

APPENDIX A

BLACKLOCK RESTORATION: PHRAGMITES CONTROL AND REVEGETATION ENVIRONMENTAL COMMITMENTS

ENVIRONMENTAL COMMITMENTS

As part of plan implementation, individual project proponents would incorporate certain environmental commitments (ECs) and best management practices (BMPs), identified in the Suisun Marsh Plan (SMP) Environmental Impact Statement (EIS)/Environmental Impact Report (EIR), into specific projects to avoid or minimize potential impacts as applicable. Numbering of the environmental commitments has been added for ease of reference. Project proponents and the appropriate agencies also would coordinate the planning, engineering, and design phases of the project. For restoration activities, “project proponent” is defined as any federal, State, or local agency, landowner, or implementing body of a restoration action. As applicable, the following BMPs and ECs would be implemented during restoration enhancement activities. Many of these ECs are not relevant to the Proposed Project because no earthmoving or ground disturbance will occur.

EC-1: STANDARD DESIGN FEATURES AND CONSTRUCTION PRACTICES

The U.S. Fish and Wildlife Service (USFWS), U.S. Bureau of Reclamation (Reclamation), and California Department of Fish and Wildlife (CDFW), as lead agencies for the SMP, determined that the following design features and construction practices potentially are feasible and implementable measures to reduce or mitigate certain short-term, construction-related effects. These measures will be implemented on a site-specific level, as appropriate, depending on the location of construction, potential effects of the specific project, and surrounding land uses. The identified measures are as follows:

- ▶ If a conflict with a utility facility occurs, stop work immediately and notify the affected utility of the conflict, assist it in coordinating repairs, and coordinate with the utility to avoid additional conflicts in the field.
- ▶ Construct structures in accordance with California Building Code and county general plan standards, to resist seismic effects and meet the implementation standards outlined in the Solano County General Plan.
- ▶ To ensure that changes to the Suisun Marsh channels will not significantly affect navigation and emergency access, have personnel from the Rio Vista and Vallejo Coast Guard stations review the plans to assess safety issues associated with the changes when in-channel work can affect access.
- ▶ Implement BMPs to minimize any presence of disease-carrying mosquitoes and threats to public health, if project components are found to pose a threat to public health.
- ▶ Control construction equipment access and placement of fill to maintain acceptable loading, based on the shear strength of the foundation material.
- ▶ Minimize degradation of wetland habitats where feasible by conducting work from the levee crown.
- ▶ Implement BMPs and measures to minimize water quality impacts, such as temporary increases in turbidity (see “Erosion and Sediment Control Plan” below).
- ▶ Inspect all equipment for oil and fuel leaks every day before use.
- ▶ Avoid using equipment with oil or fuel leaks within 100 feet of wetlands.

- ▶ Require the construction contractor to remove all trash and construction debris after construction, and to implement a revegetation plan for temporarily disturbed vegetation in the construction zones.
- ▶ Maintain waste facilities (i.e., concrete wash-out facilities, chemical toilets, and hydraulic fluid containers) and remove waste to an appropriate disposal site.

EC-2: ACCESS POINTS/STAGING AREAS

In coordination with the resource agencies, project proponents will establish staging areas for equipment storage and maintenance, construction materials, fuels, lubricants, solvents, and other possible contaminants. Practices and procedures for construction activities along city and county streets will be consistent with the policies of the affected local jurisdictions.

Each staging area will have a stabilized entrance and exit and will be at least 100 feet from water bodies, unless site-specific circumstances do not allow such a setback, in which case the maximum possible setback will be used. If an off-road site is chosen, qualified biological and cultural resources personnel will survey the selected site, to verify that staging activities will not disturb any sensitive resources. If sensitive resources are found, an appropriate buffer zone will be staked and flagged to avoid impacts. If impacts on sensitive resources cannot be avoided, the site will not be used and an alternate site will be selected.

Where possible, no equipment refueling or fuel storage will take place within 100 feet of a water body. Vehicular traffic will be confined to existing roads and the proposed access route. Ingress and egress points will be clearly identified in the field, using orange construction fencing. Work will not be conducted outside the designated work area.

EC-3: EROSION AND SEDIMENT CONTROL PLAN

For projects that may result in substantial erosion, project proponents will prepare and implement an erosion and sediment control plan, to control short and long-term erosion and sedimentation effects and restore soils and vegetation in areas affected by construction activities. The plan will include all necessary requirements as established by local jurisdictions for erosion control and will involve implementing BMPs for erosion and sediment control as required. Furthermore, the plan will ensure that construction activities do not increase erosion and sedimentation levels during rain events. This plan will include the use of erosion control materials (i.e., baffles, fiber rolls, or hay bales, and temporary containment berms) and measures such as straw application or hydroseeding with native grasses on disturbed slopes. The plan also will include floating sediment booms and/or curtains to minimize any potential impacts from increased mobilization of sediments.

EC-4: STORMWATER POLLUTION PREVENTION PLAN

For projects that involve grading or disturbance of more than 1 acre, an SWPPP will be developed by a qualified engineer or erosion control specialist and will be implemented before the start of construction. The objectives of the SWPPP will be twofold: to identify pollutant sources associated with construction activity and project operations that may affect the quality of stormwater; and to identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction.

The project proponents and/or their contractor(s) will develop and implement a spill prevention and control plan as part of the SWPPP, to minimize effects from spills of hazardous, toxic, or petroleum substances during project

construction. Implementation of this measure will comply with federal and State water quality regulations. A copy of the SWPPP will be kept on site during construction activity and project operation, and will be made available on request to representatives of the San Francisco Bay Regional Water Quality Control Board. The SWPPP will include the following:

- ▶ a description of pollutants that can reach stormwater from erosion,
- ▶ management of dredged sediments and hazardous materials present on site during construction (including fuels from vehicles and equipment),
- ▶ details regarding how the sediment and erosion control practices will comply with federal and State water quality regulations, and
- ▶ a description of pollutants that can reach stormwater from project operation.

EC-5: NOISE COMPLIANCE

The project proponents and/or their contractors will comply with local noise regulations when construction activities occur near residences, by limiting construction to the hours specified by Solano County. Construction activities are anticipated to occur during normal working hours, between 7 a.m. and 6 p.m. Monday through Friday and between 8 a.m. and 5 p.m. Saturday and Sunday.

In addition, when a site-specific analysis determines that construction can occur near residences, the following noise-reduction practices will be implemented:

- ▶ Use electrically powered equipment instead of internal combustion equipment where feasible.
- ▶ Locate staging and stockpile areas and supply and construction vehicle routes as far from sensitive receptors as possible.
- ▶ Establish and enforce construction site and haul road speed limits.
- ▶ Restrict the use of bells, whistles, alarms, and horns to safety warning purposes.
- ▶ Design equipment to conform to local noise standards.
- ▶ Locate equipment as far from sensitive receptors as possible.
- ▶ Equip all construction vehicles and equipment with appropriate mufflers and air inlet silencers.
- ▶ Restrict hours of construction to periods permitted by local ordinances.
- ▶ Locate redirected roadways away from sensitive receptors.

EC-6: TRAFFIC AND NAVIGATION CONTROL PLAN AND EMERGENCY ACCESS PLAN

For projects that will substantially affect traffic or navigation patterns or can result in hazardous road or waterway conditions, the project proponents will develop and implement a traffic and navigation control plan in coordination with affected jurisdictions. This plan will include an emergency access plan, to reduce construction-related effects on local roadways and waterway systems and avoid hazardous traffic and circulation patterns during construction. All construction activities will follow the standard construction specifications and procedures of the appropriate jurisdictions, and major construction activities will be avoided on days known or expected to experience a significant increase in traffic because of events in Suisun Marsh.

The emergency access plan will provide access into and adjacent to the construction zone for emergency vehicles. This plan, which will require preconstruction coordination with emergency service providers such as the U.S. Coast Guard, will require effective traffic and navigation direction, substantially reducing the potential for disruptions to response routes.

The traffic and navigation control plan will include the following actions, depending on site-specific conditions:

- ▶ Coordinate with the affected jurisdictions regarding hours of construction.
- ▶ Follow the local jurisdiction's guidelines for road closures caused by construction activities.
- ▶ Install traffic control devices as specified in the *Manual of Traffic Controls for Construction and Maintenance Works Zones* (Caltrans 2004).
- ▶ Notify the public of road closures in the immediate vicinity regarding the open trenches in the construction zone and regarding temporary closures of recreation trails.
- ▶ Post signs conforming to the California Uniform State Waterway Marking System in locations upstream and downstream from the dredge areas, to warn boaters of project-related work.
- ▶ Provide access to driveways and private roads outside the immediate construction zone.
- ▶ Coordinate with Solano County to monitor and repair damage to levee roads and any other roads damaged during construction, to the extent allowed by law, depending on the specific project proponent. A memorandum of understanding may be implemented for specific restoration projects and may include the following measures, as suggested by Solano County:
 - The restoration project will be responsible for the cost of maintaining, repairing, paving, and/or reconstructing roads affected during construction, operation, and maintenance of the restoration projects.
 - Repairs will be implemented to comply with the current Solano County Road Improvement Standards, except that repairs to damaged paved sections of roadway may be made within 5 inches of asphalt concrete at the discretion of Solano County, while repairs to damaged gravel roadway sections will involve replacing the pre-existing depth of aggregate base but not less than 12 inches in depth.

- ▶ Coordinate with the Union Pacific Railroad before beginning any work within the right-of-way of a rail line to ensure that the line’s integrity is maintained and minimize service disruptions.
- ▶ Coordinate with emergency service providers before the start of construction to develop an access plan for emergency vehicles in and adjacent to the construction zone. The emergency access plan will need to include effective traffic direction, substantially reducing the potential for disruptions to response routes.

EC-7: RECREATION BEST MANAGEMENT PRACTICES

The project proponents will implement the following measures related to recreation and recreation facilities to reduce impacts:

- ▶ Avoid nesting habitats and other sensitive areas, such as important roosting and foraging sites during critical nesting periods.
- ▶ To minimize temporary impacts on boating access:
 - Do not allow construction to occur during major summer holiday periods.
 - Maintain boat access to prime areas.
 - Provide public information regarding alternate access.
 - Post warning signs and buoys in channels upstream of and downstream from all construction equipment, sites, and activities during construction.
 - Post signs describing alternate boating routes in convenient locations when boating access is restricted.
 - Minimize fluctuations in water levels during construction.

EC-8: MOSQUITO ABATEMENT BEST MANAGEMENT PRACTICES

As described in Section 7.8, “Public Health and Environmental Hazards” of the SMP EIS/EIR, the Solano County Mosquito Abatement District is concerned that tidal restoration will have the potential to increase mosquito production in Suisun Marsh. However, tidal restoration will be designed to minimize such effects. In addition, the Solano County Mosquito Abatement District has recommended several measures to reduce the potential for the production and subsequent spread of diseases carried by mosquitoes. Project proponents will develop site-specific plans to address mosquito production for each restoration activity, based on the following recommendations, which will be implemented before any levee or water control structure is removed or breached:

1. Develop a management program consistent with Marsh-wide management actions for the control of mosquitoes.
2. If necessary, obtain an engineering survey to locate depressions that will retain tidal water and design site restoration to promote water drainage.

EC-9: HAZARDOUS MATERIALS MANAGEMENT PLAN

A hazardous materials spill plan will be developed before construction of each action. The plan will describe the actions that will be taken in the event of a spill. The plan also will incorporate the preventive measures to be implemented for activities such as vehicle and equipment staging, cleaning, maintenance, and refueling, and for management and storage of contaminants (including fuel). In the event of a contaminant spill, work at the site will cease immediately until the contractor has contained and mitigated the spill. The contractor will immediately prevent further contamination, notify the appropriate authorities, and mitigate damage as appropriate. Adequate spill containment materials, such as oil diapers and hydrocarbon cleanup kits, will be available on site at all times. Containers for storage, transportation, and disposal of contaminated absorbent materials will be provided on the project site.

The project proponents and their contractors will not use any hazardous material in excess of reportable quantities, as specified in Title 40, Section 355.50 of the Code of Federal Regulations (40 CFR 355.50), unless approved in advance by the Governor's Office of Emergency Services. The annual compliance report to that office will list the hazardous materials contained at a project site in reportable quantities. Hazardous materials that exceed the reportable quantities identified in 40 CFR Part 355 must be reported annually to the Solano County Environmental Health Services Division as the County's certified unified program agency.

For large-scale projects, the project proponents will prepare a risk management plan. The plan will be submitted to the U.S. Environmental Protection Agency (EPA) and will reflect the comments of the Solano County Certified Unified Program Agency. The risk management plan will address acutely hazardous materials, such as chlorine gas, ammonia gas, hydrogen chloride, and flammable gases. This document will be submitted to the EPA as well as to the Solano County Environmental Health Services Division as the certified unified program agency. The plan will describe procedures, requirements for protective equipment, and training, and it will contain a checklist. At least 60 days before the start of construction, or a lesser period of time as mutually agreed on, the project proponents will provide the final risk management plan and the safety plan to the certified property manager.

EC-10: AIR QUALITY BEST MANAGEMENT PRACTICES

The following control practices will be used to offset any air quality issues that may arise (BAAQMD 1999).

EC-10-1: BASIC CONTROL MEASURES

The following control will be implemented at all construction sites:

- ▶ Treat all graded surfaces to prevent nuisances from dust or spillage on roads or adjacent properties.

EC-10-2: ENHANCED CONTROL MEASURES

The following measures will be implemented at construction sites greater than 4 acres in area:

- ▶ Hydroseed with native or noninvasive species appropriate to that specific location or apply (nontoxic) soil stabilizers to inactive construction areas (i.e., previously graded areas inactive for 10 days or more).
- ▶ Limit traffic speeds on unpaved roads to 15 miles per hour.

- ▶ Install sandbags or other erosion control measures to prevent runoff of silt to public roadways.
- ▶ Replant vegetation with native or non-invasive species appropriate to that specific location in disturbed areas as quickly as possible.

EC-10-3: ADDITIONAL AIR QUALITY BEST MANAGEMENT PRACTICES

In addition to the above BMPs, the following measures will be required to further reduce construction emissions:

- ▶ Maintain properly tuned engines.
- ▶ Minimize the idling time of diesel-powered construction equipment to 2 minutes.
- ▶ Use alternative-powered (e.g., hybrid, compressed natural gas, biodiesel, electric) construction equipment.
- ▶ Use add-on control devices, such as diesel oxidation catalysts or particulate filters.
- ▶ Require all contractors to use equipment that meets the California Air Resources Board’s most recent certification standard for off-road, heavy-duty diesel engines.

EC-11: VISUAL/AESTHETIC BEST MANAGEMENT PRACTICES

For projects that have the potential to affect views or create a new source of light or glare, project proponents will identify sensitive view receptors for site-specific analysis and ensure that contractors minimize fugitive light from portable sources used for nighttime operations. Also, a visual barrier will be installed to prevent light spill from truck headlights in areas with sensitive view receptors.

EC-12: INADVERTENT DISCOVERY OF CULTURAL RESOURCES

Federal and State laws and regulations outline the courses of action required in the event of inadvertent discoveries of cultural resources, including human remains. Section 106 of the National Historic Preservation Act (NHPA) allows federal agencies to plan for post-Section 106 review, or inadvertent discoveries of cultural resources before authorization of a federal action or undertaking (36 CFR 800.13[a]). One avenue for planning is through a programmatic agreement (PA) (see 36 CFR 800.13[a][2]). Such PAs must define the parties responsible for action in the event of cultural resource discoveries, communication protocols, response times, and specific action items. The cultural resources analysis in this EIS/EIR identifies a PA as a critical element in mitigating significant effects on cultural resources; the PA will include provisions for inadvertent discoveries.

Federal and State laws and regulations impose additional requirements specific to the discovery of human remains and associated artifacts. On federal or tribal land, human remains discoveries are subject to the Native American Grave Protection and Repatriation Act (NAGPRA). In addition, Reclamation has specific policies for the implementation of the NAGPRA provisions (Reclamation Directives and Standards LND 07-01). For human remains discoveries on non-federal land, the requirements of the California Public Resources Code and Health and Safety Code apply, as described below. In the event that human remains are discovered inadvertently during ground-disturbing activities, the lead State or federal agency will implement the following measures. These measures also will be discussed, with explicit treatment of roles and responsibilities under the various applicable regulations, in the PA referenced previously.

- ▶ The contractor immediately will cease work within 100 feet of the find. All construction personnel will leave the area. Vehicles and equipment will be left in place until a qualified archaeologist identifies a safe path out of the area. The on-site supervisor will flag or otherwise mark the location of the find and keep all traffic away from the resource. The on-site supervisor immediately will notify the lead State or federal agency of the find.
- ▶ The lead federal agency is responsible for compliance with NAGPRA (43 CFR 10) if inadvertent discovery of Native American remains occurs on federal lands. The lead federal agency is responsible for compliance with State laws relating to the disposition of Native American burials (Public Resources Code [PRC] 5097 and California Health and Safety Code 7050.5[b]) for human remains discoveries on non-federal lands.
- ▶ If human remains of Native American origin are discovered during ground-disturbing activities on non-federal land, the lead State or federal agency must comply with State laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (NAHC) (PRC 5097). If human remains are discovered or recognized in any location other than a dedicated cemetery, the lead State or federal agency will not allow further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:
 - the Solano County coroner has been informed and has determined that no investigation of the cause of death is required; and
 - if the remains are of Native American origin,
 - the descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC 5097.98; or
 - the NAHC was unable to identify a descendant or the descendant failed to make a recommendation within 48 hours after being notified by the NAHC.

EC-13: BIOLOGICAL RESOURCES BEST MANAGEMENT PRACTICES

The following section outlines the potential BMPs that will be implemented to avoid or minimize impacts on biological resources. The BMPs that are implemented for each specific project will depend on the project location, potential to adversely affect biological resources, and guidance and requirements set forth by resource agencies through informal and formal consultations. Environmental commitments, including an erosion and sediment control plan, SWPPP, hazardous materials management plan, spoils disposal plan, and environmental training content will be provided to the National Marine Fisheries Service (NMFS), USFWS, and CDFW 30 days before the start of construction at a restoration site. Any adverse effects on special-status species, critical habitat, or essential fish habitat (EFH) attributable to construction activities may require implementation of additional avoidance or mitigation measures. NMFS, USFWS, and CDFW will be consulted, and additional avoidance and mitigation measures may be implemented on a site-specific basis.

EC-13-1: GENERAL BEST MANAGEMENT PRACTICES

- ▶ No firearms (except for those carried by federal, State, or local law enforcement officers and security personnel) will be permitted on the project site, to avoid harassment, killing, or injuring wildlife.

- ▶ No pets will be permitted on the project site, to avoid harassment, killing, or injuring wildlife.
- ▶ Native vegetation that is trimmed or removed on the project site will be stockpiled during project work. After construction completion, removal of temporary mats and construction-related materials, and application of native seed mix, stockpiled native vegetation will be re-applied over temporarily disturbed wetlands to provide temporary soil protection and as a seed source.
- ▶ Where vegetation removal is required, work will be conducted using hand-held tools to enable wildlife to escape, where feasible and effective. Invasive vegetation may be removed by mechanical or chemical methods if other methods are not feasible or effective. Vegetation will be removed under the supervision of a qualified biologist, pre-approved by CDFW and USFWS. If a mouse of any species is observed within the areas where vegetation is being removed, CDFW and USFWS will be notified. Vegetation removal may begin when no mice are observed and will start at the edge farthest from the salt marsh or the poorest habitat and work its way toward the salt marsh or the better salt marsh habitat.
- ▶ Removal of vegetation in wetland habitat will be conducted with a qualified biological monitor present. This monitor will watch for special-status wildlife species and temporarily will stop work if special-status species are encountered. Wildlife will be allowed to escape before work is resumed. Monitors with the appropriate qualifications to handle special-status species will be allowed to move special-status species to safe locations as permitted by their authorizations.
- ▶ Temporarily affected wetlands will be restored by removing construction-related debris and trash. Affected areas will be seeded with a seed mix of local native wetland species.

EC-13-2: WORKER TRAINING

Project proponents will provide training to field management and construction personnel on the importance of protecting environmental resources. Communication efforts and training will be conducted during preconstruction meetings, so that construction personnel are aware of their responsibilities and the importance of compliance.

Construction personnel will be educated on the types of sensitive resources in the project area and the measures required to avoid impacts on these resources. Materials covered in the training program will include environmental rules and regulations for the specific project and requirements for limiting activities to the construction right-of-way and avoiding demarcated, sensitive resources areas. Training seminars will educate construction supervisors and managers on:

- ▶ the need for resource avoidance and protection,
- ▶ construction drawing format and interpretation,
- ▶ staking methods to protect resources,
- ▶ the construction process,
- ▶ roles and responsibilities,
- ▶ project management structure and contacts,
- ▶ environmental commitments, and
- ▶ emergency procedures.

If new construction personnel are added to the project, the contractor will ensure that they receive the mandatory training before starting work. A representative will be appointed during the employee education program to be the

contact for any employee or contractor who inadvertently may kill or injure a listed species, or who finds a dead, injured, or entrapped individual. The representative's name and telephone number will be provided to USFWS before the start of ground disturbance.

EC-13-3: SPECIAL-STATUS PLANT SPECIES PROTECTION

A botanical survey of restoration areas will be completed using the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 1996) and *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009):

- ▶ Special-status plant surveys required for project-specific permit compliance will be conducted within 1 year before the start of construction. The purpose of these surveys will be to verify that the locations of special-status plants that were identified in previous surveys are extant, identify any new special-status plant occurrences, and cover any portions of the project area not previously identified. The extent of mitigation of direct loss of or indirect impacts on special-status plants will be based on these survey results.
- ▶ Locations of special-status plants in project construction areas will be recorded using a global positioning system (GPS) unit and will be flagged.
- ▶ If initial screening by a qualified biologist identifies the potential for special- status plant species to be directly or indirectly affected by a specific project, the biologist will establish an adequate buffer area to exclude activities that may directly remove or alter the habitat of an identified special-status plant population or result in indirect adverse effects on the species.
- ▶ Access may be restricted around restoration sites where necessary to protect special-status plant populations through appropriate management plans and the design of the tidal marsh restoration. This may include signage, buffers, seasonal restrictions and design or no access, depending on the sensitive species in question.
- ▶ The project proponents will oversee installation of a temporary, plastic mesh–type construction fence (Tensor Polygrid or equivalent) at least 4 feet tall around any established buffer areas, to prevent encroachment by construction vehicles and personnel. A qualified biologist will determine the exact location for the fencing. The fencing will be strung tightly on posts that are set at maximum intervals of 10 feet and will be checked and maintained weekly until all construction is completed. The buffer zone established by the fencing will be marked by a sign stating the following:

This is habitat of [the special-status species being protected], a [identify the species' status] plant species, and must not be disturbed. This species is protected by [the Endangered Species Act of 1973, as amended/California Endangered Species Act/California Native Plant Protection Act].

Violators are subject to prosecution, fines, and imprisonment.

- ▶ No construction activity, including grading, will be allowed until this condition is satisfied.
- ▶ No grading, clearing, storage of equipment or machinery, or other disturbance or activity will occur until all temporary construction fencing has been inspected and approved by a qualified biologist.

- ▶ Where feasible for stump-sprouting vegetation, construction will limit removal of woody vegetation by trimming vegetation to approximately 1 foot above ground level.

EC-13-4: SPECIAL-STATUS WILDLIFE SPECIES PROTECTION

If individuals of listed wildlife species may be present and subject to potential injury or mortality from project construction activities, a qualified biologist will conduct a preconstruction survey. Minimum qualifications for the qualified biologist will be a 4-year college degree in biology or related field and 2 years of professional experience in the application of standard survey, capture, and handling methods for the species of concern. However, in the case of fully protected species, no capture or handling will be done. Fully protected wildlife species are listed in Section 6.3, “Wildlife” in the SMP EIS/EIR. Any special-status mammal, bird, or other species observed during surveys will be reported to CDFW, so that the observations can be added to the California Natural Diversity Database.

EC-13-4A: MAMMALS

- ▶ A USFWS-approved biologist, with previous salt marsh harvest mouse monitoring and surveying experience, will identify suitable salt marsh habitat for the mouse prior to project initiation.
- ▶ Disturbance to wetland vegetation will be avoided to the extent feasible in order to reduce potential impacts on salt marsh harvest mouse habitat. If wetland vegetation cannot be avoided, it will be removed by hand. The USFWS-approved biologist will be on site to monitor all wetland vegetation removal activities.
- ▶ The upper 6 inches of soil excavated within salt marsh harvest mouse habitat will be stockpiled separately and replaced on top of the backfilled material.
- ▶ Vegetation will be removed by hand using hand tools.
- ▶ In construction and staging areas where habitat is to be disturbed, vegetation must be cleared to bare ground or stubble no higher than 1 inch.
- ▶ Work will be scheduled to avoid extreme high tides (6.5 feet or above, as measured at the Golden Gate Bridge) when there is potential for salt marsh harvest mouse to move to higher, drier grounds. All equipment will be staged on existing roadways away from the project site when not in use.
- ▶ To prevent salt marsh harvest mouse from moving through the project site during construction, temporary exclusion fencing will be placed around a defined work area before construction activities start and immediately after vegetation removal. The fence should be made of a material that does not allow salt marsh harvest mouse to pass through or over, and the bottom should be buried to a depth of 2 inches so that mice cannot crawl under the fence. Any supports for the salt marsh harvest mouse exclusion fencing must be placed on the inside of the project area.
- ▶ Prior to the start of daily construction activities during initial ground disturbance, the USFWS-approved biological monitor will inspect the salt marsh harvest mouse–proof boundary fence to ensure that it has no holes or rips and the base is still buried. The fenced area also will be inspected to ensure that no mice are trapped in it. Any mice found along and outside the fence will be closely monitored until they move away from the construction area.

- ▶ If a salt marsh harvest mouse is discovered, construction activities will cease in the immediate vicinity of the individual until DFG and USFWS are contacted and the individual has been allowed to leave the construction area.
- ▶ A DFG- and USFWS-approved biologist with previous salt marsh harvest mouse experience will be on site during construction activities occurring in wetlands. The biologist will document compliance with the project permit conditions and avoidance and conservation measures. The biologist has the authority to stop project activities if any of the requirements associated with these measures is not being fulfilled. If the biologist has requested work stoppage because of take of any of the listed species, the USFWS and DFG will be notified within 1 day by email or telephone.

EC-13-4B: BIRDS

If construction activities occur during active nesting periods, the project proponents will perform preconstruction surveys to determine whether nesting birds, including migratory birds, raptors, and special-status bird species, are present on or immediately adjacent to the project sites and associated staging and storage areas. Bird species using the managed wetland habitat include waterfowl, shorebirds, Suisun song sparrow, Suisun common yellowthroat, and several other resident and migratory songbirds.

- ▶ The project proponents will remove all woody and herbaceous vegetation from construction areas (earthwork areas) during the nonbreeding season (September 1–February 1), to minimize effects on nesting birds.
- ▶ During the breeding season, all vegetation subject to impacts will be maintained to a height of approximately 6 inches to minimize the potential for nesting.
- ▶ If construction occurs during the breeding season and not all affected vegetation has been removed, a qualified biologist will survey the construction area for active nests and young migratory birds immediately before construction.
- ▶ If active nests or migratory birds are found within the boundaries of the construction area, the project proponents will develop appropriate measures and coordinate with CDFW to determine an acceptable buffer width.
- ▶ Inactive nests for migratory birds (excluding raptors) located outside construction areas will be preserved. If an inactive migratory bird nest is found in the area of effect, it will be removed before the start of the breeding season (approximately February 1).
- ▶ Impacts on great blue heron rookeries will be avoided; mature trees will not be removed; and nearby work will occur outside the nesting season.

Raptors

- ▶ Preconstruction surveys will be performed before and during the raptor nesting season (bimonthly, i.e., two times per month), to identify existing nests that may be used during the nesting season.
- ▶ Raptors may nest from later winter through mid-summer; therefore, multiple nesting-season surveys will be performed.

- ▶ CDFW will be notified of all raptor nests that are located during the preconstruction surveys. If a raptor nest is in the recommended buffer, the project proponents will coordinate with CDFW to determine an acceptable buffer width.
- ▶ If an active raptor nest is found outside the construction areas, a buffer zone will be created around the nest tree. For special-status species, a larger buffer will be required (e.g., 0.5-mile Swainson’s hawk buffer). The project proponents will coordinate with CDFW before project implementation, to determine species-specific buffer widths.

California Clapper Rail and California Black Rail

If construction activities are necessary during the breeding season, preconstruction surveys for California clapper rail and black rail will be conducted in and adjacent to areas of potential tidal and managed wetlands habitats for California clapper rail and black rail. The surveys will focus on potential habitat that may be disturbed by construction activities during the breeding season, to ensure that these species are not nesting in these locations.

Survey methods will follow the protocols used by CDFW during previous rail surveys in Suisun Marsh (CDFW 2007; USFWS 2017). The specific project proponent will implement the following survey protocols:

- ▶ Surveys will begin sometime between January 15 and February 1.
- ▶ A minimum of four surveys will be conducted. The survey dates will be spaced at least 2–3 weeks apart and will cover the time from the date of the first survey through the end of March or mid-April. This will allow the surveys to encompass the period when the highest frequency of calls is likely to occur.
- ▶ Listening stations will be established at 150-yard intervals along roadways, trails, and levees that will be affected by plan implementation.
- ▶ Recordings of California clapper rail and California black rail vocalizations will be played at each station.
- ▶ For California clapper rails, each listening station will be occupied for 10 minutes, followed by 1 minute of playing California clapper rail vocalization recordings, followed by an additional minute of listening.
- ▶ For black rails, each listening station will be occupied for 1 minute of passive listening, 1 minute of “grr” calls, followed by 30 seconds of “ki-ki-krrr” calls, then by another 3.5 minutes of passive listening.
- ▶ Sunrise surveys will begin 60 minutes before sunrise and conclude 75 minutes after sunrise (or until presence is detected).
- ▶ Sunset surveys will begin 75 minutes before sunset and conclude 60 minutes after sunset (or until presence is detected).
- ▶ Surveys will not be conducted when tides are greater than 4.5 feet National Geodetic Vertical Datum or when sloughs and marshes are more than bankfull.
- ▶ Vocalizations of California clapper rails and California black rails will be recorded. A GPS receiver will be used to identify call location and distance. Call types, locations, distances, and times will be recorded on a data sheet.

If California clapper rail or black rail is present in the immediate project area, the following measures will apply during construction activities:

- ▶ To avoid the loss of individual California clapper rails or black rails, activities will not occur within or adjacent to California clapper rail or black rail habitat within 2 hours before or after extreme high tides (6.5 feet or above, as measured at the Golden Gate Bridge) when the marsh plain is inundated, because protective cover for California clapper rails is limited and activities could prevent them from reaching available cover.
- ▶ To avoid the loss of individual California clapper rails or black rails, activities within or adjacent to tidal marsh areas will be avoided during the California clapper rail breeding season (February 1–August 31) each year, unless surveys are conducted to determine the locations of California clapper rails and the activities can avoid California clapper rail and black rail territories.
- ▶ If breeding California clapper rails or black rails are determined to be present, activities will not occur within 700 feet of an identified calling center. If an intervening distance of more than 200 feet exists across a major slough channel or across a substantial barrier between the California clapper rail calling center and any activity area, activity may proceed at that location during the breeding season.
- ▶ *Exception:* Only inspection, maintenance, research, or monitoring activities may be performed during the breeding season for California clapper rail or black rail in areas within or adjacent to California clapper rail breeding habitat, with approval of USFWS and CDFW and under the supervision of a qualified biologist.

California Least Tern

- ▶ No activities will be performed within 300 feet of an active least tern nest during the least tern breeding season, April 15 to August 15 (or as determined through surveys).
- ▶ *Exception:* Only inspection, maintenance, research, or monitoring activities may be performed during the least tern breeding season in areas within or adjacent to least tern breeding habitat, with approval of USFWS and CDFW and under the supervision of a qualified biologist.

EC-14: BIOLOGICAL MONITORING

- ▶ The project proponents will provide a biologist/environmental monitor, who will be responsible for monitoring implementation of the conditions in the federal and State permits (i.e., Clean Water Act Sections 401, 402, and 404; Endangered Species Act Section 7; California Fish and Game Code Section 1602 and/or Section 2050; project plans [SWPPP]; and EIS/EIR mitigation measures).
- ▶ The biologist/environmental monitor will determine the locations of environmentally sensitive areas adjacent to each project site, based on mapping of existing land cover types and special-status plant species. If such maps are not available, the biologist/environmental monitor will map and quantify the land cover types and special-status plant populations in the Proposed Project footprint before construction.
- ▶ To avoid construction-phase disturbance of sensitive habitats immediately adjacent to a project site, the monitor will identify the boundaries of sensitive habitats and add at least a 100-foot buffer, where feasible, using orange construction barrier fencing. The fencing will be mapped on project specifications. Erosion-

control fencing also will be placed at the edges of construction, where activities occur upslope from wetlands and channels, to prevent sediment from washing off-site. Sensitive habitat and erosion-control fencing will be installed before the start of any construction activities and will be maintained throughout the construction period.

- ▶ During dredging operations, the biologist/environmental monitor will ensure that all sensitive habitat areas outside direct project footprints, including patches of tidal wetland along channel banks, are avoided to the extent practical.
- ▶ Plants for revegetation primarily will come from natural recruitment. Plants imported to restoration areas will come from local stock, and to the extent possible, from local nurseries. Only native plants will be used for restoration efforts.

The timing of restoration construction activities will depend on the type of activity, presence or absence of sensitive resources, tides, and/or water management in wetlands. In general, landside work will occur between July and September. In-water activities will be conducted from August through November. Work outside this time frame will require additional approvals from the resource agencies. Other timing restrictions may be necessary during the hunting season, such as limiting work to days other than Saturday, Sunday, and Wednesday.

EC-15: NONNATIVE PLANT CONTROL

The project proponents will include the following measures in project specifications, to minimize the potential for the introduction of new noxious weeds and the spread of weeds previously documented to be in the project area:

- ▶ Use certified, weed-free, imported erosion control materials (or rice straw in upland areas).
- ▶ Coordinate with the Solano County agricultural commissioner and land management agencies to ensure that the appropriate BMPs are implemented.
- ▶ Educate construction supervisors and managers on weed identification and the importance of controlling and preventing the spread of noxious weeds.
- ▶ Clean all equipment at designated wash stations after leaving noxious-weed infestation areas.
- ▶ Treat isolated infestations of noxious weeds that are identified in the project area with approved eradication methods at an appropriate time, to prevent further formation of seed, and destroy viable plant parts and seed.
- ▶ Minimize surface disturbance to the greatest extent possible.
- ▶ Use certified, weed-free native mixes for any restoration planting or seeding as may be necessary, as provided in the revegetation plan developed in cooperation with CDFW. Mulch with certified, weed-free mulch. Rice straw may be used to mulch upland areas.
- ▶ Use native, noninvasive species or nonpersistent hybrids in erosion control plantings, to stabilize site conditions and prevent invasive species from colonizing.

EC-16: CULTURAL RESOURCES

- ▶ If any previously unknown historic or archaeological artifacts are discovered while accomplishing the authorized work, DWR will stop work immediately and notify the U.S. Army Corps of Engineers. The activity will not be authorized until the requirements of Section 106 of the National Historic Preservation Act are satisfied.
- ▶ Work will not be authorized within 100 feet of archaeological site CAL-SOL-13.

PROJECT-SPECIFIC BMPS

VEGETATION CONTROL BMPS: MOWING

1. Mower rotors will not operate while travelling over water, and mowing will only occur within the *Phragmites*-vegetated sections.
2. Removal of vegetation in wetland habitat will be conducted with a USFWS-approved biological monitor present. This monitor will watch for special status species and temporarily stop work if special status species are encountered. Fish or wildlife will be allowed to escape before work is resumed.
3. Vegetation will be cut in a line pattern (rather than in a circular pattern) starting at the outside edge (channel-side) working toward the interior of the vegetation to allow wildlife opportunity to escape toward appropriate refuge cover.
4. Mowing will occur at approximately 3 miles per hour (mph), or slower, to allow fish or wildlife to leave the area in time to avoid contact with the equipment.
5. DWR and/or their contractor(s) will develop and implement a Non-native Invasive Species Prevention Plan (NISPP) to minimize the movement of non-native invasives during proposed action activities. The NISPP will be kept on site during *Phragmites* control and monitoring activities and will be made available upon request.

VEGETATION CONTROL BMPS: HERBICIDE APPLICATION WITH BOOM AND BACKPACK SPRAYERS

1. Herbicide applications will occur by an authorized and certified aquatic pest control applicator with experience in the Bay-Delta.
2. Herbicides will be applied using precision methods by foliar spray with a UAV, backpack sprayer, or small boom sprayer.
3. Herbicide label recommendations will be followed regarding application rate and spray nozzle adjustments. Spray nozzles will be adjusted to the coarsest setting possible while maintaining efficacy, to minimize overspray.
4. Herbicide treatment will not occur when wind speeds are greater than 10 mph.
5. All herbicide applications will occur during low tide to maximize plant coverage and the non-wetted portion of the plant will be targeted to minimize water contamination.
6. A water-safe dye will be added to the herbicide formulations to enhance the precision and evenness of herbicide applications.

7. DWR has developed and will implement a Spill Prevention and Control Plan (SPCP) to minimize effects of spills of hazardous, toxic, or petroleum substances during proposed action activities (Appendix IV). The SPCP will be kept on site during *Phragmites* control and monitoring activities and will be made available upon request.

VEGETATION CONTROL BMPS – UAV HERBICIDE APPLICATION

1. Before spraying, the equipment will be flushed with water through the system to remove residual air bubbles and to check if any leaks can be identified from damaged connections, hoses, etc., and to avoid cross contamination from previous products.
2. UAV application equipment (Leading Edge Aerial Technologies Precisionvision 35) will be cleaned after use including cleaning of the tank and waste will be properly disposed of. The tank will be partially filled and sprayed-out to ensure the pipes are clean. Once dry the UAV will be inspected to make sure there is no damage to the rotors, integrity of the pipes, clips, nozzles.
3. Necessary documentation will be checked before application including UAV registration and license, pest control and/or chemical handling license.
4. DWR’s UAV pre-flight checklist will be followed to check every part of the UAV for signs of damage or obstruction, ensure the battery is charged, and the battery charging equipment is available and functional if required. Check functioning of the controller and that the equipment is safe for transport.
5. UAVs will be fitted with an automatic internal-pump calibration system. The UAV will be calibrated by adding test water according to the manufacturer’s instructions. The UAV will be set to run the calibration system on the ground. If irregularities are found, then nozzles will be replaced.
6. UAVs will not operate if winds exceed 10 mph to minimize off-target herbicide impacts. Weather conditions will be checked prior to operation.
7. UAVs will only operate in clear weather conditions (no fog, rain, clouds that obstruct visibility).
8. Mixing locations will occur at the designated staging areas (Figure 6).
9. A USFWS-approved biologist will be present during clearing of levee vegetation for landing and launching areas with handheld mowers. The area will be checked for any special status species or any other fish and wildlife prior to mowing.
10. Herbicide applicators will wear appropriate personal protective equipment such as long sleeves and long pants, boots, face protection, chemical resistant gloves, and chemical resistant apron upon mixing. When flying the UAV, PPE is not required unless handling the UAV after use and when handling herbicides.
11. Spraying will be stopped if people or animals enter the application area. Spraying will not resume until people or animals have left of their own accord.
12. All practitioners will be aware of sensitive species or ecologically sensitive habitats detected during surveys and will exercise caution to avoid impacts to sensitive species or habits by limiting flight over the target vegetation.
13. UAV operations will cease if excessive disruption to wildlife is detected. Any wildlife response to drone activity will be documented.

UNMANNED AERIAL VEHICLE (UAV) BMPS - MONITORING

The use of UAVs for vegetation monitoring (DJI Phantom 4 for RGB imagery and DJI Matrice 200 for multispectral imagery) could have undesirable and unforeseen impacts on wildlife. BMPs listed here are meant to minimize and avoid impacts to wildlife and are based on DWR’s UAV policies and published recommendations (e.g., Hodginson and Coh 2016).

1. Drones will be operated in accordance with DWR drone policies (DAM 3890; Appendix V), by certified operators, in accordance with manufacturer instructions, and in adherence to civil aviation rules.
2. UAV equipment will be regularly serviced to ensure good working order, and maintenance recorded.
3. UAV specifications and flight practices will be recorded by DWR and made available to the USFWS upon request.
4. All practitioners will exercise caution during UAV deployment, particularly if sensitive species or ecologically sensitive habitats have been detected in surveys prior to proposed action implementation.
5. A USFWS-approved biologist will be present during drone monitoring activities at Blacklock. The biologist will document compliance with this biological opinion, including conservation measures. The biologist will have the authority to stop drone operation to comply with the conservation measures.
6. Launch and recovery sites will be located at least 300 feet (ft) from any sentient listed or sensitive species detected in the Action Area, and flight speeds will be limited to 10 mph to minimize potentially threatening appearance to resident wildlife.
7. Drones will be flown at a minimum height of 20 ft above the marsh canopy to avoid or minimize disturbance of birds, nests, or other sensitive species.
8. Drones will not be flown in winds in excess of 22 mph.
9. Drones will be operated in a manner to minimize disruption to wildlife to the extent possible.
10. Any wildlife response to drone activity will be documented by the USFWS-approved biologist and will be reported annually to the Service.

WORKER TRAINING

1. A USFWS-approved biological monitor will provide environmental and special status species training to field management and study personnel on the importance of protecting environmental resources. Communication efforts and training will take place during pre-proposed action meetings so that personnel are aware of their responsibilities and the importance of regulatory compliance.
2. Study personnel will be educated on the species and critical habitat that have the potential to occur within or near the site and along access routes, habitat used by those species, and how the proposed action has the potential to impact those species. Materials covered in the training program will include environmental rules and regulations for the specific proposed action, requirements for limiting activities to designated work areas, and avoiding any nearby sensitive resource areas. Training will include, but not be limited to:
 - The need for resource avoidance and protection.
 - Study objectives.
 - Roles and responsibilities.
 - Proposed action management structure and contacts.
 - Conservation measures.
 - Emergency procedures.
3. If new personnel are added to the proposed action, the biological monitor will ensure the new personnel receive the mandatory training before starting work.
4. DWR will notify the USFWS within 24 hours of the finding of any injured or dead listed species or any unanticipated damage to its habitat associated with the proposed action. Injured listed species will be cared by a licensed veterinarian or other qualified person, such as the USFWS-approved biological monitor for the proposed action. Notification will be made to the USFWS, and must include the date, time, and precise location of the individual/incident clearly indicated on a U.S. Geological Survey 7.5

minute quadrangle or other maps at a finer scale, as requested by the Service, and any other pertinent information. Dead animals or fish should be sealed in a zip lock bag containing a piece of paper indicating the location, date, and time when it was found, and the name of the person who found it; and the bag should be frozen in a freezer in a secure location.

BIOLOGICAL MONITORING

1. DWR will provide a Service-approved biological monitor who will be responsible for monitoring implementation of the conditions in the State and Federal regulatory documents.
2. Prior to work being performed, the biological monitor will determine the location of environmentally sensitive areas within Blacklock and identify access routes based on mapping of existing land-cover types and special status plant species intended to avoid or minimize effects to listed species.

SPECIAL STATUS PLANT SPECIES PROTECTION

1. The first special status plant survey will be conducted in June prior to the first year of treatments by DWR botanists. Federal and state listed plants will be flagged and pointed out to the contractor and workers for avoidance. Herbicide treatment by UAV will not occur within a 100-foot radius of each detection. Spot treatments using backpack sprayers and mowing will be used in areas within this 100-foot buffer. The next survey will be conducted after proposed action activities are initiated in the spring of 2023, and each subsequent year, during correct blooming season for special status plant species with the potential to occur within Blacklock.
2. Disturbance to vegetated areas will be minimized to the extent feasible with the exception of the sections of *Phragmites* targeted for treatment.

NONNATIVE INVASIVE PLANT PREVENTION

1. DWR will avoid or minimize the potential for the introduction of new invasive plant species and the spread of species previously documented in the Action Area. Measures will include cleaning of equipment prior to mobilization on site and minimizing surface disturbance to the greatest extent possible.

SALT MARSH HARVEST MOUSE

1. All proposed activities will take place one hour after sunrise to one hour before sunset, when mice are least likely to be moving through the work areas.
2. Disturbance to wetland vegetation outside of the treatment areas will be avoided to the extent feasible to reduce potential impacts on salt marsh harvest mice. The amphibious mower will use the shortest route possible traveling between plots and will use open water channels where possible for navigation, to minimize disturbance within the emergent vegetation. The biological monitor will be on-site to monitor all wetland vegetation removal and herbicide application activities. During the Control Study, we found it unsafe and in-feasible to flush the areas using physical sweepers or people immediately ahead of the mower.
3. Vegetation will be cut in a line pattern (rather than in a circular pattern) starting at the outside edge (channel-side) working toward interior of the vegetation to allow wildlife opportunity to escape toward appropriate cover.

4. Mowing will occur at approximately 3 mph, to allow mice to leave the area in time to avoid contact with the equipment.
5. Work will be scheduled to avoid extreme high tides when there is potential for salt marsh harvest mouse to move higher in the vegetation. All equipment will be staged on existing roadways away from the study site when not in use.
6. If a suspected salt marsh harvest mouse is discovered, proposed activities will cease in the immediate vicinity of the individual until the individual has been allowed to leave the area where work is occurring.
7. A USFWS-approved biologist will be onsite during proposed action activities occurring in wetlands. The biologist will document compliance with this biological opinion, including conservation measures. The biologist will have the authority to stop all activities to comply with the conservation measures.

RIDGWAY'S RAIL

1. To avoid or minimize the loss of individual Ridgeway's rails, activities within or adjacent to rail habitat will not occur within 2 hours before or after extreme high tides (6.5 ft or above, as measured at the Golden Gate Bridge), when the marsh plain is inundated, because protective cover for rails is limited and activities could prevent them from reaching available cover.
2. To minimize or avoid the loss of individual Ridgeway's rails, activities within or adjacent to tidal marsh areas will be avoided during the rail breeding season from February 1 through August 31 each year, unless surveys are conducted to determine rail locations and territories can be avoided. Surveys will be conducted as described in the Service's June 2015 California Clapper Rail Survey Protocol (and/or another Service-approved protocol).
3. If breeding Ridgeway's rails are determined to be present, activities will not occur within 700 ft of an identified calling center. If the intervening distance across a major slough channel or across a substantial barrier between the Ridgeway's rail calling center and any activity area is greater than 200 ft, it may proceed at that location within the breeding season.
4. A USFWS-approved biologist will be on site during study activities occurring in wetlands. The biologist will document compliance with this biological opinion, including conservation measures. The biologist will have the authority to stop proposed action activities to comply with the conservation measures.
5. Only inspection, surveys, and monitoring activities will be performed within 2 hours before or after extreme high tides or during the Ridgeway's rails breeding season in areas within or adjacent to Ridgeway's rail breeding habitat with approval of the Service under the supervision of a qualified biologist.

DELTA SMELT

Since the Action Area falls within designated Delta smelt critical habitat, herbicide concentrations and water quality parameters that have the potential to impact the delta smelt food web will be monitored closely to ensure avoidance and minimization of any effects. These include herbicide concentrations, chlorophyll-a, dissolved oxygen, and turbidity. If any water quality parameters fall outside of the triggers listed below, the Service will be contacted for guidance on adaptive management and how to best proceed. Specifically, the following measures will be taken to avoid or minimize effects:

1. Mower rotors will not operate while travelling over water, and mowing will only occur within the *Phragmites* treatment sections.
2. Herbicide concentrations will be monitored prior to herbicide application, within 24-hours before applications occur, as well as during high slack tide within one week following herbicide application,

with a goal to quantify overspray or herbicide runoff. If herbicide concentrations fall above the National Pollutant Discharge Elimination System (NPDES) maximum limit of 700 parts per billion (ppb) for glyphosate or the 11.2 parts per million (ppm) monitoring trigger for imazapyr, then the Service will be notified.

3. Water quality parameters will be monitored in concert with water sample collection. Primary productivity in receiving waters will be measured as chlorophyll-a via handheld YSI.
4. Electrical conductivity, temperature, dissolved oxygen, turbidity, and pH have been measured periodically at the site throughout the Control Study. All of these parameters will be measured directly prior to and directly after herbicide application or mowing at the site. If any of these parameters measured post-action vary significantly from the range of background measurements (by 50% or greater), the Service will be notified. All water quality monitoring results will be documented and available upon Service request.

SALMONIDS AND GREEN STURGEON

Water quality parameters that have the potential to impact habitat for Central Valley spring-run Chinook salmon, Sacramento River winter-run Chinook salmon, California Central Valley steelhead DPS, and Southern DPS of North American green sturgeon include herbicide concentrations, chlorophyll-a, dissolved oxygen, and turbidity. If any water quality parameters fall outside of the triggers listed below, NMFS will be contacted by USBR for guidance on adaptive management and how to best proceed. Specifically, the following measures will be taken to minimize effects:

1. Mower rotors will not operate while travelling over water, and mowing will only occur within the *Phragmites*-vegetated plots
2. Mowing will occur at approximately 3 miles per hour, to help encourage sentient species to leave the area in time to avoid contact with the equipment.
3. Herbicide concentrations will be monitored prior to herbicide application, within 24-hours before applications occur, as well as during a subsequent high slack tide within one week following herbicide application, with a goal to quantify overspray or pesticide runoff. If herbicide concentrations fall above the NPDES maximum limit of 700 ppb for glyphosate or the 11.2 ppm monitoring trigger for imazapyr, then NMFS will be notified by USBR.
4. Water quality parameters will be monitored in concert with water sample collection. Primary productivity in receiving waters will be measured as chlorophyll-a via handheld YSI.
5. Electrical conductivity, temperature, dissolved oxygen, turbidity, and pH have been measured periodically at the site throughout the Control Study. All of these parameters will be measured directly prior to and directly after herbicide application or mowing at the site. If any of these parameters measured post-action vary significantly from the range of background measurements (by 50% or greater), the Service will be notified. All water quality monitoring results will be documented and available upon Service request.

CALIFORNIA LEAST TERN

1. California least tern nests during the California least tern breeding season, April 15 to August 15, will be fully avoided by the proposed action, since there is no suitable nesting substrate is located within the work areas. Surveys will be conducted to confirm the efficacy of this avoidance measure.

2. A Service-approved biologist will be on site during study activities occurring in wetlands. The biologist will document compliance with this biological opinion, including conservation measures. The biologist will have the authority to stop proposed activities to comply with the conservation measures.

WESTERN SNOWY PLOVER

3. Western snowy plover nests during the western snowy plover breeding season, March through September, will be fully avoided by the proposed action since there no suitable nesting substrate is located within the work areas. Surveys will be conducted to confirm the efficacy of this avoidance measure.
4. A USFWS-approved biologist will be on site during study activities occurring in wetlands. The biologist will document compliance with this biological opinion, including conservation measures. The biologist will have the authority to stop proposed action activities to comply with the conservation measures.

INVASIVE PLANT PREVENTION

DWR will include the measures in the study specifications to avoid or minimize the potential for the introduction of new invasive plant species and the spread of species previously documented in the action area. Measures will include cleaning of equipment prior to mobilization on site, minimizing disturbance areas, and where feasible treat noxious weed and invasive plants.

REFERENCES

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