

Attachment

**SECTION IV, “RECOMMENDATIONS,”
OF THE YAKIMA RIVER BASIN
WATER STORAGE FEASIBILITY STUDY
FISH AND WILDLIFE COORDINATION ACT REPORT
AND RECLAMATION’S RESPONSES**

ATTACHMENT

This attachment includes Section IV, “Recommendations,” of the *Yakima River Basin Water Storage Feasibility Study Fish and Wildlife Coordination Act Report* (CAR), October 10, 2007, prepared by the U.S. Fish and Wildlife Service, Upper Columbia Fish and Wildlife Office, Spokane, Washington, and Reclamation’s responses to the CAR recommendations

The CAR discusses the Joint Alternatives with respect to the environment and offers recommendations from the Service regarding mitigating impacts to the environment.

The entire CAR report is available on the Storage Study Web site:
http://www.usbr.gov/pn/programs/storage_study/index.html

IV. RECOMMENDATIONS

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

The Service has numerous concerns regarding adverse effects to fish and wildlife resources associated with Reclamation’s three action alternatives. Among these concerns are: (1) the continuing and cumulative loss of shrub-steppe habitat; (2) fragmentation and degradation of remaining upland habitat through introduction of non-native invasive plants; (3) likely development of the area (suitable for building) adjacent to the proposed reservoir sites (e.g., water based recreation facilities, access roads, housing); (4) increased fire danger associated with increased human use; (5) disruption of established migratory corridors for large and small mammals and other wildlife, especially the greater sage grouse, through the formation of barriers to wildlife movement, both during and after construction of the proposed facilities (e.g., large bodies of water, pipelines, access roads, construction activities); (6) disturbance of nesting migratory birds

during construction and subsequent use of the proposed facilities; (7) Flow alteration in the Yakima River may change fish species composition; and (8) Augmentation of flows in the Yakima River utilizing Columbia River water may alter spawning behavior in bull trout.

The Service considers shrub-steppe habitat as meeting the criteria of Resource Category 2, that is; “The habitat to be impacted is of high value for evaluation species and is scarce or becoming scarce on a national basis or in the ecoregion section.” Thus the Service’s mitigation goal for this habitat type is “No net loss of in-kind habitat value.” Furthermore, the Service “will recommend ways to avoid or minimize losses . . .” (USFWS 1981). Shrub-steppe habitat within the Black Rock valley, Rattlesnake Hills and Yakima Training center have been identified by the state of Washington as very important habitat for wildlife (Stinson et al. 2004, TNC 1999, WDFW 1996).

IV-1) Service’s Recommended Alternative

After careful consideration of fish and wildlife resources analyzed in the CAR, the Service has determined that the most limited and endangered resource is shrub-steppe. All action alternatives, if implemented, would impact this resource. For that reason, based on our review and evaluation of the information acquired during preparation of the CAR, particularly the significant loss and/or fragmentation of shrub-steppe habitat, the Service recommends that the “No Action” alternative be selected with the following qualification: The Service further recommends that water conservation measures continue to be explored and implemented as a means to increase the availability of water for native aquatic species in the Yakima River corridor.

We recognize that there will likely be a net-loss of wetlands in the lower Basin as existing water delivery systems are made to be more efficient. To mitigate for any lost wetlands, the Service recommends that Reclamation consider reconnecting the floodplain and restore historic wetlands along the Yakima River.

IV-2) Mitigation Recommendations: Action Alternatives

If Reclamation proceeds with any of the three action alternatives, the Service recommends that the following mitigation measures be implemented:

Aquatic

- The following Service recommendations to avoid or mitigate potential adverse impacts or enhance these resources are based on current information about the proposed alternatives. If these alternatives are subsequently modified, the Service may modify recommendations as appropriate.

- In the accompanying Environmental Impact Statement (EIS), analyze additional alternatives. These would include, but are not limited to, the Keechelus Lake to Kachess Lake Pipeline, commonly referred to as the K-K Pipeline. In addition, an analysis of aquifer storage and water banking should also be considered in the EIS. These alternatives have the potential for benefits to bull trout and resident fish.
- Conduct Instream Flow Incremental Methodology (IFIM) studies below Reclamation facilities to quantify changes in fish habitat resulting from the release of flow augmentation; compare results against existing model data.
- Examine the effect of Black Rock or Wymer Reservoir flow releases on water quality in the Yakima River Basin.
- Ensure Black Rock or Wymer Reservoir flow releases are compatible with migration, spawning, and rearing of resident fish that utilize the Yakima River Basin.
- Investigate whether Columbia River water used for flow augmentation in the Yakima River Basin alters spawning behavior of anadromous fish, bull trout, and resident fish within the basin.
- If the Black Rock or Wymer Reservoir is constructed, Reclamation should monitor flow augmentation releases from the reservoir and effects on riparian and wetland habitats in the Yakima River Basin.
- Develop studies that examine the change in resident fish species distribution and abundance in the Yakima River Basin.
- Maintain Yakima River Basin reservoirs at levels that enable adult bull trout to migrate into spawning tributaries.
- Monitor entrainment of bull trout and resident fish in Yakima River Basin reservoirs and compare to flow augmentation regimes and accompanying reservoir levels.
- Coordinate all bull trout and resident fish studies with the Service.

Wildlife

Wildlife Mitigation Common to the Three Action Alternatives

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

- Centralize any construction staging areas and locate them in areas that would provide minimal disturbance to wildlife and damage to shrub-steppe habitat. Existing degraded habitat may be the most suitable for this purpose.
- Bury pipelines underground and restore native vegetation along the pipeline corridor. The Service would be willing to provide a list of native plants for this purpose. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.
- To compensate for the loss of shrub-steppe habitat, and also to ensure that residential, recreational and agricultural developments are compatible with Project resource mitigation objectives, an area equal to that lost to the project should be acquired around the periphery of the reservoir. Within the acquired land, agriculturally converted former shrub-steppe habitat and degraded shrub-steppe habitat should be fully restored. This would require a contiguous area of land for the purpose of providing habitat benefits for wildlife species displaced by the proposed action. The Service would be willing to assist Reclamation in identifying suitable sites as well as provide a list of native plants for this purpose. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.
- If a suitable area for shrub-steppe restoration cannot be found in the immediate project area, then another location will need to be selected in the Affected Area and evaluated in the CAR for the three action alternatives. If a suitable area for shrub-steppe restoration cannot be found in the Affected Area, then Reclamation should work with the Service to find a mutually agreeable location in the mid-Columbia area.
- There are currently several state and federal agencies, as well several private organizations and public groups, that have signed a South Central Washington Shrub steppe/rangeland Conservation Partnership Memorandum of Understanding, which created a partnership dedicated to the protection and preservation of shrub-steppe habitat. Reclamation should work with that group to identify areas of shrub-steppe habitat that could be protected or restored as mitigation for any shrub-steppe lost during the creation of the selected reservoir.
- Unregulated cattle grazing would continue to degrade wildlife habitat and would also impede development or enhancement of riparian, wetland, and upland habitats. Cattle should be excluded from all wildlife mitigation

lands including restored shrub-steppe habitats, created wetland/riparian habitats, and acquired mitigation lands.

- Human activities may displace wildlife from high value habitats to less suitable habitat. New recreation facilities should be located away from important wildlife areas including wildlife mitigation lands. The Service would be willing to work with Reclamation to identify appropriate sites for new recreation facilities.
- The Service recommends that Reclamation work with the Washington Natural Heritage Program to identify and protect any existing federal and state threatened and endangered candidate, federal species of concern, and state sensitive plant species and their associated habitats, that may occur within the Affected Area.

Mitigation for each Action Alternative

Black Rock Reservoir Site

- Although there is currently limited wetland and riparian habitat identified within the Black Rock footprint, the creation of the reservoir could provide the potential for creation of at least low quality wetland and riparian habitats. This would attract species that utilize these habitats. Based on this, the Service recommends that Reclamation construct dikes in shallow water areas within the reservoir, and if necessary pump water into these areas to maintain adequate water levels for the production of wetland/riparian vegetation. The Service would be willing assist Reclamation in identifying suitable sites as well as provide a list of native plants for this purpose. The north boundary and upper end of the reservoir likely contain suitable sites for dike construction and wetland and riparian habitat development. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.
- Based on the significant loss of wildlife habitat that would occur with the creation of this reservoir, the Service recommends that Reclamation work to establish a wildlife management area adjacent to the reservoir in areas that would be able to provide suitable wildlife habitat. This would likely attract some replacement species associated with open waterbodies, such as shorebirds and waterfowl. The northern boundary of the Black Rock footprint falls near the southern end of the U.S. Army's Yakima Training Center. Reclamation could inquire as to the availability of any lands that could be protected to further protect that adjacent area.

- Based on the continuing loss, degradation and fragmentation of shrub-steppe habitat within eastern Washington, the Service recommends that Reclamation consider the construction of a smaller reservoir at this site, in order to reduce the amount of lost shrub-steppe habitat.
- Although there are currently no existing trees or snags within the footprint of the Black Rock Reservoir, this site is an important area for several raptor species. The creation of the reservoir could bring in other raptor species (i.e. bald eagle, osprey), especially if a fishery were to be established. Large trees and snags are used by raptors and many other birds as perches for foraging and roosting. Artificial perches should be installed on selected areas adjacent to the new reservoir to provide perches for raptors. These structures would significantly enhance the habitat for raptors and other birds within the Black Rock Affected Area. The Service would be willing to work with Reclamation to identify appropriate sites and specifications for artificial perches.
- Based on HEP analyses conducted within the potential Black Rock Reservoir footprint, the Service determined that 1692 average annual habitat units for the brewer's sparrow would be lost if the reservoir were created. The Service recommends that Reclamation work to create, restore and/or protect the amount of shrub-steppe habitat that would lead to production of a similar number of habitat units, elsewhere within the Yakima River Basin.
- Plant surveys should be conducted for Columbia milk-vetch (federal species of concern), prior to final selection of this alternative, in any habitats that are suitable for its existence within the Black Rock Reservoir Affected Area. The Service would be willing to assist Reclamation in the completion of plant surveys.
- Protect any discovered populations of Columbia milk-vetch that are located adjacent to the Black Rock Reservoir from recreation, residential and agriculture field development, grazing, and invasion of non-native plants. Protection measures may include obtaining a conservation easement for the land containing the population or acquiring the land. The area could be fenced to exclude livestock and a weed control program developed to prevent invasion of non-native plants.

Wymer Reservoir Site

- The creation of a reservoir at the Wymer site would result in the loss of sixty acres of wetland, riparian and cottonwood forest habitat. Based on the loss of this habitat, the Service recommends that Reclamation design the new reservoir to include construction of dikes in shallow water areas within the reservoir, and if necessary pump water into these areas to

maintain adequate water levels for the production of wetland/riparian vegetation. If a similar number of acres cannot be replaced on site, Reclamation should replace the same number of wetland and riparian acres by identifying, creating or restoring similar habitats elsewhere in the Affected Area. The Service would be willing assist Reclamation in identifying suitable sites as well as provide a list of native plants for this purpose. The upper end of the reservoir likely contains suitable sites for dike construction and wetland and riparian habitat development. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.

- The creation of the Wymer Reservoir would result in the loss of existing large trees and snags within the footprint of the reservoir. Large trees and snags are used by raptors and many other birds as perches for foraging and roosting. Artificial perches should be installed on selected areas adjacent to the new reservoir to provide perches for bald eagles, osprey and other raptors. These structures would, in the short term, replace trees and snags that would be lost due to the creation of the Wymer Reservoir. The Service would be willing to work with Reclamation to identify appropriate sites and specifications for artificial perches.
- Based on HEP analyses conducted within the potential Wymer Reservoir footprint, the Service determined that 378 average annual habitat units for the brewer's sparrow would be lost if the reservoir were created. The Service recommends that Reclamation work to create, restore and/or protect the amount of shrub-steppe habitat that would lead to production of a similar number of habitat units, elsewhere within the Yakima River Basin.
- Plant surveys should be conducted for the Sukdorf's monkey-flower (federal species of concern), prior to final selection of this alternative, in any habitats that are suitable for its existence within the Wymer Reservoir Affected Area. The Service would be willing to work with Reclamation in completion of plant surveys.
- Protect any discovered populations of Suksdorf's monkey-flower that are located adjacent to the Wymer Reservoir from recreation, residential and agriculture field development, grazing, invasion of non-native plants and possible spray drift from adjacent agriculture fields. Protection measures may include obtaining a conservation easement for the land containing the population or acquiring the land. The area could be fenced to exclude livestock and a weed control program developed to prevent invasion of non-native plants.

- Plant surveys should be conducted for basalt daisy (federal Candidate species), prior to final selection of this alternative, in any habitats that are suitable for its existence within the Wymer Reservoir Affected Area. The Service would be willing to work with Reclamation in completion of plant surveys.
- Protect any basalt daisy populations, discovered during new surveys that are located adjacent to the Wymer Reservoir from recreation, residential and agriculture field development, grazing, invasion of non-native plants and possible spray drift from adjacent agriculture fields. Protection measures may include obtaining a conservation easement for the land containing the population or acquiring the land. The area could be fenced to exclude livestock and a weed control program developed to prevent invasion of non-native plants.
- Based on the significant loss of wildlife habitat that would occur with the creation of this reservoir, the Service recommends that Reclamation work to establish a wildlife management area adjacent to the reservoir in areas that would provide suitable wildlife habitat. This would likely attract some replacement species associated with open water bodies, such as shorebirds and waterfowl. The U.S. Army's Yakima Training Center owns property along the extreme eastern end of the potential reservoir footprint. Reclamation could inquire as to the availability of any lands that could be protected to further protect that adjacent area.

Wymer Reservoir with the Yakima River Pump Exchange

Bury pipelines underground and restore native vegetation along the pipeline corridor. The Service would be willing to provide a list of native plants for this purpose. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.

Locate any above ground structures in areas that would cause minimal disturbance to wildlife and associated habitats. Potential disturbances to be avoided include; creation of any barriers to, or fragmentation of movement corridors, loss of habitat, degradation of remaining habitat, and invasion of exotic species.

LITERATURE CITED

Stinson, D. W. D. W. Hayes and M.A. Schroeder. 2004. Washington state recovery plan for the greater sage grouse. Washington Department of fish and Wildlife. Olympia, Wa.

The Nature Conservancy. 1999. Species Management Abstract. Brewer's sparrow (*Spizella breweri*). The Nature Conservancy, Arlington, Va., USA.

USFWS. 1981. U.S. Fish and Wildlife Service Mitigation Policy. Notice of Final Policy, Federal Register, Vol. 46, No. 15, January 23, 1981, (As corrected in the Federal Register of February 4, 1981), Washington, DC.

WDFW. 1996. Washington State recovery plan for the ferruginous hawk. Washington Department of Fish and Wildlife. Olympia, WA.

RECLAMATION'S RESPONSES TO SERVICE RECOMMENDATIONS

IV-1) Service's Recommended Alternative

After careful consideration of fish and wildlife resources analyzed in the CAR, the Service has determined that the most limited and endangered resource is shrub-steppe. All action alternatives, if implemented, would impact this resource. For that reason, based on our review and evaluation of the information acquired during preparation of the CAR, particularly the significant loss and/or fragmentation of shrub-steppe habitat, the Service recommends that the "No Action" alternative be selected with the following qualification: The Service further recommends that water conservation measures continue to be explored and implemented as a means to increase the availability of water for native aquatic species in the Yakima River corridor.

We recognize that there will likely be a net-loss of wetlands in the lower Basin as existing water delivery systems are made to be more efficient. To mitigate for any lost wetlands, the Service recommends that Reclamation consider reconnecting the floodplain and restore historic wetlands along the Yakima River.

- Reclamation will continue to restore floodplains and riparian areas through the Yakima River Basin Water Enhancement Program (YRBWEP). This program has purchased land along the Yakima, Naches, and Teanaway Rivers for this purpose.

IV-2) Mitigation Recommendations: Action Alternatives

Aquatic

In the accompanying Environmental Impact Statement (EIS), analyze additional alternatives. These would include, but are not limited to, the Keechelus Lake to Kachess Lake Pipeline, commonly referred to as the K-K Pipeline. In addition, an analysis of aquifer storage and water banking should also be considered in the EIS. These alternatives have the potential for benefits to bull trout and resident fish.

- The K-K pipeline was analyzed as part of the planning study but eliminated from further consideration as outlined in the Draft PR/EIS. Aquifer storage and water banking or water acquisition are analyzed in the Draft PR/EIS as State Alternatives.

Conduct Instream Flow Incremental Methodology (IFIM) studies below Reclamation facilities to quantify changes in fish habitat resulting from the release of flow augmentation; compare results against existing model data.

- Should an action alternative be selected, further modeling would likely occur.

Examine the effect of Black Rock or Wymer reservoir flow releases on water quality in the Yakima River Basin.

- Water quality of Black Rock or Wymer reservoir flow releases has been analyzed in the Draft PR/EIS.

Ensure Black Rock or Wymer reservoir flow releases are compatible with migration, spawning, and rearing of resident fish that utilize the Yakima River Basin.

- Releases from Black Rock reservoir will be to the Roza and Sunnyside Division canals. As such they would not affect migration, spawning, or rearing of resident fish. Releases from Wymer reservoir in all but low water years will be for fish enhancement purposes. While specific operational details of the proposed reservoirs have not yet been developed, the proposed releases from Wymer reservoir assessed in the Draft PR/EIS provide benefits for resident fish.

Investigate whether Columbia River water used for flow augmentation in the Yakima River Basin alters spawning behavior of anadromous fish, bull trout, and resident fish within the basin.

- This issue is addressed in the Draft PR/EIS; no effect to spawning behavior should occur.

If the Black Rock or Wymer Reservoir is constructed, Reclamation should monitor flow augmentation releases from the reservoir and effects on riparian and wetland habitats in the Yakima River Basin.

- This may be accomplished as a part of other studies in the basin.

Develop studies that examine the change in resident fish species distribution and abundance in the Yakima River Basin.

- Reclamation is not a fishery manager and would not likely undertake such a study.

Maintain Yakima River Basin reservoirs at levels that enable adult bull trout to migrate into spawning tributaries.

- It is unclear what reservoir elevations are needed to enable bull trout migration. This appears to involve a complex interaction involving stream discharge, reservoir elevation, migration run timing and perhaps other variables. Operation details of the proposed reservoirs have not yet been

developed, but consultation with fish biologists will occur prior to implementation to assure the best operations scenario for fish. This scenario will have to balance a variety of needs and tradeoffs between competing needs, such as spring migration flows and end-of-season reservoir elevations. The operations outlined in the Draft PR/EIS generally benefited bull trout migration from the reservoirs.

Monitor entrainment of bull trout and resident fish in Yakima River Basin reservoirs and compare to flow augmentation regimes and accompanying reservoir levels.

- Currently, such studies are not planned as part of this project.

Coordinate all bull trout and resident fish studies with the Service.

- Should such studies be conducted they will be coordinated with the Service and other appropriate parties.

Wildlife

Wildlife Mitigation Common to the Three Action Alternatives

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

- Reclamation will work with the Service and other agencies to minimize impacts from construction activities. The period outlined, however, is the prime construction season and cannot likely be avoided.

Centralize any construction staging areas and locate them in areas that would provide minimal disturbance to wildlife and damage to shrub-steppe habitat. Existing degraded habitat may be the most suitable for this purpose.

- Staging areas will be designated prior to construction. For large facilities like the dams and reservoirs they will likely be located in the reservoir.

Bury pipelines underground and restore native vegetation along the pipeline corridor. The Service would be willing to provide a list of native plants for this purpose. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.

- Reclamation would revegetate those areas disturbed by construction activities but not occupied by facilities.

To compensate for the loss of shrub-steppe habitat, and also to ensure that residential, recreational, and agricultural developments are compatible with Project resource mitigation objectives, an area equal to that lost to the project should be acquired around the periphery of the reservoir. Within the acquired land, agriculturally converted former shrub-steppe habitat and degraded shrub-steppe habitat should be fully restored. This would require a contiguous area of land for the purpose of providing habitat benefits for wildlife species displaced by the proposed action. The Service would be willing to assist Reclamation in identifying suitable sites as well as provide a list of native plants for this purpose. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.

- The Service conducted a HEP analysis for the project and mitigation lands should be evaluated similarly. This may result in more or less acreage required to mitigate for impacts of the project. This recommendation will be implemented as budget and land availability, allow.

If a suitable area for shrub-steppe restoration cannot be found in the immediate project area, then another location will need to be selected in the Affected Area and evaluated in the CAR for the three action alternatives. If a suitable area for shrub-steppe restoration cannot be found in the Affected Area, then Reclamation should work with the Service to find a mutually agreeable location in the mid-Columbia area.

- Reclamation will look for shrub-steppe mitigation in the areas outlined above.

There are currently several state and Federal agencies, as well several private organizations and public groups, that have signed a South Central Washington Shrub steppe/rangeland Conservation Partnership Memorandum of Understanding, which created a partnership dedicated to the protection and preservation of shrub-steppe habitat. Reclamation should work with that group to identify areas of shrub-steppe habitat that could be protected or restored as mitigation for any shrub-steppe lost during the creation of the selected reservoir.

- Should an action alternative be selected, Reclamation would work with all parties interested in preserving and protecting shrub-steppe.

Unregulated cattle grazing would continue to degrade wildlife habitat and would also impede development or enhancement of riparian, wetland, and upland habitats. Cattle should be excluded from all wildlife mitigation lands including restored shrub-steppe habitats, created wetland/riparian habitats, and acquired mitigation lands.

- Reclamation concurs.

Human activities may displace wildlife from high value habitats to less suitable habitat. New recreation facilities should be located away from important wildlife areas including wildlife mitigation lands. The Service would be willing to work with Reclamation to identify appropriate sites for new recreation facilities.

- Some public use of mitigation lands may be desirable but public access sites and recreational areas will be sited to minimize impacts to habitat and wildlife.

The Service recommends that Reclamation work with the Washington Natural Heritage Program to identify and protect any existing federal and state threatened and endangered, candidate, federal species of concern, and state sensitive plant species and their associated habitats, that may occur within the Affected Area.

- To the extent practicable, Reclamation will undertake this action should an action alternative be selected.

Mitigation for each Action Alternative

Black Rock Reservoir Site

Although there is currently limited wetland and riparian habitat identified within the Black Rock footprint, the creation of the reservoir could provide the potential for creation of at least low quality wetland and riparian habitats. This would attract species that utilize these habitats. Based on this, the Service recommends that Reclamation construct dikes in shallow water areas within the reservoir, and if necessary pump water into these areas to maintain adequate water levels for the production of wetland/riparian vegetation. The Service would be willing assist Reclamation in identifying suitable sites as well as provide a list of native plants for this purpose. The north boundary and upper end of the reservoir likely contain suitable sites for dike construction and wetland and riparian habitat development. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.

- The Draft PR/EIS concludes that some vegetation will naturally establish in the upper end of the reservoir. If this area can be expanded with the use of low dikes, it will be considered.

Based on the significant loss of wildlife habitat that would occur with the creation of this reservoir, the Service recommends that Reclamation work to establish a wildlife management area adjacent to the reservoir in areas that would be able to provide suitable wildlife habitat. This would likely attract some replacement

species associated with open waterbodies, such as shorebirds and waterfowl. The northern boundary of the Black Rock footprint falls near the southern end of the U.S. Army's Yakima Training Center. Reclamation could inquire as to the availability of any lands that could be protected to further protect that adjacent area.

- As outlined above, Reclamation will mitigate for impacts to wildlife with the initial focus at the reservoir site.

Based on the continuing loss, degradation, and fragmentation of shrub-steppe habitat within eastern Washington, the Service recommends that Reclamation consider the construction of a smaller reservoir at this site, in order to reduce the amount of lost shrub-steppe habitat.

- The reservoir was sized to meet the three goals of the Storage Study.

Although there are currently no existing trees or snags within the footprint of the Black Rock Reservoir, this site is an important area for several raptor species. The creation of the reservoir could bring in other raptor species (i.e., bald eagle, osprey), especially if a fishery were to be established. Large trees and snags are used by raptors and many other birds as perches for foraging and roosting. Artificial perches should be installed on selected areas adjacent to the new reservoir to provide perches for raptors. These structures would significantly enhance the habitat for raptors and other birds within the Black Rock Affected Area. The Service would be willing to work with Reclamation to identify appropriate sites and specifications for artificial perches.

- Should it appear that the development of artificial perches successfully enhance the area for raptors, Reclamation would work with the Service and others to site and install the perches.

Based on HEP analyses conducted within the potential Black Rock Reservoir footprint, the Service determined that 1692 average annual habitat units for the brewer's sparrow would be lost if the reservoir were created. The Service recommends that Reclamation work to create, restore and/or protect the amount of shrub-steppe habitat that would lead to production of a similar number of habitat units, elsewhere within the Yakima River Basin.

- As outlined above, Reclamation concurs that using HEP is the appropriate way to assess mitigation needs.

Plant surveys should be conducted for Columbia milk-vetch (federal species of concern), prior to final selection of this alternative, in any habitats that are suitable for its existence within the Black Rock Reservoir Affected Area. The Service would be willing to assist Reclamation in the completion of plant surveys.

- Should an action alternative be selected, this recommendation will be implemented.

Protect any discovered populations of Columbia milk-vetch that are located adjacent to the Black Rock Reservoir from recreation, residential and agriculture field development, grazing, and invasion of non-native plants. Protection measures may include obtaining a conservation easement for the land containing the population or acquiring the land. The area could be fenced to exclude livestock and a weed control program developed to prevent invasion of non-native plants.

- Populations of Columbia milk-vetch could be included in mitigation lands acquired, depending upon the value of the lands for mitigation and the availability of the lands for acquisition. A land management plan would need to be developed for acquired lands to address issues like weed control.

Wymer Reservoir Site

The creation of a reservoir at the Wymer site would result in the loss of sixty acres of wetland, riparian and cottonwood forest habitat. Based on the loss of this habitat, the Service recommends that Reclamation design the new reservoir to include construction of dikes in shallow water areas within the reservoir, and if necessary pump water into these areas to maintain adequate water levels for the production of wetland/riparian vegetation. If a similar number of acres cannot be replaced on site, Reclamation should replace the same number of wetland and riparian acres by identifying, creating or restoring similar habitats elsewhere in the Affected Area. The Service would be willing assist Reclamation in identifying suitable sites as well as provide a list of native plants for this purpose. The upper end of the reservoir likely contains suitable sites for dike construction and wetland and riparian habitat development. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.

- The lands included in the Wymer reservoir site are generally very steep and not conducive to impoundment by diking. While opportunities may exist they would likely be quite small. Some vegetation may develop along Lumuma Creek below the reservoir that could mitigate for losses at the site. Some areas along the reservoir shoreline may also develop wetland and riparian vegetation. Finally, depending upon which alternative is chosen that includes a Wymer reservoir, wetland and riparian vegetation may be enhanced along the Yakima and Naches Rivers as a result of the project. At this point it is premature to identify additional wetland and riparian mitigation that may be necessary.

The creation of the Wymer Reservoir would result in the loss of existing large trees and snags within the footprint of the reservoir. Large trees and snags are used by raptors and many other birds as perches for foraging and roosting. Artificial perches should be installed on selected areas adjacent to the new reservoir to provide perches for bald eagles, osprey and other raptors. These structures would, in the short term, replace trees and snags that would be lost due to the creation of the Wymer Reservoir. The Service would be willing to work with Reclamation to identify appropriate sites and specifications for artificial perches.

- Should it appear that the development of artificial perches successfully enhance the area for raptors, Reclamation would work with the Service and others to site and install the perches.

Based on HEP analyses conducted within the potential Wymer Reservoir footprint, the Service determined that 378 average annual habitat units for the brewer's sparrow would be lost if the reservoir were created. The Service recommends that Reclamation work to create, restore and/or protect the amount of shrub-steppe habitat that would lead to production of a similar number of habitat units, elsewhere within the Yakima River Basin.

- As outlined above, Reclamation concurs that using HEP is the appropriate way to assess mitigation needs.

Plant surveys should be conducted for the Sukdorf's monkey-flower (federal species of concern), prior to final selection of this alternative, in any habitats that are suitable for its existence within the Wymer Reservoir Affected Area. The Service would be willing to work with Reclamation in completion of plant surveys.

- Should an action alternative involving Wymer reservoir be selected, this recommendation will be implemented.

Protect any discovered populations of Sukdorf's monkey-flower that are located adjacent to the Wymer Reservoir from recreation, residential and agriculture field development, grazing, invasion of non-native plants and possible spray drift from adjacent agriculture fields. Protection measures may include obtaining a conservation easement for the land containing the population or acquiring the land. The area could be fenced to exclude livestock and a weed control program developed to prevent invasion of non-native plants.

- Populations of Sukdorf's monkey-flower could be included in mitigation lands acquired, depending upon the value of the lands for mitigation and the availability of the lands for acquisition. A land management plan would need to be developed for acquired lands to address issues like weed control.

Plant surveys should be conducted for basalt daisy (federal Candidate species), prior to final selection of this alternative, in any habitats that are suitable for its existence within the Wymer Reservoir Affected Area. The Service would be willing to work with Reclamation in completion of plant surveys.

- Should an action alternative involving Wymer reservoir be selected, this recommendation will be implemented.

Protect any basalt daisy populations, discovered during new surveys that are located adjacent to the Wymer Reservoir from recreation, residential and agriculture field development, grazing, invasion of non-native plants and possible spray drift from adjacent agriculture fields. Protection measures may include obtaining a conservation easement for the land containing the population or acquiring the land. The area could be fenced to exclude livestock and a weed control program developed to prevent invasion of non-native plants.

- Populations of basalt daisy could be included in mitigation lands acquired, depending upon the value of the lands for mitigation and the availability of the lands for acquisition. A land management plan would need to be developed for acquired lands to address issues like weed control.

Based on the significant loss of wildlife habitat that would occur with the creation of this reservoir, the Service recommends that Reclamation work to establish a wildlife management area adjacent to the reservoir in areas that would provide suitable wildlife habitat. This would likely attract some replacement species associated with open water bodies, such as shorebirds and waterfowl. The U.S. Army's Yakima Training Center owns property along the extreme eastern end of the potential reservoir footprint. Reclamation could inquire as to the availability of any lands that could be protected to further protect that adjacent area.

- As outlined above, Reclamation will mitigate for impacts to wildlife with the initial focus at the reservoir site.

Wymer Dam Plus Yakima River Pump Exchange

Bury pipelines underground and restore native vegetation along the pipeline corridor. The Service would be willing to provide a list of native plants for this purpose. This measure would also require that Reclamation develop a vegetation maintenance and monitoring plan, performance criteria, and clear goals and objectives that would need to be met over a stipulated timeline, to ensure the success of this mitigation effort.

- Most of the pipeline corridor would be on private land, for which Reclamation would seek an easement, but not fee title ownership. Reclamation would have to work with the involved landowner on any revegetation plans and meet their needs as well. Large portions of the

corridor would be on developed lands including agricultural, rural, and urban uses. Revegetation with native species would not be appropriate in most of these locations.

Locate any above ground structures in areas that would cause minimal disturbance to wildlife and associated habitats. Potential disturbances to be avoided include; creation of any barriers to, or fragmentation of movement corridors, loss of habitat, degradation of remaining habitat, and invasion of exotic species.

- As noted above, large portions of the corridor would be in developed areas including lands being used for agricultural, rural, and urban uses. Impacts to wildlife along the corridor are not expected to be significant. Where valuable habitat for wildlife is present, above-ground structures would be avoided to the extent practicable.