

Childs/Irving Hydroelectric Project **Noxious Weed Guidance**

Project Area

The project area is located along Fossil Creek between the towns of Camp Verde and Strawberry, Arizona. Fossil Creek is the county border between Gila and Yavapai Counties. The easternmost point of the project limits begins at the dam spanning Fossil Creek that is approximately ¼-mile downstream of Fossil Springs. Water collected at this dam is conveyed approximately four miles west through a steel flume along the sides of the Fossil Creek canyon to the Irving Power Plant. The water is then discharged into the Childs flume intake system, continuing west for approximately five miles where the water is discharged into Stehr Lake. The flume intake system then traverses west away from Fossil Creek (which turns due south at this point) over an upland area for approximately 2.5 miles and connects to the Childs Power Plant on the eastern banks of the Verde River. The total flume length is approximately 14 miles.

The entire project area is located on two National Forests. North of Fossil Creek and east of the Verde River lies the Coconino National Forest, whereas the Tonto National Forest lies south of Fossil Creek and west of the Verde River. Likewise, the site has been designated cooperatively as the Fossil Creek Planning Area for the Coconino and Tonto National Forests. Several management areas comprise the Fossil Creek Planning Area. In addition, there are several portions of the project area that are protected under the Arizona Wilderness Act. These portions include a segment of the Verde River near the Childs Power Plant, which is designated as a “Scenic” section of this “Wild and Scenic River,” and there are two designated Wilderness Areas, Fossil Springs and Mazatzal Wilderness Areas.

Purpose

Arizona Public Service (APS) is proposing to decommission the Childs/Irving Power Plant facilities. Construction activities associated with this project will include removal of the total above-ground portions of the flume intake system, temporary widening of the flume road, removal of the Irving Power Plant and various Childs Power Plant facilities, removal of the structures at Stehr Lake, breaching the Stehr Lake dam, and subsequent regrading of Stehr Lake. In addition, the project may include modifications or partial removal of the diversion dam below Fossil Springs. The purpose of this Noxious Weed Guidance is to prescribe methods to prevent and control the spread of noxious weeds during and following the deconstruction of the APS facilities.

History of Noxious Weeds Within the Project Area

There have been no formal surveys for noxious weeds within the project area limits, but the Coconino National Forest has compiled a list of noxious weeds that have been documented at the site over the last twenty years (Table 1.). However, this list only represents a small fraction of the total project area and does not provide a true

representation of the current noxious weed inhabitation in the project area. Furthermore, the list is outdated. It is anticipated that there are additional species of weeds such as Dalmatian toadflax, bull thistle, yellow-star thistle, and diffuse knapweed within the project area (Agyagos 2002).

Table 1: Invasive Plant Species and Locations within the Fossil Creek Planning Area.

Common Name	Scientific Name	Location Observed
Tamarisk	<i>Tamarix</i> spp.	Fossil Creek Riparian, Fossil Creek Uplands
Himalayan Blackberry	<i>Rubus procerus</i>	Fossil Creek Riparian, Fossil Creek springs # 13-28
Bur Clover	<i>Medicago ploymorpha</i>	Fossil Springs Botanical Area
Hoarhound	<i>Marrubium vulgare</i>	Fossil Creek Uplands and Fossil Spring Botanical Area
Johnson Grass	<i>Sorghum halepense</i>	Fossil Springs and Fossil Springs Botanical Area
Silverleaf Nightshade	<i>Solanum eleagnifolium</i>	Fossil Springs Botanical Area and Fossil Creek Uplands

Source: Coconino National Forest; Fossil Creek Watershed Analysis Existing Condition of Vegetation and Special Status Species.

Best Management Practices

Because the total project area occurs on lands managed by the U.S. Forest Service, noxious weed control should abide by U.S. Forest Service practices. The U.S. Department of Agriculture Forest Service Guide to Noxious Weed Prevention Practices provides a comprehensive directory of weed prevention practices for use in Forest Service planning and wildland resource management activities and operations. The Guide uses the term “*weed*” to include all plants defined as “*noxious weeds*” by U.S. Forest Service policy:

“. . .plants designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof.” (FSM 2080.5)

This Guide to Noxious Weed Prevention Practices supports implementation of the February 3, 1999 Executive Order 13112 on Invasive Species: projects which occur on federal lands or are federally funded must, “use relevant programs and authorities to: i) prevent the introduction of invasive species; ii) detect and respond rapidly to, and control, populations of such species in a cost-effective and environmentally sound manner; iii) monitor invasive species populations accurately and reliably; and iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded.”

The Guide provides best management practices (BMP). The Coconino, Kaibab, and Prescott National Forests have supplemented this Guide into a General Integrated Weed Management Practice for All Site-disturbing Projects and Maintenance Programs. The applicable BMPs from the supplemented Guide include the following:

- Remove mud, dirt, and plant parts from project equipment before moving it into a project area. Determine the need for, and when appropriate, identify sites where equipment can be cleaned. Clean equipment before entering National Forest System lands; a Forest Officer, in coordination with the Unit Invasive Species Coordinator, needs to approve use of on-Forest cleaning sites in advance. This practice does not apply to service vehicles traveling frequently in and out of the project area that will remain on the roadway. Seeds and plant parts should be collected when practical and incinerated.
- If operating in areas infested with weeds, clean all equipment before leaving the project site. To minimize time spent cleaning equipment time, all work in infested areas should be performed last and concurrently, designate a “contaminate” parking lot where project vehicles working in the infested area may be parked for the duration of the project. This area should be monitored in follow-up mitigation and should be near a “clean” vehicle/equipment lot. Identify sites where equipment and vehicles can be cleaned before leaving the site at the end of project. Seeds and plant parts should be collected when practical and incinerated.
- Workers need to inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment after being trained to recognize the priority species in the area. Proper disposal means bagging the seeds and plant parts and incinerating them.
- Inspect material sources on site, and ensure that they are weed-free before use and transport. Treat weed-infested sources for eradication, and strip and stockpile contaminated material before any use of pit material.
- Inspect and document the area after project completion where material from treated weed-infested sources is used (including those from treated weed-infested sources), annually for a time period agreed upon with the U.S. Forest Service, to ensure that any weeds transported to the site are promptly detected and controlled.
- Maintain stockpiled, uninfested material in a weed-free condition.
- Retain native vegetation in and around project activity to the maximum extent possible and consistent with project objectives.
- Minimize soil disturbance to the extent practical, consistent with project objectives.
- Revegetate disturbed soil (except travelways on surfaced projects) in a manner that optimizes plant establishment for that specific site (see the appendix Revegetation Plan). Define for each project what constitutes disturbed soil and objectives for plant cover revegetation.
- Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching as necessary (see the appendix Revegetation Plan). Use

native material where appropriate and feasible. Use certified weed-free or weed-seed-free hay or straw where certified materials are required and/or are reasonably available. Always use certified materials in areas closed by administrative order. Where practical, stockpile weed-seed-free topsoil and replace it on disturbed areas (e.g. road embankments or landings)

- Inspect and document all limited term ground-disturbing operations in noxious weed infested areas for at least five growing seasons following completion of the project. For on-going projects, continue to monitor until reasonable certainty is obtained that no weeds have occurred. Provide for follow-up treatments based on inspection results.
- Schedule and coordinate blading or pulling of noxious weed-infested roadsides or ditches in consultation with the local weed specialist. Do not blade or pull roadsides and ditches that are infested with noxious weeds unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, ensure the weeds remain on-site. Blade from least infested to most infested areas. When it is necessary to blade noxious weed-infested roadsides or ditches, schedule activity when seeds or propagules are least likely to be viable and to be spread. Minimize soil surface disturbance and contain bladed material on the infested site.
- Avoid acquiring water for dust abatement where access to the water is through weed-infested sites.
- Treat weeds in road decommissioning and reclamation projects before roads are made impassable. Reinspect and follow-up based on initial inspection and documentation.

Noxious Weed Control

- A survey to identify existing noxious weeds within all disturbed portions of the project area is necessary prior to deconstruction activities. Methods of controlling and eliminating noxious weeds depend on the actual weeds present.
- Once the survey has been conducted, the locations for all Category A and B noxious plants must be mapped on a 1:24,000 scale map for entry into the Southwest Exotic Plant Mapping Program database. Copies of all survey forms and maps should be sent to the lead Forest Service district. Surveys should identify Noxious Weed species listed on the Coconino and Tonto National Forests (Appendices A and B), as well as the federal and Arizona state list (Appendices C and D). Surveys should be in accordance with the U.S. Forest Service Invasive Plant Inventory, Monitoring and Mapping Protocol. In addition to invasive and noxious weeds, all exotic and ornamental species should be identified and included in the treatment process, as well. Exotic and ornamental species should be included because of the goal to return the Fossil Creek Planning Area to a natural state. These species include but are not limited to Bermuda grass (*Cynodon dactylon*), iris (*Iris* spp.), fruit trees or other ornamental trees and shrubs.

- A risk assessment must be completed. The weeds located on the project site must be inventoried and prioritized for treatment in project operating areas and along access routes. Project operations should begin in uninfested areas before operating in weed-infested areas. Operating areas and access routes should be planned to avoid heavy infestation areas, and closure of access routes should be planned at the finish of the project. Weed-free project staging areas should be located and used. Avoid or minimize all types of travel through weed-infested areas, or restrict to those periods when spread of seed or propagules are least likely.
- Appropriate measures must be taken to eradicate species before construction begins to prevent spreading propagules into other areas. Depending on the species identified on the survey, treatment methods may include hand pulling or herbicidal application. Herbicidal application is the recommended procedure based on cost and effectiveness of treatment. However, herbicidal application may only be performed by a certified individual, and use of an herbicide on Forest Service land requires an Environmental Assessment to be prepared in accordance with the National Environmental Policy Act. Treatment should be in accordance with the U.S. Forest Service Invasive Plant Inventory, Treatment of Invasive Plants.
- Monitoring may be required depending on the species identified during the survey. Monitoring should be in accordance with the U.S. Forest Service Invasive Plant Inventory, Monitoring and Mapping Protocol.

References:

Agyagos, Janie. 2002. Coconino National Forest; Fossil Creek Watershed Analysis Existing Condition of Vegetation and Special Status Species

General Integrated Weed Management Practices for the Coconino, Kaibab, and Prescott National Forests. 2001.

USDA Forest Service Guide to Noxious Weed Prevention Practices. 2001.

APPENDIX A
COCONINO, KAIBAB, & PRESCOTT NATIONAL FORESTS
INVASIVE PLANT SPECIES LIST 2001

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>OBJECTIVE</u>
<i>Acroptilon repens</i>	Russian knapweed	Contain/Control
<i>Aegilops cylindrica</i>	jointed goatgrass	Contain/Control
<i>Ailanthus altissima</i>	tree of heaven	Eradicate/Control
<i>Alhagi pseudoalhagi</i>	camelthorn	Contain/Control
<i>Arundo donax</i>	reed grass	Eradicate/Control
<i>Asphodelous fistulosus</i>	onion weed	Prevent/Eradicate
<i>Avena fatua</i>	wild oats	Contain/Control
<i>Bromus tectorum</i>	cheatgrass	Contain/Control
<i>Cardaria chalepensis</i>	lens-podded hoary cress	Prevent/Eradicate
<i>Cardaria draba</i>	whitetop or hoary cress	Eradicate/Control
<i>Cardaria pubescens</i>	globe-potted hoary cress	Prevent/Eradicate
<i>Carduus nutans</i>	musk thistle	Eradicate/Control
<i>Centaurea calcitrapa</i>	purple starthistle	Prevent/Eradicate
<i>Centaurea diffusa</i>	diffuse knapweed	Contain/Control
<i>Centaurea maculosa</i>	spotted knapweed	Eradicate/Control
<i>Centaurea melitensis</i>	Malta starthistle	Eradicate
<i>Centaurea solstitialis</i>	yellow starthistle	Eradicate/Control
<i>Chrysanthemum leucanthemum</i>	oxeye daisy	Prevent/Eradicate
<i>Cirsium arvense</i>	Canada thistle	Prevent/Eradicate
<i>Cirsium vulgare</i>	bull thistle	Contain/Control
<i>Cynoglossum officinale</i>	houndstongue	Eradicate
<i>Dipsacus sylvestris</i>	teasel	Eradicate
<i>Drymaria arenarioides</i>	alfombrilla	Prevent/Eradicate
<i>Echhornia azurea</i>	anchored waterhyacinth	Prevent/Eradicate
<i>Eleagnus angustifolia</i>	Russian olive	Contain/Control
<i>Euphorbia esula</i>	leafy spurge	Contain/Control
<i>Euryops subcarnosus</i>	sweet resin bush	Contain/Control
<i>Halogeton glomeratus</i>	halogeton	Prevent/Eradicate
<i>Hydrilla verricillata</i>	hydrilla	Prevent/Eradicate
<i>Hyoscyamus niger</i>	black henbane	Prevent/Eradicate
<i>Hypericum perforatum</i>	common St. Johnswort	Prevent/Eradicate
<i>Isatis tinctoria</i>	dyer's woad	Prevent/Eradicate
<i>Kochia scoparia</i>	kochia	Contain/Control
<i>Linaria dalmatica</i>	Dalmatian toadflax	Contain/Control
<i>Linaria vulgaris</i>	yellow toadflax	Eradicate
<i>Lythrum salicaria</i>	purple loosestrife	Prevent/Eradicate
<i>Myriophyllum spicatum</i>	Eurasian water milfoil	Eradicate
<i>Onopordum acanthium</i>	Scotch thistle	Contain/Control
<i>Peganum harmala</i>	African rue	Prevent/Eradicate
<i>Potentilla recta</i>	Sulfur cinquefoil	Eradicate
<i>Rubus procerus</i>	Himalayan blackberry	Contain/Control
<i>Salvia aethiopsis</i>	Mediterranean sage	Eradicate/Control
<i>Sorghum halepense</i>	Johnson grass	Contain/Control
<i>Tamarix ramosissima & spp.</i>	salt cedar or Tamarix	Contain/Control
<i>Tribulus terrestris</i>	puncture-vine	Contain/Control
<i>Ulmus pumula</i>	Siberian elm	Eradicate/Control
<i>Verbascum thapsus</i>	common mullein	Contain/Control

APPENDIX B
TONTO NATIONAL FOREST
INVASIVE PLANT SPECIES LIST 2001

APPENDIX C

FEDERAL NOXIOUS WEED LIST

Aquatic/Wetland

Azolla pinnata (Azollaceae) (mosquito fern, water velvet)
Caulerpa taxifolia (Caulerpaceae)(Mediterranean clone of caulerpa)
Eichhornia azurea (Pontederiaceae) (anchored waterhyacinth)
Hydrilla verticillata (Hydrocharitaceae) (hydrilla)
Hygrophila polysperma (Acanthaceae) (Miramar weed)
Ipomoea aquatica (Convolvulaceae) (Chinese waterspinach)
Lagarosiphon major (Hydrocharitaceae) (Oxygen weed)
Limnophila sessiliflora (Scrophulariaceae) (ambulia)
Melaleuca quinquenervia (Myrtaceae) (broadleaf paperbark tree)
Monochoria hastata (Pontederiaceae) (monochoria)
Monochoria vaginalis (Pontederiaceae) (pickerel weed)
Ottelia alismoides (Hydrocharitaceae) (duck-lettuce)
Sagittaria sagittifolia (Alismataceae) (arrowhead)
Salvinia auriculata (Salviniaceae) (giant salvinia)
Salvinia biloba (Salviniaceae) (giant salvinia)
Salvinia herzogii (Salviniaceae) (giant salvinia)
Salvinia molesta (Salviniaceae) (giant salvinia)
Solanum tampicense (Solanaceae)(wetland nightshade)
Sparganium erectum (Sparganiaceae) (exotic bur-reed)

Parasitic

Aeginetia spp. (Orobanchaceae)
Cuscuta spp. other than native or widely distributed species (Cuscutaceae)(dodders)
Orobanche spp. other than native or widely distributed species (Orobanchaceae) (broomrapes)
Striga spp. (Scrophulariaceae) (witchweeds)

Terrestrial

Ageratina adenophora (Asteraceae) (crofton weed)
Alternanthera sessilis (Amaranthaceae) (sessile joyweed)
Asphodelus fistulosus (Liliaceae) (onionweed)
Avena sterilis L. (Poaceae) (animated or wild oat)
Carthamus oxyacanthus (Asteraceae) (wild safflower)
Chrysopogon aciculatus (Poaceae) (pilipiliula)
Commelina benghalensis (Commelinaceae) (Benghal dayflower)
Crupina vulgaris (Asteraceae) (common crupina)
Digitaria scalarum (Poaceae) (African couch grass or fingergrass)
Digitaria velutina (Poaceae) (velvet fingergrass or annual couchgrass)
Drymaria arenarioides (Caryophyllaceae) (lightening weed, alfombrilla)
Emex australis (Polygonaceae) (three-cornered jack)
Emex spinosa (Polygonaceae) (devil's thorn)
Galega officinalis (Fabaceae) (goatsrue)
Heracleum mantegazzianum (Apiaceae) (giant hogweed)
Homeria spp. (Iridaceae) (cape tulip)
Imperata brasiliensis (Poaceae) (Brazilian satintail)
Imperata cylindrica (Poaceae) (cogongrass)
Ischaemum rugosum (Poaceae) (murrain-grass)

FEDERAL NOXIOUS WEED LIST (Cont'd)

Leptochloa chinensis (Poaceae) (Asian sprangletop)
Lycium ferocissimum (Solanaceae) (African boxthorn)
Melastoma malabathricum (Melastomataceae) (no common name)
Mikania cordata (Asteraceae) (African mile-a-minute)
Mikania micrantha (Asteraceae) (mile-a-minute)
Mimosa invisa (Fabaceae) (giant sensitive plant)
Mimosa pigra (Fabaceae) (catclaw mimosa)
Nassella trichotoma (Poaceae) (serrated tussock)
Opuntia aurantiaca (Cactaceae) (jointed prickly pear)
Oryza longistaminata (Poaceae) (red rice)
Oryza punctata (Poaceae) (red rice)
Oryza rufipogon (Poaceae) (red rice)
Paspalum scrobiculatum (Poaceae) (Kodo-millet)
Pennisetum clandestinum (Poaceae) (kikuyugrass)
Pennisetum macrourum (Poaceae) (African feathergrass)
Pennisetum pedicellatum (Poaceae) (kyasuma-grass)
Prosopis articulata
Prosopis burkartii
Prosopis caldenia
Prosopis calingastana
Prosopis campestris
Prosopis castellanosi
Prosopis denudans
Prosopis elata
Prosopis farcta
Prosopis ferox
Prosopis fiebrigii
Prosopis hassleri
Prosopis humilis
Prosopis kuntzei
Prosopis pallida
Prosopis palmeri
Prosopis reptans
Prosopis rojasiana
Prosopis ruizlealii
Prosopis ruscifolia
Prosopis sericantha
Prosopis strombulifera
Prosopis torquata
Rottboellia cochinchinensis (Poaceae) (itchgrass or raoulgrass)
Rubus fruticosus (Rosaceae) (wild blackberry complex)
Rubus moluccanus (Rosaceae) (wild raspberry)
Saccharum spontaneum (Poaceae) (wild sugarcane)
Salsola vermiculata (Chenopodiaceae) (Mediterranean saltwort)
Setaria pallide-fusca (Poaceae) (cattail grass)
Solanum torvum (Solanaceae) (turkeyberry)
Solanum viarum (Solanaceae) (tropical soda apple)
Spermacoce alata (Rubiaceae) (borreria)
Tridax procumbens (Asteraceae) (coat buttons)
Urochloa panicoides (Poaceae) (liverseed grass)

APPENDIX D

ARIZONA STATE NOXIOUS WEED LIST

Acroptilon repens (L.) DC. (Russian knapweed)
Aegilops cylindrica Host. (jointed goatgrass)
Alhagi pseudalhagi (Bieb.) Desv. (camelthorn)
Alternanthera philoxeroides (Mart.) Griseb. (alligator weed)
Cardaria pubescens (C.A. Mey) Jarmolenko (hairy whitetop)
Cardaria chalepensis (L.) Hand-Muzz (lens podded hoary cress)
Cardaria draba (L.) Desv. (globed-podded hoary cress or whitetop)
Carduus acanthoides L. (plumeless thistle)
Cenchrus echinatus L. (southern sandbur)
Cenchrus incertus M.A. Curtis (field sandbur)
Centaurea calcitrapa L. (purple starthistle)
Centaurea iberica Trev. ex Spreng. (Iberian starthistle)
Centaurea squarrosa Willd. (sugarrose knapweed)
Centaurea sulphurea L. (Sicilian starthistle)
Centaurea solstitialis L. (yellow starthistle or St. Barnaby's thistle)
Centaurea diffusa L. (diffuse knapweed)
Centaurea maculosa L. (spotted knapweed)
Chondrilla juncea L. (rush skeletonweed)
Cirsium arvense L. Scop. (Canada thistle)
Convolvulus arvensis L. (field bindweed)
Coronopus squamatus (Forsk.) Ascherson (creeping wartcress or coronopus)
Cucumis melo L. var. *Dudaim* Naudin (dudaim melon or Queen Anne's melon)
Cuscuta spp. (dodder)
Drymaria arenarioides H.B.K. (alfombrilla or lightningweed)
Eichhornia azurea (SW) Kunth. (anchored waterhyacinth)
Elytrigia repens (L.) Nevski (quackgrass)
Euphorbia esula L. (leafy spurge)
Halogeton glomeratus (M. Bieb.) C.A. Mey (halogeton)
Helianthus ciliaris DC. (Texas blueweed)
Hydrilla verticillata Royale (hydrilla or Florida-elodea)
Ipomoea spp. (morning glory) All species except *Ipomoea carnea* (Mexican bush morning glory) *Ipomoea triloba*, (three-lobed morning glory) (which is considered a restricted pest); and *Ipomoea aborescens*, (morning glory tree)
Medicago polymorpha L. (burclover)
Nassella trichotoma (Nees.) Hack. (serrated tussock)
Onopordum acanthium L. (Scotch thistle)
Orobanche ramosa L. (branched broomrape)
Panicum repens L. (torpedo grass)
Peganum harmala L. (African rue or Syrian rue)
Portulaca oleracea L. (common purslane)
Rorippa austriaca (Crantz.) Bess. (austrian fieldcress)
Salvinia molesta (giant salvinia)
Senecio jacobaea L. (tansy ragwort)
Solanum carolinense L. (Carolina horsenettle)
Sonchus arvensis L. (perennial sowthistle)
Solanum viarum Dunal (tropical soda apple)
Stipa brachychaeta Godr. (puna grass)
Striga spp. (witchweed)
Trapa natans L. (water-chestnut)
Tribulus terrestris L. (puncturevine)

ARIZONA STATE REGULATED AND RESTRICTED NOXIOUS WEED LIST

Cenchrus echinatus L. (southern sandbur)
Cenchrus incertus M.A. Curtis (field sandbur)
Convolvulus arvensis L. (field bindweed)
Eichhornia crassipes (Mart.) Solms (floating waterhyacinth)
Medicago polymorpha L. (burclover)
Portulaca oleracea L. (common purslane)
Tribulus terrestris L. (puncturevine)

ARIZONA STATE RESTRICTED PEST LIST

Acroptilon repens (L.) DC. (Russian knapweed)
Aegilops cylindrica Host. (jointed goatgrass)
Alhagi pseudalhagi Bieb. Desv. (camelthorn)
Cardaria draba (L.) Desv. (globed-podded hoary cress or whitetop)
Centaurea diffusa L. (diffuse knapweed)
Centaurea maculosa L. (spotted knapweed)
Centaurea solstitialis L. (yellow starthistle or St. Barnaby's thistle),
Cuscuta spp. (dodder)
Elytrigia repens (L.) Nevski (quackgrass)
Euryops sunbcarnosus subsp. *vulgaris* (sweet resinbush)
Halogeton glomeratus (M. Bieb.) C.A. Mey (halogeton)
Helianthus ciliaris DC. (Texas blueweed)
Ipomoea triloba L. (three-lobed morning glory)
Linaria genistifolia var. *dalmatica* (Dalmation toadflax)
Onopordum acanthium L. (Scotch thistle)