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FISH AND WILDLIFE SERVICE
Upper Columbia Fish and Wildlife Office
Spokane, Washington 99206

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November 24, 2008

Yakima, Washington

MEMORANDUM

To: Study Manager, Yakima River Basin Water Storage Feasibility Study
U.S. Bureau of Reclamation, Yakima, Washington
Attention: Kim McCartney

From: Acting Project leader, Upper Columbia Fish and Wildlife Office, U.S. Fish and Wildlife Service, Spokane, Washington *Robert J. Tozner*

Subject: Planning Aid Memorandum and Addendum to the Coordination Act Report, Yakima River Basin Water Storage Feasibility Study Seepage Mitigation Proposal.

This Planning Aid Memorandum (PAM) transmits the U.S. Fish and Wildlife Service's (Service) Addendum to the Coordination Act Report (CAR) (attached) pursuant to the Interagency Acquisition (IA) with the Bureau of Reclamation for the Yakima River Basin Water Storage Feasibility Study (Study). This PAM is being submitted pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 15 U.S.C. 661 *et seq.*).

The Service appreciates the opportunity to work with the Bureau of Reclamation during the preparation of this Addendum to the CAR. Please contact Rick Donaldson (509)893-8009, if you have further questions or comments.

Attachment

C.

USFWS, Hanford Reach National Monument (Greg Hughes)
USFWS, Mid-Columbia FRO – Leavenworth (Jim Craig)
USFWS, CWFO – Wenatchee (Greg Van Stralen)

**Yakima River Basin Water Storage Feasibility Study
Fish and Wildlife Coordination Act Report – Addendum
Response to Seepage Mitigation Proposal**



**Prepared for
Pacific Northwest Region
Bureau of Reclamation
Yakima, Washington**

November 24, 2008

**Prepared by
U.S. Fish and Wildlife Service
Upper Columbia Fish and Wildlife Office
Spokane, Washington**

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INTRODUCTION

Background

On October 10, 2007, the U.S. Fish and Wildlife Service (Service) delivered a Fish and Wildlife Coordination Act Report (CAR) to the U.S. Bureau of Reclamation (Reclamation) for the Yakima River Basin Water Storage Feasibility Study (Study). The CAR was prepared for Reclamation pursuant to Section 2(b) of the Fish and Wildlife Coordination Act and the 2007 Interagency Agreement (IA) between Service and Reclamation. The primary purpose of the CAR was to: (1) describe the baseline condition of fish and wildlife resources within a defined geographic area likely to be affected (Affected Area¹) by the four alternatives under consideration in the Study; (2) generally describe the effects of the four alternatives on fish and wildlife resources within the Affected Area; and (3) provide recommendations to avoid, minimize and/or compensate for adverse impacts to fish and wildlife resources associated with the four Study alternatives.

In January 2008, the Draft Planning Report/Environmental Impact Statement (DEIS) for the Study was released for review and comment by Reclamation. The Service's October 2008 CAR was referenced as an appendix in that document.

After the conclusion of the DEIS comment period, Reclamation informed the Service that a design proposal had been developed to mitigate for seepage from the Black Rock Dam and Reservoir (if constructed). Reclamation's proposed mitigation measure is intended to prevent seepage related ground and surface water from reaching the aquifer within the Hanford site. These features would be constructed almost entirely within the Fitzner/Eberehart Arid Lands Ecology Reserve (ALE) portion of the Hanford Reach National Monument (Monument), administered by the Service. Subsequently, Reclamation requested that the Service prepare an addendum to the October 10, 2007, CAR (CAR Addendum) to specifically address potential affects of their Black Rock Dam and Reservoir seepage mitigation proposal on fish and wildlife resources, as well as conservation recommendations to mitigate the effect of that proposal on those resources.

Hanford Reach National Monument and Arid Lands Ecology Reserve

The ALE is a 77,000 acre unit within the Monument, located southwest of the Columbia River and State Highway 240, between State Highways 24 and 225 (See Figure 1, map of

¹ For the purpose of the CAR, the "Affected Area" is defined as the entire area that may be affected directly or indirectly with the implementation of Reclamation's three action alternatives and not merely the immediate area (*i.e.*, footprint) involved in the action. The "Affected Area" would be defined similarly under the no action alternative. This definition of the "Affected Area" is consistent with usage of the term "Action Area" in section 7 Endangered Species Act consultations. Furthermore, "direct effects" are those which are caused by the action and occur at the same time and place, while "indirect effects" are those which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable (40 CFR §1508.8(a&b) and 50 CFR §402.02).

the Monument and ALE, page 3). The ALE, identified by the Service as a sensitive ecological area was established in 1967 to preserve “portions of vegetation types that once covered a great expanse of the west” (USFWS 2002 and 2008d). The ALE ranges in elevation from approximately 1200 to over 3500 feet above sea level. Prominent natural features of the ALE include the ridge top and mostly north-facing slope of Rattlesnake Mountain, a portion of the Rattlesnake Hills, and the east end of Yakima Ridge.

Shrub-steppe Habitat: One of the few remaining large tracts of native shrub-steppe vegetation in Washington is also found within the ALE. Undisturbed vegetation in the shrub-steppe habitat is characterized by big sagebrush (*Artemisia tridentata*) as the dominant shrub species, and blue bunch wheatgrass (*Pseudoroegneria spicata*) as the dominant grass species (Daubenmire 1970). Lesser coverage of gray rabbitbrush (*Chrysothamnus nauseosus*), green rabbitbrush (*Chrysothamnus viscidiflorus*), spiny hopsage (*Grayia spinosa*), three-tip sage (*Artemisia tripartita*) and black greasewood (*Sarcobatus vermiculatus*) may occur in the shrub layer.

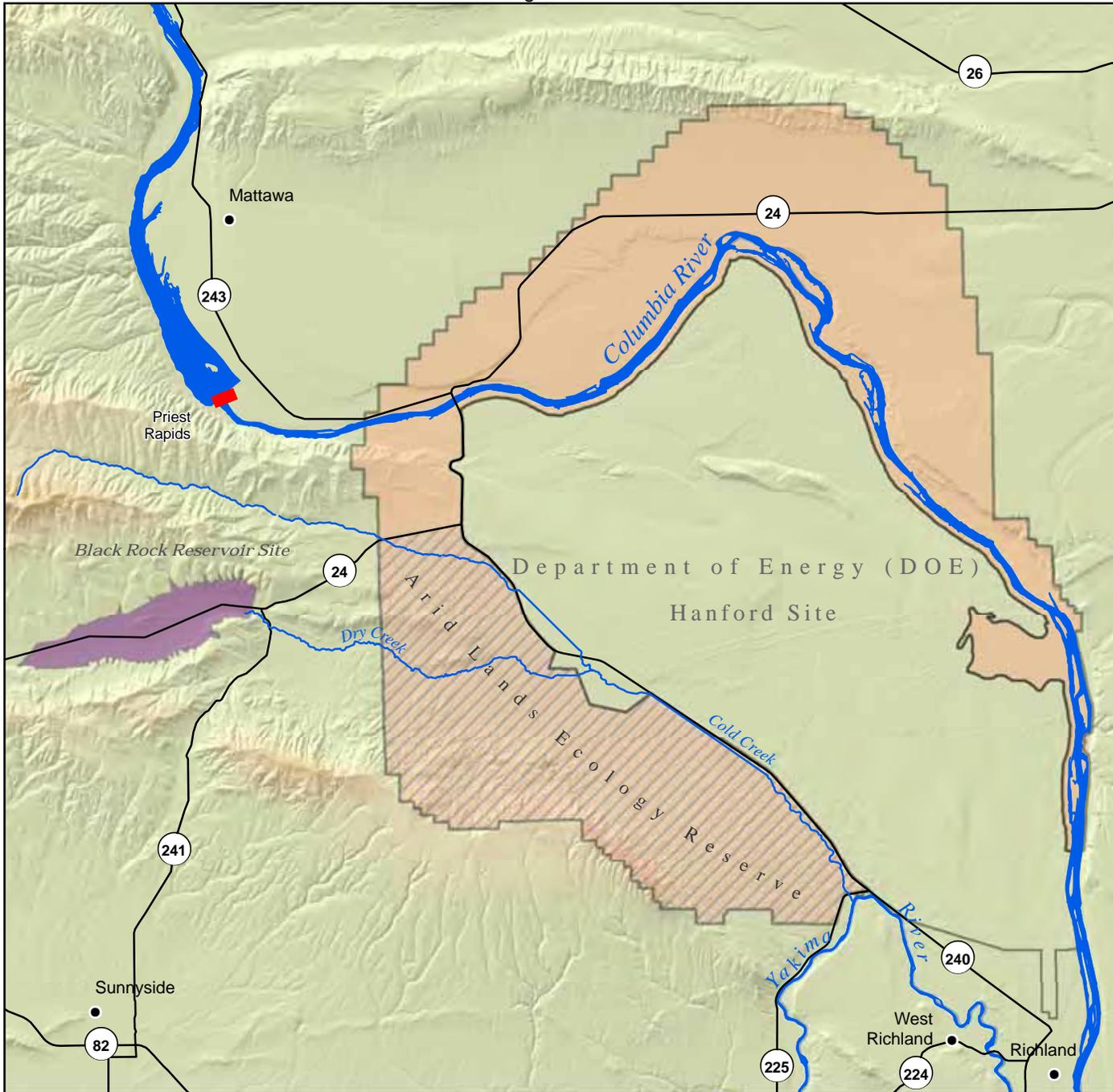
Wildlife: An array of shrub-steppe obligate species of wildlife are found within the ALE, including burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), sage sparrow (*Amphispiza belli*), long-billed curlew (*Numenius americanus*), sagebrush vole (*Lemmyscus curtatus*), Merriam’s shrew (*Sorex merriami*), black-tailed jackrabbit, (*Lepus californicus*), northern sagebrush lizard (*Sceloporus graciosus*) and striped whipsnake (*Masticophis taeniatus*). Other habitat generalists that occur in this area include Rocky Mountain elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), and coyote (*Canis latrans*). Forty-six species of butterflies and one hundred seven taxa of moths also occur here (USFWS 2008a).

Rare Plants: A total of 127 populations of thirty rare plant taxa have been documented to occur on the Monument. In addition, a new plant has been identified on the ALE, the Rattlesnake Mountain milk-vetch (*Astragalus comjunctus* var. *rickardii*), which occurs on top of Rattlesnake Mountain. A relatively large population of Piper’s daisy (*Erigeron piperianus*), a state sensitive plant, also occurs on the Monument (USFWS 2008a).

Invasive Plants: Although cheatgrass (*Bromus tectorum*), an exotic annual, is established in some areas on the ALE, a majority of the land on the ALE is dominated by native perennial grass communities with low levels of non-native species. Intact native plant communities seem to resist invasion by cheatgrass in the absence of disturbance. Many areas in the ALE that support cheatgrass are intermixed with native Sandberg bluegrass (*Poa secunda*) (USFWS 2008d).

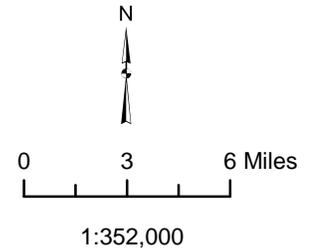
Wetland and Riparian Habitats: Although a relatively small component of the landscape, wetland and riparian habitats also occur within the ALE. These occur primarily as riparian springs, unique natural features that increase the value of the surrounding areas for wildlife. For example, Rattlesnake and Snively Springs comprise two of these unique natural features and are considered a critical component for all shrub-steppe wildlife

Figure 1



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Arid Lands Ecology Reserve
and
Hanford Reach National Monument



-  Existing Dam
-  Arid Lands Ecology Reserve
-  Hanford Reach NM



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species found within the ALE (USFWS 2008d). Some of the plant species associated with these habitats include black cottonwood (*Populus trichocarpa*), sandbar willow (*Salix interior*) and coyote willow (*Salix exigua*).

Public use in the ALE is currently limited to approved ecological research and environmental education activities. A major human-caused wildfire burned most of this unit in 2000 and then again in August of 2007, spreading across thousands of acres of the ALE, devastating native plants, especially big sagebrush, which does not easily recover after a fire of that intensity. The loss of shrub cover due to the fire reduced the diversity and complexity of the vegetation structure present on the landscape (USFWS 2002 and USFWS 2007a). Fires have also damaged the microbiotic crust, a critical component of shrub-steppe. This collection of mosses, lichens, liverworts, algae and bacteria stabilizes the soils and fills the space between bunchgrass clumps (USFWS 2002).

The Service has actively carried out post-fire restoration and re-vegetation activities on the ALE. Although recovery tends to be slow in an arid environment, shrub-steppe vegetation is expected to trend toward pre-fire conditions in the absence of further disturbances (USFWS 2008d).

PART I PROJECT DESCRIPTION

I-1) Black Rock Reservoir Alternative

As discussed in greater detail in the DEIS, the Black Rock alternative involves the creation of a reservoir within the predominantly shrub-steppe zone of the Mid-Columbia Basin. The Black Rock Valley lies between Rattlesnake Hills to the south and the Yakima Ridge to the north, and is a tributary to the lower Yakima River. The reservoir site is drained via Dry Creek (an ephemeral watercourse)² which flows into Cold Creek and thence via Cold Creek through the Monument into the lower Yakima River near Richland. Black Rock Reservoir would have an active storage capacity of 1,300,000 acre-feet. The impoundment would be created by constructing a 760 foot high concrete face, rock-fill dam at the east end of the valley. Water pumped from the impoundment of Priest Rapids Dam on the Columbia River would be conveyed to the proposed reservoir via aqueduct using a 3,500-cfs pumping plant. Water stored in the reservoir would be used (as needed) for flow augmentation in the lower Yakima River Basin using a 2,500-cfs reservoir outflow conveyance system and exchanged with Yakima River water (Reclamation 2008a).

² Except in the reach of Dry Creek downstream from Rattlesnake Springs which remains wetted throughout the year

I-2) Black Rock Reservoir - Seepage Mitigation Proposal

As a modification of the Black Rock Reservoir alternative, Reclamation designed a method to capture and transport ground and surface water that is expected to seep from beneath the dam into Dry Creek and eventually onto the Hanford site. These flows would be captured by a cut-off wall, approximately 200 feet in depth (below the ground surface), 5,500 feet in length across Dry Creek channel, located approximately 35,000 feet (6.6 miles) downstream from Black Rock Dam. A pipe inlet structure/lined transition would be constructed on the upstream side of the 15-foot-high embankment to direct water into a 48-inch-diameter pipeline (pipeline), which in turn would transport captured water 20.6 miles distant to an outlet in the Yakima River at Horn Rapids County Park. The inlet to the pipeline would have a trash rack to catch large debris, a trash rake for cleaning and a steel slide-gate to close off flow to the pipeline if needed. The pipeline would be sized to accommodate a maximum flow of 71 cfs at a velocity of approximately 5 to 7 feet per second. Surface flow exceeding the capacity of the pipeline would pass through a spillway in the cut-off wall and continue down Dry Creek. Ten wells (reaching to a depth of about 300 feet deep) located immediately downstream of the cutoff wall would capture sub-surface seepage flow and other water that may pass under the cutoff wall. Any water captured by these wells would also be directed into the pipeline. Additional wells may be situated upstream of the cutoff wall/embankment to augment removal of sub-surface seepage flow (Reclamation 2008b).

The pipeline would be buried along its entire route, and situated along existing roadways (including State Highway 240). A baffled outlet structure would be constructed to transition water from the pipeline to the Yakima River near Horn Rapids. Riprap would be placed around the outlet structure to guard against erosion from the Yakima River (Reclamation 2008b).

Construction of the pipeline would require the use of a right-of-way (ROW) up to 150-foot in width running down-gradient from the cut-off wall to its outlet (20.6 miles distant) in the Yakima River. In addition, four staging areas (each 52 acres in area), one borrow site, and various temporary access roads would also be required during construction activities. The temporary construction staging areas would be situated proximate to the cut-off wall and the pipeline outlet into the Yakima River to facilitate construction of those two facilities. The exact locations of the four staging areas and a borrow site have not been determined by Reclamation at the time of this writing (Reclamation 2008b).

Table 1. Project Feature Acreages (Reclamation 2008e)

Project Features	Disturbance	
	Temporary Acres	Permanent Acres
Pipeline	375	250
Staging Areas (4)	8	
Borrow Area	5	
Access Roads		17
Power lines/Private		41
Power lines/ALE		3
Cut-off wall		10
Baffled Outlet		1
Total	384	322

Permanent, post-construction project features (not including the cut-off wall and appurtenant facilities, pipeline, and baffled outlet structure at the Yakima River) include several access roads, and a pipeline ROW maintained at 100-feet in width for the life of the project. Most of the pipeline ROW is located within ALE portion of the Monument, except for where the pipeline discharges into the Yakima River, which is situated within Horn Rapids County Park (Reclamation 2008b).

I-3) Description of the Affected Area

For this addendum to the CAR, the Affected Area comprises 6,036 acres of various habitat types (Table 2., pg. 14) and is considered the geographic area that includes both the temporary and permanent “*footprint*” of Reclamation’s seepage mitigation proposal, with the addition of a 200 meter disturbance buffer extending from the center point of that footprint, as described below:

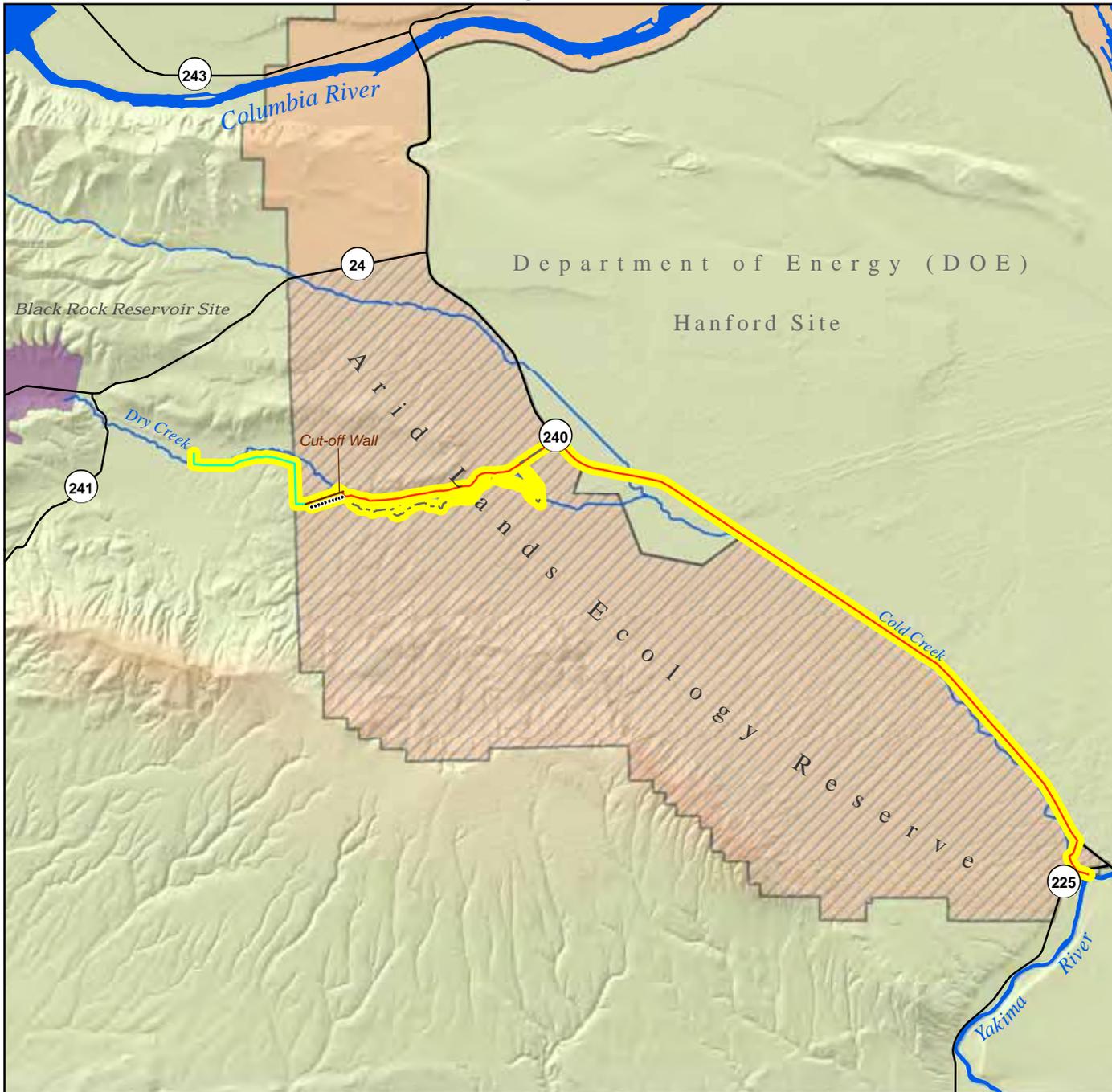
Thus the “*Affected Area*” includes the ROW for the new power line running between an existing substation and the proposed cut-off wall, the cutoff wall³ and appurtenant facilities (e.g., berm and wells), the ROW for the pipeline running between the cut-off wall and the Yakima River, temporary and permanent access roads, four equipment and material staging areas, a single borrow site⁴, and outfall structure in the Yakima River. In addition, the Service is applying a 200 meter- wide disturbance buffer⁵ surrounding all of the above.

³ An area identified as a “*shallow impoundment*” located immediately upstream from proposed cut-off wall is indicated on maps prepared by Reclamation for the Black Rock Assessment Study. However, the Service has been informed by Reclamation that the cut-off wall would not impound any water associated with seepage from Black Rock Dam and Reservoir (Reclamation 2008c and 2008d).

⁴ GIS analyses did not include the borrow site, staging areas or their associated project features because the exact location of those features was not known at the time that this document was prepared.

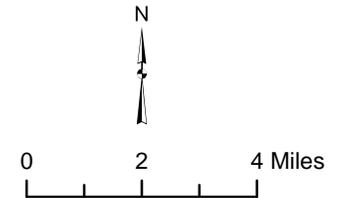
⁵ The 200 meter-wide disturbance buffer area is based on a recommendation for the burrowing owl from the Conservation Strategy for Landbirds in the Colombia Plateau of Eastern Oregon and Washington (Altman and Holmes 2000). Active and inactive burrowing owl nests are found within and adjacent to the rights-of-way for the powerline and pipeline associated with the proposed seepage mitigation measures (Goldie 2008 and WDFW 2007).

Figure 2



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Project Location
and
Affected Area



1:210,000

- Cut-off Wall Wells
- Potential Pipeline ROW
- - - Access Road
- Potential Powerline
- Affected Area
- ▨ Arid Lands Ecology Reserve
- Hanford Reach NM



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PART II FISH AND WILDLIFE RESOURCES IN THE AFFECTED AREA

II-1) Fisheries Resources

Fish species within the Affected Area only occur in the Yakima River, proximate to the proposed pipeline outlet. These species include bull trout (*Salvelinus confluentus*), rainbow trout (*Oncorhynchus mykiss*), west-slope cutthroat (*Oncorhynchus clarki*), steelhead, coho salmon (*Oncorhynchus kisutch*), chinook salmon (*Oncorhynchus tshawytscha*), pacific lamprey (*Lampetra tridentata*), northern pikeminnow (*Ptychocheilus oregonensis*), large-scale sucker (*Catostomus macrocheilus*), bridgelip sucker (*Catostomus columbianus*), and several sculpin species (*Cottus sp.*) Some non-native species that occur here include smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), and channel catfish (*Ictalurus punctatus*) (Reclamation 2008a: pp.127 and 161).

II-2) Wildlife

The Affected Area supports an array of plant and animal species. For the CAR Addendum, the Service conducted a review of species known to occur in the Affected Area, as identified in the Priority Habitat and Species (PHS) Database (WDFW 2007a). A subset of the PHS species, in addition to species identified by Service biologists (Kevin Goldie 2008a and 2008b; USFWS 2008d) or noted in Hanford site baseline data (USFWS 2008a; USFWS 2008e), were then selected from the Washington GAP⁶ vertebrate distribution models for mammals, birds, and reptiles (Johnson and Cassidy 1997; Smith et al. 1997; and Dvornich et al. 1997, respectively). These models, which include 110 mammal, 240 bird and 48 amphibian/reptile species distributions, predict core habitat and assist in establishing conservation priorities in Washington (Smith et al. 1997). The Service reviewed a representative proportion of the species using this region, including the following mammal, bird and reptile species occurring in the Affected Area that have predicted core habitat⁷. Many of these species have also been observed by Service personnel or volunteers (Goldie, USFWS, *pers. comm.* 2008a; Goldie 2008).

Some mammal species having core habitat in the Affected Area include Townsend's ground squirrel (*Spermophilus townsendii*), black-tailed jackrabbit, white-tailed jackrabbit (*Lepus townsendii*), great basin pocket mouse (*Perognathus parvus*), northern grasshopper mouse (*Onychomys leucogaster*), badger (*Taxidea taxus*), mule deer, elk,

⁶ The Gap Analysis Program (GAP) is a state-based cooperative effort to map major indicators of biodiversity over states, along with the existing network of conservation lands. The indicators of biodiversity that the GAP state projects map using geographic information system (GIS) technology are dominant vegetation types and distributions of each native vertebrate species (USGS 2008).

⁷ "Core Habitat" refers to a vegetation zone that is core, or important for a particular species. Developed by Washington Department of Fish and Wildlife for use in their GAP analysis

pallid bat (*Antrozous pallidus*) and small-footed myotis bat (*Myotis ciliolabrum*) (Johnson and Cassidy 1997).

The Affected Area provides core habitat for a variety of avian species, including ferruginous hawk (*Buteo regalis*), prairie falcon (*Falco mexicanus*), American kestrel (*Falco sparverius*), burrowing owl, barn owl (*Tyto alba*), short-eared owl (*Asio flammeus*), common raven (*Corvus corax*), long-billed curlew, loggerhead shrike, greater sage grouse (*Centrocercus urophasianus*), sage sparrow, sage thrasher (*Oreoscoptes montanus*), and Brewer's sparrow (*Spizella breweri*) (Smith et al. 1997).

Reptile species found within core habitat in the Affected Area include sagebrush lizard, night snake (*Hypsiglena torquata*), striped whipsnake, and side-blotched lizard (*Uta stansburiana*).

II-3) Riparian Habitat

The riparian plant community represents a very small portion of the Affected Area amounting to a total area of only about twenty-five acres⁸ (out of 6,036 acres in the Affected Area). This habitat type is situated primarily at two locations within the Affected Area: (1) along a relatively short reach of Dry Creek, approximately 1.6 miles in length, immediately downstream from Rattlesnake Springs (USFWS 2008e), and (2), along the north (or left) bank of the Yakima River at the outlet of Reclamation's proposed seepage mitigation pipeline near Horn Rapids (about 1,500 feet downstream from the confluence of Cold Creek with the Yakima River).

Dry Creek/Rattlesnake Springs Riparian Area

For most of its run, Dry Creek is probably best characterized as an ephemeral stream channel with very little vegetation dependent on surface water flow. Any sub-surface and infrequent surface flows eventually reach Cold Creek, an intermittent watercourse, which drains into a portion of the Hanford Site, ultimately reaching its confluence with the Yakima River near Horn Rapids. An exception to this arid habitat type is found in the reach of Dry Creek downstream from Rattlesnake Springs⁹. Located about three miles below the site of the proposed cut-off wall, the discharge from Rattlesnake Springs, a bedrock source spring and perennial water source, provides the hydrology needed to sustain the riparian plant community found at that location.

⁸ The Washington GAP project data (GAP data) identifies riparian plant communities along both Dry and Rattlesnake Creeks as well as on the north or left bank of the Yakima River near the outlet of Cold Creek. These are characterized as "riparian woodland," having a total area of twenty-five acres (USFWS 1979 and 2000b, and Davidson et al. 2007).

⁹ Rattlesnake Springs is actually a group of springs. There are at least four or five true spring sites in close proximity to each other within the "Rattlesnake Canyon" reach of Dry Creek. However, the water source for this riparian area begins in the Rattlesnake Creek drainage, a tributary and upgradient of Dry Creek and Rattlesnake Springs, likely indicating shifting in the spring locations over time and the continued presence of water close to the surface upgradient of the springs (Goldie 2008b; USFWS 2008d, and Reclamation 2008c).

No groundwater has been found in the sediments of Dry Creek upstream from Rattlesnake Springs (Didricksen 2008). Occasional surface flow associated with storm run-off is not considered significant factor in providing the necessary hydrology to maintain vegetation found in the Dry Creek/Rattlesnake Springs riparian area. Typical vegetation associated with the Dry Creek/Rattlesnake Springs Riparian Area includes coyote willow, black cottonwood, Wood's rose (*Rosa woodsii*), golden currant (*Ribes aureum*), and red-osier dogwood (*Cornus stolonifera*). Riparian vegetation at Rattlesnake Springs is highly degraded and increasingly dominated by invasive species such as Russian knapweed (*Acroptilon repens*), whitetop (*Lepidium draba*), and Canada thistle (*Cirsium arvense*) (Evans 2003).

Although compromised by invasive species, the plant communities that still persist within the Dry Creek/Rattlesnake Springs riparian area are highly varied and often extremely localized. Some riparian species in addition to those mentioned in the paragraph above, may include plains cottonwood (*Populus deltoides*), pacific willow (*Salix lucida lasiandra*), peachleaf willow (*Salix amygloides*), pussy willow (*Salix discolor*; introduced, but naturalized and valuable), Bebb's willow (*Salix bebbiana*), arroyo willow (*Salix lasiolepis* var. *lasiolepis*), Scouler's willow (*Salix scouleriana*), wax currant (*Ribes cereum*), western white clematis (*Clematis ligusticifolia*), mockorange (Philadelphia lewisii), basin wildrye (*Leymus cinereus*), saltgrass, black greasewood, Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), basin big sagebrush (*Artemisia tridentata tridentata*), grey rabbitbrush (*Ericameria nauseosa*), green rabbitbrush (*Chrysothamnus viscidiflorus*), Indian ricegrass (*Achnatherum hymenoides*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg bluegrass, milkvetch/locoweed, lomatium/desert-parsley/biscuitroot, daisy (including Piper's daisy), equisetum, as well as numerous sedge, bulrush, spikerush, and rush species (USFWS 2008d).

The Dry Creek/Rattlesnake Springs riparian area also includes approximately 280 acres of black greasewood/alkali saltgrass (*Distichlis spicata*) habitat, a unique riparian transition plant community. In general, greasewood plant communities are located in low-lying, flat areas of the Columbia Basin with silt loam and loam soils. Greasewood, a salt- or alkali-tolerant plant requiring root contact with groundwater, is usually found adjacent to ephemeral or permanent water sources, including creeks and springs (Sackschewsky and Downs 2001). This plant community type, identified as an ecologically important element occurrence (USFWS 2008e), was burned during several wildfire events and is dwindling in overall extent (Goldie, USFWS, *pers. comm.* 2008b; USFWS 2008d). Although degraded, this is considered an uncommon example of a black greasewood/saltgrass plant community (USFWS 2008e).

Recent wildfires on the ALE have significantly altered vegetation and degraded riparian habitat, especially impacting slower growing trees and shrubs (USFWS 2008b and USFWS 2008c, and Davidson et al. 2007). The Service is actively restoring these areas by planting native trees and establishing elk exclosures to protect remaining riparian areas (Goldie, USFWS, *pers. comm.* 2008b). Other restoration activities have targeted the hydrology of the spring systems. The Service recently installed rock and log check

dams in spring areas to retain water longer and decrease erosion in these areas. The Service anticipates recovery of the riparian habitat over the long-term, as we continue to plant native shrubs and trees, and protect the existing habitat from further disturbance (USFWS 2008d).

Since 2003, the Service has also focused on invasive species management throughout the ALE, including the Affected Area. Management of invasive species in the spring areas has decreased the extent of exotic plants and greatly improved riparian habitat. Although the process is slow, these riparian areas are recovering, and in the absence of further disturbance, along with continued invasive species management, these areas are expected to fully recover over time (USFWS 2008d).

Yakima River Riparian Area at Horn Rapids (Horn Rapids Riparian Area).

Regulated perennial flows and seasonal flooding in the Yakima River sustain riparian habitat within the Affected Area at Horn Rapids County Park. The National Wetlands Inventory (NWI) classifies the riparian/wetland plant community on the reach of the Yakima River near the outlet of Cold Creek as palustrine scrub-shrub, broad leaved deciduous, seasonally flooded (PSS1C)¹⁰ (USFWS 1979 and 2008b). Based on USFWS staff observations (June 10, 2008) and aerial photography of the area, an additional (not indicated on the NWI data) relatively narrow band of riparian vegetation is found on the left or north bank of the Yakima River continuing downstream from the outlet of Cold Creek along the base of the low bluffs (also known as the “*Horn*”) where Reclamation’s proposed pipeline outfall would be situated.

Typical plant species found at the Horn Rapids Riparian Area include black cottonwood and coyote willow.

Recent wildfires in the ALE also damaged the Horn Rapids Riparian Area (Goldie, USFWS, *pers. comm.* 2008b). Human-caused disturbance, including the development and seasonal use of a parking lot, picnic area, and boat launching ramp at Horn Rapids County Park, occurs within a few hundred feet of the site of the proposed pipeline outfall (Reclamation 2008c). Disturbance from these activities likely impacts avian use of this habitat.

Wildlife Species common to the Dry Creek/Rattlesnake Springs and Yakima River Riparian Areas

The Dry Creek/Rattlesnake Springs and Horn Rapids Riparian Areas may support common avian species, including American robin (*Turdus migratorius*), black-billed magpies (*Pica hudsonia*), song sparrows (*Melospiza melodia*), dark-eyed juncos (*Junco hyemalis*); upland gamebirds, such as ring-necked pheasants (*Phasianus colchicus*) and

¹⁰ This is the only location within the Affected Area where a palustrine riparian/wetland plant community is identified on the NWI database.

California quail (*Callipepla californica*); and raptors, including common barn owls (*Tyto alba*) and great horned owls (*Bubo virginianus*). Brewer's blackbirds (*Euphagus cyanocephalus*), mourning doves (*Zenaida macroura*), black-billed magpies (*Pica hudsonia*), northern orioles (*Icterus galbula*), lazuli buntings (*Passerina amoena*), eastern kingbirds (*Tyrannus tyrannus*), western kingbirds (*Tyrannus verticalis*), and western wood peewees (*Contopus sordidulus*) are among the bird species expected to nest in these riparian habitats (USFWS 2008e). Bald eagles (*Haliaeetus leucocephalus*), great blue herons (*Ardea Herodias*) and black crowned night herons (*Nycticorax nycticorax*) may occasionally use these riparian areas (USFWS 2008e), although there are only a few large trees or snags suitable for perching or roosting.

These riparian habitats may also support an array of mammal species, including rodents, mink (*Neovison vison*) and weasels (*Mustela spp.*), porcupines (*Erethizon dorsatum*), raccoons (*Procyon lotor*), and skunks (*Mephitis mephitis*) (USFWS 2008e). Dry Creek/Rattlesnake Springs Riparian Area may provide foraging habitat for myotis, small-footed myotis (*Myotis leibii*), silver-haired bats (*Lasionycteris noctivagans*), and pallid bats (*Antrozous pallidus*) that feed on emergent aquatic insects (USFWS 2008e); and year-round habitat for mule deer; and winter habitat for elk (Goldie, USFWS, *pers. comm.* 2008b).

Rattlesnake Springs also provides habitat for numerous reptiles, including the striped whipsnake, Rocky Mountain rubber boa (*Charina bottae*), western yellow-bellied racer (*Coluber constrictor*), night snake and western rattlesnake (*Crotalus viridis*). The greasewood habitat associated with the Dry Creek/Rattlesnake Springs Riparian Area supports sagebrush lizards (Goldie, USFWS, *pers. comm.* 2008b).

II-4) Wetlands

According to Davidson et al. (2007), about thirteen acres of wetlands are found within the Affected Area. These wetlands are characterized as “*Intermountain Basins Alkaline Closed Depression* (4 acres)”, “*North American Arid West Emergent Marsh*” (1 acre), and “*Open Water*” (8 acres) (Davidson et al. 2007). These wetlands do not include the additional (area not quantified) wetlands characterized as PSS1C on NWI maps of the area (USFWS 2008b). Most of the open water component quantified above is found in the backwater area of the Yakima River upstream from Horn Rapids Dam. Small isolated pockets of emergent and alkaline closed depression wetlands are found in the Affected Area outside of the Horn Rapids area. These isolated wetlands provide some benefit to avian and other wildlife species (Davidson et al. 2007).

II-5) Shrub-Steppe

Of the roughly 10.4 million acres of shrub-steppe that existed in Washington State prior to the 1850s, only about 40% (4.2 million acres) remain, a significant portion of which is in a degraded state (Yakima Subbasin Plan 2004). The most significant cause of loss or

degradation of this habitat type was the modification of the historic hydrograph to facilitate the expansion of Yakima River Basin agriculture during the twentieth century, resulting in the conversion of shrub-steppe habitat to agriculture. Other significant causes of loss or degradation of shrub-steppe habitat include the proliferation of invasive, non-native plant species that compete with native plants, and damage caused by large scale wildfires. The viability of remaining shrub-steppe is increasingly threatened by new and on-going stresses to the ecosystem. Some sources of stress include increased fragmentation, invasive species encroachment, and altered fire regimes (USFWS 2007b).

According to the Washington Natural Heritage Database (2007), dominant plant species associations found in the shrub-steppe habitat within the Affected Area include Wyoming big sagebrush/bluebunch wheatgrass and Wyoming big sagebrush/Sandberg bluegrass. These two plant communities, although considered secure globally, are regarded as rare and vulnerable within the State of Washington. While these plant communities may be abundant at some locations, they are likely found in a restricted range or are vulnerable to extirpation in the State (WNHP 2007). According to Washington GAP Project data, only forty-four acres of shrub-steppe habitat remains within the Affected Area. Another 4,747 acres of recently burned habitat has been identified within the Affected Area, a large percentage of which was formerly shrub-steppe (Davidson et al. 2007; USFWS 2008d). See Table 2 below for habitat types and acreages within the Affected Area. This recently burned area would likely return to its former shrub-steppe condition in the absence of further disturbance. Many of the native bunchgrass communities can recover fully in three to five years post-fire and native shrubs may take seven to ten years. Thus, the Service expects this habitat will eventually recover, given the emphasis on restoration and invasive species control efforts within the ALE (USFWS 2008d).

Invasive plant species pose a significant problem for shrub-steppe habitats. While the ALE contains many of the highest quality native plant communities within the Monument, invasive species continue to be a significant concern. Russian knapweed and whitetop are common and are likely spreading in highly disturbed lands along the length of Cold Creek. Diffuse knapweed (*Centaurea diffusa*) has spread along many roadways within the ALE, including those at higher elevations and in remote locations, and in the dry creek-bed of upper Cold Creek. The species has not yet been documented colonizing in natural areas surrounding these corridors and is a high priority for treatment to prevent this colonization. Rush skeletonweed (*Chondrilla juncea*) is established in the lower Cold Creek Valley and has recently been discovered in Iowa Flats and other areas on the low slopes of Rattlesnake Mountain. There is great concern regarding the ability of this mobile species to move further into high-quality natural areas, making all occurrences high priorities for treatment on ALE. The recent fire history of the ALE Reserve has favored the increase and spread of many of these invasive species, along with cheatgrass and Russian thistle (*Salsola tragus*) (Evans et al. 2003).

Table 2. Project Vegetation/Habitat Type in Affected Area (Davidson et al. 2007).

Vegetation/Habitat Type (Affected Area)	Acres
Shrub-Steppe	44
Wetland (all classes)	13
Riparian woodland	25
Inter-Mountain basins active and stabilized dunes	166
Introduced upland vegetation	146
Rocky Mountain aspen forest and woodland	4
Recently burned vegetation*	4,747
Conservation Reserve Program lands	24
Developed, medium intensity	223
Borrow Area **	436
Staging Areas (4)**	208
TOTAL ACRES in Affected Area	6036 acres

* Includes approximately 280 acres of black greasewood that has been burned in recent wildfires

** The locations of the borrow area and four staging areas had not been determined by Reclamation at the time of this writing, therefore only the acreage (not vegetation/habitat type) of these proposed activities are shown in Table 2.

II-6) Federally Listed Threatened and Endangered Species, Candidates, and Species of Concern within the Affected Area.

Federally Listed Threatened or Endangered Species

- Upper Columbia River steelhead endangered
- Upper Columbia River chinook endangered
- Middle Columbia River steelhead threatened
- Bull trout threatened

Federal Candidate Species

Greater sage grouse: Greater sage grouse is the only Federal candidate species known to occupy the Affected Area. A portion of the Washington sage grouse recovery area is found in the ALE. As recently as 2007, sage grouse have been observed on the ALE. In addition, if the Yakima Training Center population expands, it is expected that the ALE would provide suitable habitat (USFWS 2008d). For more information about this species, please refer to the CAR (Section II-6, pp. 15-16).

Federal Species of Concern

- Burrowing owl

- Loggerhead shrike
- Ferruginous hawk.
- Columbia milk-vetch (*Astragalus columbianus*).

Burrowing Owl: Burrowing owls inhabit grassland and sparsely vegetated areas, often near agricultural and developed areas. Burrowing owls rarely excavate their own burrows, but usually depend on abandoned burrows of other wildlife, including ground squirrels or prairie dogs (Ehrlich et al. 1988), and larger mammals such as badgers, foxes or coyotes (NMDG&F 2007).

Considered uncommon in Washington State, burrowing owls are localized to grassland and shrub-steppe habitat east of the Cascade Mountain Range. Over half of the total nest sites in Washington are found in Franklin and Grant Counties (Klute et al. 2003). Data on burrowing owl population trends are inconsistent. Some breeding bird survey data indicate population increases (Nordstrom 2004) or no significant change (Klute et al. 2003), but in general, existing data indicate declining populations throughout Washington, especially in the Channeled Scablands, the Okanogan Valley, and southeastern part of the State (Klute et al. 2003; WDFW 2003).

Burrowing owls often nest in disturbed areas; nest burrows can be observed along irrigation or road banks and near human habitation. However, habitat fragmentation caused by urbanization and agricultural conversion poses a large threat to this species. Increasing use of highway right-of-ways and ditch banks make these owls more vulnerable to highway mortality, greater predation and increased disturbance (Altman and Holmes 2000). Further, as urban development increases, so do road densities and therefore owl-vehicle collisions. The loss of natural habitat may lead to greater exposure to predation and inter-specific competition (McDonald et al. 2004). The Oregon-Washington Partners-in-Flight has identified burrows as an important conservation focus for this species (Altman and Holmes 2000).

In 2008, biologists identified both active and inactive burrows in the Affected Area (Goldie 2008). Predictably, these burrows are vulnerable to vibration caused by vehicles, construction work, and similar activities. Annually, approximately 15-20% of the burrows collapse or are destroyed in the Affected Area by human activity, such as fire suppression. The Service has identified conservation measures for owl burrows in this area, that include protecting known burrows from potential collapse, and protecting all fossorial mammal communities to encourage future occupation by burrowing owls (USFWS 2008d).

Loggerhead Shrike: Unlike the burrowing owl, the loggerhead shrike requires a mixture of shrub overstory and grassy open areas (Poole 1992; Vander Haegen 2004). In eastern Washington, shrikes primarily nest in big sagebrush and bitterbrush, defending territories averaging 34.35 (\pm 4.9) acres (Poole 1992). In general, loggerhead shrikes feed on insects, small mammals, birds, reptiles and amphibians (Vander Haegen 2004). On the ALE, loggerhead shrikes were found to prefer grasshoppers, lizards and small mammals as forage (Poole 1992).

Loggerhead shrikes have shown statistically significant declining population trends in the Columbia Plateau Breeding Bird Survey Physiographic Region (Altman and Holmes 2000; Dobkin and Sauder 2004). Before excessive wildfires, the Affected Area provided nesting habitat for approximately eight loggerhead shrike territories (WDFW 2007a). Because this area has experienced successive wildfires over the past ten years, loggerhead shrikes have likely declined (Browers, *pers. comm.*, 2008; USFWS 2008d). However, Service biologists have noted that loggerhead shrikes have maintained nesting territories around Rattlesnake Springs where black greasewood has re-sprouted, indicating the importance of this area for their recovery (USFWS 2008d).

Because of excessive loss of habitat in this region, management for loggerhead shrikes should include reducing habitat fragmentation (Woods and Cade 1996). Additionally, activities occurring in this area should avoid or minimize the following deleterious effects: creating ground disturbance, promoting exotic plant invasion, or increasing risk of wildfire (Dechant et al. 2003; Leu and Manuwal 1996; Vander Haegen 2004).

Ferruginous Hawk: Ferruginous hawks prefer grassland or shrub-steppe habitat in the arid lands of southeastern Washington (Richardson et al. 2004). In Washington, prey for ferruginous hawks include northern pocket gophers, as well as insects, snakes and other rodents (WDFW 1996). Ferruginous hawks may select ledges on hills and in canyons, rock outcrops, steep low cliffs, isolated trees, or artificial structures for nesting (WDFW 1996).

Ferruginous hawk populations are declining in Washington. Sensitive to human disturbance, Washington ferruginous hawk populations are no longer able to exploit vast expanses of undisturbed natural habitat. Lack of suitable nesting sites in undisturbed areas poses the greatest threat to ferruginous hawks (Richardson et al. 2004). Surveys conducted by the Washington Department of Fish and Wildlife (WDFW) between 1983 to 2003 show a decrease in the percent of occupied nesting territories. In addition, nest mortality has been identified as a factor affecting ferruginous hawks by WDFW. Recent drought in eastern Washington may be decreasing small mammal populations, thereby increasing hawk mortality during nesting season (Watson 2003).

Audubon has identified Important Bird Areas (IBA) that support breeding ferruginous hawks, one of which is the ALE IBA (Audubon 2008). Several nest sites have been identified in the vicinity of Affected Area (WDFW 2007a). Although these sites were unoccupied during the 2008 nesting season, ferruginous hawks are known to show fidelity to nest sites, often returning each year to the same nesting territories. It is expected that as populations rebound, ferruginous hawks will likely return to these historic nesting locations (USFWS 2008d).

Columbia milk-vetch: Columbia milk-vetch occurs within an elevational range of 500 to 2100 feet in the shrub-steppe vegetation zone (i.e, big sagebrush/ bluebunch wheatgrass, big sagebrush/Sandberg's bluegrass and stiff sagebrush/Sandberg's bluegrass plant

associations). This plant species grows on deep sandy loams, gravelly loams, lithosols and flood bars composed of cobbly sand (WNHP 2007).

The number of Columbia milk-vetch plants increase following low intensity fires. Historic fire frequency within its habitat is thought to be thirty to forty years. The delivery and accumulation of sediment caused by erosion on un-surfaced roads may also provide suitable substrate for colonization (WNHP 2007).

PART III POTENTIAL EFFECTS TO FISH AND WILDLIFE RESOURCES IN THE AFFECTED AREA

III-1) Fisheries Resources

The Service has not included an analysis of effects to fish resources in this draft addendum to the CAR. Effects to fisheries resources associated with the implementation of the three action alternatives, without Reclamation's seepage mitigation measures are addressed in the Service's October 10, 2008, CAR.

Under the No Action Alternative, water available for fish in the lower Yakima River Basin will continue to be shared and compete with the needs of agriculture, recreation, residential and commercial development and other human activities.

III-2) Wildlife

Implementation of Reclamation's seepage mitigation proposal would cause both permanent and temporary loss of wildlife habitat. According to Reclamation, construction of the cut-off wall and wells, access roads, power lines and the baffled outlet would lead to permanent loss of approximately 322 acres of wildlife habitat for shrub-steppe obligates and other wildlife species (Reclamation 2008e). Neo-tropical birds, including those that are shrub-steppe obligate species, as well as other shrub-steppe obligate species would be negatively affected by any further permanent reduction of shrub-steppe habitat. Construction and utilization of staging areas, borrow areas, temporary roads, as well as construction of power lines and excavation of a trench for the pipeline will temporarily disturb up to 6,036 acres of wildlife habitat (see Affected Area description). Areas where vegetation is removed would not be available for use by some wildlife species until the area recovers and vegetation is re-established. Invasive plant species, such as cheatgrass are likely to invade disturbed sites and compete with native species, also providing fuel for wildfires.

Migratory birds

Construction activities associated with the seepage mitigation proposal may affect several avian species protected under the Migratory Bird Treaty Act, such as songbirds, raptors,

game birds. The removal of vegetation during nesting season may cause mortality, reproductive failure, and abandonment of breeding areas. Most bird species would avoid the affected area for the duration of construction activities due to the magnitude and intensity of these activities. Migratory birds may also be adversely affected by the long-term maintenance and disturbances associated with the Project (i.e., pump maintenance, power line activities, etc.) after the initial construction phase (USFWS 2008d).

The proposed 3.6 mile new power line may adversely affect several avian species. In particular, raptors use power poles as perches from which to establish territorial boundaries, hunt, rest, and feed. Power line structures are also used by many species as nesting substrates. There are few trees, and no cliffs within the Affected Area. Therefore, power poles will provide a vertical structure for birds to use. Birds that use these structures are vulnerable to electrocution and also injury or mortality from collisions. Mortality and injury are directly related to the design of the power poles and power line configuration. Additionally, new power poles on the landscape would increase the threat to sage grouse recovery in the area by providing more perches for raptor foraging activities (USFWS 2008d).

Under the No Action Alternative, no new construction would likely occur in the Affected Area, especially in the ALE, which is protected for ecological value, with restrictions on human entry.

Wildlife movement

Reclamation's proposed cut-off wall, power line, and pipeline extend for distances of 5,500 feet, 3.6 miles, and 20.6 miles respectively. A variety of heavy equipment and vehicles, along with a large workforce will be employed during the construction period.

Construction activities associated with the seepage mitigation proposal could displace wildlife, affect their daily movement through the area and possibly block seasonal migration routes, particularly for species such as elk, deer, jackrabbits, sage grouse and reptiles. There is evidence that the construction activities associated with an existing borrow pit area, located southwest of Highway 240, disturbed wintering elk on the Monument and displaced them during winter months (USFWS 2008d).

Under the No Action Alternative, the construction of proposed cut-off wall, pipeline, powerline, access roads, and subsequent maintenance of these facilities would not occur, thus the impacts associated with these features, including disruption of migration corridors would not occur. However, invasive plants and fire will continue to be a threat to wildlife and their habitats. Restoration activities will continue to take place within the ALE.

III-3) Riparian Habitat

Dry Creek/Rattlesnake Springs Riparian Area

As discussed in section II-3, above, the hydrology within this isolated riparian zone is sustained mostly by the discharge from Rattlesnake Springs (and tributary source springs in Rattlesnake Creek drainage), and is not dependent on infrequent surface flows in Dry Creek. Construction of the cut-off wall would be designed to capture and transport out-of-channel all surface and subsurface flows originating as seepage from Black Rock Dam and Reservoir (Reclamation 2008b). Accordingly, this facility would also capture any background subsurface flows in Dry Creek. Surface flows associated with storm events exceeding the capacity of the seepage flow conduit (71 cfs) would pass the cut-off wall and continue down-gradient in Dry Creek. The transportation of water out of Dry Creek channel via the proposed seepage mitigation pipeline is not expected to diminish the discharge at Rattlesnake Springs and may even increase discharge from the springs, which in turn, could expand the extent and affect the quality of the plant community found there (Didricksen 2008).

Any significant increase of water to this sensitive area could result in negative changes to the Dry Creek/Rattlesnake Springs Riparian Area. For example, increased water in Dry Creek below the proposed cut-off wall could create a wetter plant community or perhaps inundate the few remaining trees in the spring area. Without active management, the plant community could degrade as invasive species increase (Goldie, USFWS, *pers. comm.* 2008b; USFWS 2008d).

Construction activity and to a lesser extent, subsequent maintenance work, could disturb and/or displace wildlife in the Dry Creek/Rattlesnake Springs Riparian Area, based on proximity of the pipeline ROW and construction access road, both parallel to and within 300 hundred feet from the creek at this location (Reclamation 2008c).

Under the No Action alternative, there would be no change to the hydrology in Dry Creek. The creek would continue to exhibit the characteristics of a dry ephemeral watercourse, except in the Rattlesnake Springs area where the plant community would be sustained by discharge of the springs found there at the confluence of the Rattlesnake Creek (alluvial fan). The riparian area would continue to be subject to degradation from periodic wildfires or other stochastic events (e.g., infrequent flood damage), however ongoing restoration activities in the spring area would continue. Without additional disturbance, riparian habitat is expected to improve over the short and long-term (USFWS 2008d).

Yakima River Riparian Area at Horn Rapids (Horn Rapids Riparian Area)

Up to one acre of riparian habitat would be permanently lost due to the construction of the seepage mitigation outfall at Horn Rapids County Park (Reclamation 2008e). Additional disturbance to nesting and foraging avian species could occur if construction activity is conducted adjacent to the riparian zone, especially during avian nesting season. Avian injury and/or mortality may occur if riparian vegetation is removed during nesting season (variable, but usually from about March 1 to August 1 each year).

Under the No Action Alternative, human activity associated with the use of Horn Rapids County Park would continue, impacting the quality of the open water-riparian habitat found there. Based on the location of the proposed seepage mitigation outfall in the low bluffs (the “Horn”), it is unlikely that the area would be developed, thus the riparian zone would likely remain in its present state.

III-4) Wetlands

Construction of Reclamation’s proposed pipeline and outfall structure would likely result in the temporary loss of open water (and associated riparian) habitat adjacent to the Horn Rapids Riparian Area. The maintenance of the outfall structure would also result in the permanent loss of riparian and wetland habitat values in this area. Construction of the pipeline along the State Highway 240 corridor could impact small isolated pockets of emergent and alkaline closed depression wetlands. Maintenance of the pipeline corridor will likely result in the loss of some of these isolated wetlands. In addition, pipeline construction could result in the modification of hydrology in this area with potential impacts to these wetlands (Davidson et al. 2007).

Under the No Action Alternative, human activity associated with the use of Horn Rapids County Park would continue, impacting the quality of the open water-riparian habitat found there. The isolated wetlands adjacent to State Highway 240 would also continue to be affected by human disturbance.

III-5) Shrub-Steppe

Implementation of the seepage mitigation proposal would result in direct and indirect negative effects to shrub-steppe habitat within the Affected Area. Direct effects include further loss of existing shrub-steppe during construction activities, and fragmentation of remaining habitat. Indirect negative effects include increased degradation of remaining habitat through introduction and spread of non-native invasive plants such as cheatgrass, Russian thistle and rush skeletonweed. Non-native invasive plants such as these tend to out-compete native grasses and shrubs by reducing available groundwater, and they dry out earlier in the year, making them prone to more frequent wildfires, further degrading the remaining habitats within the Affected Area.

Construction of the underground cut-off wall to capture groundwater emanating from the Black Rock Reservoir could create a situation where surface water exists more frequently within the wetted perimeter of Dry Creek than at present. An increase in the availability of surface water or groundwater near the surface would alter the present habitat conditions by increasing plant species diversity and density along the edge of the wetted area and possibly create riparian or wetland areas where more xeric plant communities presently exist. Modification of the hydrology in Dry Creek would likely result in the loss of approximately twenty-two acres of existing shrub-steppe habitat (Reclamation

2008e). There is strong evidence that artificially establishing water sources on existing shrub-steppe habitat can result in overall adverse effects. The Service has documented several shrub-steppe sites that have been artificially exposed to irrigation water. These sites degraded to low quality riparian/wetland habitat. Non-native riparian species from adjacent disturbed areas have invaded these sites, including kochia (*Kochia scoparia*), Canada and Russian thistle, tumble mustard (*Sisymbrium altissimum*), prickly lettuce (*Lactuca serriola*), Russian olive, salt cedar (*Tamarix ramosissima*), reed canarygrass (*Phalaris arundinacea*). Additional adverse impacts include destabilization of highly erodible soils, resulting in soil slumping. Therefore, planting and invasive plant management is requisite if water is added to a shrub-steppe landscape (Goldie, USFWS, *pers. comm.* 2008b; USFWS 2008d).

Shrub-steppe restoration is difficult in these areas due to low precipitation, fragile soils, and established populations of non-native invasive plants. Based on these limiting factors, Service staff identified a number of potential restoration sites within the Monument and ALE (Goldie, *pers. comm.* 2008). The proposed cut-off wall, pipeline, and appurtenant facilities would be constructed through several of these potential restoration sites. Construction activities would hinder restoration of these habitats within the boundaries of the Monument, and specifically the ALE.

Under the No Action Alternative, fire and the proliferation of invasive plant species would continue to be a concern. Refuge staff would continue to identify suitable sites and implement shrub-steppe restoration activities.

III-6) Federally Listed Threatened and Endangered Species, Candidates, and Species of Concern within the Affected Area

Federally Listed Threatened and Endangered Species

The only Federally listed threatened and endangered species found in the Affected Area are fish species. Because the Service is not analyzing the effect to fish resources in this addendum to the CAR, the Service has not included an analysis of project related impacts to those species.

However, effects to threatened and endangered species will need to be addressed during section 7 Endangered Species Act consultation associated with the implementation of any of Reclamation's action alternatives.

Federal Candidate Species

Greater sage grouse: As described in the CAR (Section III-5, p 49), the Black Rock Reservoir Alternative would have direct and indirect effects on the greater sage grouse. The addition of Reclamation's seepage mitigation proposal would exacerbate those effects in several ways. First, construction activities could act as a temporal barrier to sage grouse movements within the Affected Area, and could displace any that might be

occupying habitat within the area during that time frame. Second, maintenance of the cut-off wall and access roads would further fragment shrub-steppe habitat within the Affected Area, on a permanent basis, reducing habitat available to sage grouse. Furthermore, construction activities have the potential to introduce invasive species of plants, which could degrade the shrub-steppe habitat within and adjacent to the Affected Area, also reducing the habitat available to the sage grouse.

Long-term recovery of the greater sage grouse requires the maintenance and enhancement of existing habitat corridors that link the Yakima Training Center with the Monument, the Yakama Reservation and WDFW Wildlife Areas (WDFW 2007b). Implementation of this proposal could impede this process, making long-term recovery much more difficult.

Under the No Action Alternative, existing habitat corridors linking areas vital to sage grouse recovery would remain intact. However, fire and invasive plant species would continue to be a limiting factor in re-connecting fragmented shrub-steppe habitat, which is important to sage grouse survival.

Federal Species of Concern

Burrowing owl – Active and historic nest burrows are found in the Affected Area. Construction activities could directly affect burrowing owls by destroying these nest sites. Other effects could include causing the abandonment of active nests during construction activities, elimination of potential nest sites, as well as displacement of any owls in the area. Introduction of invasive plant species could degrade the habitat available to burrowing owls.

Loggerhead shrike – The Affected Area provides nesting and foraging core habitat for the loggerhead shrike (shrike). Noise from construction activities could displace nesting shrikes, which could lead to nest failure. Removal of vegetation during nesting activities could lead to a reduction in the food available to shrikes, in turn decreasing the value of the core habitat.

Ferruginous hawk – The Affected Area provides nesting and foraging core habitat for the ferruginous hawk. Noise from construction activities could displace nesting hawks, which could lead to nest failure. Removal of vegetation during nesting activities could lead to a reduction in the prey base available to the hawks, in turn decreasing the value of the core habitat.

Columbia milk-vetch - Populations of Columbia milk-vetch have been known to occur within the Affected Area, and would be negatively effected by construction activities that would include vegetation removal. Construction activities could also lead to the introduction of invasive plant species, which would have a negative effect on milk-vetch populations.

PART IV RECOMMENDATIONS

During the process of formulating recommendations to mitigate for potential impacts associated with Reclamation's proposed seepage mitigation proposal, the Service relies on established Mitigation Policy (FWS Manual, 501 FW 2) (Policy). In accordance with this policy, the definition of mitigation includes: a) avoiding the impact altogether by not taking a certain action or parts of an action; b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and e) compensating for the impact by replacing or providing substitute resources or environments (40 CFR Part 1508.20(a-e)). The Service has also considered its responsibilities under Endangered Species Act, Migratory Bird Treaty Act, Bald Eagle Protection Act, and the National Environmental Policy Act (USFWS 1981).

The Service continues to have has numerous concerns regarding adverse effects to fish and wildlife resources associated with Reclamation's Black Rock Reservoir Alternative. Among these concerns are: (1) the continuing and cumulative loss of shrub-steppe habitat; (2) fragmentation and degradation of adjacent upland habitat through introduction of non-native invasive plants; (3) increased fire danger associated with increased human use within the ALE; (4) disruption of established migratory corridors for large and small mammals and other wildlife, especially the greater sage grouse, through the formation of barriers to wildlife movement, both during and after construction of the proposed facilities (e.g., pipelines, access roads, construction activities); (5) disturbance of nesting migratory birds during construction and subsequent use of the proposed facilities; and (6) disturbance to a unique and sensitive spring-fed habitat.

As originally stated in the October 10, 2007, the Service considers shrub-steppe habitat as meeting the criteria of Resource Category 2, that is: "*The habitat to be impacted is of high value for evaluation species and is scarce or becoming scarce on a national basis or in the ecoregion section.*" Thus the Service's mitigation goal for this habitat type is "*no net loss of in-kind habitat value.*" Furthermore, the Service "*will recommend ways to avoid or minimize losses . . .*" (USFWS 1981). In addition, shrub-steppe habitat within the Black Rock valley, Rattlesnake Hills and Yakima Training center has been identified by the State of Washington as very important habitat for wildlife (Stinson et al. 2004, TNC 1999, WDFW 1996).

IV-1) Service's Recommended Alternative

Therefore, after careful consideration of both the benefits and detriments to fish and wildlife resources associated with the implementation of the Black Rock Reservoir Alternative *with* the addition of Reclamation's seepage mitigation proposal, the Service continues to recommend that the No Action Alternative be selected as the Preferred

Alternative in the Final Environmental Impact Statement being prepared by Reclamation. As before, the Service is particularly concerned about the significant loss and/or fragmentation of shrub-steppe habitat associated with the selection of the Black Rock Reservoir Alternative with the implementation of Reclamation's seepage mitigation proposal. The seepage mitigation proposal would cause further degradation of this resource, primarily within the ALE, specifically established to protect that endangered resource. Furthermore, in accordance with Service policy regarding appropriate uses on National Wildlife Refuges, the Service has determined that the construction of a cut-off wall and pipeline -- and the subsequent permanent conversion of Monument lands -- is not an appropriate use of the Monument. As a result of Service management and compatible use policies, this use would not be allowed (USFWS 2008d).

The Service continues to recommend that Reclamation explore the feasibility of implementing water conservation measures as a means to increase the availability of water for native aquatic species in the Yakima River corridor. We recognize that there will likely be a net-loss of wetlands in the lower Basin as existing water delivery systems are made to be more efficient. Therefore, to mitigate for any lost wetlands, the Service recommends that Reclamation consider reconnecting the floodplain and restoring historic wetlands.

However, if Reclamation selects the Black Rock Alternative along with the addition of the proposed seepage mitigation measures, the Service recommends that Reclamation consider the following conservation measures to avoid, minimize and/or compensate for the effects of the proposed action to fish and wildlife resources found in the Affected Area.

IV-2) Mitigation Recommendations

Burrowing owl nest sites: Due to the presence of nesting burrowing owls and the vulnerability of their nest burrows to collapse, the Service recommends that Reclamation attempt to avoid construction activities within 200 meters of any active nests. In addition, Reclamation will need to conduct a survey, locate and map any active and inactive nest sites immediately prior to construction activities, and mitigate for any sites destroyed or potentially disturbed within 200 meters of activities.

Migratory Bird Nesting: During construction, minimize or avoid all vegetation removal during avian nesting seasons to minimize the effect of the action on federally protected migratory birds. Typically nesting season in this part of Washington occurs between March and August each year.

Migratory Birds - Prevention of Electrocution and Collision: Bury the new power line that runs between the existing substation and the proposed cut-off wall or use construction designs for above ground power lines with proper spacing of design elements as described in *Suggested Practices for Avian*

Protection on Power Lines: The State of the Art in 2006 (APLIC). In its EIS, Reclamation states that it “would agree to install above ground power lines with proper spacing of design elements as described in *Suggested Practices for Avian Protection on Power Lines: State of the Art in 2006*” (Reclamation 2008f).

Shrub-steppe Restoration: Coordinate with Hanford Monument staff to identify and initiate shrub-steppe restoration opportunities within the ALE, as part of mitigation for implementation of the seepage mitigation proposal.

Rare, Threatened and Endangered (RTE) Plant Surveys: Conduct RTE plant surveys in the affected area prior to initiating ground disturbance activities, and protect areas where RTE plants are found.

Habitat Surveys: Prior to final layout and construction of the cut-off wall, pipeline and access roads, undertake surveys to identify any wetland, riparian, or rare plant habitats that fall within the footprint of the construction activities. Reclamation should take extra measures to conduct surveys during the appropriate time of year to detect specific plants (depending on the phenology of the plant), and to detect species of wildlife of concern (USFWS 2008d). Alternative construction paths should be discussed, and if disturbance of identified areas is unavoidable, then restoration or mitigation opportunities should be identified and implemented.

Re-vegetation: Develop a re-vegetation plan for any sites disturbed by construction activities (i.e. staging areas, borrow areas, access routes, power line corridor, pipeline corridor, well sites, and the embankment on top of the cut-off wall). Native plants species that are typically found in the area should be used for planting. The emphasis should be to re-establish big sagebrush and effectively control cheatgrass and other non-native species. The re-vegetation plan should also address vegetation maintenance and monitoring to ensure the success of this mitigation measure.

Mitigation Funding: Reclamation should incorporate the cost of all of these activities (i.e., re-vegetating all sites with native species, controlling non-natives, preparing disturbed sites for restoration, follow-up monitoring for several years) into the project budget (USFWS 2008d).

Weed Management: Develop a weed management plan that includes monitoring disturbed sites for invasion of noxious weeds and implementing control activities where problems occur. The Executive Order on Invasive Species, February 3, 1999, requires that Federal agencies whose actions may affect the status of invasive species shall not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States.

Riparian: Reroute pipeline and access roads away from the Dry Creek/Rattlesnake Springs Riparian Area, to minimize disturbance to its unique habitat values during construction and subsequent maintenance activities. According to Reclamation's EIS; "*Current plans call for the pipeline to follow Dry Creek from the cutoff wall to SR-240, but this alignment will not disturb riparian areas. There will be setback from the creek channel; this will be determined in the final designs after consultation with the Service*" (Reclamation 2008f).

Groundwater Measurements: Reclamation should conduct groundwater measurements in Dry Creek channel as needed to determine the effect of the cut-off wall on the discharge at Rattlesnake Springs and the subsequent effect on the riparian plant community and habitat at that location. Groundwater measurements will need to be conducted both prior to and after construction to determine background flow and potential impact to Rattlesnake Springs. These measurements would be conducted for the life of the project. Reclamation may need to develop additional mitigation measures based on the outcome of these investigations in consultation with the Service. According to Reclamation's EIS; "*Reclamation is agreeable to groundwater monitoring*" (Reclamation 2008f).

Contingency for seepage adversely affecting groundwater (USFWS 2008d): Reclamation should work with the Service to identify additional measures for seepage control, in the event that the current proposal fails to prevent groundwater seepage from continuing toward the Hanford Works.

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Personal Communication

Goldie, Kevin. USFWS. Hanford Reach National Monument. 2008a.
Subject: Wildlife species within the Affected Area.

Goldie, Kevin. USFWS. Hanford Reach National Monument. 2008b.
Subject: August 22, 2008, field inspection of the ALE conducted by Kevin Goldie (biologist, USFWS) accompanied by Kathleen Fulmer (biologist USFWS) and Rick Donaldson (biologist USFWS): Site visit included detailed discussion about recent wildfires, habitat conditions, local plant & animal species, and management activities.

Browsers, Howard. USFWS. Hanford Reach National Monument. 2008
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