

Columbia Estuary Ecosystem Restoration Program
Finding of No Significant Impact
Bonneville Power Administration
DOE/EA-2006
July 2016

SUMMARY

Bonneville Power Administration (BPA) announces its environmental findings for the Columbia Estuary Ecosystem Restoration Program. The ongoing program, implemented by BPA and United States Army Corps of Engineers (Corps), involves activities and projects to restore estuary habitat along the Columbia River for fish and wildlife. The estuary is considered the tidally-influenced area along the Columbia River from its mouth at the Pacific Ocean (river mile 0), upstream to Bonneville Dam (river mile 146).

BPA, in cooperation with the Corps¹, prepared an environmental assessment (EA) to analyze the potential impacts of the restoration actions in the estuary in order to support more efficient environmental review of site-specific restoration actions and projects. Based on the analysis in the EA, BPA has determined that the Proposed Action would not significantly affect the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321 *et seq.*). Therefore, the preparation of an environmental impact statement (EIS) is not required and BPA is issuing this Finding of No Significant Impact (FONSI) for the Proposed Action. The Proposed Action is not the type of action that normally requires preparation of an EIS and is not without precedent. The Corps will prepare their own agency-specific FONSI and decision document for the project.

The comments received on the Draft EA and responses to the comments are included in the Final EA. The Final EA also identifies changes made to the Draft EA.

The attached Mitigation Action Plan identifies the mitigation measures that BPA and Corps would use as appropriate for site-specific restoration actions and projects as part of the Proposed Action. The FONSI also includes a statement of findings on how the Proposed Action would impact wetlands and floodplains.

PUBLIC AVAILABILITY

This FONSI will be mailed to individuals who previously requested it; a notification of availability will be mailed to other potentially affected parties; and the EA and FONSI will be posted on BPA's project website www.bpa.gov/goto/EstuaryRestorationProgram.

PROPOSED ACTION

Under the Proposed Action, the agencies would use the EA to help evaluate the potential environmental impacts and support NEPA responsibilities for their decisions on proposed estuary restoration actions and projects.

¹ BPA and the Corps are referred to as agencies in this document.

The programmatic EA evaluates the typical environmental effects and identifies mitigation measures for estuary improvement actions or projects that will continue to be proposed as part of the Columbia River Estuary Ecosystem Restoration Program. Under the Proposed Action, the agencies would tier environmental analyses for site-specific projects to the EA.

The extent of site-specific project NEPA analyses would be commensurate with the size, scope and potential environmental impacts of the specific estuary restoration proposal. Site-specific NEPA analyses could be documented in a categorical exclusion, a supplement analysis², an EA, or an EIS, as appropriate for the specific proposal. All of these documents could incorporate by reference or tier to the analysis in the EA.

As part of the NEPA review, all proposals would also be reviewed to ensure compliance with all applicable laws and regulations—including, but not limited to the Endangered Species Act, National Historic Preservation Act, Clean Water Act, and the Migratory Bird Treaty Act.

In addition, public notification or involvement would be conducted, as appropriate, for projects with potential effects to landowners, local governments, tribes, or interest groups to inform these potential stakeholders of proposed actions, to help determine the suitable level of NEPA analysis to be conducted, and to identify issues to be addressed.

The mitigation measures listed in the Mitigation Action Plan and adopted in this FONSI would be used, as applicable, to help lessen potential impacts of site-specific actions and projects.

Under the Proposed Action, restoration actions would be implemented to restore wetland and estuarine habitats; restore or improve hydrologic connectivity between river flows and those restored habitats; and restore hydrologic and estuarine processes (flow patterns, localized flood regimes, sediment accretion, erosion, and floodplain function). Specific actions to achieve this could include protection of existing habitats, using dredged materials to better shape estuarine landforms, channel excavation, floodplain re-contouring, removal or relocation of water control structures (e.g. levees, dikes, tide gates, drainage structures), and invasive species removal.

NO ACTION ALTERNATIVE

Under the No Action (status quo) Alternative, the agencies would not make changes from the current approach of conducting environmental review of estuary improvement actions and site-specific projects without the support of the programmatic EA. The agencies would not utilize analysis in the EA through incorporation by reference or tiering to help expedite site-specific project environmental review.

Currently, the agencies evaluate habitat improvement projects as they are advanced by different sponsors or proponents at different times. These projects are rarely packaged or timed in a manner that facilitates coordinated efforts to satisfy environmental review under NEPA. The agencies, therefore, often conduct individual environmental evaluations and NEPA documentation for similar projects in close proximity with nearly identical environmental effects. The No Action Alternative continues this practice.

² A Supplement Analysis is a NEPA document developed by an agency to determine if an existing NEPA document should be supplemented or to support a decision to prepare a new NEPA document (see 40 CFR 1502.9(c) and 10 CRF 1021.104(b)).

SIGNIFICANCE OF POTENTIAL IMPACTS OF THE PROPOSED ACTION

The EA evaluated the potential environmental effects of typical actions and projects of the estuary restoration program, as well as of the Proposed Action and the No Action Alternative. The EA analysis helped determine whether the actions, projects, or alternatives could cause significant environmental effects (see Chapter 3 of the EA). To summarize potential impacts, four impact levels were used - high, moderate, low, and no impact. These impact levels are based on the considerations of context and intensity defined in the Council on Environmental Quality regulations for implementing NEPA (40 CFR 1508.27). High impacts could be considered significant impacts, if not mitigated, while moderate and low impacts are not. In general, implementation of restoration actions and projects would have short-term negative impacts associated with construction disturbances, but long-term beneficial effects to natural resources due to improvement of estuary habitat. The Proposed Action would have no significant impacts.

The following discussion provides a summary of the Proposed Action's potential impacts and the reasons these impacts would not be significant. Many of the effects discussed below would be minimized through the application of mitigation measures identified in the Mitigation Action Plan as well as other resource-protective designs and measures that may be identified during site-specific project review.

FISH

Impacts to fish would be moderate.

- Construction activities could have short-term impacts to individual fish from turbidity increases, accidental spills of fluids from construction equipment, loss of fish habitat (before new habitats form), or direct injury or mortality.
- Restoration of physical estuarine processes and estuarine habitats would provide long-term benefits to anadromous fish through improved food-web support, increased refugia, and slower backwaters (than exist currently). Improvements are expected to increase survival of out-migrating fish before they move into ocean waters, and in-migrating fish as they transition to fresh water and prepare for the migration upriver to spawn.
- Estuary restoration would expand and improve habitats for resident estuarine fish species such as flounder, perch, herring, and smelt. These species will benefit from the restoration of estuarine processes such as sedimentation and accretion, tidal flows, river connections with floodplains, and wetland development and succession. All of these provide additional habitats and improve the carrying capacity of existing habitats through increased food-web support and improved water quality.

HYDROLOGY AND HYDRAULICS

Impacts to Hydrology and Hydraulics would be moderate.

- Hydrologic connectivity between river flows and estuarine habitats would be restored or improved.
- The volume of water entering and exiting the estuary on the flood and ebb tides; and the exchange of water across the intertidal zone would both be increased.

- The frequency, duration, and extent of tidal inundation of estuarine, wetland, floodplain, and stream habitats would be increased and restored to conditions more natural and beneficial to estuarine processes.
- Floodplain function would be improved by increasing the floodplain's water-holding capacity; and slowing and facilitating the movement of floodwaters down the floodplain.

These impacts are all beneficial to water quality, fish and wildlife production, sediment transport processes, nutrient cycling, primary production, food-web dynamics, and the processes of estuarine, wetland, and riparian habitat formation.

WATER QUALITY

Impacts to water quality would be low to moderate.

- Construction activities would create short-term localized increases in turbidity.
- Restoration of vegetated wetland and riparian areas would improve long-term water quality by providing shade that would help moderate stream temperatures and light penetration; and providing root structure and woody material that would help stabilize stream banks, moderate stream velocities, reduce channelization, and reduce erosion and suspended sediments.
- New tidal channels would facilitate increased floodplain water flow and flushing of nutrients, which would improve water quality where current nutrient concentrations may be unsafe for fish and wildlife.
- Restoring wetlands at sites where intensive grazing or agricultural operations had been occurring may reduce long-term non-point source pollution from elevated nutrient levels (animal waste, fertilizers, etc.) from these acres.
- If re-flooded areas had once been under agricultural use, a short-term flush of nutrients into the Columbia River could temporarily degrade local water quality. These potential impacts would be minimized through specific design and implementation considerations to slowly release these nutrients and avoid any quick, concentrated flush into adjacent waters.
- Managing invasive plants would help improve water quality, as invasive plants typically exclude light into the water column creating stagnant waterbodies with low oxygen levels, and increase water temperatures.

GEOMORPHOLOGY, SOILS, AND TOPOGRAPHY

Impacts to geomorphology, soils, and topography would be low to moderate.

- Soil disturbance due to construction activities would temporarily increase soil erosion, compaction, and mixing of soil horizons.
- Estuary restoration actions would beneficially restore sediment transport processes which are currently highly degraded in the Columbia River estuary.
- Dike and levee removal or breaching has the potential to alter hydrology and hydraulics. Ditch filling, excavation, and grading to create tidal channels have the potential to alter a site's geomorphology, soils, and topography.

- Restoration of tidal process restores alluvial processes (sediment accretion and natural soil development processes), which support the establishment of self-sustaining marsh ecosystems and increasing marsh surface elevations.
- Site topography and elevation is anticipated to change in response to sediment accretion; marsh development and succession; and localized patterns of erosion. This elevation change is a natural result of wetland successional processes and a desired outcome from restoration projects because it provides for an increased diversity of wetland and riparian habitats and the fish and wildlife species they support.
- Restoration projects would have a short-term impact on geomorphology, soils, and topography due to the amount of material displaced, but the long-term impacts would ultimately restore natural soil-forming processes, erosion patterns, and floodplain function.

SEDIMENT QUALITY

Impacts to sediment quality would be moderate.

- Dredging, relocation of dredged sediments, and dike/levee removal would temporarily re-suspend sediments in the water column, and redistribute them within the estuary. The effect of this redistribution on sediment quality depends on the degree of contamination in those sediments. These actions may also expose contaminated sediments that had previously been buried (sequestered), but since sediment quality is generally high throughout the estuary, this occurrence would likely be rare.
- Redistribution of high quality sediment provides potential long-term benefits by contributing to the burial of low quality sediments elsewhere. Low quality sediment redistribution makes the toxic contaminants in them available for uptake by organisms in the water column. Burying these sediments reduces the chance for these contaminants to move up the food chain.
- Re-flooding agricultural lands may provide a short-term pulse of contaminated or nutrient-rich sediments (if there is contamination in the soil) into the waterways. Nutrient-rich sediments may foster short-term algal blooms that could temporarily degrade water quality. Consideration of this potential during planning, design and implementation could minimize this effect.
- Restored wetlands would provide increased acreage for sediment development with high organic content. Sediments with high organic content have a high capacity for uptake of contaminants from the water column. This could increase sequestration of contaminants in these soils thereby improving water quality.

AIR QUALITY

Impacts to air quality would be low.

- Short-term construction effects would be possible from dust and exhaust from the operation of construction equipment.
- There would likely be no long-term impact on air quality because completed restoration projects routinely require no on-going construction equipment operations; and the wetland and riparian habitats that result function to improve air quality.

WILDLIFE

Impacts to wildlife would be moderate.

- Long-term (permanent) effects on upland wildlife species may result from the conversion of drained pasture habitat or freshwater wetlands to tidal marsh habitat, such as the conversion of meadowlark, ground squirrel and coyote habitat to muskrat, fish, and waterfowl habitat.
- Animals, such as beaver, amphibians, waterfowl, shorebirds, and insect-eating birds, would have expanded and improved wetland and aquatic habitat for breeding and feeding. Species favoring riparian forests would benefit.
- Restoration actions are expected to benefit migratory birds through the expansion of wetland and riparian habitats, though some agricultural lands where waterfowl may feed and rest could be reduced.
- ESA-listed species such as the Columbian white-tailed deer and the streaked horned lark, occur within the implementation area and have an affinity for sites such as agricultural habitats (Columbia white-tailed deer) or sparsely vegetated or frequently-disturbed sites (streaked horned lark) that may be altered by estuary restoration projects. Consultation with the U.S. Fish and Wildlife Service would be required to determine potential impacts for site-specific projects.
- All land cover types provide some form of habitat for some wildlife, with differing species each benefitting from differing habitats. Habitat changes will therefore always favor some species of wildlife over others. The habitat changes planned in these estuary restoration projects are designed to benefit ESA-listed fish species.

WETLANDS, FLOODPLAINS, AND VEGETATION

Impacts to wetlands, floodplains, and vegetation would be moderate.

- Restoration activities would be designed to restore ecological function to floodplains, increasing floodwater conveyance and storage capacity. This would increase the floodplain's ability to more safely store and move floodwater.
- Riparian vegetation communities would be enhanced, which would promote ecosystem resiliency to the future effects of climate change.
- Dramatic vegetation changes would be anticipated on restored sites, with a loss of former agricultural and upland vegetative cover, including larger trees in some areas, and replacement by wetland or riparian species.
- Restoration of flow regimes is anticipated to restore estuary successional processes, which include the development of tidal channels; sediment accretion and buildup of soils and banks within the wetland. This would, in turn, facilitate vegetation community changes from low marsh plant communities to upper wetland, riparian shrub-scrub, and, ultimately, riparian hardwood or coniferous forest species.
- Invasive species management would occur initially and periodically as the wetlands mature.
- Impacts to ESA-listed plant species could occur with changes in habitat type, but is expected to be unlikely. Consultation with the U.S. Fish and Wildlife Service would be initiated to ensure adequate protection for these species.

- Impacts to existing high-quality wetlands are not anticipated, as that is not the type of land targeted for restoration as part of the restoration program. Historical wetlands that were drained, ditched, or diked would likely be restored to maximize beneficial effects to native vegetation, wetlands, and ESA-listed species.

LAND USE AND RECREATION

Impacts to land use and recreation would be low to moderate.

- Site-specific restoration projects could occur on lands identified as prime, unique, or farmlands of statewide importance; projects could also change land use from agricultural to wetland habitat. However, restoration projects would be located on lands purchased from willing sellers. Few highly productive, high-value croplands are expected to be impacted, but site-specific project reviews would evaluate these potential impacts.
- Changes in land use have the potential to affect adjacent land owners as discussed below under Socioeconomics.
- Much of the land anticipated for estuary restoration (and that has been restored to date) would be subsidized farm lands with infrastructure in disrepair, and vulnerable to loss of economic viability, especially considering potential sea-level rise.
- Long-term increases in recreation potential are anticipated because of changes in land ownership and public access, though some forms of recreation (waterfowl hunting over feeding areas in agricultural fields, for example) would be impacted.
- Long-term changes in recreational opportunities from upland based activities to wetland or water-based activities may occur with land-use changes from drained agricultural lands to water-dominated habitats with diurnal or seasonal flooding.
- The scale of land use and recreational changes, and the concentration of such projects in any local area, are expected to be small and would be evaluated at the site-specific level.

CULTURAL RESOURCES

Impacts to cultural resources would be low.

- Site-specific cultural resource analysis (surveys and consultations) would lessen potential impacts to historic and archaeological resources potentially eligible for inclusion on the National Register of Historic Places.
- A cultural resources monitor would be present during construction activities that take place in close proximity to known avoidance areas.
- Mitigation measures to mark avoidance areas and to stop work if cultural materials are revealed during construction would lessen potential cultural resource impacts.

SOCIOECONOMICS

Impacts to socioeconomics would be low.

- Short-term beneficial economic effects are anticipated for local businesses during construction activities, though these benefits would likely be small and temporary.

- Estuary restoration has the potential to improve fish runs and restore natural scenery, which could benefit fishing and tourism.
- Restoration actions could remove lands from agricultural production, potentially reducing the tax base and decrease local income and expenditures from agriculture-based employment. Actions would only occur on lands acquired from willing sellers and the amount of acres and productivity of those acres is anticipated to be low.
- A reduced tax base could affect revenues available to school districts, diking districts, and local governments. This impact could be mitigated for certain projects if project sponsors continue to pay property taxes.
- There would likely be no, to low, impact on local populations or available housing, though some local farm households may relocate.
- Land use conversions from agricultural to estuarine habitats are expected to affect grazing and hay-producing lands primarily, but not high-value croplands.
- Depending on the acreage and concentration of changes in any one area, there could be a loss of agricultural infrastructure (diking, drainage structures, etc.) that could be difficult to re-establish. Planning of site-specific projects would evaluate this effect and decisions concerning them would be made accordingly.
- Impacts to adjacent landowners are possible if not avoided through careful planning and design. Alteration of drainage structures could change flow patterns thereby putting adjacent properties at risk of flooding or damage. Restoration of wetland habitats could attract wildlife of types or numbers that could create a nuisance, or damage crops on adjacent properties. The presence of endangered species of fish newly adjacent to ongoing agricultural practices could raise regulatory considerations for that landowner's operations that were not previously required. Planning of site-specific projects would consider these potential effects, and evaluate designs or other appropriate measures to minimize them where possible. Decisions concerning them would be made accordingly, with the objective being to prevent losses to adjacent landowners, and minimize uncontrollable nuisance risk as much as possible.

VISUAL RESOURCES

Impacts to visual resources would be low to moderate.

- Long-term transformation of scenery from agricultural uses to undeveloped natural landscapes would occur in some locales.
- The character of some sites where dikes or levees are removed would change visual character from an engineered human landscape to one shaped by nature's forces.
- Projects would be designed to be consistent with the historical natural esthetics of each site to the extent practicable.

NOISE, HAZARDOUS WASTE, AND PUBLIC HEALTH AND SAFETY

Impacts to public health and safety and from noise and hazardous waste would be low.

- There would be short-term noise impacts from construction activities.
- There would be a long-term decrease of machinery noise from reduced agricultural machine activity in some locations.

- There would be a short-term potential for accidental leakage of gasoline, lubricants and hydraulic fluids from equipment during construction, though there would be no long-term hazardous waste potential.
- A short-term increase in construction traffic could increase vehicle congestion and accident risks.
- Increasing the surface area of flowing water (tidal flows) and standing water in places where there was none recently could create safety concerns (e.g., accidental drowning, stranding, etc.).
- An increased acreage of surface water could increase some species of mosquito populations with their attendant health and nuisance risks.

TRANSPORTATION AND INFRASTRUCTURE

Impacts to transportation and infrastructure would be moderate.

- There would be a temporary increase in construction traffic.
- Breached or removed dikes and levees could eliminate local roads that top them. Potential impacts to local or collector roads that may be important to local populations would be assessed during planning of site-specific projects.
- No impacts to navigability of Columbia River or tributaries are anticipated by channel depth changes from restored flow regimes and altered sediment deposition patterns in the tributaries. Any potential for this would be addressed in site-specific analyses.
- Infrastructure, such as roads, bridges, and utility lines not designed to withstand water flows, could be placed at risk by restored tidal or riverine flows. Potential impacts to these features would be assessed during planning of site-specific projects.

CLIMATE CHANGE

Impacts to climate change would be low.

- There would be temporary and local greenhouse gas emissions during short-term construction activities.
- Creation of tidal wetlands would help mitigate greenhouse gas emissions by creating more acreage for carbon storage (i.e., sink). Re-flooding formerly drained and exposed soils would reduce areas from which previously-stored soil carbon is being exported.
- Restoring native plant communities and soil forming processes such as sediment accretion would also better position the restoration sites to respond to sea level rise.
- Riparian vegetation communities would be enhanced, which would promote ecosystem resiliency to the future effects of climate change.

FLOODPLAIN AND WETLAND STATEMENT OF FINDINGS

This Floodplain Statement of Findings was prepared in accordance with DOE's NEPA implementing regulations and compliance with Floodplain and Wetland Environmental Review Requirements (10 Code of Federal Regulations 1021 and 1022). An assessment of impacts to floodplains and wetlands is included in Chapters 3, 4, and 5 of the EA. The purpose of the estuary restoration program is to restore floodplain connectivity and function and estuarine

wetland functions and values by returning land in floodplains, including wetlands, to pre-development conditions where practicable. Development within the floodplain would not occur as a result of implementing the estuary restoration program. While wetlands may be impacted by the estuary restoration program in the short-term, the return of natural estuarine processes will serve to preserve and enhance the natural and beneficial values of the wetlands in the long-term. BPA would implement mitigation measures to avoid or minimize impacts on floodplains and wetlands from construction activities, including impacts to soils, vegetation, and water quality.

DETERMINATION

Based on the information in the EA, as summarized here, BPA determines that the Proposed Action is not a major federal action significantly affecting the quality of the human environment within the meaning of NEPA (42 USC 4321 *et seq.*). Therefore, an EIS will not be prepared and BPA is issuing this FONSI for the Proposed Action.

Issued in Portland, Oregon on

/s/ F. Lorraine Bodi

F. Lorraine Bodi

Vice President

Environment, Fish and Wildlife

July 7, 2016

Date

Columbia Estuary Ecosystem Restoration Program

Mitigation Action Plan

MITIGATION ACTION PLAN

This Mitigation Action Plan is part of the Finding of No Significant Impact (FONSI) for the Columbia Estuary Ecosystem Restoration Program. The mitigation measures were identified through the EA analysis as typical measures that would help lessen potential environmental impacts of implementing restoration actions and projects. Most measures are focused on mitigating construction type impacts, but also included are measures to be considered during project design and site-specific environmental review.

The applicable mitigation measures from the Mitigation Action Plan would be adopted through the site-specific environmental review process. The Bonneville Power Administration (BPA) and the US Army Corps of Engineers (Corps), where appropriate, would be responsible for implementing the mitigation measures during various phases of estuary restoration project work. Relevant portions of this Mitigation Action Plan would be included in the construction contract to ensure implementation.

The Mitigation Action Plan may be amended if revisions are needed due to new information or if there are any significant project changes.

MITIGATION MEASURES

Minimization and mitigation measures have been identified to reduce potential impacts associated with the Proposed Action, and are provided below in Table 1.

Table 1 Mitigation Action Plan

Environmental Resource	Mitigation Measure
Fish	Isolate in-water work areas and conduct fish salvage and relocation, as needed.
	Maintain fish passage around isolated in-water work areas.
	Follow established protocols (legal or scientific) for handling ESA-listed species.
Hydrology and Hydraulics	Design projects to restore ecosystem processes with hydrology and hydraulics beneficial for estuary marsh development and vegetation succession.
	Schedule construction activities and manage flows and water levels to work in dry working conditions as much as possible.
	Sequence dike removal or levee breaching with the tide cycle whenever possible to minimize erosion.
	Replace natural in-water materials and features within water courses if altered during project.
Water Quality	Design projects to minimize impacts to water quality.
	Follow project-specific Clean Water Act permit protection measures.
	Isolate in-water work areas from the water bodies when possible.
	Implement erosion control and stormwater pollution prevention plans.
	Operate machinery for in-water work from atop levees or within adjacent dry areas as much as possible.
	Sample water and sediment quality during project planning to identify potential contamination concerns.
	Use only hydraulic fluids approved for work in aquatic environments when working below mean high water.
	Wash heavy equipment before delivery to project site to remove oils, fluids, grease, etc.; inspect and clean equipment regularly.
	Locate staging areas, storage sites (e.g., fuel, chemical, equipment, and materials), and potentially polluting activities, away from water resources.
	Inspect machinery daily for fuel or lubricant leaks. Perform all non-emergency maintenance of equipment off site.
Geomorphology, Soils, and Topography	Develop and implement soil stabilization plans during and following project activities (e.g. seeding, planting, mulching, etc.).
	Implement Best Management Practice erosion and sediment control measures during construction.
	Use low ground-pressure heavy equipment or mats to prevent soil compaction.
	Minimize the size of disturbed areas in access routes, staging areas and during operations to avoid unnecessary impacts to soils and vegetation.
	Cover disturbed soils if they will be inactive for more than a few days to minimize loss of soil from stockpiles.
	De-compact and restore construction roads and staging areas following project completion.

Environmental Resource	Mitigation Measure
Sediment Quality	Use only non-contaminated soils, sediments, dredged materials, etc. for restoration activities.
Air Quality	Apply dust control measures (e.g. watering trucks, low speeds, apply gravel to access roads, etc.) as needed.
	Regularly inspect, maintain, and replace (if defective) mufflers and other emission control devices on all construction equipment.
Wildlife	Implement appropriate protective measures (e.g. timing restrictions, noise levels, activity buffers, etc.) for sensitive fish and wildlife species as identified in site-specific analyses and consultation with regulatory agencies.
Wetlands, Floodplains, and Vegetation	Protect and retain existing native vegetation as much as possible.
	Use native plants and materials in estuary restoration projects.
	Inspect and wash equipment as necessary to avoid transport of invasive species (plants and animals).
	Use floodplain seed mix and native plants in post-project rehabilitation plans, where appropriate.
	Have state-licensed applicators apply herbicides with strict adherence to label requirements. Minimize their applications around water and fish as much as possible.
	Remove invasive species from the project site, where possible.
Land Use and Recreation	Monitor project results to ensure restoration objectives are met.
	Consider the use of working lands conservation agreements where land use and restoration objectives are compatible.
Cultural Resources	Provide opportunity for public input for projects likely to be of interest or concern.
	Prepare an Archaeological/Cultural Resource Inadvertent Discovery Plan.
	Mark known cultural resource sites as avoidance areas on construction drawings and flag as no-work areas in the field prior to construction.
Socioeconomics	Protect any unanticipated cultural resources discovered during construction as follows: Stop all work; cover and protect find in place. Notify Project Manager and agency cultural resources specialist immediately. Implement mitigation or other measures as instructed by agency cultural resource specialist.
	Use local labor and materials as possible.
Visual Resources	Design and mitigate restoration actions to prevent losses to adjacent property owners.
	Remove all equipment, materials, supplies, and waste from project site when restoration work is complete.
Noise, Hazardous Waste, and Public Health and Safety	Stage equipment and locate construction travel routes far from public travel lanes whenever possible.
	Limit restoration construction work hours to normal workday working hours as much as possible.

Environmental Resource	Mitigation Measure
	Use the least noise-generating equipment and methods as much as possible.
	Minimize construction noise-generating activities (equipment, pumps, at night).
	Develop and implement a Spill Prevention Control and Countermeasures Plans (SPCC).
	Develop and follow the protocol for dealing with hazardous substances inadvertently discovered during project activities.
	Design restored sites to minimize stagnant water bodies (mosquito breeding areas) as much as possible.
	Post notifications of pending and ongoing restoration actions and effects related to public safety, transportation, etc.
	Limit the use of products containing hazardous materials (e.g. wood preservatives, petroleum products, asphaltic compounds, asbestos, lead, etc.) in restoration projects.
	Dispose of non-hazardous wastes in approved landfills.
	Dispose of hazardous wastes according to applicable federal and state laws.
	Use flaggers and safety signage as necessary to avoid vehicle and other conflicts.
Transportation and Infrastructure	Repair damage to roads and trails that may occur through project construction.