Washington State Department of Transportation

MOSES LAKE WETLAND MITIGATION BANK INSTRUMENT

February 21, 2003

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Approved:

U.S. Army Corps of Engineers
Date: _____

Washington Department of Ecology
Date: _____

U.S. Environmental Protection Agency
Date: _____

Washington Department of Fish and Wildlife
Date: _____

Federal Highway Administration
Date: _____

Washington State Department of Transportation
Date: _____

City of Moses Lake
Date: _____

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Executive Summary

The North Central Region of The Washington State Department of Transportation (WSDOT) is establishing the Moses Lake Wetland Mitigation Bank to provide off-site wetland compensatory mitigation for future highway projects located within the service area designated for the bank (description of service area is located in section 1.3 of this document). It is the goal of the North Central Region to ensure a greater economy of construction, maintenance and performance that is consistent with WSDOT policy as well as providing meaningful compensation for unavoidable wetland impacts.

The goals of the Moses Lake Wetland Mitigation Bank are to improve the functions and values of a degraded urban wetland. Removal of fill and other materials, enlarging open water habitat, and enhancing native plant communities is proposed to increase the wildlife habitat values of the site. Development of a viewing area and installation of interpretive signs will increase educational values.

1. Location

   The Moses Lake Bank Site is located within the corporate limits of the City of Moses Lake. The site is adjacent to the Pelican Horn arm of Moses Lake in Grant County, Washington. The project is located primarily in the SE ¼, NW ¼, of Section 23, T 19 N, R28E, with small areas extending into portions of the S ½, NE ¼ and the E ½, SW ¼, and NW ¼ of Section 23 (Figure 1 on page 1-2).

2. Size of Bank

   The Moses Lake Bank Site wetland mitigation area is 11.3 acres in size. The size of the entire site is 12.2 acres. However, approximately one acre within the site is comprised of an upland area where mitigation activities will not take place.

   The site contains one large wetland that encompasses 17.3 acres, including a portion that extends off-site on adjacent property. Mitigation activities will result in a 0.5-acre increase of wetland area on-site. Wetland delineation will be conducted after the Bank becomes established, and the wetland area is expected to be 17.8 acres in size as a result of fill removal activities.

3. Land Owners

   The City of Moses Lake owns the Bank Site property.

4. Bank Sponsor

   The Moses Lake Bank is being constructed and operated by WSDOT.

5. Type of Bank

   The proposed bank will be a multi-project, wetland mitigation bank. Credits will be generated through wetland restoration and enhancement, buffer establishment, preservation, and providing environmental education opportunities.

6. Purpose, Goals and Objectives of the Bank

   The purpose of the bank is to provide compensation for unavoidable impacts to wetlands from proposed highway construction projects within the Columbia Basin. The goal of the bank is to increase the habitat functions and educational values of an existing degraded urban wetland.

7. Use of Bank Credits

   Credits from the Bank Site will be used by the WSDOT for highway construction projects within the Columbia Basin Service Area. Credits withdrawn from the Bank Site (debits) will be used to compensate only for impacts to Category 2, 3, or 4 wetlands.

8. Long Term Protection and Management

   A Memorandum of Agreement (Appendix H) and Conservation Easement (Appendix G) specify arrangements for the long-term protection and management of the Moses Lake Bank.

9. WSDOT Wetland Compensation Bank Memorandum of Agreement

   The *Washington State Department of Transportation Wetland Compensation Bank Program Memorandum of Agreement* (CBMOA) (1994) provides the principles and procedures for establishing, implementing, and maintaining the WSDOT Moses Lake Wetland Mitigation Bank. The CBMOA is located in Appendix F.

10. Service Area

    The service area of the Moses Lake Wetland Mitigation Bank includes portions of five Water Resources Inventory Areas (WRIA 36, 41, 42, 43, and 44). The Columbia River forms the southern and western boundary of the service area. State Route (SR) 2 forms the northern boundary. The eastern boundaries of WRIAs 43, 41, and 36 form the eastern boundary of the service area (Figure 5).

11. Credit Determination

    The Moses Lake Bank is eligible to generate five acres of wetland credits that are available for use based on attainment of agreed upon success standards listed in the Moses Lake Bank Instrument.

12. Permits/Approvals

    A table of completed environmental documentation and permits received for this project are located in Appendix L.

1.0 INTRODUCTION AND BACKGROUND INFORMATION

The Moses Lake Wetland Mitigation Bank Instrument (MBI) contains required information for certification of the Moses Lake Wetland Mitigation Bank. The outline and contents of the MBI are based on WSDOT's 1994 Wetland Compensation Bank MOA, negotiations with State and Federal wetland regulatory agencies, and the City of Moses Lake.

1.1 PROJECT OVERVIEW

The Washington State Department of Transportation (WSDOT) is establishing the Moses Lake Wetland Mitigation Bank to provide compensatory wetland mitigation for unavoidable impacts to wetlands during proposed highway construction projects located in the Columbia Basin. The Bank Site is located within the corporate limits of the City of Moses Lake in Grant County, Washington (Figure 1). The bank is intended to compensate for unavoidable impacts to Category 2, 3, or 4 wetlands. Unavoidable impacts to Category 1 wetlands, fish and flood flow impacts are to be compensated separately.

Construction of the mitigation bank as described in the MBI will result in the establishment of five-acre credits of mitigation. These credits will become available for use by WSDOT, in increments, as the success standards specified in Section 3.2 of the MBI are met and approved by the Bank Oversight Committee (BOC). Site conditions before and after construction of the mitigation bank are summarized in Table 1.

Table 1. Site Conditions Summary

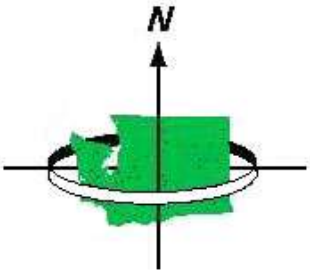
	Pre-construction Conditions	Post-construction Conditions
Wetland Size On-site	10.15 acres	10.65 acres
Total Wetland Size (including off-site area)	17.29 acres	17.79 acres
Size of Mitigation Area	11.30 acres	11.30 acres
Size of Site	12.21 acres	12.21 acres

The State Route (SR) 17 Pioneer Way to Stratford Road project (Figure 2) is a candidate project to use mitigation credits from the Bank Site. The project proposes to widen SR 17 from an existing two-lane highway to a four-lane facility and includes widening the bridge over the Parker Horn arm of Moses Lake. Descriptions of wetland and wildlife resources in the project area are located in the wetland delineation report prepared for this project (Appendix A). Wetlands adjacent to the highway in the project area are rated as Category 2 and 3 according to the Department of Ecology's Wetland Rating System for Eastern Washington (1991).

Moses Lake Wetland Mitigation Bank Site

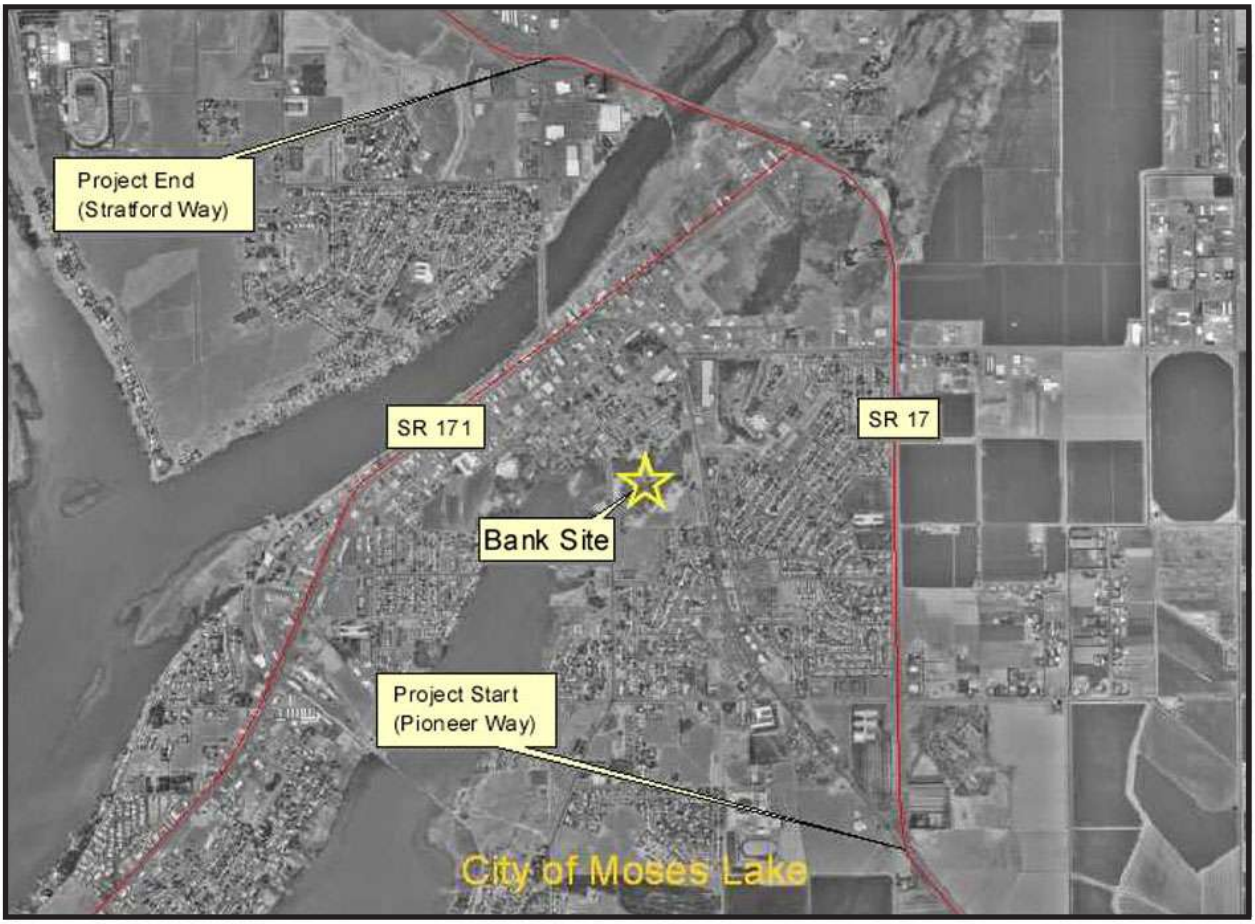
Bank Site Property Boundary

0 0.1 0.2 Miles

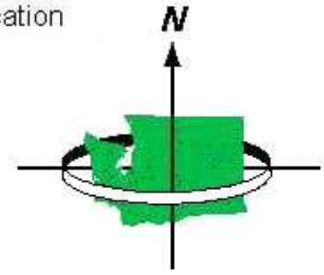


Washington State Department of Transportation

Figure 1



Map Location



State Routes LRS

0 0.5 1 1.5 2 Miles

Washington State
Department of Transportation

Figure 2

Other WSDOT projects within the Columbia Basin Service Area (as defined in this document) may also use credits from this bank for minor Category 2, 3, or 4 wetland impacts.

1.1.1 General Mitigation Bank Goals and Objectives

The goal of Moses Lake Bank is to improve wetland functions and values of an existing degraded urban wetland. Removal of fill materials, enlarging open water habitat, and enhancing native plant communities is proposed to increase the wildlife habitat functions of the site. Development of a viewing platform, trail, and installation of interpretive signs will increase educational values.

1.1.2 Project Area Setting

The Bank Site is located in the Columbia Basin region of eastern Washington within the shrub-steppe zone. Climax vegetation for this area includes the big sagebrush (*Artemisia tridentata*) and blue bunch wheat grass (*Agropyron spicatum*) plant association occurring in upland areas (Franklin and Dyrness, 1988), and the basin wild-rye (*Elymus cinereus*) and inland salt grass (*Distichlis stricta*) community in more alkaline wetland areas (Daubenmire, 1970).

Major land uses in the immediate area include residential neighborhoods, commercial urban centers, open space and irrigated agriculture (occurring on the perimeter of the City).

Water resources in the vicinity of the Bank Site include Pelican and Parker Horns of Moses Lake, Crab Creek, and two unnamed streams. Numerous wetlands are found in this area ranging from riparian and lake fringe emergent marshes and shrub zones to groundwater-fed slope marshes dominated by dense stands of cattails. Irrigation canals and excavated open water ponds are also numerous in the vicinity.

Ecological conditions in the Columbia Basin region of Washington have changed dramatically over the last 75 years. Development and operation of the U.S. Bureau of Reclamation's Columbia Basin Irrigation Project has resulted in tremendous alteration of native landscapes and ecosystems. Changes in water distribution patterns have resulted in the creation of numerous wetlands supported by irrigation water runoff. Wind blown sediments (from agricultural and grazing practices) have increased sedimentation rates in both natural and irrigation water supported wetlands. Numerous non-native plant species have been introduced and become well established as a result of human settlement and agricultural practices. These landscape level changes have influenced the ecology of the Moses Lake Bank and limit to some extent the restoration potential of the site.

1.1.3 Site Selection Rationale

The City of Moses Lake initially identified the site, locally known as the Three Ponds property, as a mitigation bank for City projects. The site was donated to the City and was incorporated into the comprehensive plan as "Open Space". The City of Moses Lake lacked funds to restore the property and offered the site to WSDOT to develop as a mitigation bank. The property offers an excellent opportunity for wetland restoration and enhancement and, due to its urban location, is also an excellent site for environmental education.

The bank property meets the following site selection criteria as outlined in the *WSDOT Wetland Compensation Bank Memorandum of Agreement* (CBMOA) (1994):

a. Excellent opportunities exist for restoring and enhancing the functions and values of the wetland;

b. Wetland restoration and enhancement work targets wildlife habitat improvement needs within the Columbia Basin as identified by the Washington State Department of Fish and Wildlife (WDFW);

c. Similar wetland restoration projects completed in the Columbia basin have successfully improved habitat for waterfowl and shorebirds;

d. Fill removal and site clean-up activities can improve the condition and vigor of the wetland;

e. Credits from the Bank Site provide good compensation for the majority of wetlands likely to be impacted by highway construction projects in the service area;

f. The Bank Site is in close proximity to the proposed highway project likely to use the largest number of bank credits;

g. Hydrology is provided by freshwater springs and is not solely dependent upon irrigation water or fluctuating lake levels;

h. Enhancement and restoration efforts are likely to succeed, minimizing risk of site failure; and

i. Urban setting of the bank provides ideal location for environmental education.

The Bank Oversight Committee (BOC) visited the site in May of 1999 and agreed that the Moses Lake Wetland Mitigation Bank met the required site-selection criteria as specified in the WSDOT CBMOA.

1.1.4 Bank Site Description

1.1.4a Historic Condition

The Moses Lake Bank Site was the location of an early homestead and later a farm. A freshwater spring located on the property provided drinking water for the town of Neppel, which later became the City of Moses Lake (WSDOT Cultural Resources Survey, 1999, Appendix B). Little information exists on the historical conditions of the wetland. During the 1950s the site (based on local knowledge and historic photos) consisted of one large open water wetland surrounded by a fringing marsh. The central portion of the pond was filled with construction debris and other materials sometime around 1959. In the early 1980s, large quantities of volcanic ash were deposited into the site after the eruption of Mt. St. Helens. Additional sediment likely came into the wetland with more recent urban development in the surrounding area. Fill material and volcanic ash spread outward into the wetland and hastened the invasion of cattails (*Typha latifolia*) and other plants.

Uplands surrounding the wetland have a long history of disturbance. The site was tilled, farmed, and grazed in association with the early homestead and farm that occupied the site. A series of

controlled burns and herbicide applications were used to remove plant debris and treat noxious weeds in the early 1990s. The site also received damage by off road vehicles, development of trails, and garbage dumping.

Disturbances to the wetland changed the type and distribution of native plant communities. A near monoculture of cattails occupies the majority of the wetland. Non-native tree species such as Russian olive (*Eleagnus angustifolia*) have invaded, and now dominate the dryer portions of the wetland. Other non-native species such as yellow iris (*Iris pseudacorus*) and purple loosestrife (*Lythrum salicaria*) occur in small, scattered populations within the wetland. Upland areas surrounding the site are characterized by a mix of native and non-native species.

1.1.4b Base Line Conditions

The site currently consists of one wetland divided into two lobes by an upland berm (Figure 3). The total wetland area comprises 17.3 acres including the portion that extends off-site. The wetland has palustrine emergent and forested components (Figure 4). Emergent areas are dominated by large monocultures of cattails. Patches of bulrush (*Scirpus* spp.) occur adjacent to open water areas. Salt grass dominates dryer areas. Shrubs including Russian olive and willows (*Salix* spp.) exist in small, scattered communities. The forested wetland is dominated by Russian olive, with an understory of inland saltgrass, quackgrass (*Agropyron repens*), and other native and non-native forbs (Haddaway, 1999, Moses Lake Bank Wetland Delineation Report, Appendix C).

Figure 3. Aerial Photo

Figure 4. Vegetation Map

Other vegetation at the site include black locust (*Robinia pseudo-acacia*), elm (*Ulmus* sp.), poplar (*populus* sp.), and single specimens of pear, apple, and weeping willow (*Salix babylonica*). Understory plants on the upland portion of the site include non-native species such as cheatgrass (*Bromus tectorum*), Canadian thistle (*Cirsium arvense*), alfalfa (*Medicago sativa*), mustard (*Brassica* spp.), Russian thistle (*Salsola kali*), and crested wheatgrass (*Agropyron cristatum*). Native species include basin wild rye, rabbit brush (*Chrysothamnus nauseosus*), and sagebrush. Table 2 lists plant species observed at the site.

Table 2.
Moses Lake Mitigation Bank Site Plant List

Common Name	Latin Name
Russian olive	*Elaeagnus angustifolia*
Cattail	*Typha latifolia*
Duckweed spp.	*Lemna* spp.
Inland saltgrass	*Distichlis stricta*
Purple loosestrife	*Lythrum salicaria*
Weeping willow	*Salix babylonica*
Elm	*Ulmus* spp.
Tumble mustard	*Sisymbrium* spp.
Yellow iris	*Iris pseudacorus*
Spike – rush spp.	*Eleocharis* spp.
Quack grass	*Agropyron repens*
Kochia	*Kochia scoparia*
Lamb's quarters	*Chenopodium album*
Reed canary grass	*Phalaris arundinaceae*
Common reed	*Phragmites communis*
Barley spp.	*Hordeum* spp.
Speedwell spp.	*Veronica* spp.
Horseweed	*Conyza Canadensis*
American bulrush	*Scripus americanus*
Willow spp.	*Salix* spp.
Canada thistle	*Cirsium arvense*
White sweet clover	*Melilotus alba*
Cheat grass	*Bromus tectorum*
Watercress	*Rorippa nasturtium-aquaticum*
Tall fescue	*Festuca arundinaceae*
Wheat grass spp.	*Agropyron* spp.
Quaking aspen	*Populus tremuloides*
Sagebrush	*Artemisia tridentata*
Rabbitbrush	*Chrysothamnus nauseosus*

Wildlife use at the site includes waterfowl, shorebirds, beaver, pheasants, quail and deer. Table 3 lists bird species observed at the site by WDFW.

Table 3.
Working Bird List for the Three Ponds Area of Moses Lake[a]

Great blue heron, CR	**Black-crowned night heron, CR**	Green-winged teal, UW
Blue-winged teal, CM	Cinnamon teal, CM	**Northern shoveler, CW**
Gadwall, CR	American wigeon, UM	Redhead, CW
Northern Harrier, UR	**Sharp-shinned hawk, UW**	Cooper's hawk, UW
Mallard, CR	Red-tailed hawk, UW	American kestrel, CW
Merlin, UW	**Ring-neck pheasant, CR**	**California quail, CR**
Virginia rail, CR	Sora, US	**American coot, CR**
Spotted sandpiper, US	Killdeer, CS	American avocet, US
Greater yellowlegs, US	Western sandpiper, UM	Common snipe, UR
Ring-billed gull, CR	**Mourning dove, CR**	**Great horned owl, UR**
Common nighthawk, CS	Belted kingfisher, UR	Downy woodpecker, UR
Northern flicker, CR	Says'phobe, US	Western kingbird, US
Violet-green swallow, CS	Cliff swallow, CS	Barn Swallow, CS
Black-billed magpie, CR	Marsh wren, UR	Ruby-crowned kinglet, CS
American robin, CR	Varied thrush, UR	Cedar waxwing, UW
Northern shrike, WW	**European starling, CR**	Warbling vireo, UM
Orange-crowned warbler, UM	**Yellow-rumped warbler, CM**	Common yellowthroat, US
Black-headed grosbeak, US	**Song sparrow, CR**	**White-crowned sparrow, CW**
Dark-eyed junco, CW	**Red-winged blackbird, CR**	**Western meadow lark, CR**
Yellow-headed blackbird, US	Brewer's blackbird, CS	Brown-headed cowbird, CS
Northern oriole, US	**House finch, CR**	**American goldfinch, UR**
House sparrow, CR		

[a]Based on random observations in the Moses Lake area and from the Moses Lake Audubon Christmas Bird Count data between 1988-99. This "working" list is meant to illustrate the potential bird populations of Three Ponds Area. (Ron Friesz, Habitat Biologist for Washington Department of Fish and Wildlife, Ephrata.)

Key to Table Notes:

C: = common, often seen or heard in appropriate habitat
U: = uncommon, usually present but not always seen or heard
R: = resident, present all year but abundance may vary seasonally
S: = summer resident
W: = winter visitor
M: = migrant

Species highlighted with **Bold** are observed more frequently and may considered more characteristic of the Three Ponds Area.

1.1.4c Wetland Functions Assessment

In spring 2000, the wetland Bank Site was evaluated using the Department of Ecology's Wetland Functional Assessment Methodology. The Bank Site is classified as a depressional flow through, freshwater, long duration wetland with areas of short duration wetland. The assessment indicated that improvements to wildlife habitat could increase the wildlife habitat potential of the site. A summary of the functional assessment is provided in Appendix D.

Wetland functions and values were also characterized using the *Wetland Functions Characterization Tool* (Null, et al., 2000); Table 4 provides a summary both of the functions that are *likely provided* and the *principal functions* provided at the site. Eleven of the fourteen functions that were characterized were found "likely provided" by the wetland. Flood flow alteration was determined as not likely to be provided by the wetland, since it maintains a consistent water level and has a culvert at the outlet. The "erosion control and shoreline stabilization" function also was determined as not likely to be provided because, despite a hydrologic connection with Moses Lake, the wetlands are separated by a road and culvert. The "uniqueness and heritage" value was also determined not likely to be provided, as it failed to meet the criteria.

Table 4. Characterization of Wetland Functions and Values for the Moses Lake Mitigation Bank Site

Function/Value	Occurrence	Rationale (qualifiers and attributes present)	Principal Function	Comments
Flood flow alteration	No	5	No	Wetland maintains consistent water levels. Culvert at outlet.
Sediment removal	Yes	1, 2, 3, 4, 5, 6	Yes	Receives unregulated irrigation water from agriculture upgradient of site.
Nutrient and toxic removal	Yes	1, 2, 4, 5	Yes	Receives unregulated irrigation water from agriculture upgradient of site.
Erosion control & shoreline stabilization	No	Criteria not met.	No	Associated with Moses Lake, but separated by a culvert.
Production of organic matter and its export	Yes	1, 5, 6	No	Production of organic matter is high. Export is likely, although most trapped at site, there is a culvert at outlet with flow.
General habitat suitability	Yes	3, 5, 7	No	Wildlife use observed at site. Surrounded by development.
Habitat for aquatic invertebrates	Yes	1, 2, 3, 4, 5, 6	Yes	Emergent vegetation, various water depths, and perennial water present.
Habitat for amphibians	Yes	1, 2, 4, 6	No	Habitat exists, no visual observation made.
Habitat for wetland-associated mammals	Yes	1, 2, 3, 4, 5, 6, 7	Yes	Much beaver and muskrat activity at site.
Habitat for wetland-associated birds	Yes	2, 3, 4, 6	Yes	Provides winter habitat for birds. Spring keeps wetland from freezing during the winter.
General fish habitat	Yes	2, 3, 4, 5	Yes	Fish observed at site.
Native plant richness	Yes	2, 3, 4	No	Mature trees are Russian Olive, and site is dominated by cattails.
Educational or scientific use	Yes	1, 2, 3	No	Site is currently used for some education and Audubon society.
Uniqueness and heritage	No	Criteria not met.	No	

In the best professional judgment of WSDOT biologist Heather Roughgarden, the principal functions provided by the wetland appeared to be sediment removal, nutrient and toxic removal, and also habitat for aquatic invertebrates, wetland-associated mammals and birds, and general fish habitat. Although the site is surrounded by development, it provides critical wintering habitat for wildlife because the wetland is spring fed and does not completely freeze over during the winter.

1.1.4d Soils

The Grant County Soil Survey lists the soils at the site as Starbuck very fine sandy loam. This soil type occurs on the upland areas surrounding the wetland. Soils within the wetland appear to be a mixture of muck, fill material and volcanic ash.

Fill material consists primarily of volcanic ash, soil and construction debris. Soil pH is neutral to slightly alkaline. Soil testing for plant growth potential showed water was the only limiting factor in upland areas. Tests of soil samples taken from various locations at the site did not find any hazardous materials.

1.1.4e Hydrology

Freshwater springs provide the primary hydrologic support of the wetland. Locations of springs are indicated on Plan Sheet L-2 (located at the end of Section 2). The input of cold (pH neutral) fresh water provides numerous benefits to the ecology of this shallow water wetland and to wildlife species utilizing the area. The springs provide hydrologic stability for the wetland throughout the year and assist in regulating water temperature during both winter and summer months. The springs also maintain the neutral pH of the water (pH is based on water samples taken from various locations throughout the wetland). The slight current produced by the springs prevents the wetland from freezing until late in winter (after other shallow wetlands in the vicinity are frozen).

The wetland also receives unregulated irrigation water run off from agricultural fields located on the perimeter of the City to the east of the site. Irrigation water originates as surface water that infiltrates through the soil and into the groundwater system. The groundwater surfaces along the west side of Stratford Road and enters the Bank Site after flowing through a series of road side ditches and wetland systems that occur up gradient from the site. There is no way to measure the exact amount of irrigation water that enters the site.

High water levels in Moses Lake occasionally influence the wetland. The City installed a staff gauge to monitor the water level of the ponds. Measurements from the gauge indicate that water levels are fairly steady throughout the year with a slight drop during fall months. The water level in the wetland remains relatively stable and is not significantly influenced by low fall water levels in Moses Lake.

1.1.4f Current Public Use

Current public use includes undirected pedestrian access, recreational activities by local children, off-road vehicle use and unauthorized dumping. Local students visit the site periodically to collect water quality samples and study the wetland. The local chapter of the Audubon Society uses the site for bird watching.

1.1.4g Proposed Public Use

Public use is an important component of the Bank Site. Proposed public use includes wildlife watching and other environmental educational activities. Public use will be directed to an approved trail and viewing area. WSDOT will construct a viewing platform that will be accessible from Division Street (see location on Plan Sheet L-2). It is expected that directed public use combined with a strong community presence will enhance public stewardship of the site and reduce vandalism and other site disturbance activities. Wildlife watching from designated viewpoints and trail will provide the public with the opportunity to study, learn and appreciate wildlife and wetland resources.

The bank plan takes into consideration that access must be controlled and restricted to ensure long-term site protection. A tank trap (see location on Plan Sheet L-2) is proposed to limit vehicular access to the site from adjacent private properties. Fencing along the western edge of the site will provide a barrier to pedestrian access. The exterior buffer located on the perimeter of the site provides visual screening and a physical barrier.

The City will monitor public use at the site. The site is in close proximity to the Moses Lake City Hall and is visible from Division Street and Pioneer Way. City maintenance staff members visit the site regularly to monitor the water levels in the ponds and clean culverts, which provides site surveillance opportunities. Long-term maintenance and site protection mechanisms are listed in the Agreement and Conservation easement prepared for this project between WSDOT and the City of Moses Lake.

1.1.5 Surrounding Landscape

The area surrounding the Bank Site is either urban land or vacant property that is zoned for urban or residential development. The Bank Site is surrounded by residential and urban development to the north and east, and approximately 24-acres of vacant land to the south. Pioneer Way and Division Street form the eastern and western boundaries of the site. The 24-acres of vacant land adjacent to the bank is primarily zoned Multi-Family Residential (R3) with a small amount zoned Commercial (C2). The City's Critical Areas Ordinance requires a 50- to 100-foot buffer for a Category 2 wetland depending on the intensity of the proposed development.

1.1.6 Japanese Garden

The City of Moses Lake dedicated the upland area between two lobes of the wetland as a park to be developed as a Japanese garden. Information on the garden is included in the MBI due to its proximity to the Bank Site and concerns regarding its management. The Moses Lake Parks and Recreation Department will maintain and manage the Japanese garden. The goal of the project is development of a contemplative garden with a focus on form and beauty (see Japanese Garden plan in Appendix E). Plantings for the garden were based on those select species that are non-invasive to wetland or upland areas. The Department of Ecology will review and approve final selection of plant materials for the park based on conditions in the Shoreline Permit issued for this project.

WSDOT worked with the City on joint use of the Bank Site and park property. WSDOT designed the edges of the berm (adjacent to the garden) as a buffer between the two land uses. A small trench, constructed around the upper edges of the berm, is designed to catch and hold run-off water from the garden. The water will filter through the berm before entering the wetland. The Conservation easement and Agreement developed between WSDOT and the City of Moses

Lake outlines the management relationship between WSDOT and the city's Japanese garden (Appendix H).

The design of the Japanese garden is in the conceptual phase. Final plans will be developed after excavation and grading of the wetland mitigation bank has been completed. Design elements of the garden are confined to approximately 1 acre on top of the upland berm.

1.1.7 Cultural Resources Survey

A cultural resources survey of the Moses Lake Bank Site was completed in June 1999. The only cultural resources of interest are concrete structures that relate to the City of Moses Lake's urban predecessor, Neppel. These include structural foundation and wall features that are identified as part of the pre-1917 water pumping plant, or might have belonged to the post-1929 farm that occupied the site. None of these structures are eligible for inclusion in the National Register of Historic Places due to their poor physical condition, however it is recommended that they remain in place and further disturbances be avoided. The restoration and enhancement of the Bank Site will not disturb any of these structures.

1.2 LEGAL AUTHORITY AND RESPONSIBILITY OF BANK SPONSOR AND PARTNERS

1.2.1 WSDOT Wetland Compensation Bank Program Memorandum of Agreement

WSDOT entered into a Memorandum of Agreement for wetland banking with State and Federal wetland regulatory agencies in 1994. The "Washington State Department of Transportation Wetland Compensation Bank Program Memorandum of Agreement" (1994) (CBMOA) provides the principles and procedures that all the signatories have agreed to adhere to in establishing, implementing, and maintaining WSDOT wetland mitigation banks. A copy of the CBMOA is located in Appendix F. Signatories to the CBMOA include U.S Army Corps of Engineers (Corps), U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Federal Highway Administration (FHA), Washington Department of Ecology (Ecology), Washington Department of Fish and Wildlife, and WSDOT.

The CBMOA establishes a Bank Oversight Committee (BOC) to review and approve WSDOT mitigation bank proposals. WSDOT is responsible for convening and facilitating meetings of the committee. The BOC is made up of one representative from each signatory agency to the Agreement plus a representative of the local government where the Bank Site is located. The committee meets quarterly and provides a venue for project review and coordination between WSDOT and State, Federal and local governments.

The BOC reviews and comments on of all phases of WSDOT Bank Site development. WSDOT uses a tiered approach in soliciting approvals for Bank Site certification. Candidate Bank Sites are submitted to the BOC for preliminary determination of approval based on site-selection rationale (outlined in the CBMOA). The second stage of the process involves submitting a draft development plan for the Bank Site. This is followed by the submittal of a draft MBI. The last step involves final approval and signing of the MBI. Signatories to the MBI include the same agencies as those listed as signatories to the CBMOA in addition to the local government (city of Moses Lake). In order to facilitate project review, WSDOT initiated a concurrence point process based on approval of milestones that represent critical points in bank project development. The

BOC either concurs with/or recommends modifications needed for concurrence for each milestone reached in the bank development process.

1.2.2 Responsibility of WSDOT and the City of Moses Lake

WSDOT is responsible for the development, operation, management and maintenance of the Moses Lake Bank Site in accordance with the MBI. WSDOT is also responsible for the preparation and distribution of monitoring reports and maintaining accounting statements/ledger, as required.

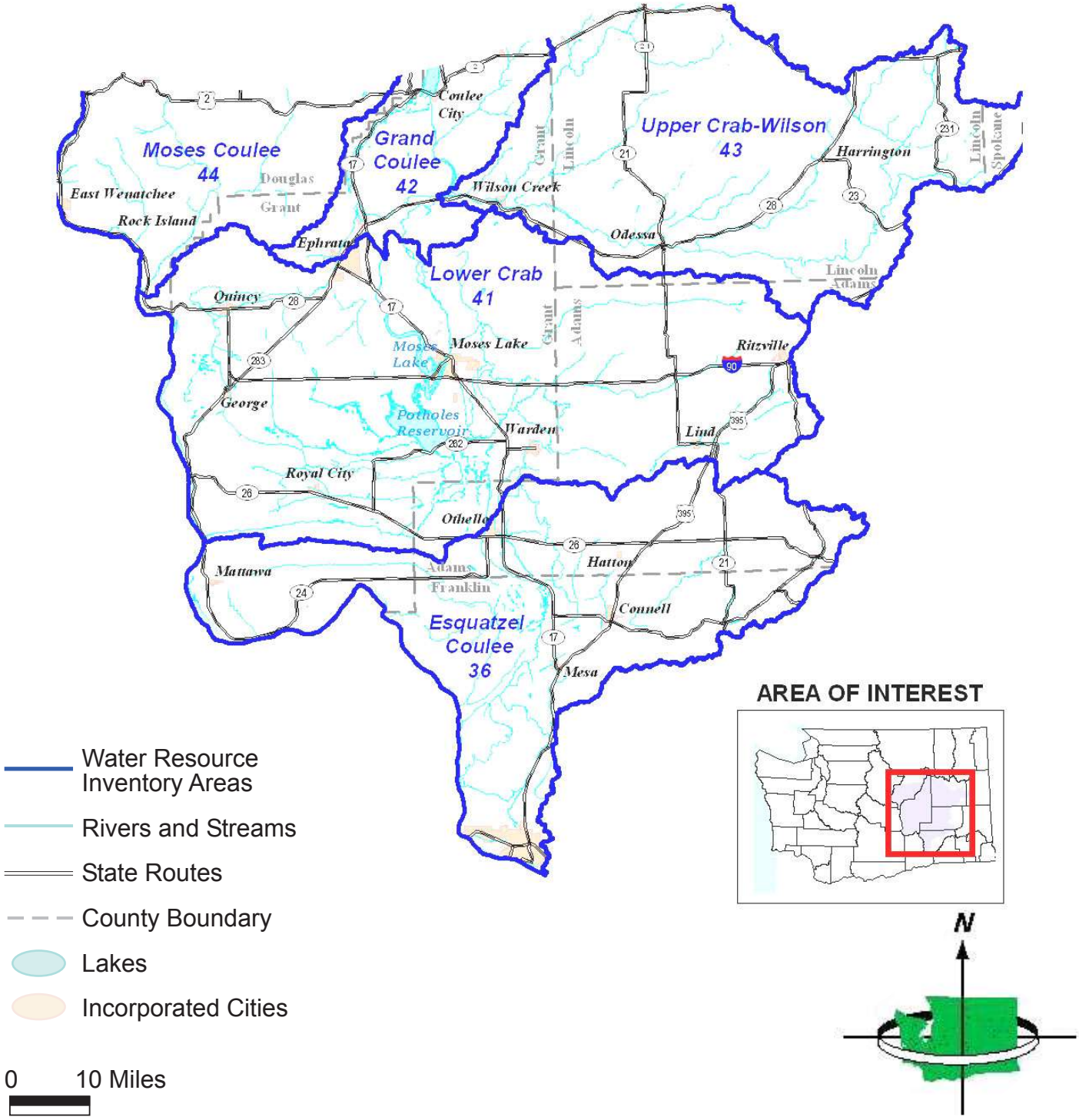
The Conservation Easement (Appendix G) and Agreement (Appendix H) outline responsibilities and requirements of the WSDOT and the City of Moses Lake for short and long-term site maintenance and management. WSDOT is responsible for short-term maintenance and management of the site and the City is responsible for long-term maintenance and management. The City is solely responsible for the construction management, and maintenance of the Japanese Garden.

1.3 SERVICE AREA

The service area is the geographic area in which the WSDOT projects occur. The service area for the Moses Lake Bank Site encompasses portions of five Water Resource Inventory Areas (WRIAs) within the Columbia Basin ecoregion of Washington State (Figure 5). The Bank Site is located within WRIA 41 - Lower Crab Creek, which is centrally located within the service area. The following rationale based on criteria outlined in the WSDOT CBMOA, was used to define the scope of the bank's service area:

1. Watershed units within the Columbia Basin are small. Additional highway projects projected to use the bank cross several of these small watershed units;
2. All of the projects are located in the shrub-steppe zone within the Columbia Basin ecoregion;
3. Many wetlands within the service area are supported either directly or indirectly by irrigation water from the U.S. Bureau of Reclamation, Columbia Basin project;
4. The majority of wetland impacts due to highway project construction will be to small, low quality wetlands adjacent to the highway; and
5. Educational opportunities developed at the site will be available to residents throughout the central Columbia Basin.

Moses Lake Mitigation Bank Site
Site Service Area



Washington State
Department of Transportation

Figure 5

2.0 ESTABLISHMENT OF THE BANK

2.1 PROJECT OVERVIEW

The Moses Lake wetland mitigation bank proposes to restore and enhance the wetland and its buffer as well as preserve on-site wetlands. Enhancement of wildlife habitat functions is the primary goal of the bank. Providing educational opportunities is a secondary goal.

2.2 WETLAND MITIGATION BANK PLAN OVERVIEW

The mitigation plan focuses on fill removal to restore open-water habitat for waterfowl and shorebirds, and the installation of a viewing platform, trail and interpretive sign to provide educational opportunities. Wildlife habitat improvements are based on discussions with WDFW staff familiar with the site and successful WDFW wetland restoration projects completed in the Columbia basin. Vegetation selection was based on those native species known to occur in the area, provide good cover and forage for wildlife species, and can be purchased commercially or collected locally. Plan sheets L-1 through L-4 are located at the end of this section. They illustrate grading, planting, and detail drawings for this project.

The mitigation plan is based on activities that occur in specific areas defined as:

- Restoration means those areas where fill material is removed to restore the historical hydrologic regime of wetland areas;
- Wetland enhancement means those existing wetland areas enhanced through the reduction in cover of Russian olive, control of non-native species and planting of native vegetation; and garbage and debris removal;
- Exterior buffer enhancement means those areas located on the perimeter of the Bank Site boundary designated as buffer; and
- Preservation means the protection of existing wetlands.

2.3 WETLAND MITIGATION BANK PLAN

2.3.1 Wetland Restoration

Restoration activities involve removing fill material and construction debris. The majority of fill material will be removed from the large cattail dominated portion of the wetland located on the west side of the upland berm.

2.3.2 Restoration of Open Water Wetland

Restoration of the large cattail stand located to the west of the berm (see plan sheets) includes removal of up to 18,000 cubic yards of fill material to create open water habitat. Side slopes of the open water area vary. The side slope of finger channels will be steep to prevent rapid recolonization of the site by cattails. Gentler slopes in areas adjacent to the berm (next to the Japanese garden) will be used to enhance establishment of a shrub buffer.

The depth of the open water varies from 2 to 10 feet. The shape of the open water area also varies from a broad open water area adjacent to the berm to longer finger channels interspersed by cattails (Plan Sheet L-1).

2.3.2a Construction Elements

Excavation equipment will operate from the edge of the berm and from construction pads to minimize impacts to the remaining wetland. Sediment removed by excavators will be loaded into trucks to be placed on the top of the berm for temporary storage.

2.3.2b Planting Plan

Plugs of *Scirpus acutus* and *Scirpus validus* will be planted four feet on center along shallow edges of open water located within the emergent wetland enhancement area (Plan Sheet L-2). A total of 165 plugs will be installed in this planting area, which is 0.15 acre in size. However, only a portion of the 0.15 acre occurs along the open water area, while the other portion is located between the buffer and wetland preservation area.

2.3.2c Habitat Value

Creation of open water wetland increases the habitat value of this area by converting it from a solid cattail monoculture to an open water wetland with cattails interspersed. This design creates habitat for waterfowl and shorebirds and increases wildlife viewing opportunities. Installation of floating logs (Plan Sheet L-2) provides additional habitat value.

2.3.2d Monitoring

The open water area will be surveyed after construction to determine final area and depth of excavation. This area will also be monitored carefully for establishment of non-native species during quarterly site visits and formal site monitoring.

2.3.3 Wetland Enhancement

Wetland enhancement involves reduction in the cover of Russian olive, planting of native species, control of non-native species, and garbage and debris cleanup.

2.3.3a. Construction Elements

Construction debris and other materials will be removed from various locations. Removal of debris will increase wetland area available for colonization of plant materials and restore wetland function.

2.3.3b Planting

Tree and shrub planting will occur in enclosures within the wetland (Plan Sheet L-2). Two enclosures 18 feet in diameter and one enclosure 35 feet in diameter will be used. Emergent wetland enhancement includes installation of *Scirpus acutus* and *Scirpus validus* plugs approximately 4 feet on center. Emergent planting will occur along edges of the buffer and open water areas.

2.3.3c Habitat Value

Tree and shrub plantings will increase the species and structural diversity of the wetland. Debris removal and cleanup will improve habitat value by increasing areas for native species establishment.

2.3.3d. Monitoring

Enhancement areas will be monitored to assess the initial survival of planted species, cover of native species over time, and encroachment of non-native species.

2.3.4 Exterior Buffer Enhancement

Exterior buffer enhancement includes planting native trees and shrubs in open areas of the buffer and placement of access control and habitat structures (e.g., brush piles, fencing) along the site perimeter (Plan Sheet L-2).

2.3.4a Construction Elements

Rock barriers will be placed along the perimeter of exterior buffer to control site access and provide additional habitat. Fencing will be installed along the western boundary of the wetland to restrict access.

2.3.4b Planting

Native species will be planted in open areas within the exterior buffer to increase vegetation diversity (Plan Sheet L-2). This planting area is located around the perimeter of the site. Bare root or unrooted cuttings will be installed 8 feet on center. Willows will be installed 4 feet on center, and will be propagated by unrooted cuttings collected from the immediate area.

2.3.4c Habitat Value

Increasing native plant diversity and habitat structures will provide additional forage and cover for wildlife.

2.3.4d Monitoring

The exterior buffer will be monitored to measure the survival and cover of native tree and shrub species.

2.3.5 Education

Providing opportunities for the public to view wildlife and to learn about the wetland will increase educational values of the site. The proposed viewing platform and pedestrian trail allows for low impact public access (Plan Sheets L-2 and L-3). Wetland restoration and enhancement activities will increase the type and numbers of wildlife that use the area, allowing the public to view waterfowl, shorebirds and other species within the city limits of Moses Lake. The public will also have the opportunity to learn about the wetland and watch the progress of a wetland restoration project.

2.4 PROJECT CONSTRUCTION ELEMENTS

Project construction includes excavation, grading, and hauling. WSDOT State Forces will perform construction activities. Local Washington Conservation Corps, inmate crews, and volunteers will conduct planting, construction of viewing platform, trail, weed control, and other activities.

2.4.1 Excavation

Excavation is limited to the areas shown on the attached plan sheets (Plan Sheet L-1) in Appendix F. Depths of excavation will vary from 2 to 10 feet. A minor amount of material will be excavated from the area designated for the Japanese garden to strip the area of previously deposited construction waste materials and flatten the slope. A maximum of 18,000 cubic yards will be excavated from the wetland.

2.4.2 Excavated Soils

Excavated soils will be temporarily stored on top of the berm. Approximately 850 cubic yards will be distributed in the area of the proposed Japanese garden to provide a new organic soil surface layer conducive to plant growth and establishment. Fill material will be placed above the Ordinary High Water Line (OHWL) of the existing wetland.

2.4.3 Hauling

Trucks will haul soil (stockpiled on the berm) to a WSDOT designated waste site (location of pit site is shown in Figure 1). The waste site is approved by the Department of Natural Resources (permit #70010836). A map of the waste site and a reclamation plan are located in Appendix I.

2.5 PLANTING PLAN

The planting plan indicates the areas to be planted, species and spacing of plant materials. Table 5 provides a list of the plant materials, spacing quantities, and size of stock to be planted. Vegetation selection was based on those native species known to occur at the site, provide cover, forage or nesting habitat for wildlife, and could be purchased commercially or collected locally. The areas to be planted are defined as follows:

1. Buffer – Slope between the wetland and Japanese garden.
2. Enclosures – Fenced areas to be planted with native trees.
3. Emergent – Shallow areas along shoreline of excavated open water.
4. Exterior Buffer – 50-foot area on the site perimeter.
5. Disturbed Areas – Bare ground disturbed during construction.

Table 5. Proposed Planting List

Plant	Units	Spacing	Quantity
Enclosures and Exterior Buffer			
Black cottonwood (*Populus balsamifera* ssp. *Trichocarpa*)	Unrooted cuttings, 4' length	8 FT OC	250
Quaking Aspen (*Populus tremuloides*)	2-0 bare root	8 FT OC	100
Choke Cherry (*Prunus virginiana*)	2-0 bare root	8 FT OC	100
Water Birch (*Betula occidentalis*)	2-0 bare root	8 FT OC	100
Willow (*Salix* sp.) (from immediate area)	Unrooted cuttings, 4' length	4 FT OC	250
Buffer			
Golden currant (*Ribes aureum*)	2-0 bare root – 18-36" HT	4 FT OC	200
Serviceberry (*Amelanchier alnifolia*)	1-1 bare root – 18-36" HT	4 FT OC	86
Pacific Ninebark (*Physocarpus malvaceus*)	2-0 bare root – 18-36" crown	4 FT OC	131
Bald hip rose (*Rosa gymnocarpa*)	2-0 bare root – 12-18" HT	4 FT OC	220
Wood's rose (*Rosa woodsii*)	1-1 bare root - 12-18" HT	4 FT OC	86
Big Sagebrush (*Artemisia tridentata*)	Seed	3#/acre	-
Bitterbrush (*Purshia tridentata*)	Seed	3#/acre	-
Greasewood (*Sarcobatus vermiculatus*)	Seed	3#/acre	-
Disturbed Areas Seed Mix	30#/acre		
Saltgrass (*Distichlis stricta*)	19% Pure Seed	30#/acre	-
Blue Wild Rye (*Elymus glaucus*)	38% Pure Seed	30#/acre	-
Bluebunch Wheatgrass (*Agropyron spicatum*) "Goldar"	19% Pure Seed	30#/acre	-
Yellow Sweet Clover (*Melilotus officinalis*)	19% Pure Seed	30#/acre	-
Emergent Area			
Scirpus acutus	Plug	4 FT OC	165
Scirpus validus	Plug	4 FT OC	165

2.6 CONSTRUCTION SCHEDULE

The project will be competed in several phases (See Table 6).

2.6.1 Phase I

The Corps issued a nationwide permit 27 (NWP) (2000-1-00841) on September 15, 2000 authorizing the excavation and grading work at the site. Excavation and grading of the Bank Site began in late September 2000. Excavation of open water areas and finger channels was the first task completed. Fill material was removed with heavy equipment and stockpiled on the center of the upland berm to drain. Drained material was contained on the berm by a swale, which circled the berm. Selected Russian olive trees were removed at this time.

2.6.2 Phase II

Dump trucks hauled excavated material stockpiled on the berm to the WSDOT pit site in March and April of 2001.

2.6.3 Phase III

Initial site planting occurred in November and December of 2001. A second planting was completed in the fall of 2002 to replace dead or missing plant material. Construction and installation of the viewing platform (Plan Sheet L-3) and interpretive signs will be competed during the summer of 2003.

2.6.4 Phase IV

Additional Russian olive tree removal and native tree establishment will occur in Years 3 through 5.

Table 6. Construction Schedule

Phase	Activity	Timing
I	Excavation & Grading	September 2000
II	Hauling	March / April 2001
III	Planting	November 2001 & 2002
III	Construction of viewing platform	Summer 2003
IV	Russian Olive control and tree planting	Years 3 through 5

Figure 6. Plan Sheet L-1

Figure 7. Plan Sheet L-2

Figure 8. Plan Sheet L-3

Figure 9. Plan Sheet L-4

3.0 GOALS, OBJECTIVES, AND STANDARDS OF SUCCESS

3.1 OVERALL PROJECT GOAL

The goal of the Moses Lake Bank is to restore and enhance wetland functions and values to benefit wildlife resources. Wildlife habitat improvements are the primary wetland functions targeted by the restoration and enhancement work at the Bank Site. A secondary goal is to provide opportunities for public education. The project will restore 0.50 acre of open water wetland, enhance 0.79 acre of open water wetland and 0.15 acre of emergent wetland, enhance and preserve 3.25 acres of the exterior buffer that is comprised of wetland, preserve 5.96 acres of wetland, and designate 0.65 acre to buffer establishment. Educational values of the site will be increased by the proposed restoration and enhancement activities and by development of a trail and the installation of a viewing platform and interpretive sign.

3.2 PERFORMANCE OBJECTIVES AND SUCCESS STANDARDS

A subset of the goals listed above are identified as performance objectives for the project that will be used to evaluate and gauge success in achieving the overall goals. Success standards for this project reflect the following specific criteria based on the location of the bank and the WSDOT CBMOA:

- Success standards selected for vegetation reflect growth rates in the Columbia Basin area of eastern Washington (vegetation growth rates for eastern Washington are much slower than what can be expected for western Washington); and
- Success standards are written to be fully achievable (and eligible for full credit release) by the end of 5 years with approval from the BOC.

Management standards have been developed to guide long-term maintenance and management of the site. These can be found in section 5.4 of the MBI.

The following performance objectives and standards provide criteria against which site success will be measured. Figures 6, 7, and 8 contain Plan Sheets as a reference for site specific details of the performance objectives and success standards.

Performance Objective 1: Water/vegetation interspersion of the wetland area will increase to improve wildlife habitat.

Success Standards		Monitoring Methods
1A.	Linear feet of shoreline edge will increase from 200 feet to 1,300 linear feet by the end of Year 1.	Linear feet of shoreline will be measured from current aerial photography of the Bank Site.
1B.	As-Built plans documenting the excavation work and documentation of the length of the pre-construction shoreline edge will be submitted to the BOC prior to credit release.	Linear feet of shoreline before and after construction will be determined and indicated on copies of aerial photos. Copies of the aerial photos will be submitted as part of the As-Built plans required for credit release.

Contingency Measures: Additional minor excavation and/or grading may be necessary to correct design deficiencies. The BOC will be consulted to determine additional measures if needed.

Performance Objective 2: Native shrub species will dominate the buffer zone established between the Bank Site and Japanese Garden. This area is intended to provide a natural vegetated screen between the wetland and garden area. It will also provide shade, forage, cover, and nesting areas for wildlife and reduce sedimentation and provide shoreline stabilization.

Success Standards		Monitoring Methods
2A.	60% survival or greater of planted material at Year 1.	A total census of woody plantings will be used to determine survival of plantings in Year 1.
2B. 2C. 2D. 2E.	15% or > aerial cover after Year 3 30% or > aerial cover after Year 5 45% or > aerial cover after Year 7 * 60% or > aerial cover after Year 10 *	Aerial cover of woody species in the buffer zone will be calculated using temporary, random transects and line or point intercept methods.

* Note: Years 7 and 10 are not tied to credit release.

Adaptive Management: Shrub establishment and survival will be monitored closely during the first year after planting. Dead shrubs will be replaced if mortality rates rise above 40 percent. Browse damage by beaver, deer, or other wildlife species will be evaluated and protective measures taken to prevent further damage. Fencing may be used to protect plantings if browse damage continues to be a problem. If adaptive management actions do not allow attainment of success standard then contingency actions will be initiated.

Contingency Measures: Evaluate potential causes for poor vegetation establishment; rectify site conditions and/or plant additional vegetation. WDFW staff will be consulted to discuss ways to reduce browse damage by wildlife. Actions may include removing or reducing the numbers of beaver at the site as a temporary measure. The BOC will be consulted if plant materials continue to fail and are not meeting specified success standards.

Performance Objective 3: The cover of Russian olive at the site will be reduced to enhance establishment of native species. A 1998 aerial photo of the site provides the baseline of the cover of Russian olive trees prior to construction. Updated aerial photography will be used to document changes in Russian olive cover over time. The long-term goal for management of the site is to achieve no more than 55 percent of the original (pre-construction 1,259 square feet) aerial cover of Russian olive. Russian olive seedlings will be controlled as part of long-term site management.

Success Standards		Monitoring Methods
3A. Year 0	Establish baseline area occupied by Russian olive.	Baseline (pre-construction) area covered by Russian olive will be outlined on an Aerial Photo, quantified, and submitted in As-Builts.
3B. Year 1	85% or < original aerial cover of Russian olive.	Each year updated aerial cover of Russian olive will be documented by visual assessment and recorded on an aerial photo to be included in monitoring reports.
3C. Year 3	70% or < original aerial cover	
3D. Year 5	55% or < original aerial cover	
3E. Year 7	55% or < original aerial cover	
3F. Year 10	55% or < original aerial cover	

* Note: Years 7 and 10 are not tied to credit release.

Adaptive Management: Observations of first round tree removal will help guide subsequent tree removal efforts.

Contingency Measures: Reevaluate Russian olive removal strategies and discuss habitat needs/options with WDFW and the BOC.

Performance Objective 4: Native tree species will be planted within fenced enclosures in areas formerly occupied by Russian olive within the wetland.

Success Standards		Monitoring Methods
4A. Year 0	Construct enclosures and install plantings.	As-Built plans will be submitted documenting the number, location, and sizes of enclosures and the number and species of plantings.
4B. Year 1	80% survival of plantings	Trees planted in each enclosure will be counted to determine survival.
4C. Year 3	35% or > aerial cover of native trees per enclosure	Aerial cover of native woody species in fenced enclosures will be calculated using temporary, random transects and line or point intercept methods.
4D. Year 5	50% or > aerial cover of native trees per enclosure	
4E. Year 7	50% or > aerial cover of native trees per enclosure	
4F. Year 10	50% or > aerial cover of native trees per enclosure	

*Note: Year 7 and 10 standards are not tied to credit release.

Adaptive Management: Tree survival will be assessed at frequent intervals during formal and informal site monitoring. The effectiveness of the fenced enclosures to reduce herbivory by deer and beaver will be closely monitored. Damaged fencing will be replaced and/or modified to increase effectiveness.

Contingency Measures: Evaluate potential causes for poor vegetation establishment; rectify site conditions, and/or plant additional vegetation. WDFW staff will be consulted to evaluate damage and/or mortality to trees from deer, beaver or other species of wildlife. The BOC will be contacted to discuss further options if plant materials continue to fail.

Performance Objective 5: The emergent planting zones of the wetland enhancement area will be dominated by native plant species. Plugs of *Scirpus* spp. will be planted along shallow edges of open water to increase native vegetation diversity.

Success Standards		Monitoring Methods
5A. Year 0	Establish areas of emergent vegetation (*Scirpus* spp.) along edges of open water wetland. Plants will be installed on 4-foot centers.	Submit As-Built plans showing area of emergent planting zone and location of plantings.
5B. Year 7	Cover and area of *Scirpus* spp. will be estimated and reported.	Percent cover of *Scirpus* spp. will be determined based on ocular estimates and recorded on aerial photos.
5C. Year 10	Cover and area of *Scirpus* spp. will be estimated and reported.	

Performance Objective 6: Purple loosestrife control will meet or exceed Grant County Noxious Weed Control Board requirements. Purple loosestrife will be controlled anytime encountered on the site. Total eradication is not likely given the historic distribution in the area and likely levels of seed in the soil at the site. If uncontrolled, purple loosestrife could threaten

the native species diversity and wildlife habitat functions at the site. Baseline levels consisted of five to six individual flowering plants scattered throughout the cattails. In 2000, the Grant County Weed Board released purple loosestrife bio-control agents into the wetland located directly west of the Bank Site to reduce a large infestation. This action successfully reduced the purple loosestrife infestation and the bio-control agents have likely been active at the Three Ponds Wetland.

Success Standards		Monitoring Method
6A. Year 0	Determine base line levels of purple loosestrife	Document base line infestation levels of purple loosestrife and indicate locations on map. Submit with As-Built Plans.
6B. Years 1-10	Purple loosestrife will not exceed pre-construction levels (5 to 6 individual plants) in any one year.	Conduct site inventories three times during the loosestrife monitoring period each year. Document the location and extent of infestation (Reports of infestations will trigger weed control action within a week of each inventory). Submit results of site inventories and a description of control actions taken in monitoring reports.

Adaptive Management: The locations and numbers of purple loosestrife plants shall be closely tracked. If purple loosestrife exceeds success standard threshold levels, WSDOT will consult with the Grant County Weed Board to increase hand control efforts or to release bio-control agents into the area.

Contingency Measures: If purple loosestrife continues to be a problem WSDOT will discuss with the BOC and Grant County Weed Board. Options may include increased hand control efforts and consideration of chemical control.

Performance Objective 7: Open spaces within the 50-foot exterior buffer will be planted with native woody vegetation to increase the diversity of tree and shrub species. The buffer will provide habitat, visual screening and discourage pedestrian and vehicular access into the site. Habitat structures such brush piles will be added to this area to include a minimum of three structures.

Success Standards		Monitoring Methods
7A. Year 0	As-Built plans will document locations of plantings and habitat structures.	Visually observe and document locations of plantings and habitat structures on As-Built plan sheets.
7B. Year 5	There will be 20 or more living native woody plants per acre consisting of at least three separate native woody species.	Inventories and direct counts will be used to document the number and species of native woody plants per acre.

Adaptive Management: Native tree and shrub plantings will be closely monitored during the first year plant establishment period to assess survival rates and/or browse damage by deer, beaver or other species of wildlife. Steps will be taken to reduce damage of planted material by replacing plant materials and/or increasing the level of protection of damaged planted materials throughout the monitoring period.

Contingency Measures: Evaluate potential causes for poor vegetation establishment; rectify site conditions, and/or plant additional vegetation. WDFW staff will be consulted to evaluate damage and/or mortality to tree and shrubs from deer, beaver or other species of wildlife.

WSDOT will consult the City of Moses Lake if unauthorized pedestrian or vehicular access becomes a problem or cannot be controlled by existing means. Increasing the number of signs, surveillance measures, and replacing fencing, may be used to enhance site protection. The BOC will be contacted if unauthorized access cannot be controlled.

Performance Objective 8: State and local listed noxious weeds will be controlled to meet requirements of the Grant County Noxious Weed Control Board. Grant County adopts a noxious weed list each year categorizing weeds into three categories (A, B, and C). Based on this list, landowners are required by law to: Eradicate all class A noxious weeds; Control and prevent the spread of all class B noxious weeds designated for control in that region within and from the owner's property; and Control and prevent the spread -of all class B and class C noxious weeds listed on the county weed list as locally mandated control priorities within and from the owner's property (**RCW 17.10.140).** Only Class B and C weeds exist on site at this time. In addition to purple loosestrife (objective 6), species of concern include, but are not limited to Canada thistle (*Cirsium arvense*), Kochia (*Kochia scoparia*), and Common reed (*Phragmites communis*).

Success Standards		Monitoring Methods
8A. Year 1	Report area and cover of non-native and native species of concern.	Visually estimate area and cover of non-native and/or invasive native species of concern. Document conditions on a site map and submit with monitoring reports.
8B. Years 3&5	Report area and cover of non-native and native species of concern.	Visually estimate area and cover of non-native and/or invasive native species of concern. Document conditions on a site map and submit with monitoring reports.

Adaptive Management: Weed control efforts will focus on controlling existing infestations and preventing establishment of new ones. Funds are set aside for weed control and other site maintenance activities.

3.3 CONTINGENCY MEASURES AND REMEDIAL ACTIONS

Monitoring will be used to gauge the success of the Bank Site. Annual monitoring reports will document achievement or non-attainment of success standards and any remedial actions taken. Each success standard contains an adaptive management and contingency component that will be used if, and when, a portion of the site is not meeting a success standard. In the event that one or more components of the bank do not achieve success standards or comply with any other requirements of this MBI, the following actions will be taken:

1. Upon discovering that a component of the bank does not comply with the requirements of this MBI, WSDOT shall take all appropriate actions to bring that component into compliance as soon as practicable.
2. If remedial actions taken by WSDOT do not bring that component of the bank into compliance with the requirements of this MBI despite reasonable efforts being made by WSDOT, WSDOT may elect to take the following actions:
    a. Submit to the signatory agencies a proposal to modify the MBI (e.g., shift from one type of vegetation to another). Any modification to the MBI shall require the approval of the signatory agencies.
    b. Provide written notice of WSDOT's intent to discontinue efforts to achieve the standards of success for that component of the bank. Upon providing such notice, no credits may be established for that component,

but WSDOT shall be released from future maintenance and monitoring obligations for that component provided that releasing WSDOT from those obligations does not adversely affect the remainder of the bank. Any unused previously established credits for that component shall be removed from the bank. Any used previously established credits for that component shall be replaced with other unused established credits in the bank. If there are insufficient unused credits to replace those removed credits, WSDOT shall implement other appropriate compensatory mitigation approved by the appropriate permitting agencies.

4.0 OPERATION OF BANK

4.1 CURRENCY

The "currency" for the Moses Lake Bank is presented in terms of "acre-credits," whereby one acre-credit of compensation can be exchanged for one acre of wetland impact. A 1:1 ratio will be applied to projects debiting from the bank as compensation for unavoidable impacts to Category 2, 3, or 4 wetlands.

4.2 CREDIT DETERMINATION

The BOC determined that the Moses Lake Bank is eligible to generate 5 acres of wetland credits that are available for use based on attainment of agreed upon success standards. An exchange ratio of 1:1 will be used when withdrawing credits from the bank to compensate for unavoidable wetland impacts from highway construction projects within the bank's Service Area. Temporal losses will be mitigated through the phased release of credits. Credits will be released based on the credit release schedule outlined below.

The generation of 5 acres of wetland credits is based on the overall wetland functions and values being restored, enhanced and preserved at the site, rather than on specific areas or treatments within the Bank Site or use of variable ratios based on the category of wetlands impacted. This approach was selected to simplify the credit/debit process and increase bank instrument clarity. The BOC decided to use this approach based on the following criteria related specifically to the Moses Lake Bank:

- Small size of the bank and limited number of credits generated,
- Narrow linear nature of wetland impacts,
- Impacts are primarily to Category 2 and 3 wetlands (impacts to Category 1 wetlands shall not be mitigated at the Bank Site),
- Consolidates mitigation efforts at the Bank Site based on overall ecological function.

4.3 CREDIT RELEASE SCHEDULE

Credits generated from the Moses Lake Bank are eligible for use based on the following credit release schedule providing that all success standards for that time period have been met and As-Built plans have been submitted and approved by the BOC (See Table 7 on the following page).

4.4 FINANCIAL ASSURANCES

Funding for WSDOT Bank is secured through highway construction projects. WSDOT's Advance Environmental Mitigation Revolving Account (AEMRA) is used to fund bank projects prior to the availability of highway construction dollars. AEMRA funds support acquisition, design, development, monitoring, and maintenance costs of a Bank Site. In addition, WSDOT's Wetland Remediation Account funds are available and will be used for unanticipated activities that may be necessary to assure that the bank meets targeted goals and objectives.

Table 7. Credit Release Schedule

Year	Credit Release	Requirements
1	2	Signed MBI
2	1	Complete Plantings Submit/approve As-Built Plans[a]. Approval of Years 1 & 2 monitoring and attainment of success standards.
3	1	2nd Phase of Russian olive removal Approval of Year 3 monitoring and attainment of success standards. Submit/approve As-Built Plans[b].
5	1	3rd Phase of Russian olive removal Submit/approve As-Built Plans[c]. Approval of Year 5 monitoring and attainment of success standards.

Footnotes:

[a]Plans to include all earthwork and initial plantings

[b]Plans to include site conditions after 2nd phase of Russian olive control and additional site modifications such as additional plantings and/or additional structures for educational or wildlife habitat features

[c]Plans to include site conditions after 3rd phase of Russian olive control and additional site modifications such as additional plantings and/or additional structures for educational or wildlife habitat features

4.5 SITE REVIEW

Members of the BOC will be able to access and inspect the Bank Site at any time. Reasonable notice to WSDOT and the City should be given to access portions of the site that are not accessible to the public from approved trails or viewing platform.

4.6 ACCOUNTING PROCEDURES AND LEDGER MANAGEMENT

WSDOT will maintain a record ledger of all project transactions (Appendix J). This will include credit and debit history of the Bank Site. WSDOT will provide an annual summary of credit/debit transactions to all members of the BOC by December 31 of each year.

4.7 CREDIT RELEASE AND MONITORING

Reports of credits earned, debited, and remaining will be prepared annually and submitted to MBI signatories along with monitoring reports. In addition, the Corps and Ecology will be notified of each individual credit debited at the time it occurs, including a copy of the transaction document.

4.8 SITE COMPLIANCE MONITORING

WSDOT will prepare and submit annual monitoring reports to signatories of the MBI by March 31 of each year. These reports will address progress toward meeting the success standards as specified in the MBI and any recommended adaptive management actions taken to correct deficiencies that occurred in meeting these standards. The Bank Site will be formally monitored over a 10-year period. Informal monitoring will occur for an additional 10 years (for a total of 20 years) to document changes and provide information to the City of Moses Lake to help guide site management. In contrast to quantitative sampling during formal monitoring, informal monitoring includes a general visual review of the mitigation area to determine the effectiveness of the mitigation. Formal site monitoring will occur once annually between June

and September. Informal monitoring will occur up to 4 times annually, during various times of the year.

WSDOT's Wetland Mitigation Monitoring Program staff will conduct the monitoring at the Bank Site. The Monitoring Program conducts compliance monitoring of all of WSDOT's compensatory wetland mitigation projects. Compliance monitoring provides a means for tracking the development of WSDOT mitigation projects over time, and for determining compliance with permits issued by federal, state, local, or tribal jurisdictions. The Monitoring Program also provides an important internal feedback role in mitigation site management and maintenance that serves as an essential link in the internal adaptive management process, which increases the overall success of the mitigation sites.

The Monitoring Program uses a variety of ecological monitoring techniques including those outlined in the Guide for Wetland Mitigation Monitoring by (Horner and Raedeke, 1989). Many standard techniques such as transect lines, and sample plots are used, however the number and placement are dependent on the statistical precision and accuracy necessary to ensure that the site meets specified levels of performance. A monitoring plan developed for the Moses Lake Bank is located in Appendix K.

WSDOT will provide justification to the BOC for altering any portion of the monitoring plan. Modifications can be made to procedures outlined in the monitoring plan when WSDOT and signatory agencies agree upon such modifications. Additional monitoring may be required by the signatory agencies if remedial actions are required on the site. Table 8 lists the monitoring schedule for the Bank Site.

Table 8. Compliance Monitoring Schedule

Year	Formal Monitoring	Frequency
1	Yes	Quarterly site visits
2	No	Quarterly site visits
3	Yes	Quarterly site visits
4	No	Quarterly site visits
5	Yes	Quarterly site visits
7	Yes	Annual site visit
10	Yes	Annual site visit
11 through 20	No	Annual site visits

5.0 WETLAND MITIGATION BANK MANAGEMENT AND MAINTENANCE

5.1 WETLAND BANK SITE MANAGEMENT

The Bank will be managed to maximize fulfillment of mitigation bank goals and objectives by ensuring the long-term protection of wetland and buffer areas. Short- and long-term management of the site will focus on maintaining native plant communities and wildlife habitat diversity.

5.2 PROTECTION MECHANISMS

A Memorandum of Agreement and Conservation Easement, in addition to the MBI, have been established to ensure that the Bank Site will be managed and maintained to protect wetland and wildlife habitat functions and educational values of the wetland. These documents address the roles and responsibilities of the City of Moses Lake and WSDOT in managing and maintaining the Bank Site. WSDOT will record the Bank Instrument, Agreement, and the Conservation Easement in Grant County, Washington to ensure that the Bank Site cannot be modified without the written consent of WSDOT and other signatory agencies.

5.2.1 Bank Instrument

The Moses Lake MBI specifies the overall goals and specific objectives for this project. Objectives and success standards guide the short-term management of the site. Long-term management is based on meeting and maintaining goals associated with wetland functions including wildlife habitat diversity as outlined in this MBI. Signatories to this Bank Instrument agree to the goals and objectives for long-term site management and protection as outlined in this document.

5.2.2 Moses Lake Agreement

The Agreement defines the rights and responsibilities of the WSDOT and the City of Moses Lake regarding the restoration, enhancement, short and long-term management of the Bank Site (see Appendix H). The Agreement also specifies the City of Moses Lake's role in long-term management of the Japanese garden.

5.2.3 Conservation Easement

WSDOT purchased a conservation easement from the City of Moses Lake to ensure long-term site protection. The Conservation Easement lists the rights and restrictions that apply to the Bank Site property (see Appendix G). The Conservation Easement ensures that the property will be protected in perpetuity as a natural wetland system.

5.2.4 Site Monitoring

Results of formal and informal monitoring will determine if management actions are necessary to ensure that the Bank Site is meeting standards necessary for credit release. If remedial actions are required, site monitoring in addition to the schedule outlined herein may be required by signatory agencies.

5.3 SITE MANAGEMENT AND MAINTENANCE

WSDOT is responsible for all site management and maintenance until all success standards are met. At this time, the City is responsible for long-term site management and maintenance activities. WSDOT will conduct monitoring that extends through year 20 (see Table 8) and will provide information to the City on maintenance or management needs.

Maintenance activities include, but are not limited to weed control, trash collection, and vandalism repair. WSDOT established an agreement with Grant County for use of Community Service Crews for maintenance activities that will occur at the site. This will include weed control work, litter pickup, installation and maintenance of wildlife fencing, tank trap functionality for prohibiting vehicular access and other work as necessary.

5.4 LONG-TERM MANAGEMENT STANDARDS

The following standards are established to assist in long-term ecological management of the site (year 5 and beyond).

- Native shrub species will dominate the buffer zone established between the Bank Site and Japanese Garden. Native shrub vegetation within the buffer zone should comprise 30 percent or greater aerial cover after year 5, 45 percent or greater aerial cover in year 7, and 60 percent or greater aerial cover in year 10. The long-term goal is to maintain 60 percent or greater native shrub cover of this area.
- Non-native species or invasive native species that occur within the Japanese garden will not be allowed to spread into the wetland bank.
- The long-term goal for the cover of Russian olive is to limit aerial cover to no more than 55 percent of the year 2000 pre-project distribution and cover, and until native tree species contribute significantly to the tree canopy on-site.
- Long-term management will focus on maintaining wetland functions including wildlife habitat diversity. The site will consist of forested, scrub-shrub and open water wetland areas. The view to open water areas will be maintained to facilitate wildlife viewing opportunities from the platform.
- Trails, signs, and viewing platforms will be maintained to support educational use of the site.
- Weed control activities at the site will meet all Grant County Noxious Weed Program standards for control of listed noxious weeds.
- Native tree species will be present within fenced enclosures in areas formerly occupied by Russian olive. At least 50 percent cover of native trees will be maintained within the fenced enclosures.
- Native plant species will dominate the emergent areas adjacent to the open water wetland.
- The exterior buffer is to be maintained to provide wildlife habitat, visual screening and discourage pedestrian and vehicular access into the site.

6.0 OTHER PROVISIONS

6.1 ENVIRONMENTAL EDUCATION

The urban setting of the bank and close proximity to local schools makes this site an important educational amenity for the Moses Lake area. A secondary goal of the bank is to encourage educational use of the site without degrading or compromising the ecological functions of the wetland. The educational values of the wetland will be enhanced by increasing wildlife viewing opportunities and by constructing a viewing platform and improving an existing footpath. WSDOT is working with local school groups to encourage educational use of the site. The Moses Lake Bank Site is being listed, through the WDFW as a Watchable Wildlife Area. It is also listed as a wildlife viewing area in WSDOT's Heritage Corridor Program. Both of these programs will highlight the wildlife viewing and educational opportunities available at the site.

6.1.1. Public Access

Public access within the site will be directed to an approved trail and viewing area (Plan Sheet L-2). Dense plantings, existing wetland vegetation and open water areas will assist in confining and directing site access. A tank trap will be installed to limit vehicular access to the site from adjacent private properties Signs will be used to indicate appropriate site access points. An educational sign located at the viewing platform will also include site access and use guidelines. The buffer surrounding the wetland is intended to discourage pedestrian and vehicular access into the wetland. Dense stands of Russian olive, boulder barricades, and fencing will help discourage access to the site through the buffer area.

Trails and viewing areas will also exist within the City's Japanese garden. This will allow visitors to view the wetland from the garden area without having to enter the Bank Site.

WSDOT and the City will be monitoring the Bank Site and Japanese garden area carefully for signs of site disturbance and/or vandalism. Site access modifications may be necessary to eliminate or minimize damage.

6.1.2 Educational Use

WDFW is listing the site in its Watchable Wildlife Program. This program enhances public opportunities to enjoy wildlife on public and private lands and promotes learning about wildlife and habitat needs. The program establishes a statewide network of quality viewing areas, complemented by interpretive signs, easy access, and Watchable Wildlife Viewing Guides. The Columbia Basin chapter of the Audubon Society is interested in using the site for bird watching activities and field trips.

WSDOT is working with teachers from the Moses Lake High School biology program to establish use of the site for educational purposes. Students will participate in site monitoring and will also be monitoring water quality and hydrologic parameters of the wetland.

6.1.3 Site Protection and Stewardship

Educational and public use access is to be allowed at the site as long as it does not damage or degrade the wetland or wetland functions targeted by this plan. It is anticipated that appropriate use of the site will encourage a higher level of site protection and stewardship. Visitor use of the Japanese garden will provide a site presence and will help discourage inappropriate uses within

the wetland. WSDOT and the City will monitor the site for any problems associated with inappropriate access and/or damage to the site. Changes in public access or levels of use may be modified if necessary to limit site damage.

7.0 REFERENCES

Daubenmire, R. 1970. *Steppe Vegetation of Washington.* Washington Agricultural Experiment Station, College of Agriculture, Washington State University. Technical Bulletin 62. February, 1970

Franklin, J.T. and C.T. Dyrness. 1988. *Natural Vegetation of Oregon and Washington.* Oregon State University Press. 452 p.

Friesz, Ron. 2000. Personal Communication. Habitat Biologist for Washington Department of Fish and Wildlife, Ephrata. August 30, 2000.

Haddaway. 1999. *Moses Lake Bank Wetland Delineation Report*, Appendix C.

Horner, R., and K. Raedeke. 1989. *Guide for Wetland Mitigation Monitoring*. National Technical Information Service, Springfield, VA 22616.

Null, W., G. Skinner, and W. Leonard. 2000. *Wetland Functions Characterization Tool for Linear Projects*. WSDOT. http://www.wsdot.wa.gov/eesc/environmental/programs/biology/docs/bpjtool.pdf

Revised Code of Washington 17.10.140. Owner's duty to control spread of noxious weeds. [1997 c 353 § 17; 1969 ex.s. c 113 § 14.]

Washington State Department of Ecology. 1991 *Washington State Wetlands Rating System, Eastern Washington.* Washington State Department of Ecology. Publication #91-058.

Washington State Department of Transportation. 1994. *Washington State Department of Transportation Wetland Compensation Bank Program Memorandum of Agreement.* Signatories include U.S. Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Federal Highway Administration, Washington State Department of Ecology, Washington State Department of Fish and Wildlife, and Washington State Department of Transportation.

Washington State Department of Transportation. 1999. *WSDOT Cultural Resources Survey,* Appendix B.

Moses Lake Wetland Mitigation Bank Monitoring Plan

Introduction

The Moses Lake Wetland Mitigation Bank provides advance compensatory mitigation for unavoidable impacts to wetlands from proposed highway construction projects within the Columbia Basin. The Washington Department of Transportation (WSDOT) is required to monitor the Moses Lake Wetland Mitigation Bank to document how well the site is performing in relation to performance objectives and success standards listed in the Moses Lake Wetland Mitigation Bank Instrument (MBI Section III Goals, Objectives and Standards of Success).

WSDOT Wetland Mitigation Monitoring Program

WSDOT's Wetland Mitigation Monitoring Program staff will conduct the monitoring at the bank site. The Monitoring Program conducts compliance monitoring of all of WSDOT's compensatory wetland mitigation projects. Compliance monitoring provides a means for tracking the development of WSDOT mitigation projects over time, and for determining compliance with permits issued by federal, state, local, or tribal jurisdictions. The Monitoring Program also provides an important internal feedback role in mitigation site management and maintenance that serves as an essential link in the internal adaptive management process, which increases the overall success of mitigation sites.

Copies of recent annual monitoring reports for WSDOT wetland mitigation projects are available on WSDOT's web page (http://www.wsdot.wa.gov/eesc/environmental/programs/wetmon/wetmon.htm).

Monitoring Protocols used by WSDOT

WSDOT's Monitoring Program uses a variety of monitoring methods. Quantitative data collection techniques are based on standard ecological and biostatistical methods including those described in the following references:

- Bonham, C.D. 1989. *Measurements for Terrestrial Vegetation*. John Wiley & Sons, New York, NY.
- Coulloudon, B., K. Eshelman, J. Gianola, N. Habich, L. Hughes, C. Johnson, M. Pellant, P. Podborny, A. Rasmussen, B. Robles, P. Shaver, J. Spehar, J. Willoughby. 1999. *Sampling Vegetation Attributres*. Bureau of Land Management Technical Reference 1734-4, Denver, CO.
- Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. *Measuring and Monitoring Plant Populations*. Bureau of Land Management Technical Reference 1730-1, BLM/RS/ST-98/005+1730, Denver, CO.
- Krebs, C.J. 1999. *Ecological Methodology, 2nd edition*. Benjamin/Cummings, New York, NY.
- Horner, R.R. and K.J. Raedeke. 1989. *Guide for Wetland Mitigation Monitoring Operational Draft.* Prepared for Washington State Transportation Commission, Department of Transportation, Olympia, WA. WA-RD 195.1.

- Zar, J.H. 1999. *Biostatistical Analysis, 4th edition*. Prentice-Hall, Inc., Upper Saddle River, NJ.

The configuration, placement, and number of sample units (e.g., plots, lines, point-lines, point frames) required to address site-specific performance objectives will be based on characteristics observed within the vegetative community and patterns of plant distribution. Sample size analysis will be used to ensure data from an adequate number of sample units has been obtained to meet the monitoring objectives. The monitoring report will include a complete description of the methods and sampling designs used to monitor the bank site.

Submission of Annual Reports

WSDOT will prepare and submit annual monitoring reports to signatory agencies by March 31st of each year. The reports will address progress toward meeting the success standards specified in the MBI and the results of any adaptive management actions taken to correct deficiencies that occurred in meeting these standards.

Performance Objectives

Performance objectives outlined in the MBI are intended to gauge the success of the site in meeting the overall project goal. The goal of the Moses Lake Bank is to restore and enhance wetland functions and values to benefit wildlife and provide opportunities for public education and interpretation about wetlands. Wildlife habitat improvements are the primary wetland functions targeted by the restoration and enhancement work at the bank site. Wildlife viewing opportunities and educational values of the site will be increased by the proposed restoration and enhancement activities and by the installation of a viewing platform and interpretive sign.

Monitoring Schedule

The Moses Lake Bank site will be formally monitored over a ten-year period. Informal monitoring will occur for an additional 10 years (for a total of 20 years) to document changes in the site over time and provide information to the City of Moses Lake to guide long-term site management. Formal site monitoring will occur between June and September. Informal monitoring will occur throughout the year. It should be noted that more frequent monitoring might be recommended because of specific site conditions or site-specific goals. For example, more frequent monitoring may be needed if the cover of invasive weeds is unusually high or important results of a management treatment are needed. The bank site will be monitored annually according to the schedule listed below:

Monitoring Year	Tasks	Expected Date
Year 0	Conduct Verification Inspection. Establish baseline area occupied by Russian olive, determine length of shoreline edge before and after construction and document conditions on copies of aerial photos. Document plant installation, location of habitat features, location and extent of Purple Loosestrife/Russian olive populations, and post-construction shoreline edge on As-Builts.	Once upon completion site construction/plant installation (2001)
Year 1	Conduct first-year plant inspection. Determine length of shoreline edge, aerial cover of Russian olive population, and document conditions on current aerial photography, and calculate differences from previous year. Document location and extent of noxious weed populations and implement control. Record wildlife use observed. Complete Monitoring Report.	Quarterly site visits (2002)
Year 2	Conduct informal monitoring. Complete Monitoring Report.	Quarterly site visits (2003)
Year 3	Determine aerial cover of native woody plant species in the buffer and enclosures. Determine aerial cover of Russian olive population, document conditions on current aerial photography, and calculate differences from previous year. Document location and extent of noxious weed populations and implement control. Record wildlife use observed. Complete Monitoring Report.	Quarterly site visits (2004)
Year 4	Conduct informal monitoring. Complete Monitoring Report.	Quarterly site visits (2005)
Year 5	Determine aerial cover of native woody plant species in the buffer and enclosures. Determine native woody plants per acre in the exterior buffer. Determine aerial cover of Russian olive population, document conditions on current aerial photography, and calculate differences from previous year. Document location and extent of noxious weed populations and implement control. Record wildlife use observed. Complete Monitoring Report.	Quarterly site visits (2006)
Year 7	Determine aerial cover of native woody plant species in the buffer and enclosures. Estimate aerial cover of *Scirpus* spp. and record conditions on aerial photography. Determine aerial cover of Russian olive population, and document conditions on current aerial photography, and calculate differences from previous year. Document location and extent of noxious weed populations and implement control. Record wildlife use observed. Complete Monitoring Report.	Annual site visit (2007)
Year 10	Determine aerial cover of native plant species in the buffer and enclosures. Estimate percent cover of *Scirpus* spp. and record conditions on aerial photography. Determine aerial cover of Russian olive population, document conditions on current aerial photography, and calculate differences from previous year. Document location and extent of noxious weed populations and implement control. Record wildlife use observed. Determine area of open water on-site using current aerial photography. Complete Monitoring Report.	Annual site visit (2008)
Year 11-20	Conduct informal monitoring. Complete Annual Monitoring Reports.	Annual site visits (2009-2018)

Monitoring Methodology

Verification inspection

Provide documentation of plant installation to include existing conditions approximately 2 months after planting activities are complete to include only those plants that survived transplant shock. Include information on the location, species and count of all installed plant species on As-Built plans.

First-year plant inspection

A total count of all installed trees and shrubs will be conducted one year after installation. This first year monitoring will serve as the one-year plant establishment period.

Determine aerial cover of native woody plant species in the buffer and enclosures

Calculate percent aerial cover of native woody species in the buffer zone and fenced enclosures of the wetland enhancement area. Aerial cover will be quantified along random transects using line or point intercept methods. To ensure effective interspersion of sample units (points or lines) across the buffer and wetland enhancement zones, sample units will be located along transects using simple, stratified, systematic, or restricted random sampling methods. The location and method of each sampling area will be identified in monitoring reports.

Determine native woody plants per acre in the exterior buffer

Inventories and direct counts will be used to determine native woody plant species in the exterior buffer. The number of different species that are included in the inventory will be documented.

Estimate aerial cover of Scirpus spp. and record conditions on aerial photography

Percent aerial cover of *Scirpus* spp. within emergent planting zones of the wetland enhancement area will be determined based on ocular estimates. Results will be recorded on aerial photography and submitted with monitoring reports during Years 7 and 10.

Establish baseline area/determine aerial cover of Russian olive population, document conditions on current aerial photography

A 1998 aerial photo of the site will be used to determine the baseline conditions of Russian olive coverage. Subsequent years will utilize current photos to calculate aerial cover of Russian olive populations. Both updated aerial photos and changes in Russian olive populations will be included in all monitoring reports.

Determine length of shoreline edge, document conditions on current aerial photography

The linear feet of shoreline along the open-water wetland will be determined before and after construction of the site and indicated on copies of aerial photos. All measurements will be made using a delineation of the shoreline edge based on current aerial photography. Both updated aerial photos and documentation of shoreline variation will be included in monitoring reports.

Document noxious weed populations.

Base line infestation levels of purple loosestrife will be indicated on As-Built Plans. Each year, the location and extent of purple loosestrife infestation will be documented and included in

annual monitoring reports. If Purple loosestrife is encountered, control methods will be implemented. Purple loosestrife control will meet or exceed Grant County Noxious Weed Board requirements.

Wildlife observations

Wildlife observations will be recorded during formal site monitoring in the summer (June-September). All species observed on site will be recorded, including birds flying overhead. Signs of wildlife use, including scat and fur, will also be recorded.

Determine area of open water on-site using current aerial photography

The area of open water on-site will be calculated by delineating the area on current aerial photography. The aerial photograph and calculated area of open water will be included in the Year 10 monitoring report.

Informal monitoring

In contrast to quantitative sampling during formal monitoring, a general visual review of the mitigation area will be conducted to determine the effectiveness of the mitigation.

Complete monitoring report

Monitoring reports will provide a description of site conditions observed during the past year. Reports will also include a discussion of site conditions as they relate to performance objectives as stated in MBI. Current aerial photography will be included in monitoring reports except during informal monitoring years. Results of monitoring will lead to recommendations for maintenance and contingency activities to ensure performance objectives and mitigation goals are met. The monitoring report will describe adaptive management procedures necessary to achieve the greatest success for meeting performance objectives by the end of the monitoring period.

Appendix L

Record of Permit Activity Associated with Restoration and Enhancement Work Done at the Moses Lake Wetland Mitigation Bank Site

Permit/ Concurrence Letter	Agency	Permit#	Date Received
Concurrence on Biological Assessment	USFWS	1-9-00-I-137 Cross Reference: 1-9-00-SP-115 (807.2000)	8/17/2000
Hydraulic Project Approval	WDFW	00-D4882-01	8/29/2000
Nationwide Permit (NWP) #27	ACOE	2000-4-00841	9/15/2000
Water Quality Certification under NWP #27	DOE	See above	9/21/2000
Shoreline Substantial Development/ Conditional Use Permit	DOE	2000-ER-10034-1	9/19/2000
Concurrence on Cultural Resources Assessment	CTED, OAHP	101399-08-FHWA	10/13/1999
Excavation/ Reclamation Permit	DNR	70-010836	9/12/2000

Environmental Documentation	Date Completed
Wetland Biology Report	May 2000
Determination of Non Significance	6/6/2000
Determination of "No Effect" for NMFS- regulated species	6/7/2000

Public Notification	Date
Public Comment Period under SEPA	6/6/2000
Public Hearing (associated with Shoreline Management)	7/27/2000