this information in an alternate format may call (206)202-1940 or TTY (206)202-1125.

Lesquerella tuplashensis

Whitebluffs bladderpod

Ecology: The range of this species is within the driest region in the state of WA; the general area receives an average of about 6 inches of precipitation/year. As a result, the overall cover of vegetation is extremely low. As noted above, the species is restricted to a highly alkaline substrate that most plants find inhospitable. The species is presumably reliant on periodic exposure of these substrates.

State Status Comments: This recently described species is known from only one population. It is within an area with increased slope failures resulting from irrigation of adjacent lands.

Inventory Needs: Other outcroppings of caliche substrate in Franklin and Grant counties, WA, should be inventoried.

Threats and Management Concerns: The population is vulnerable to both illegal ORV use of its habitat and to slope failure due to increased irrigation.

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1997 Produced as part of a cooperative project between the Washington Department of Natural Resources, Washington Natural Heritage Program, and the U.S.D.I. Bureau of Land Management. Persons needing this information in an alternate format may call (206)202-1940 or TTY (206)202-1125.

13. Idaho's Special Status Vascular and Nonvascular Plants

DRAFT

Tracked Plant List and Ranks. Version October, 2012 from Observations Database. Please Note, Idaho Region was not updated with this update but is included.

SSciName	SCommon	G Rank	S Rank	US FWS	INPS	INPS Threat	BLM	USFS Reg1	USFS Reg4	USFS Reg6	Idaho Region
Agastache cusickii	Cusick's Giant-hyssop	G3G4	SNR		GP3	11	TYPE 5				EC
Agoseris lackschewitzii	Pink Agoseris	G4	S2		S		TYPE 4		S		EC
Allenrolfea occidentalis	Iodine Bush	G4	S1		1						SE
Allium aaseae	Aase's Onion	G3	S3		S2S3		TYPE 2				SW, WC
Allium anceps	Two-headed Onion	G4	S2		2		TYPE 3				SE
Allium madidum	Swamp Onion	G3	S3		GP3	8			S		WC
Allium tolmiei var. persimile	Tolmie's Onion	G4G5T3	S3		GP3	12	TYPE 3		S		WC
Allium validum	Tall Swamp Onion	G4	S3		S						WC
Allotropa virgata	Candystick	G4	S3		S				S		NC
Andreaea heinemannii	Heinemann's Andreaea Moss	G3G5	S1		1						?
Andromeda polifolia	Bog-rosemary	G5	S1		1			S			N
Angelica kingii	Nevada Angelica	G4	S1		1		TYPE 3				SW
Antennaria arcuata	Meadow Pussytoes	G2	S1		GP2	5					SE
Artemisia campestris ssp. borealis var. purshii	Northern Sagewort	G5T5	S1		1						EC
Aspicilia fruticulosa	Rim Lichen	G3	S3		GP3	11	TYPE 5				
Asplenium septentrionale	Northern Spleenwort	G4G5	S1		1					S	SE
Asplenium trichomanes	Maidenhair Spleenwort	G5	S1		S1			S			N
Asplenium trichomanes-ramosum	Green Spleenwort	G4	S1		1					S	SE
Astragalus adanus	Boise Milkvetch	G3G4	SNR		GP3	?					SW, WC, SE, EC
Astragalus amblytropis	Challis Milkvetch	G3	S3		GP3	11	TYPE 3				EC
Astragalus amnis-amissi	Lost River Milkvetch	G3	S3		GP3	11	TYPE 3		S		EC
Astragalus anserinus	Goose Creek Milkvetch	G2	S1	C	GP2	2	TYPE 1		S		SE
Astragalus aquilonius	Lemhi Milkvetch	G3	S3		GP3	5	TYPE 2		S		EC
Astragalus arrectus	Palouse Milkvetch	G2G4	S2		GP2	2				S	NC
Astragalus asotinensis	Asotin Milkvetch	G2	S1		G1,S1						NC
Astragalus atratus var. insepatus	Mourning Milkvetch	G4G5T3	S3		M		TYPE 3				SE
Astragalus bisulcatus var. bisulcatus	Two-grooved Milkvetch	G5T5	S2		S		TYPE 4				EC
Astragalus bourgovii	Bourgeau's Milkvetch	G5	S1		1						N
Astragalus conjunctus	Stiff Milkvetch	G4	S2		S		TYPE 5				SW
Astragalus cusickii var. packardiae	Packard's Milkvetch	G5T1	S1	C	S1		TYPE 1				SW
Astragalus cusickii var. sterilis	Barren Milkvetch	G5T2	S1		GP3	3	TYPE 3				SW
Astragalus diversifolius	Meadow Milkvetch	G2	S2		GP2	11	TYPE 3		S		EC
Astragalus gilviflorus	Plains Milkvetch	G5	S2		S		TYPE 3				EC
Astragalus jejunus var. jejunus	Starveling Milkvetch	G3T3	S2		GP3	9	TYPE 2		S		SE
Astragalus leptaleus	Park Milkvetch	G4	S3		M						EC
Astragalus microcystis	Least Bladdery Milkvetch	G5	SH		1		TYPE 5	S		S	N
Astragalus mulfordiae	Mulford's Milkvetch	G2	S2		GP2	2	TYPE 2				SW
Astragalus newberryi var. castoreus	Newberry's Milkvetch	G5T5	S2		M		TYPE 4				SW
Astragalus oniciformis	Picabo Milkvetch	G3	S3		GP3	11	TYPE 3				SE
Astragalus paysonii	Payson's Milkvetch	G3	S3		GP3	11	TYPE 3	S	S		NC
Astragalus purshii var. ophiogenes	Snake River Milkvetch	G5T3	S3		M		TYPE 5				SW
Astragalus riparius	Piper's Milkvetch	G1G2	SX		SX		TYPE 5				NC
Astragalus tetrapterus	Four-wing Milkvetch	G4G5	S1		1		TYPE 3				SW

SSciName	SCommon	G Rank	S Rank	US FWS	INPS	INPS Threat	BLM	USFS Reg1	USFS Reg4	USFS Reg6	Idaho Region
Astragalus vexilliflexus var. nubilus	White Clouds Milkvetch	G4T2	S2		GP2	12			S		EC
Astragalus vexilliflexus var. vexilliflexus	Bent-flowered Milkvetch	G4T4	S1		1						WC
Astragalus yoder-williamsii	Mud Flat Milkvetch	G3	S3		GP3	11	TYPE 3				SW
Betula pumila	Swamp Birch	G5	S2		S			S			N
Blechnum spicant	Deer-fern	G5	S3		S		TYPE 3	S			N
Blepharidachne kingii	King's Desertgrass	G4	S1		1		TYPE 3				SW
Botrychium ascendens	Triangular-lobed Moonwort	G2G3	S1		GP3	8		S		S	N
Botrychium crenulatum	Crenulate Moonwort	G3	S1		GP3	11		S	S	S	N
Botrychium lanceolatum var. lanceolatum	Lance-leaved Moonwort	G5T4	S3		S			S			N
Botrychium lineare	Linear-Leaved Moonwort	G2?	SH		GP1	?	TYPE 1	S	S	S	N
Botrychium minganense	Mingan Moonwort	G4	S3		S		TYPE 4	S			N
Botrychium montanum	Mountain Moonwort	G3	S2		GP3	8		S		S	N
Botrychium paradoxum	Peculiar Moonwort	G2	S1		GP2	?		S		S	N
Botrychium pedunculatum	Stalked Moonwort	G2G3	S1		GP3	5		S		S	N
Botrychium pinnatum	Northern Moonwort	G4?	S2		S			S			N
Botrychium simplex	Least Moonwort	G5	S2		2			S	S		N
Bouteloua gracilis	Blue Grama	G5	S2		1		TYPE 3				EC
Bryoria tortuosa	Tortured Horsehair Lichen	G5	S2		S						NC
Bryum calobryoides	Beautiful Bryum	G3	SH		GP3	2			S	S	WC
Buxbaumia aphylla	Leafless Bug-on-a-stick	G4G5	S1		1			S			NC
Buxbaumia viridis	Green Bug-on-a-stick	G3G4	S3		M			S			N
Calamagrostis tweedyi	Cascade Reedgrass	G3	S2		GP3	8	TYPE 2		S		WC
Calandrinia ciliata	Red Maids	G4	S1		M		TYPE 5				
Callitriche trochlearis	Waste-water Winged Starwort	G3?	SNR		GP3	?					?
Calochortus macrocarpus var. maculosus	Green-band Mariposa Lily	G5T2	S2		GP2	3	TYPE 2			S	WC
Calochortus nitidus	Broad-fruit Mariposa Lily	G3	S3		GP3	8	TYPE 2	S		S	NC
Camassia cusickii	Cusick's Camas	G4	S2		M				S		WC
Camissonia pterosperma	Winged-seed Evening Primrose	G4	S2		S		TYPE 4				EC
Cardamine constancei	Constance's Bittercress	G3	S3		GP3	8	TYPE 2	S			NC
Carex aboriginum	Indian Valley Sedge	G1	S1		GP1	2	TYPE 2				WC
Carex californica	California Sedge	G5	S3		M						NC
Carex chordorrhiza	String-root Sedge	G5	S2		1			S		S	N
Carex comosa	Bristly Sedge	G5	S1		1		TYPE 3	S		S	N
Carex engelmannii	Brewer's Sedge	G4G5	S2		S						EC
Carex flava	Yellow Sedge	G5	S3		M			S			N
Carex idahoensis	Idaho Sedge	G2	S2		GP2	9	TYPE 2			S	EC
Carex incurviformis	Maritime Sedge	G4G5T4T5	S1		2				S		EC
Carex lacustris	Lake-bank Sedge	G5	S1		1						N
Carex leptalea	Bristle-stalked Sedge	G5	S2		S			S			N
Carex livida	Pale Sedge	G5	S2		S		TYPE 4	S		S	N
Carex magellanica ssp. irrigua	Poor Sedge	G5T5	S2		2			S		S	N
Carex rostrata	Beaked Sedge	G5	S2		S					S	N
Carex stramineiformis	Mt. Shasta Sedge	G5	S2		S						WC
Carex sychnocephala	Many-headed Sedge	G4	S1		1					S	NC, SE

SSciName	SCommon	G Rank	S Rank	US FWS	INPS	INPS Threat	BLM	USFS Reg1	USFS Reg4	USFS Reg6	Idaho Region
Castilleja christii	Christ's Indian Paintbrush	G1	S1	C	GP1	2			S		SE
Castilleja pulchella	Beautiful Indian Paintbrush	G3G4	S2		GP3	11					EC
Catapyrenium congestum	Compact Earth Lichen	G4	S2		S		TYPE 4				SW
Ceanothus prostratus	Mahala-mat Ceanothus	G5?	S1		1		TYPE 3				WC
Cephalanthera austiniae	Phantom Orchid	G4	S3		M						NC
Cercocarpus montanus	Birchleaf Mountain-mahogany	G5	S2		1		TYPE 5				SE
Chaenactis cusickii	Cusick's False Yarrow	G3	S2		GP3	8	TYPE 2				SW
Chaenactis stevioides	Desert Pincushion	G5	S2		S		TYPE 4				SW
Chrysosplenium tetrandrum	Northern Golden-carpet	G5	S1		1					S	EC
Chrysothamnus nauseosus ssp. nanus	Dwarf Gray Rabbitbrush	G5T4	S3		M		TYPE 5				NC
Cicuta bulbifera	Bulb-bearing Waterhemlock	G5	S2		S		TYPE 4	S		S	N
Cirsium brevifolium	Palouse Thistle	G3	S2		GP3	5					NC
Cladonia andereggi	Anderegg's Cup Lichen	G1	S1		GP1	?		S			NC
Cladonia bellidiflora	Cup Lichen	G5	S1		1						N
Cladonia luteoalba	Reindeer Lichen	G2	S1		GP2	8					EC
Cladonia transcendens	Transcending Reindeer Lichen	G5	S3		2						N
Cladonia uncialis	Thorn Cladonia	G4G5	S1		1						N
Claytonia multiscapa	Yellow Spring Beauty	G4?	S1		M						EC
Cleomella plocasperma	Alkali Cleomella	G4	SH		S1		TYPE 3				SW
Collema curtisporum	Short-spored Jelly Lichen	G3	S2		GP3	11	TYPE 3				N
Collomia debilis var. camporum	Flexible Alpine Collomia	G5T2	S2		GP2	12			S		EC
Cornus nuttallii	Pacific Dogwood	G5	S1		1			S			NC
Corydalis caseana ssp. hastata	Case's Corydalis	G5T3	S3		GP3	12	TYPE 3				NC
Crepis bakeri ssp. idahoensis	Idaho Hawksbeard	G4T2	S2		GP2	3	TYPE 2				NC
Cryptantha caespitosa	Tufted Cryptantha	G4	S1		M		TYPE 2				
Cryptantha sericea	Silky Cat's-eye	G4	SNA		1		TYPE 5				SE
Cuscuta denticulata	Sepal-tooth Dodder	G4G5	S1		1		TYPE 3				WC
Cymopterus acaulis var. greeleyorum	Greeley's Wavewing	G5T2	S2		GP2	6	TYPE 3				SW
Cymopterus davisii	Davis' Wavewing	G3	S3		GP3	11			S		SE
Cymopterus douglassii	Douglass' Wavewing	G3	S3		GP3	11			S		EC
Cyperus bipartitus	Shining Flatsedge	G5	S2		M						SW
Cypripedium fasciculatum	Clustered Lady's-slipper	G4	S3		2			S		S	NC
Cypripedium parviflorum var. pubescens	Small Yellow Lady's-slipper	G5T5	S1		1						N
Damasonium californicum	Fringed Waterplantain	G4	S2		M					S	SW
Dasynotus daubenmirei	Daubenmire's Dasynotus	G3	S3		GP3	10		S			NC
Dermatocarpon lorenzianum	Silverskin Lichen	G2	S1		GP2	11	TYPE 3				WC
Dimeresia howellii	Dimeresia	G4?	S2		2		TYPE 3				SW
Dodecatheon dentatum	White Shooting-star	G4	S3		M						NC
Douglasia conservatorum	Bloom Peak Douglasia	G1	S1		G1,S1						N
Douglasia idahoensis	Idaho Dwarf-primrose	G3	S2		GP2	11		S	S		NC
Downingia bacigalupii	Bacigalupi's Downingia	G4	S2		S		TYPE 4				SW
Downingia insignis	Harlequin Calicoflower	G4	S1		1		TYPE 3				SW
Draba fladnizensis	Austrian Draba	G4	S1		2						EC

SSciName	SCommon	G Rank	S Rank	US FWS	INPS	INPS Threat	BLM	USFS Reg1	USFS Reg4	USFS Reg6	Idaho Region
Draba globosa	Pointed Draba	G3	S2		2		TYPE 4	S			EC
Draba incerta	Yellowstone Draba	G5	S2		S						EC
Draba trichocarpa	Stanley Whitlow-grass	G2	S2		GP2	11		S			WC
Drosera intermedia	Spoon-leaved Sundew	G5	S1		1			S			N
Dryopteris cristata	Crested Shield-fern	G5	S2		S			S		S	N
Eatonella nivea	White Eatonella	G4G5	S3		S		TYPE 4				SW
Eleocharis elliptica	Slender Spike-rush	G5	S1		2						
Epilobium palustre	Swamp Willow-weed	G5	S3		M		TYPE 5	S			N
Epipactis gigantea	Giant Helleborine	G3G4	S3		2		TYPE 3	S			WC
Ericameria discoidea var. winwardii	Winward's Whitestem Goldenbush	GNR	SNR		GP1	5					SE
Ericameria parryi var. montana	Centennial Rabbitbrush	G5T1	S1		GP1	12		S			EC
Erigeron humilis	Low Fleabane	G4	S2		M						EC
Erigeron salmonensis	Salmon River Fleabane	G3	S3		GP3	11					EC, WC
Eriogonum capistratum var. welshii	Welsh's Buckwheat	G4T2Q	S2		GP2	9	TYPE 3	S			EC
Eriogonum hookeri	Hooker's Buckwheat	G5	S1		1						SE
Eriogonum meledonum	Guardian Buckwheat	G2	S2		GP2	11		S			WC
Eriogonum ochrocephalum var. calcareum	Calcareous Buckwheat	G5T3	S2		GP3	12	TYPE 3				SW
Eriogonum palmerianum	Palmer's Buckwheat	G4	S1		1						SW
Eriogonum prociduum var. mystrium	Pueblo Mountains Buckwheat	G3TNR	S1		GP3	?					SW
Eriogonum shockleyi var. packardiae	Packard's Buckwheat	G5T2Q	S2		GP2	9	TYPE 2				SW
Eriogonum shockleyi var. shockleyi	Matted Cowpie Buckwheat	G5T4?	S2		2		TYPE 3				SW
Eriogonum soliceps	Railroad Canyon Wild Buckwheat	G2	S1		GP2	11					EC
Eriophorum viridicarinatum	Green Keeled Cotton-grass	G5	S2		1			S		S	N
Eryngium alismifolium	Inland Coyote-thistle	G4	S2		1						SW
Eryngium articulatum	Jointed Coyote-thistle	G5	SNR		SX		TYPE 5				NC
Escobaria vivipara	Cushion Cactus	G5	S2		S		TYPE 4				EC
Eupatorium maculatum var. bruneri	Joe Pye Weed	G5T4T5Q	SNR		1						EC
Gaultheria hispidula	Creeping Snowberry	G5	S2		2			S		S	N
Gentianella propinqua	Four-parted Gentian	G5	S2		M						EC
Gentianella tenella	Slender Gentian	G4G5	S2		2						EC
Githopsis specularioides	Common Bluecup		S1		S1						
Glyptopleura marginata	White-margined Wax Plant	G4G5	S3		S		TYPE 4				SW
Grimmia brittoniae	Britton's Dry Rock Moss	G2	S1		GP2	11		S			N
Grindelia howellii	Howell's Gumweed	G3	S1		GP3	5		S			N
Hackelia cronquistii	Cronquist's Stickseed	G3	S1		GP3	11	TYPE 3				WC
Hackelia davisii	Davis' Stickseed	G3	S3		GP3	11					EC
Hackelia ophiobia	Rattlesnake Stickseed	G3	S2		GP3	11	TYPE 3				SW
Haematomma ochroleucum	Yellow Bloodstain Lichen	G5	S1								
Halimolobos perplexa var. perplexa	Puzzling Halimolobos	G4T3	S3		M		TYPE 5	S	S	S	WC
Haplopappus uniflorus var. howellii	One-flowered Goldenweed	G5T2T4Q	S1		S		TYPE 4				SW
Helodium blandowii	Blandow's Helodium	G5	S2		S					S	NC
Hierochloa odorata	Vanilla Grass	G5	S1		1						WC
Hookeria lucens	Light Hookeria	G5	S1		2			S			NC
Howellia aquatilis	Water Howellia	G3	S1	LT	GP2					S	NC

SSciName	SCommon	G Rank	S Rank	US FWS	INPS	INPS Threat	BLM	USFS Reg1	USFS Reg4	USFS Reg6	Idaho Region
Hymenoxys cooperi	Cooper's Bitterweed	G4G5	SNR		S						SE
Hypericum majus	Large Canadian St. John's-wort	G5	S3		2		TYPE 3	S			N
Hypogymnia inactiva	Inactive Tube Lichen	G3	S3		2						NC
Ipomopsis polycladon	Spreading Gilia	G4	S2		2		TYPE 3				SW
Iris versicolor	Blueflag	G5	S2		S			S			N
Ivesia tweedyi	Tweedy's Ivesia	G4	S2		M						NC
Juncus bolanderi	Bolander's Rush	G5	SNR		SX						N
Kobresia simpliciuscula	Simple Kobresia	G5	S2		2					S	EC
Lepidium davisii	Davis' Peppergrass	G3	S3		GP3	5	TYPE 3				SW
Lepidium integrifolium	Thickleaf Pepperwort	G2G3	SNR		GP2	2					SE
Lepidium papilliferum	Slickspot Peppergrass	G2	S2	LT	GP3	2	TYPE 1		T		SW
Leptodactylon glabrum	Bruneau River Prickly Phlox	G2	S2		GP1	11	TYPE 3				SW
Leptodactylon pungens ssp. hazeliae	Hazel's Prickly Phlox	G5T2Q	S2		GP2	12	TYPE 3		S		WC
Lesquerella obdeltata	Middle Butte Bladderpod	G1G3T1T3	SNR		GP2	5					
Lesquerella paysonii	Payson's Bladderpod	G3	S2		GP3	11			S		SE
Lewisia sacajawana	Sacajawea's bitterroot	G2	S2		GP3	11			S		
Limosella acaulis	Southern Mudwort	G5	S2		M						SW
Lobaria linita	Smearied Lungwort	G4G5	S1		2					S	NC
Lobaria scrobiculata	Pored Lungwort	G4	S1		2						NC
Lomatium bentonitum	Succor Creek Lomatium	G1	S1		G1,S1						
Lomatium brunsfeldianum	Brunsfeld's Lomatium		S1		S1						
Lomatium packardiae	Packard's Desert-parsley	G2	S2		GP2	8	TYPE 3				SW
Lomatium salmoniflorum	Salmon-flower Desert-parsley	G3	S2		GP3	8	TYPE 2	S			NC
Lomatogonium rotatum	Marsh Felwort	G5	S1		1		TYPE 3				EC
Ludwigia polycarpa	Many-fruit False-loosestrife	G4	S1		1						N
Lupinus uncialis	Inch-high Lupine	G4	S2		S		TYPE 4				SW
Lycopodiella inundata	Northern Bog Clubmoss	G5	S2		2			S		S	N
Lycopodium dendroideum	Groundpine	G5	S2		S			S		S	N
Lycopodium sitchense	Sitka Clubmoss	G5	S2		S						N
Maianthemum dilatatum	False Lily-of-the-Valley	G5	S1		1						N
Meesia longiseta	Meesia	G4?	S1		1			S			EC
Mentzelia congesta	Congested Stickleaf	G5	S1		M		TYPE 5				
Mentzelia mollis	Smooth Stickleaf	G2	S2		GP2	2	TYPE 2				SW
Mertensia bella	Oregon Bluebells	G4	S3		S						NC
Mimulus alsinoides	Chickweed Monkeyflower	G5	S1		1			S			NC
Mimulus ampliatus	Spacious Monkeyflower	G1	S1		GP1	5	TYPE 2	S			NC
Mimulus clivicola	Bank Monkeyflower	G4	S3		M				S		NC
Mimulus evanescens	Short-flowered Monkeyflower	G2	S1		GP2	?	TYPE 5			S	SW
Mimulus hymenophyllus	Membrane-leaved Monkeyflower	G1	S1		GP1	11	TYPE 5			S	WC
Mimulus patulus	Stalk-leaved Monkeyflower	G3Q	S1		GP3	2	TYPE 2				WC
Mirabilis macfarlanei	Macfarlane's Four-o'clock	G2	S2	LT	GP2		TYPE 1			S	WC
Musineon lineare	Rydberg's Musineon	G2	S1		GP2	11					SE
Nemacladus rigidus	Rigid Threadbush	G4	S2		S		TYPE 4				SW
Nymphaea leibergii	Leiberg's Water-lily	G5	SH		SX						N

SSciName	SCommon	G Rank	S Rank	US FWS	INPS	INPS Threat	BLM	USFS Reg1	USFS Reg4	USFS Reg6	Idaho Region
Oenothera psammophila	St. Anthony Evening Primrose	G3	S3		GP3	8	TYPE 2				SE
Orobancha pinorum	Pine Broomrape	G4	S2		S2						NC
Orthotrichum hallii	Hall's Orthotrichum Moss	G4	S1		1		TYPE 3				EC
Orthotrichum holzingeri	Holzinger's Orthotrichum Moss	G3	S1		GP2	?					NC
Oxalis trillifolia	Trillium-leaved Wood-sorrel	G5	S1		1						NC
Oxytropis besseyi var. salmonensis	Challis Crazyweed	G5T3	S3		GP3	12	TYPE 3		S		EC
Papaver radiculatum ssp. kluanense	Arctic Poppy	G5T3T4	SX		SX						EC
Parnassia kotzebuei var. kotzebuei	Kotzebue's Grass-of-Parnassus	G4T4	S2		M						EC
Paronychia sessiliflora	Low Nailwort	G5	S1		S1						
Pediocactus simpsonii	Simpson's Hedgehog Cactus	G4	S3		M		TYPE 5				SW
Penstemon compactus	Cache Penstemon	G2	S2		GP2	8			S		SE
Penstemon idahoensis	Idaho Penstemon	G2	S2		GP2	11	TYPE 3		S		SE
Penstemon janishiae	Janish's Penstemon	G4	S2		1		TYPE 3				SW
Penstemon laxus	Idaho Beardtongue	G2G3	SNR		GP2	8					
Penstemon lemhiensis	Lemhi Penstemon	G3	S3		GP3	11	TYPE 3		S		EC
Pentagramma triangularis ssp. triangularis	Gold-back Fern	G5T5	S1		2		TYPE 3	S			NC
Peraphyllum ramosissimum	Wild Crab Apple	G4	S2		2		TYPE 3				WC
Petasites frigidus var. palmatus	Sweet Coltsfoot	G5T5	S1		1			S			NC
Petasites sagittatus	Arrowleaf Coltsfoot	G5	S3		M						N
Peteria thompsoniae	Spine-noded Milkvetch	G4	S2		S		TYPE 4				SW
Phacelia inconspicua	Obscure Phacelia	G2	S1		GP1	5	TYPE 2				EC
Phacelia lutea var. calva	Malheur Yellow Phacelia	G4T3	S3		GP3	12	TYPE 3				SW
Phacelia lyallii	Lyall's Phacelia	G3	S2		S						EC
Phacelia minutissima	Least Phacelia	G3	S2		GP3	5	TYPE 2		S	S	SW
Phlegopteris connectilis	Northern Beechfern	G5	S2		2			S			N
Phlox idahonis	Clearwater Phlox	G1	S1		GP1	2					NC
Physaria didymocarpa var. lyrata	Salmon Twin Bladderpod	G5T1	S1		GP1	3	TYPE 2		S		EC
Picea glauca	White Spruce	G5	S1		2		TYPE 4				EC
Pilophorus acicularis	Nail Lichen	G4	S2		2						NC
Pilophorus clavatus	Nail Lichen	G2G4	S1		1						N
Pinus albicaulis	Whitebark Pine	G3G4	S3	C	S3		TYPE 1		S	S	
Piptatherum micranthum	Small-flowered Ricegrass	G5	S1		2		TYPE 3				EC
Platismatia herrei	Herre's Ragged Lichen	G3G5	S2		2						NC
Poa abbreviata ssp. marshii	Marsh's Bluegrass	G5T2	S1		GP2	12			S		EC
Pogogyne floribunda	Profuseflower Mesamint	G3	S1		GP3	2				S	SW
Polypodium glycyrrhiza	Licorice Fern	G5	S1		1			S			NC
Polystichum braunii	Braun's Sword-fern	G5	S1		2			S			N
Polystichum kruckebergii	Kruckeberg's Sword-fern	G4	S2		S						WC
Potamogeton diversifolius	Water-thread Pondweed	G5	S1		1		TYPE 5			S	
Potentilla bipinnatifida	Prairie Cinquefoil	G5?	S1		M						
Prenanthes exigua	Desert Prenanthes	G5?	S1		1						SW
Primula alcalina	Alkali Primrose	G2	S2		GP2	8	TYPE 2		S		EC
Primula incana	Jones' Primrose	G4G5	S1		1						EC
Psathyrotes annua	Annual Brittlebrush	G5	S2		1		TYPE 3				SW

SSciName	SCommon	G Rank	S Rank	US FWS	INPS	INPS Threat	BLM	USFS Reg1	USFS Reg4	USFS Reg6	Idaho Region
Pseudocyphellaria anomala	Pseudocyphellaria Lichen	G2G4	S2		S						NC
Psilocarphus tenellus	Slender Woolly-heads	G4	S2		S						NC
Pyrrocoma hirta var. sonchifolia	Sticky Goldenweed	G4G5T3	S1		GP3	6		S		S	NC
Pyrrocoma insecticruris	Bugleg Goldenweed	G3	S3		GP3	11	TYPE 3		S		SE
Pyrrocoma integrifolia	Entire-leaved Goldenweed	G3?	S1		GP3	11					
Pyrrocoma liatrifolmis	Palouse Goldenweed	G2	S2		GP2	2	TYPE 2				NC
Pyrrocoma linearis	One-flower Goldenweed (thinleaf goldenhead)	G4?	S3		S3						SW
Pyrrocoma radiata	Snake River Goldenweed	G3	S3		GP3	11	TYPE 3	S			WC
Ramalina pollinaria	Powdery Twig Lichen	G4	S2		2					S	NC
Ranunculus gelidus	Arctic Buttercup	G4	S1		M						EC
Ranunculus pygmaeus	Pygmy Buttercup	G5	S1		S						EC
Rhizomnium nudum	Naked Rhizomnium Moss	G4	S1		2			S			NC
Rhizoplaca idahoensis	White Grouse Pellets Lichen	G1	SNR		GP2	11					
Rhynchospora alba	White Beakrush	G5	S2		1			S		S	N
Ribes sanguineum	Red-flowered Currant	G5	S1		1						N
Ribes wolfii	Wolf's Currant	G4	S2		M					S	NC
Romanzoffia sitchensis	Sitka Mistmaiden	G4	S2		S						N
Rubus bartonianus	Bartonberry	G2	S2		GP2	8			S	S	WC
Rubus spectabilis	Salmonberry	G5	S2		1						N
Rupertia physodes	California Scurf-pea	G4	S1		1						NC
Sairocarpus kingii	King's Snapdragon	G4	S1		1						SW
Salicornia rubra	Red Glasswort	G5	S2		S		TYPE 4				SE
Salix candida	Hoary Willow	G5	S2		S		TYPE 4	S			N
Salix farriar	Farr's Willow	G4	S1		2					S	EC
Salix glauca	Gray Willow	G5	S2		2						EC
Salix pedicellaris	Bog Willow	G5	S2		2			S			N
Salix pseudomonticola	False Mountain Willow	G4G5	S1		2		TYPE 3			S	EC
Sanicula graveolens	Sierra Sanicle	G4G5	S1		S						WC
Sanicula marilandica	Black Snake-root	G5	S3		S3					S	N
Saxifraga adscendens var. oregonensis	Wedge-leaf Saxifrage	G5T4T5	S2		M					S	EC
Saxifraga bryophora var. tobiasiae	Tobias' Saxifrage	G5T2	S2		GP2	6			S		WC
Saxifraga cernua	Nodding Saxifrage	G4	S2		S					S	EC
Scheuchzeria palustris	Pod Grass	G5	S2		2			S			N
Schistostega pennata	Luminous Moss	G3G4	S1		S					S	WC
Schoenoplectus subterminalis	Water Clubrush	G4G5	S3		S		TYPE 4	S		S	N
Sedum borschii	Borsch's Stonecrop	G4?	S2		M						NC
Sedum valens	Salmon River Sedum	G1G2	S1S2		G1G2, S1S2						
Silene scaposa	Blue Mountain Catchfly	G4	S3		M		Type 5				EC, SE
Silene spaldingii	Spalding's Silene	G2	S1	LT	GP3		TYPE 1			S	NC
Silene uralensis ssp. montana	Petalless Campion	G4TNR	S1		1						EC
Sphaerocarpos hians	Liverwort	G1	S1		GP1	2					NC
Sphaeromeria potentilloides	Cinquefoil Tansy	G5	S1		2						SE

SSciName	SCommon	G Rank	S Rank	US FWS	INPS	INPS Threat	BLM	USFS Reg1	USFS Reg4	USFS Reg6	Idaho Region
Sphaerophorus globosus	Tuckermann's Ball-bearing Lichen	G4G5	S1		S						NC
Sphagnum mendocinum	Peatmoss	G4	S1		2			S			N
Sphagnum platyphyllum	Sphagnum	G5	S1		1						WC
Spiranthes diluvialis	Ute Ladies' Tresses	G2	S1	LT	GP3		TYPE 1		T	S	SE
Spiranthes porrifolia	Western Ladies' Tresses	G4	S1		1		TYPE 3			S	NC
Sporobolus compositus var. compositus	Tall Dropseed	G5T5	S1		1		TYPE 3				SE
Stanleya confertiflora	Malheur Prince's Plume	G1	S1		GP3	2	TYPE 2			S	SW
Stanleya tomentosa var. runcinata	Hairy Prince's-plume	G4T3?	SNR		GP3						EC
Streptopus streptopoides	Kruhsea	G5	S2		S			S		S	N
Sullivantia hapemanii var. hapemanii	Hapeman's Sullivantia	G3T3	S2		GP3	12					EC
Symphyotrichum boreale	Rush Aster	G5	S2		S		TYPE 4	S			N
Symphyotrichum jessicae	Jessica's Aster	G2	S2		GP3	2	TYPE 2				NC
Synthyris platycarpa	Evergreen Kittentail	G3	S3		GP3	11		S			NC
Tauschia tenuissima	Leiberg's Tauschia	G3	S3		GP3	11					NC
Telesonix heucheriformis	False Saxifrage	G4	SNR		M						
Telesonix jamesii	James' False Saxifrage	G4	S1		M						EC
Tellima grandiflora	Fringecup	G5	S3		M						N
Teucrium canadense var. occidentale	American Wood Sage	G5T5?	S2		1		TYPE 3				SW
Texosporium sancti-jacobi	Wovenspore Lichen	G2	S2		GP2	1	TYPE 2			S	SW
Thalictrum dasycarpum	Purple Meadow-rue	G5	S1		S1		TYPE 3				N
Thamnia subuliformis	Whiteworm Lichen	G3G5	S1		1						EC
Thelypodium laciniatum var. streptanthoides	Purple Thick-leaved Thelypody	G5T4Q	S2		M		TYPE 5				WC
Thelypodium paniculatum	Paniculate Thelypody	G2	S1		GP2	?					
Thelypodium repandum	Wavy-leaf Thelypody	G3	S3		GP3	11	TYPE 3		S		EC
Thelypteris nevadensis	Sierra Wood-fern	G4	S1		1		TYPE 3	S			NC
Thlaspi idahoense var. aileeniae	Stanley Thlaspi	G3G4T3	S3		GP3	12			S		WC
Townsendia scapigera	Scapose Townsendia	G4G5	S1		2		TYPE 3				SE
Triantha occidentalis ssp. brevistyla	Short-style Tofieldia	G5T4	S1		1			S			NC
Trichophorum alpinum	Hudson's Bay Bulrush	G5	S1		1			S			N
Trichophorum pumilum	Rolland Bulrush	G5	S1		1		TYPE 2				EC
Trientalis europaea ssp. arctica	Northern Starflower	G5T5	S3		S			S			N
Trientalis latifolia	Western Starflower	G5T5	S3		M						NC
Trifolium douglasii	Douglas' Clover	G2	S2		GP3	2	TYPE 2	S		S	NC
Trifolium owyheense	Owyhee Clover	G2	S1		GP3	2	TYPE 2				SW
Trifolium plumosum ssp. amplifolium	Plumed Clover	G4T2	S2		GP2	6	TYPE 2	S			NC
Tripterocladium leucocladulum	Naked Rhizomnium Moss	G3	S3		S						NC
Tuckermannopsis sepincola	Chestnut Wrinkle Lichen	G5	S2		1						N
Ulotia megalospora	Large-spored Ulotia	G3G5	S1		1						N
Vaccinium oxycoccos	Bog Cranberry	G5	S2		2			S			N
Vallisneria americana	Tapegrass	G5	S1		S						N
Viburnum opulus var. americanum	Highbush Cranberry	G5T5	SX		SX						N
Viola selkirkii	Great-spurred Violet	G5?	S1		1						N
Waldsteinia idahoensis	Idaho Strawberry	G3	S3		GP3	11	TYPE 3	S			NC
Xanthoparmelia idahoensis	Idaho Range Lichen	G1	S1		GP2	8	TYPE 2		S		EC