



## **Action Plan for Implementation of the Lower Owens River Project**

This LORP Implementation Action Plan defines the critical steps, actions and timing that need to be accomplished prior to water flow release into the river channel. Implementation of the Lower Owens River Project includes activities related to channel preparation, construction, fencing, placement of monitoring stations, etc. in the Riverine-Riparian Areas, River Channel, Blackrock Waterfowl Management Area, the Delta and adjacent uplands.

Ecosystem Sciences developed this detailed action plan, schedule, and implementation effort to meet the goal of having initial water flow by July/August, 2006 and ramping up to permanent water flow in the Owens River by January, 2007. These actions are based on the LORP Ecosystem Management Plans, Technical Memorandums and the State 401 Water Quality certificate.

The action plan is predicated on a “no mistakes” policy, or zero tolerance for any errors that delay implementation or cause a set-back in the schedule. “No mistakes” can only be achieved with thorough and complete planning, a checklist of items to be accomplished, a schedule for completion and direct oversight before actions are taken and during construction or modification.

The action plan also seeks to minimize impacts and disturbance to the environment. Through specific protocols habitat and vegetation will be protected during all activities. Likewise, construction and maintenance activities run the risk of spreading exotic plants and increasing the chances of invasive populations becoming established at each site. Therefore, appropriate scheduling and closely followed procedures will be paramount throughout the implementation effort.

### *Tasks and Actions to Implement Lower Owens River Project*

1. Blackrock – Culverts, Spillgates, Berms, Ditches
2. Temporary Flow Measuring Stations
3. Initial River Channel Clearing
4. Removal of Channel Obstructions, Rock Dams, Dikes, Bridges
5. Beaver Dam Removal
6. Fencing Installation
7. Fish Corridors Enhancement and Modifications
8. Other Culverts Replaced or Modified
9. Thibaut Ponds Staff Gages
10. Keeler Bridge Metering Station Upgrade
11. Five Culverts Replacement
12. Temporary Stream Gages In Delta
13. Rapid Assessments
14. Illustrated River Restoration Strategy
15. Data Warehouse Implementation
16. Range Trend/Grazing Management
17. LORP Mapping Assessment and Baseline Map
18. Final Baseline Monitoring Methods

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## Scheduling and Minimizing Impacts to the Environment

### *Implementation, Maintenance and Operation Guidelines<sup>1</sup>*

Many exotic plant control measures have been incorporated into the overall management strategy and water control measures. The potential risk of infecting new areas with salt cedar or of increasing the vigor and productivity of existing stands is considered a significant issue in the Blackrock Waterfowl Habitat Area, the Owens River Delta Habitat Area and the Owens River Riparian Area. As a result, several wetland management practices, such as water drawdowns (partial drainage) will be restricted to reduce this risk. Other management practices that will help circumvent and limit the spread of salt cedar (tamarisk) include: (1) minimizing construction and other disturbance of substrates; (2) providing for good water circulation and drainage in wetlands to minimize accumulation of salts; (3) restricting use of fire for vegetation management--when fire is used, then flushing or leaching along with careful monitoring should follow, (4) timing, duration and extent of wetland water drawdowns will be managed to minimize the chance of invasion by tamarisk (i.e., winter months); and (5) monitoring will be focused upon the early detection of tamarisk recruitment.

Although the suggested procedures were designed for the Blackrock Waterfowl Habitat Area, they are also appropriate and applicable to the entire LORP. Construction and routine maintenance of facilities (e.g. roads, berms, ditches, gates, etc.) are designed to avoid or reduce the risk of impacting special status plants and wildlife, while also minimizing any conditions that could promote the expansion of salt cedar and other exotic plant pests. Appropriate scheduling of construction and maintenance will help avoid many potential impacts to wildlife and will minimize exotic plant recruitment. Contingency measures will help prevent establishment of the exotic pest plants in the event that new areas become infected.

### *Plants*

Appropriate scheduling of construction and maintenance activities reduces the risk of establishing new populations of exotic pest plants.

- Schedule construction and maintenance activities during the period when salt cedar seed production is lowest, to the extent possible. This period is usually from about November to March.

The following procedures and precautions should be taken prior to new construction activities:

- Focused pre-construction surveys for the presence of special status plants should be conducted. Any construction or maintenance activity that would impact a special status plant population will be avoided.
- Focused pre-construction surveys for the presence of exotic pest plants should be conducted.

When construction or maintenance occurs in areas with an established exotic pest plant population, the following procedures and precautions should be taken:

- If the problem is salt cedar, the Inyo County Water Department Salt Cedar Control Team should be contacted to provide assistance in eradication at the site.

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<sup>1</sup> see. Technical Memorandum # 04, [Mapping Existing Vegetation Types for the Blackrock Waterfowl Habitat Area](#).  
see. Technical Memorandum # 15, [Resource Management in the Blackrock Waterfowl Habitat Area](#).  
see. Technical Memorandum # 08, [Owens River Delta Habitat Area](#).  
see. Technical Memorandum # 18, [Blackrock Waterfowl Habitat Area Implementation](#).  
see. Technical Memorandum # 20 [Special Status Wildlife and Plants Species Accounts](#).

- To the extent possible, established exotic pest plants at the work location should be eradicated as completely as possible before beginning construction or maintenance on structures.
- Barrow areas should be selected very carefully and generally not include materials from areas with an established population of exotic pest plants. Barrow material should not include stems, roots or other plant parts that might promote the spread of undesirable plants.
- Mulch or landscape cloth might be an effective deterrent to germination of weeds at small sites.

Drawdown zones and new construction and maintenance sites will be monitored (via rapid assessment) to detect recruitment of exotic plants. If exotic pest plants such as salt cedar, Russian olive, or perennial pepperweed, etc. are detected, the plants should be controlled before they have a chance to become established.

A combination of the following contingency measures is probably appropriate:

- Application of a broadleaf specific herbicide is a very effective means of eradicating young plants. The most appropriate herbicide to use depends upon specific site factors, including the target plant species, whether the site is wet or dry and the size of the treatment area.
- Hand removal of young plants is an option if the extent of problem is small.
- Cutting and flooding of young plants is an effective means of killing salt cedar if the plants can be completely submerged in water for 6 weeks.

Key riparian plant and tree species are important to the overall habitat and structure through the LORP. Every effort should be made to minimize disturbance to established trees and the root zones around the trees. Sites that will be used for construction and maintenance activities will be surveyed and flagged prior to work commencing.

### *Wildlife*

Reduce the level of disturbance to wildlife, especially during nesting times, by scheduling management and maintenance activities outside sensitive periods. To the extent possible, construction and repair of water control structures, river channel clearing, removal of obstructions, prescribed burns and roadside maintenance such as mowing and grubbing should be scheduled during the least sensitive periods for wildlife.

- The least sensitive period for nesting birds will be generally from mid-September to early January. For example, loggerhead shrike (mid-January to early September), Le Conte's thrasher (mid-January to early September), California quail (April to August), mallard (February to July) and northern harrier (March to mid-September).
- Prescribed burning should only be implemented as a last measure to reduce residual emergent vegetation in wetlands. Burns should only be conducted in wetlands and implemented during the least sensitive time for ground nesting birds (mid-September through January). No burns should be allowed within or adjacent to riparian areas. Prescribed burns will be conducted by a LADWP supervisor under current LADWP guidelines.
- Snags and downed woody material are a very important special habitat element for many species of wildlife and should not be cut or removed. Most snags and woody material are restricted to riparian areas and the areas around springs and seeps. Present LADWP policy prohibits the cutting and removal, for whatever reason, of snags, downed woody material and other live vegetation.
- To the extent possible, roadside vegetation and hedgerows should be left alone because they provide valuable nesting areas for many birds and increase structural richness.

- To the extent possible, understory vegetation and plant structure (i.e., herbaceous, shrubs, young trees, tree branches, etc.) in and around any forested areas (e.g., tree lots, riparian, lakeside, etc.) should be left alone. These areas provide valuable nesting, resting, roosting and cover for many species and they increase the structural richness of the site.
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## **Surface Water Flow**

As stated the previously, the goal is to have initial water flow by July/August, 2006 and ramping up to permanent water flow in the Owens River by January, 2007. The flows for the Lower Owens River are designated in the MOU. The base flow will be 40 cfs, with an annual riparian flow of up to 200 cfs, and an annual average flow of 6 to 9 cfs to be released to the Delta habitat area.

To accommodate the schedule for the construction of the pumpback station, water will be released to the river in two phases. The two phases and the planned schedules for commencing each phase are described below.

The Phase I release will begin once LADWP has completed the channel clearing work, the modification of the River Intake structure, the installation of 18 temporary flow measuring stations, culvert installation and several other tasks described in the next section. LADWP will begin releasing water to the Lower Owens River via the Intake. Flow releases will be increased daily in five-cfs increments until a continuous flow is achieved from the Intake to the Delta. Flows in the currently wetted reach of the river (5 to 17 cfs) will be maintained during this phase. It is expected that releases from the spillgates that currently supply the wet reach of the river will be reduced as new flows released from the Intake reach the wet reach.

Once construction of the pump station is completed, releases from the River Intake (Phase II) will be increased in 1 to 5 cfs daily increments, supplemented as necessary by various spillgates, until a 40 cfs baseflow is achieved from the Intake to the pump station. Flow adjustments based on the monitoring and thresholds described below will be conducted once the releases commence, but the flow adjustments will be subject to the objective of achieving the 40 cfs flows from the Intake to the pump station within about 30 days of the commencement of Phase II releases. An additional six months may be required to stabilize the 40 cfs flows throughout the channel.

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## Action Plan and Tasks

### Task 1. Blackrock Waterfowl Management Area – Culverts, Spillgates, Berms, Ditches

Blackrock Waterfowl Habitat Area is a "managed wetland" with a high degree of mechanistic intervention and maintenance; it consists of four separate management units with a highly controlled water regime (i.e., flooding frequency, duration, depth and drawdown). The Blackrock Waterfowl Habitat Area consists of four separate management units: Drew, Waggoner, Winterton, and Thibaut.

1.1) *GPS locate and map all structures (controls, culverts, etc) in all 4 areas*

Improvements necessary for the BWhA are described in Tech Memo #18 and the table below summarizes the plans.

Upgrading and enhancing the existing infrastructure is the first step to implementation of the Blackrock Waterfowl Habitat Area (Table 1).

Table 1. Estimated improvements to the Blackrock Wildlife Habitat Area infrastructure.					
Management Unit	dikes miles	ditches miles	No.		
			culverts and spillgates	fence miles	livestock gates
Drew Slough #11	1.30	0.00	2	0	0
Waggoner #14	1.00	1.30	4	0	0
Winterton #15	0.25	0.25	1	0	0
Thibaut Ponds #17	0.70	0.00	0	+5	+5
Total	3.25	1.55	7	+5	+5

1.2) *DGPS line/elevation of berms and dikes, channel bottom elevations*

Field verify existing conditions with Digital GPS elevation measurements to finalize gradients and flow conditions expected.

1.3) *Identify and flag critical environmental features of the site:*

The sites will be field checked to determine critical environmental features that need to be protected from construction activities. Important habitat, vegetation, and water features will be flagged to indicate protection from construction activities. Root zones of large trees will be staked and flagged to minimize over-compaction of the soils from heavy equipment. Access routes, dumping and staging areas, and clearing areas will be flagged. All flagging protocols will be coordinated with the construction foreman.

1.4) *Focused pre-construction surveys for the presence of special status plants will be conducted.*

Any construction or maintenance activity that would impact a special status plant population will be avoided. Ecosystem Sciences will conduct a special status plant survey prior to construction and indicate any plants on both the site plan and by flagging in the field. A protocol for special

status plant population surveys is included as an appendix to this document. This quick, reconnaissance survey will be conducted in conjunction with the exotic pest plant survey described below.

- 1.5) *Focused pre-construction surveys for the presence of exotic pest plants will be conducted.*  
When construction or maintenance occurs in areas with an established exotic pest plant population, the following procedures and precautions will be taken: To the extent possible, established exotic pest plants at the work location should be eradicated as completely as possible before beginning construction or maintenance on structures. This will help to minimize the spread of exotic pest plants during construction activities.
- 1.6) *Design site plans for each gauging station area:*  
The construction will be done in a manner that minimizes impacts to the river channel, riparian vegetation, wetlands and any access roads to the river channel or wetlands. A site plan for each specific construction location will be completed prior to initiation of construction activities. The site plan will use high resolution aerial images of the site with overlay graphic information. The plan will include access road location, areas to be cleared, protected areas, dumping area, special status plants (if found), exotic pest plants (if found), specific construction areas and detailed notes and protocols that will be followed for each site.
- 1.7) *Determine disposal of materials (on-site:off-site, locations)*  
Removal and disposal of materials from construction activities will be coordinated for the site. Cleared vegetation and earth material will be completely removed from the site, the riparian zone and the river channel. Dumping of cleared material including vegetation and earth will be indicated on the site plan, if appropriate, or not allowed at the site. This determination will be made upon field inspection and depending on the site parameters. If material needs to be hauled off-site an appropriate location will be determined and defined.
- 1.8) *Rehabilitation requirements needed post construction*  
An evaluation of site rehabilitation will be conducted after construction has been completed. Depending on the level of disturbance to the site a determination for rehabilitation will be made that could include replanting, earthwork, vegetation recovery, and erosion control. The site should be rehabilitated to achieve pre-construction condition on banks, floodplains and riparian corridors.
- 1.9) *Construction*  
Estimated construction period

## **Task 2. Temporary Measuring Stations for Monitoring River Flow**

- 2.1) *Install temporary gauges and water quality sampling stations in the following locations along the river channel:*
  - Above Blackrock Ditch Return
  - Below Blackrock Ditch Return
  - East of Goose Lake
  - Goose Lake Return
  - Five Culverts
  - Below Billy Lake Return
  - Mazourka Canyon Road

- Below Locust Return
- Manzanar Reward Road
- Below George's Return
- Reinhackle Springs
- Below Alabama Gates Return
- Lone Pine Ponds
- Lone Pine Narrow Gage Road
- Keeler Bridge
- Above Pumpback Station
- Below Pumpback Station

2.2) *Criteria and protocol for placement of stations on the river corridor:*

The exact placement of the temporary gauging station will be determined through field investigation by the implementation team and an LADWP hydrographer. Hydrologic parameters for the stations will require specific river geometries and location. Additionally, access and movement constraints for heavy equipment will need to be determined. The amount of maneuvering space, turning radius and staging areas will be defined by the construction foreman and indicated on the site plans.

2.3) *Determine construction schedule for gauging stations:*

Appropriate scheduling of construction and maintenance activities reduces the risk of establishing new populations of exotic pest plants. Schedule construction and maintenance activities during the period when salt cedar seed production is lowest, to the extent possible. This period is usually from about November to March. Reduce the level of disturbance to wildlife, especially during nesting times, by scheduling management and maintenance activities outside sensitive periods.

2.4) *Protocols to minimize disturbance and impacts at each site:*

The general protocols described above to minimize disturbance to both plants and wildlife will be followed. Additionally, the site plans prepared for each station will be followed by the construction crews. These site plans indicate access routes, protected areas, location of stations, etc. as described below. A representative from the implementation team will visit each site with the construction foreman to review the protocols and parameters prior to any activities. Each site will be flagged, as specified below, to indicate the extent of construction activities. Post construction clean-up and disposal of materials will follow the guidelines described below and will be detailed on each site plan.

2.5) *GPS and map specific station locations:*

Each station site will be field checked, given an exact GPS location in UTM coordinates on the river channel and each site will be placed on a detailed project area map.

2.6) *Determine and map access routes and station placement:*

Each station site will be field checked to determine the best access route for construction equipment that minimizes disturbance to the environment and locates the most appropriate placement for the station.

2.7) *Identify and flag critical environmental features of each site:*

Each station site will be field checked to determine critical environmental features that need to be protected from construction activities. Important habitat, vegetation, and water features will be flagged to indicate protection from construction activities. Root zones of large trees will be staked and flagged to minimize over-compaction of the soils from heavy equipment. Access

routes, dumping and staging areas, station location and clearing areas will be flagged. All flagging protocols will be coordinated with the construction foreman.

- 2.8) *Focused pre-construction surveys for the presence of special status plants will be conducted.*  
Any construction or maintenance activity that would impact a special status plant population will be avoided. Ecosystem Sciences will conduct a special status plant survey prior to construction and indicate any plants on both the site plan and by flagging in the field. A protocol for special status plant population surveys is included as an appendix to this document. This quick, reconnaissance survey will be conducted in conjunction with the exotic pest plant survey described below.
- 2.9) *Focused pre-construction surveys for the presence of exotic pest plants will be conducted.*  
When construction or maintenance occurs in areas with an established exotic pest plant population, the following procedures and precautions will be taken: To the extent possible, established exotic pest plants at the work location should be eradicated as completely as possible before beginning construction or maintenance on structures. This will help to minimize the spread of exotic pest plants during construction activities.
- 2.10) *Design site plans for each gauging station area:*  
The placement of the gauging stations will be done in a manner that minimizes impacts to the river channel, riparian vegetation and any access roads to the river channel. A site plan for each specific gauging station location will be completed prior to initiation of construction activities. The site plan will use high resolution aerial images of the site with overlay graphic information. The plan will include access road location, areas to be cleared, protected areas, dumping area, special status plants (if found), exotic pest plants (if found), specific placement of the gauging station and detailed notes and protocols that will be followed for each site.
- 2.11) *Determine disposal of materials (on-site:off-site, locations)*  
Removal and disposal of materials from construction activities will be coordinated for each site. Cleared vegetation and earth material will be completely removed from the site, the riparian zone and the river channel. Dumping of cleared material including vegetation and earth will be indicated on the site plans, if appropriate, or not allowed at the site. This determination will be made on a case by case basis depending on the site parameters. If material needs to be hauled off-site an appropriate location will be determined and defined.
- 2.12) *Removal and site rehabilitation requirements for temporary stations*  
Removal of the temporary gauging stations will follow the same protocols as for the installation. Site plans will be utilized, access roads followed, and appropriate areas protected. Scheduling removal should minimize wildlife disturbance and avoid exotic plant seeding and flowering periods. All construction material for the temporary stations will be completely removed, hauled off-site, and disposed of or reused. Upon removal of the temporary stations an evaluation of site rehabilitation will be conducted. Depending on the level of disturbance to the site a determination will be made that may include: no action, replanting, earthwork, vegetation recovery, erosion control, etc.
- 2.13) *Construction*  
Estimated construction period

### Task 3. Initial River Channel Clearing<sup>2</sup>

Prior to initiating the Phase 1 releases, LADWP will mechanically remove sediments and marsh vegetation obstructions from approximately 10,000 feet of the river channel downstream of the River Intake. An approximately 15-foot wide swath will be excavated within the middle of the existing 40-50 foot wide channel to allow 40 cfs to pass. It is anticipated that the 40 cfs base flow, coupled with seasonal habitat flows up to 200 cfs, will maintain an open channel.

3.1) *Construction and clearing schedule*

Appropriate scheduling of construction and maintenance activities reduces the risk of establishing new populations of exotic pest plants. Schedule construction and maintenance activities during the period when salt cedar seed production is lowest, to the extent possible. This period is usually from about November to March. Additionally, construction activity should reduce the level of disturbance to wildlife, especially during nesting times, by scheduling management and maintenance activities outside sensitive periods.

3.2) *Field Survey and GPS tule beds (location and length)*

The location and extent of the tule beds will be field checked, given an exact GPS locations in UTM coordinates on the river channel and will be digitized on a detailed project area map.

3.3) *Determine depth and width of dredging based on criteria in technical memo. Determine method of removal (burning, dredging, bucket, etc.).*

Project scientist will determine the most appropriate means for tule bed removal and channel clearing. See Technical Memorandum #9 ; *Management of Tules and Organic Sediment*.

3.4) *Identify and flag critical environmental features of the site:*

The site will be field checked to determine critical environmental features that need to be protected from construction activities. Important habitat, vegetation, and water features will be flagged to indicate protection from construction activities. Root zones of large trees will be staked and flagged to minimize over-compaction of the soils from heavy equipment. Access routes, dumping and staging areas, and clearing areas will be flagged. All flagging protocols will be coordinated with the construction foreman.

3.5) *Focused pre-construction surveys for the presence of special status plants will be conducted.*

Any construction or maintenance activity that would impact a special status plant population will be avoided. Ecosystem Sciences will conduct a special status plant survey prior to construction and indicate any plants on both the site plan and by flagging in the field. A protocol for special status plant population surveys is included as an appendix to this document. This quick, reconnaissance survey will be conducted in conjunction with the exotic pest plant survey described below.

3.6) *Focused pre-construction surveys for the presence of exotic pest plants will be conducted.*

When construction or maintenance occurs in areas with an established exotic pest plant population, the following procedures and precautions will be taken: To the extent possible, established exotic pest plants at the work location should be eradicated as completely as possible before beginning construction or maintenance on structures. This will help to minimize the spread of exotic pest plants during construction activities.

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<sup>2</sup> LORP Tech. Memo #9.

- 3.7) *Site Plan map with access areas and routes*  
The removal of channel tule beds will be done in a manner that minimizes impacts to the river channel, riparian vegetation, floodplain and any access roads to the river channel. A site plan for removal of material will be completed prior to initiation of construction activities. The site plan will use high resolution aerial images of the site with overlay graphic information. The plan will include access road location, areas to be cleared, protected areas, dumping area, special status plants (if found), exotic pest plants (if found), specific areas of tule bed removal and detailed notes and protocols that will be followed for each site.
- 3.8) *Determine disposal of materials (on-site:off-site, locations)*  
Removal and disposal of materials from construction activities will be coordinated for the site. Cleared vegetation and earth material will be completely removed from the site, the riparian zone and the river channel. Dumping of cleared material including vegetation and earth will be indicated on the site plan, if appropriate, or not allowed at the site. This determination will be made upon field inspection and depending on the site parameters. If material needs to be hauled off-site an appropriate location will be determined and defined.
- 3.9) *Determine site rehabilitation needs from clearing impacts*  
An evaluation of site rehabilitation will be conducted after clearing has been completed. Depending on the level of disturbance to the site a determination for rehabilitation will be made that could include replanting, earthwork, vegetation recovery, and erosion control. The site should be rehabilitated to achieve pre-construction condition on banks, floodplains and riparian corridors.
- 3.10) *Construction*  
Estimated construction period

#### **Task 4. Removal of Channel Rock Dams, Dikes, Bridges<sup>3</sup>**

- 4.1) *Survey channel to verify obstructions*  
Walk the entire active channel to verify all existing and/or new obstructions.
- 4.2) *GPS, map, describe and measure obstructions (verify existing report of locations)*  
The location and extent of each obstruction will be field checked, given an exact GPS locations in UTM coordinates on the river channel and will be digitized on a detailed project area map.
- 4.3) *Determine best removal method for each blockage*  
Final method to remove a particular obstruction will be determined in consultation with the construction foreman.
- 4.4) *Removal timing and schedule*  
Appropriate scheduling of construction and maintenance activities reduces the risk of establishing new populations of exotic pest plants. Schedule construction and maintenance activities during the period when salt cedar seed production is lowest, to the extent possible. This period is usually from about November to March. Additionally, construction activity should reduce the level of disturbance to wildlife, especially during nesting times, by scheduling management and maintenance activities outside sensitive periods.

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<sup>3</sup> LORP River Obstruction Survey, May 2003

- 4.5) *Erosion and sediment control measures*  
Depending upon the location and extent of obstruction removal, erosion and sediment control actions will be developed in consultation with the construction foreman.
- 4.6) *Identify and flag critical environmental features of the site:*  
The site will be field checked to determine critical environmental features that need to be protected from construction activities. Important habitat, vegetation, and water features will be flagged to indicate protection from construction activities. Root zones of large trees will be staked and flagged to minimize over-compaction of the soils from heavy equipment. Access routes, dumping and staging areas, and clearing areas will be flagged. All flagging protocols will be coordinated with the construction foreman.
- 4.7) *Focused pre-construction surveys for the presence of special status plants will be conducted.*  
Any construction or maintenance activity that would impact a special status plant population will be avoided. Ecosystem Sciences will conduct a special status plant survey prior to construction and indicate any plants on both the site plan and by flagging in the field. A protocol for special status plant population surveys is included as an appendix to this document. This quick, reconnaissance survey will be conducted in conjunction with the exotic pest plant survey described below.
- 4.8) *Focused pre-construction surveys for the presence of exotic pest plants will be conducted.*  
When construction or maintenance occurs in areas with an established exotic pest plant population, the following procedures and precautions will be taken: To the extent possible, established exotic pest plants at the work location should be eradicated as completely as possible before beginning construction or maintenance on structures. This will help to minimize the spread of exotic pest plants during construction activities.
- 4.9) *Design site plans for each gauging station area:*  
The removal of obstructions will be done in a manner that minimizes impacts to the river channel, riparian vegetation and any access roads to the river channel. A site plan for each obstruction removal location will be completed prior to initiation of construction activities. The site plan will use high resolution aerial images of the site with overlay graphic information. The plan will include access road location, areas to be cleared, protected areas, dumping area, special status plants (if found), exotic pest plants (if found), specific removal of the obstruction and detailed notes and protocols that will be followed for each site.
- 4.10) *Determine disposal of materials (on-site:off-site, locations)*  
Removal and disposal of materials from construction activities will be coordinated for the site. Cleared vegetation and earth material will be completely removed from the site, the riparian zone and the river channel. Dumping of cleared material including vegetation and earth will be indicated on the site plan, if appropriate, or not allowed at the site. This determination will be made upon field inspection and depending on the site parameters. If material needs to be hauled off-site an appropriate location will be determined and defined.
- 4.11) *Rehabilitation requirements needed post construction*  
An evaluation of site rehabilitation will be conducted after clearing has been completed. Depending on the level of disturbance to the site a determination for rehabilitation will be made that could include replanting, earthwork, vegetation recovery, and erosion control. The site should be rehabilitated to achieve pre-construction condition on banks, floodplains and riparian corridors.

- 4.12) *Construction*  
Estimated construction period

### **Task 5. Beaver Dam Removal**

- 5.1) *Survey wetted reaches and GPS ponds*  
New beaver ponds have developed since the last inventory for Tech Memo #3 (Distribution and Abundance of Beaver in the LORP), and a complete re-inventory of the wetted reach (Mazourka Canyon Road downstream) is needed. All ponds will be located and mapped (GPS, configuration and approximate size).
- 5.2) *Identify ponds with best fish habitat*  
Beaver ponds which have been identified as valuable fish habitat will be preserved, but new ponds and verification of ponds will be reviewed with the Warmwater Fisherman's Association.
- 5.3) *Create list of ponds not to be removed and map*  
Beaver ponds which are not to be removed will be identified and mapped.
- 5.4) *Create list of ponds that can be removed; map and schedule removal*  
Beaver ponds which are not valuable for fish habitat, or cause damage as a consequence of backwater effects, will be identified and mapped. Removal methods for each pond will be determined and described. Methods may vary from hand removal of just top portions of dams, allowing stream flow to naturally continue the removal process, to using a helicopter grab approach.
- 5.5) *Determine disposal of materials (on-site:off-site, locations)*  
Removal and disposal of materials from dam removal will be coordinated for the site. Cleared vegetation and earth material will be completely removed from the site, the riparian zone and the river channel. Dumping of cleared material including vegetation and earth will be indicated on the site plan, if appropriate, or not allowed at the site. This determination will be made upon field inspection and depending on the site parameters. If material needs to be hauled off-site an appropriate location will be determined and defined.
- 5.6) *Construction*  
Estimated construction period

### **Task 6. Fence Installation for Grazing and Pasture Management**

- 6.1) *Prioritize riparian pasture fencing installation*  
Riparian pastures in or near the river flood plain will be prioritized for fence construction. Initiation of river flows may create backwater flooding conditions in some pastures near or including the river channel, and in-channel flows could destabilize streambanks. Livestock enclosures and fencing in riparian pastures should be completed prior to flow release to minimize impacts to livestock, riparian vegetation, and streambank erosion while also helping to improve grazing management schemes.

- 6.2) *Determine floodplain extent related to fencing priorities*  
Mapping will determine riparian areas and landtype in relation to grazing fencing schemes. Mapping combined with grazing plans will be reviewed and fenceline construction prioritized for implementation.
- 6.3) *Coordinate installation with grazing plans*  
**New Fences Design** - All fences used for the protection of riparian-riverine habitats will be 5 strand with a high tensile smooth top wire. Fence posts will be placed 12 feet apart with 3 stays between each post. Fences used to manage upland habitats can be constructed using 4 strands. Special fence provisions will be made for frequently used elk crossing sites. Additional cattle guards will be placed at critical traffic junctions to promote recreational movement, and locks will not be used on new gates where open access was available in the past.
- Recreation Access** – Recreation policy is discussed in the Recreation chapter of the Ecosystem Management Plan. Recreationists’ needs were included in the development of land management plans, and all fences will allow recreation access to the river through well-planned fence placement, addition of smooth wire openings, and cross channel fencing that also accommodates unimpeded access for canoes and small boats. Walkovers or walkthroughs will be placed at strategic locations within fencing to allow easy access for recreationists. Any proposed river crossings that are implemented, if at all, will be of the “Arizona crossing” type to limit the obstruction of stream flow in the river channel.
- 6.4) *Construction Schedule*  
Determine construction schedule for fencing. Appropriate scheduling of construction and maintenance activities reduces the risk of establishing new populations of exotic pest plants. Schedule construction and maintenance activities during the period when salt cedar seed production is lowest, to the extent possible. This period is usually from about November to March. Additionally, construction activity should reduce the level of disturbance to wildlife, especially during nesting times, by scheduling management and maintenance activities outside sensitive periods.

## **Task 7. Develop Fish Corridors**

In addition to instream channel flows, flows will also be managed to connect off-channel fish habitats with the river channel. These connections will serve as corridors for fish migration, spawning and nursery areas, and rearing areas; corridors will also provide pathways for fish movement and create riparian habitat for a variety of birds, mammals, reptiles and amphibians. Stream corridors to be developed in the Lower Owens River will capitalize on existing connections. A connection will be established from Blackrock Ditch to Upper and Lower Twin Lakes through Waggoner wetlands, and from Coyote/Grass Lake complex to Upper and Lower Goose Lakes forming a corridor that will be extended to connect with the river channel. The connections will be accomplished by directing approximately 5 cfs of flow through the existing channel (currently runs south from Goose Lake and nearly parallel with the river to a confluence just above Five Culverts). Flow in the Blackrock Ditch will be extended to the river so that a continuous corridor from the Lower Owens River through the Blackrock wetlands, through the Twin Lakes complex, through Goose Lake and back to the river channel will be created. This corridor will allow the free movement of fish between the off-channel lakes and ponds to the river, thus providing substantially more habitat with greater diversity. Largemouth bass and bluegill are already present in these lakes and ponds and the corridor will give these game species access to and egress from the river. Another corridor, originating at the Independence spill gate and continuing through Long Pond to Billy Lake and the river channel, will be maintained.

- 7.1) *Two corridors to be developed; Blackrock and Billy Lake*  
Determine extent of corridor development and detail a description.
- 7.2) *DGPS line/elevation maps of corridors*  
Field verify existing conditions with Digital GPS elevation measurements to finalize gradients and flow conditions expected.
- 7.3) *Describe and measure obstructions*  
The location and extent of the obstructions will be field checked, given an exact GPS locations in UTM coordinates and will be digitized on a detailed project area map.
- 7.4) *Determine best removal method of obstruction*
- 7.5) *Determine removal schedule*  
Appropriate scheduling of construction and maintenance activities reduces the risk of establishing new populations of exotic pest plants. Schedule construction and maintenance activities during the period when salt cedar seed production is lowest, to the extent possible. This period is usually from about November to March. Additionally, construction activity should reduce the level of disturbance to wildlife, especially during nesting times, by scheduling management and maintenance activities outside sensitive periods.
- 7.6) *Erosion and sediment control measures*  
Depending upon the location and extent of obstruction removal, erosion and sediment control actions will be developed in consultation with the construction foreman.
- 7.7) *Identify and flag critical environmental features of the site:*  
The site will be field checked to determine critical environmental features that need to be protected from construction activities. Important habitat, vegetation, and water features will be flagged to indicate protection from construction activities. Root zones of large trees will be staked and flagged to minimize over-compaction of the soils from heavy equipment. Access routes, dumping and staging areas, and clearing areas will be flagged. All flagging protocols will be coordinated with the construction foreman.
- 7.8) *Focused pre-construction surveys for the presence of special status plants will be conducted.*  
Any construction or maintenance activity that would impact a special status plant population will be avoided. Ecosystem Sciences will conduct a special status plant survey prior to construction and indicate any plants on both the site plan and by flagging in the field. A protocol for special status plant population surveys is included as an appendix to this document. This quick, reconnaissance survey will be conducted in conjunction with the exotic pest plant survey described below.
- 7.9) *Focused pre-construction surveys for the presence of exotic pest plants will be conducted.*  
When construction or maintenance occurs in areas with an established exotic pest plant population, the following procedures and precautions will be taken: To the extent possible, established exotic pest plants at the work location should be eradicated as completely as possible before beginning construction or maintenance on structures. This will help to minimize the spread of exotic pest plants during construction activities.
- 7.10) *Design site plans for each development area:*  
The development of corridors will be done in a manner that minimizes impacts to the environment, wetlands, river channel, riparian vegetation and any access roads to the river

channel. A site plan for each specific area will be completed prior to initiation of construction activities. The site plan will use high resolution aerial images of the site with overlay graphic information. The plan will include access road location, areas to be cleared, protected areas, dumping area, special status plants (if found), exotic pest plants (if found), specific development areas and detailed notes and protocols that will be followed for each site.

- 7.11) *Determine disposal of materials (on-site:off-site, locations)*  
Removal and disposal of materials from construction activities will be coordinated for the site. Cleared vegetation and earth material will be completely removed from the site, the riparian zone and the river channel. Dumping of cleared material including vegetation and earth will be indicated on the site plan, if appropriate, or not allowed at the site. This determination will be made upon field inspection and depending on the site parameters. If material needs to be hauled off-site an appropriate location will be determined and defined.
- 7.12) *Rehabilitation requirements needed post construction*  
An evaluation of site rehabilitation will be conducted after clearing has been completed. Depending on the level of disturbance to the site a determination for rehabilitation will be made that could include replanting, earthwork, vegetation recovery, and erosion control. The site should be rehabilitated to achieve pre-construction condition on banks, floodplains and riparian corridor.
- 7.13) *Construction*  
Estimated construction period
- 7.14) *Initiate test flows as needed*  
Early flow releases into corridor channels may be necessary to determine the effects of remaining obstructions and/or flow loses. Test flow conditions (lose estimates, travel time, depth:width estimates) will define how flows will be introduced into the corridors at implementation.

#### **Task 8. Other Culverts Replaced Or Modified**

- 8.1) *Review HEC2 modeling from '93 flow study*  
Details to be determined
- 8.2) *Update HEC2 at specific locations as needed*  
Details to be determined
- 8.3) *Identify potential culverts for replacement or modification*  
Details to be determined
- 8.4) *Design and schedule any culvert changes*  
Details to be determined

#### **Task 9. Thibaut Ponds Staff Gages**

- 9.1) *Place staff gages in all 4 areas according to Ecosystem Management Plan*
- 9.2) *GPS and calibrate as needed*

## **Task 10. Keeler Bridge Metering Station Upgrade**

- 10.1) *Determine construction design and scope:*  
Develop construction requirements for the upgrade of the metering station. As part of the upgrade a temporary bypass trench for water flow will be constructed.
- 10.2) *Determine construction schedule:*  
Appropriate scheduling of construction and maintenance activities reduces the risk of establishing new populations of exotic pest plants. Schedule construction and maintenance activities during the period when salt cedar seed production is lowest, to the extent possible. This period is usually from about November to March. Additionally, construction activity should reduce the level of disturbance to wildlife, especially during nesting times, by scheduling management and maintenance activities outside sensitive periods.
- 10.3) *Criteria for excavation of temporary bypass trench:*  
The exact placement and excavation of the temporary bypass trench will be determined through field investigation by the project scientists and an LADWP hydrographer and engineer. Hydrologic and engineering parameters for the trench will require specific landform geometries and location. Additionally, access and movement constraints for heavy equipment will need to be determined. The amount of maneuvering space, turning radius and staging areas will be defined by the construction foreman and indicated on the site plans.
- 10.4) *Focused pre-construction surveys for the presence of special status plants will be conducted.*  
Any construction or maintenance activity that would impact a special status plant population will be avoided. A special status plant survey will be conducted prior to construction and will indicate any sensitive plants on both the site plan and by flagging in the field. A protocol for special status plant population surveys is included as an appendix to this document. This quick, reconnaissance survey will be conducted in conjunction with the exotic pest plant survey described below.
- 10.5) *Focused pre-construction surveys for the presence of exotic pest plants will be conducted.*  
An exotic pest plant survey will be conducted prior to construction and will indicate any exotic plants on both the site plan and by flagging in the field. When construction or maintenance occurs in areas with an established exotic pest plant population, the following procedures and precautions will be taken: To the extent possible, established exotic pest plants at the work location should be eradicated as completely as possible before beginning construction or maintenance on structures. This will help to minimize the spread of exotic pest plants during construction activities.
- 10.6) *Identify and flag critical environmental features of the site:*  
The site will be field checked to determine critical environmental features that need to be protected from construction activities. Important habitat, vegetation, and water features will be flagged to indicate protection from construction activities. Root zones of large trees will be staked and flagged to minimize over-compaction of the soils from heavy equipment. Access routes, dumping and staging areas, bypass trench location and clearing areas will be flagged. All flagging protocols will be coordinated with the construction foreman.
- 10.7) *Erosion and sediment control protocols*  
Depending upon the location and extent of construction needs, particularly the trench, erosion and sediment control actions will be developed in consultation with the construction foreman.

- 10.8) *Design site plan*  
The placement of the temporary trench will be done in a manner that minimizes impacts to the river channel, riparian vegetation, floodplain and any access roads to the river channel. A site plan for the temporary bypass trench location will be completed prior to initiation of construction activities. The site plan will use high resolution aerial images of the site with overlay graphic information. The plan will include access road location, areas to be cleared, protected areas, dumping area, special status plants (if found), exotic pest plants (if found), specific placement of the bypass trench and detailed notes and protocols that will be followed for each site.
- 10.9) *Determine disposal of materials (on-site:off-site, locations)*  
Removal and disposal of materials from construction activities will be coordinated for the site. Cleared vegetation and earth material will be completely removed from the site, the riparian zone and the river channel. Dumping of cleared material including vegetation and earth will be indicated on the site plan, if appropriate, or not allowed at the site. This determination will be made upon field inspection and depending on the site parameters. If material needs to be hauled off-site an appropriate location will be determined and defined.
- 10.10) *Removal and site rehabilitation requirements for temporary bypass trench*  
Removal of the temporary bypass trench will follow the same protocols as for the installation. Site plans will be utilized, access roads followed, and appropriate areas protected. Scheduling removal should minimize wildlife disturbance and avoid exotic plant seeding and flowering periods. All construction material for the bypass trench will be completely removed, hauled off-site, and disposed of or reused. Upon removal of the bypass trench an evaluation of site rehabilitation will be conducted. Depending on the level of disturbance to the site a determination will be made that will include replanting, earthwork, vegetation recovery, and erosion control. The site should be rehabilitated to achieve pre-construction condition.
- 10.11) *Construction*  
Estimated construction period

## **Task 11. Five Culverts Replacement**

- 11.1) *Culvert engineering, design and specifications related to flow*  
LADWP will develop an engineering design with specifications for culvert replacement.
- 11.2) *Construction schedule*  
Appropriate scheduling of construction and maintenance activities reduces the risk of establishing new populations of exotic pest plants. Schedule construction and maintenance activities during the period when salt cedar seed production is lowest, to the extent possible. This period is usually from about November to March. Additionally, construction activity should reduce the level of disturbance to wildlife, especially during nesting times, by scheduling management and maintenance activities outside sensitive periods.
- 11.3) *Erosion and sediment control measures*  
Depending upon the location and extent of construction needs and the culvert design, erosion and sediment control actions will be developed in consultation with the construction foreman.
- 11.4) *Identify and flag critical environmental features of the site:*  
The site will be field checked to determine critical environmental features that need to be protected from construction activities. Important habitat, vegetation, and water features will be flagged to indicate protection from construction activities. Root zones of large trees will be

staked and flagged to minimize over-compaction of the soils from heavy equipment. Access routes, dumping and staging areas, and clearing areas will be flagged. All flagging protocols will be coordinated with the construction foreman.

- 11.5) *Focused pre-construction surveys for the presence of special status plants will be conducted.*  
Any construction or maintenance activity that would impact a special status plant population will be avoided. Ecosystem Sciences will conduct a special status plant survey prior to construction and indicate any plants on both the site plan and by flagging in the field. A protocol for special status plant population surveys is included as an appendix to this document. This quick, reconnaissance survey will be conducted in conjunction with the exotic pest plant survey described below.
- 11.6) *Focused pre-construction surveys for the presence of exotic pest plants will be conducted.*  
When construction or maintenance occurs in areas with an established exotic pest plant population, the following procedures and precautions will be taken: To the extent possible, established exotic pest plants at the work location should be eradicated as completely as possible before beginning construction or maintenance on structures. This will help to minimize the spread of exotic pest plants during construction activities.
- 11.7) *Design site plans for culvert replacement area:*  
The placement of the new culvert will be done in a manner that minimizes impacts to the river channel, riparian vegetation and any access roads to the river channel. A site plan for culvert location will be completed prior to initiation of construction activities. The site plan will use high resolution aerial images of the site with overlay graphic information. The plan will include access road location, areas to be cleared, protected areas, dumping area, special status plants (if found), exotic pest plants (if found), specific placement of the culvert and detailed notes and protocols that will be followed for the site.
- 11.8) *Determine disposal of materials (on-site:off-site, locations)*  
Removal and disposal of materials from construction activities will be coordinated for the site. Cleared vegetation and earth material will be completely removed from the site, the riparian zone and the river channel. Dumping of cleared material including vegetation and earth will be indicated on the site plan, if appropriate, or not allowed at the site. This determination will be made upon field inspection and depending on the site parameters. If material needs to be hauled off-site an appropriate location will be determined and defined.
- 11.9) *Rehabilitation requirements needed post construction*  
An evaluation of site rehabilitation will be conducted after construction has been completed. Depending on the level of disturbance to the site a determination for rehabilitation will be made that could include replanting, earthwork, vegetation recovery, and erosion control. The site should be rehabilitated to achieve pre-construction condition on banks, floodplains and riparian corridors.
- 11.10) *Construction*  
Estimated construction period

## Task 12. Temporary Stream Gages In Delta

- 12.1) *Establish criteria for sighting stations*  
Inflow and outflow weirs will be sighted according to the purposes defined in the management plan and EIR. Weir type will depend upon the accuracy required (0.5 cfs minimum), location and terrain. These issues will be decided in consultation with LADWP hydrographers.
- 12.2) *Determine construction schedule for stations*  
Construction should be performed in the driest period possible so that equipment can actually get in to the upper and lower ends of the Delta with minimum disturbance of soil and vegetation.
- 12.3) *Protocols to minimize disturbance and impacts*  
In addition to constructing in the driest season, access for equipment will be mapped, contingency actions in the event of equipment becoming stuck will be determined and the construction foreman briefed. The least amount of wetland vegetation will be disturbed and, most importantly, the existing Delta outflow channels will not be altered.
- 12.4) *Identify and flag critical environmental features of the site:*  
The site will be field checked to determine critical environmental features that need to be protected from construction activities. Important habitat, vegetation, and water features will be flagged to indicate protection from construction activities. Root zones of large trees will be staked and flagged to minimize over-compaction of the soils from heavy equipment. Access routes, dumping and staging areas, and clearing areas will be flagged. All flagging protocols will be coordinated with the construction foreman.
- 12.5) *Focused pre-construction surveys for the presence of special status plants will be conducted.*  
Any construction or maintenance activity that would impact a special status plant population will be avoided. Ecosystem Sciences will conduct a special status plant survey prior to construction and indicate any plants on both the site plan and by flagging in the field. A protocol for special status plant population surveys is included as an appendix to this document. This quick, reconnaissance survey will be conducted in conjunction with the exotic pest plant survey described below.
- 12.6) *Focused pre-construction surveys for the presence of exotic pest plants will be conducted.*  
When construction or maintenance occurs in areas with an established exotic pest plant population, the following procedures and precautions will be taken: To the extent possible, established exotic pest plants at the work location should be eradicated as completely as possible before beginning construction or maintenance on structures. This will help to minimize the spread of exotic pest plants during construction activities.
- 12.7) *Design site plans for each gauging station area:*  
The placement of the gauging stations will be done in a manner that minimizes impacts to the river channel, riparian vegetation and any access roads to the river channel. A site plan for each specific gauging station location will be completed prior to initiation of construction activities. The site plan will use high resolution aerial images of the site with overlay graphic information. The plan will include access road location, areas to be cleared, protected areas, dumping area, special status plants (if found), exotic pest plants (if found), specific placement of the gauging station and detailed notes and protocols that will be followed for each site.
- 12.8) *Determine disposal of materials (on-site:off-site, locations)*  
Removal and disposal of materials from construction activities will be coordinated for the site. Cleared vegetation and earth material will be completely removed from the site, the riparian zone

and the river channel. Dumping of cleared material including vegetation and earth will be indicated on the site plan, if appropriate, or not allowed at the site. This determination will be made upon field inspection and depending on the site parameters. If material needs to be hauled off-site an appropriate location will be determined and defined.

12.9) *Rehabilitation requirements needed post construction*

An evaluation of site rehabilitation will be conducted after construction has been completed. Depending on the level of disturbance to the site a determination for rehabilitation will be made that could include replanting, earthwork, vegetation recovery, and erosion control. The site should be rehabilitated to achieve pre-construction condition on banks, floodplains and riparian corridors.

12.10) *Construction*

Estimated construction period

### **Task 13. LORP Rapid Assessments**

13.1) *Rapid Assessments*

Rapid assessment protocols are detailed in the LORP Monitoring Plan Protocols. Assessments will be completed immediately prior to initial flow release.

### **Task 14. Illustrated River Restoration Strategy**

14.1) *Outline topics to coincide with implementation*

The first newsletter related to the LORP Implementation Actions will include pertinent information about what facets will be completed in order for flow to be released into the river channel.

14.2) *Develop and distribute newsletters*

A series of five newsletters will be developed and distributed to interested parties and stakeholders that will describe aspects of the LORP.

14.3) *Establish vision for river evolution and endpoint*

The LORP will be described through the newsletters and Illustrated Restoration Strategy document in terms of environmental potential, long-term vision and expected change in the ecosystem over time. The information will establish a realistic vision for the LORP so that the public and interested parties can understand the potential and future of the project after flow release and management actions.

14.4) *Determine distribution method for newsletters*

14.5) *Development of Illustrated River Restoration Document*

The Illustrated River Restoration Strategy will be a culmination and synthesis of the five newsletters. The newsletters will be transformed into chapters of the Restoration Strategy. The topics for the five newsletters will include: 1.) LORP Implementation Actions and the Goals and Objectives for the project; 2.) Case Studies, relate comparable examples of other river restoration projects to set a realistic vision of what the LORP can be expected to look like and function into the future. Two or three Case Studies and their relation to the LORP will be explored. Restoration examples will include the San Pedro River Restoration; 3.) Ecology of the LORP, Management Strategies and Existing Conditions; 4.) Watershed Perspective, Management of the

Ecosystem from the Watershed Scale; 5.) Monitoring, Adaptive Management, Succession and the Long-term View for the LORP.

14.6) *Final Illustrated River Restoration Document*

The Illustrated Restoration Strategy will be formatted and edited into a comprehensive look at the LORP project. The Illustrated Restoration Strategy will display, in plain and understandable language the LORP, through mapping, photos, illustrations and text. The document will be backed by the project science and cross referenced with the Ecosystem Management Plan, Technical Memorandums, the LORP Monitoring Plan and other technical documents.

**Task 15. Data Warehouse**

15.1) *Final system and software requirements*

15.2) *Final design for warehouse access, administration and security issues*

15.3) *Final schematic structure, file naming and data population protocols*

15.4) *Initiate and populate data warehouse*

**Task 16. Range Trend/Grazing Management**

16.1) *Complete baseline data acquisition in upland and riparian pastures as needed*

Details to be determined based on results of LADWP baseline work.

16.2) *Compile data for data warehouse population*

Baseline data for range trend monitoring from LADWP measurements throughout the LORP grazing leases will be compiled in the data warehouse.

16.3) *Distribute and review grazing management plans with lessees as needed*

Final grazing plans for all LORP leases have been distributed to lessees, and not further revisions or changes are expected.

**Task 17. Final Baseline Monitoring Methods**

17.1) *Workshop with City and County to review and finalize methods*

The baseline monitoring methods are still in draft form (albeit a second iteration), and requires review and input from the ICWD and LADWP. A final Monitoring Methodology document is required to complete the LORP.

17.2) *Review adaptive management procedures and improve as necessary*

A critical exercise in finalizing the monitoring methods is to incorporate refined adaptive management procedures. MOU parties (particularly CDFG) have requested more detailed explanations and protocols for adaptive management procedures and actions.

17.3) *Evaluate endpoints and thresholds for trend analysis*

Endpoints and thresholds (expected outcomes) are described in various tech memos and in the ecosystem management plan. These need to be elucidated and described in more detail as part of the monitoring and adaptive management methods.

## **Task 18. IKONOS Satellite Mapping Assessment**

- 18.1) *Assess needs for baseline map modification*  
Develop and implement a mapping accuracy assessment of the final Space Imaging base map. For each mapping area (Delta, Riverine, Blackrock) assess mapping unit label accuracy by randomly selecting polygon shapes for ground truthing. Analyze assessment results to determine base map accuracy and opportunity for improvement. Determine if base map can be improved to acceptable level.
- 18.2) *Develop comprehensive baseline map*  
Revise SI base map through methods determined in task 18.1 if acceptable accuracy is achievable. If acceptable accuracy is not achievable, determine base map generation strategy.
- 18.3) *Determine aerial photo or satellite needs*  
Additional aerial photo and satellite imagery needs to be determined following tasks 18.1 and 18.2.

LORP Implementation  
Schedule

TASK	2006														
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>1. Blackrock – Culverts, Spillgates, Berms, Ditches</b>															
1.1 • GPS locate and map all structures (controls, culverts, etc) in all 4 areas															
1.2 • DGPS line/elevation of berms and dikes, channel bottom elevations															
1.3 • Flag critical sites and features															
1.4 • Focused pre-construction surveys for the presence of special status plants															
1.5 • Focused pre-construction surveys for the presence of exotic pest plant															
1.6 • Design site plan															
1.7 • Determine disposal of materials (on-site/off-site, locations)															
1.8 • Rehabilitation requirements needed post construction															
1.9 • Construction															
<b>2. Temporary Measuring Stations for Monitoring River Flow</b>															
2.2 • Establish criteria for placement of stations on the river corridor															
2.3 • Determine construction schedule for stations															
2.4 • Develop protocols to minimize disturbance and impacts at each site															
2.5 • Select specific station locations (GPS and map)															
2.6 • Determine and map access routes and station placement															
2.7 • Identify and flag critical sites / features															
2.8 • Focused pre-construction surveys for the presence of special status plants															
2.9 • Focused pre-construction surveys for the presence of exotic pest plant															
2.10 • Design site plans for each gauging station area:															
2.11 • Determine site rehabilitation needs for impacts															
2.12 • Removal and site rehabilitation requirements for temporary stations															
2.13 • Construction															
<b>3. Initial River Channel Clearing</b>															
3.1 • Construction schedule															
3.2 • GPS tute beds (location and length)															
3.3 • Determine depth and width of dredging based on criteria in technical memo															
3.4 • Identify and flag critical sites / features															
3.5 • Focused pre-construction surveys for the presence of special status plants															
3.6 • Focused pre-construction surveys for the presence of exotic pest plant															
3.7 • Design site plans															
3.8 • Determine disposal of material															
3.9 • Determine site rehabilitation needs for impacts															
3.10 • Construction / Clearing															
<b>4. Removal of Channel Rock Dams, Dikes, Bridges</b>															
4.1 • Survey channel to verify obstructions															
4.2 • GPS, map, describe and measure obstructions -verify existing report of locations															
4.3 • Determine best removal method for each blockage															
4.4 • Removal timing and schedule															

LORP Implementation  
Schedule

TASK	2006														
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4.5 • Erosion and sediment control measures															
4.6 • Flag critical sites and features															
4.7 • Focused pre-construction surveys for the presence of special status plants															
4.8 • Focused pre-construction surveys for the presence of exotic pest plant															
4.9 • Design site plan															
4.10 • Determine disposal of materials (on-site:off-site, locations)															
4.11 • Rehabilitation requirements needed post construction															
4.12 • Construction															
<b>5. Beaver Dam Removal</b>															
5.1 • Survey wetted reaches and GPS ponds															
5.2 • Identify ponds with best fish habitat															
5.3 • Create list of ponds not to be removed and map															
5.4 • Create list of ponds that can be removed; map and schedule removal															
5.5 • Determine disposal of materials (on-site:off-site, locations)															
5.6 • Construction / Obstruction Removal															
<b>6. Fence Installation</b>															
6.1 • Prioritize riparian pasture installation															
6.2 • Determine floodplain extent related to fencing priorities															
6.3 • Coordinate installation with grazing plans															
6.4 • Construction															
<b>7. Fish Corridors</b>															
7.1 • Two corridors to be developed; Blackrock and Billy Lake															
7.2 • DGPS line/elevation maps of corridors															
7.3 • Describe and measure obstructions															
7.4 • Determine best removal method															
7.5 • Removal schedule															
7.6 • Map location of vegetation areas to be removed and site area to be disturbed/protected															
7.7 • Determine and map access routes															
7.8 • Erosion and sediment control measures															
7.9 • Flag critical sites and features															
7.10 • Plan map location of vegetation areas to be removed and site area to be disturbed/protected															
7.11 • Determine disposal of materials (on-site:off-site, locations)															
7.12 • Removal and rehabilitation requirements post construction															
7.13 • Construction															
7.14 • Initiate test flows as needed															
<b>8. Other Culverts Replaced Or Modified</b>															
8.1 • Review HEC2 modeling from '93 flow study															
8.2 • Update HEC2 at specific locations as needed															
8.3 • Identify potential culverts for replacement or modification															
8.4 • Design and schedule any culvert changes															

LORP Implementation  
Schedule

TASK	2006														
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
8.5 • Removal and rehabilitation requirements post construction															
8.6 • Construction															
<b>9. Thibaut Ponds Staff Gages</b>															
9.1 • Place staff gages in all 4 areas according to Ecosystem Management Plan															
9.2 • GPS and calibrate as needed															
<b>10. Keeler Bridge Metering Station Upgrade</b>															
10.1 • Determine construction design and scope:															
10.2 • Construction schedule															
10.3 • Criteria for excavation of temporary bypass trench															
10.4 • Focused pre-construction surveys for the presence of special status plants															
10.5 • Focused pre-construction surveys for the presence of exotic pest plant															
10.6 • Flag critical sites and features															
10.7 • Erosion and sediment control measures															
10.8 • Plan map with access areas and routes															
10.9 • Determine disposal of material															
10.10 • Determine site rehabilitation needs for impacts															
10.11 • Construction															
<b>11. Five Culverts Replacement</b>															
11.1 • Culvert engineering, design and specifications related to flow															
11.2 • Construction schedule															
11.3 • Erosion and sediment control measures															
11.4 • Identify and flag critical sites / features															
11.5 • Focused pre-construction surveys for the presence of special status plants															
11.6 • Focused pre-construction surveys for the presence of exotic pest plant															
11.7 • Design site plan															
11.8 • Determine disposal of materials (on-site:off-site, locations)															
11.9 • Rehabilitation requirements needed post construction															
11.10 • Construction															
<b>12. Temporary Stream Gages In Delta</b>															
12.1 • Establish criteria for sighting stations															
12.2 • Determine construction schedule for stations															
12.3 • Protocols to minimize disturbance and impacts															
12.4 • Flag critical sites and features															
12.5 • Focused pre-construction surveys for the presence of special status plants															
12.6 • Focused pre-construction surveys for the presence of exotic pest plant															
12.7 • Design site plan															
12.8 • Determine disposal of materials (on-site:off-site, locations)															
12.9 • Rehabilitation requirements needed post construction															
12.10 • Construction / Gage Install															

LORP Implementation  
Schedule

TASK	2006														
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>13. LORP Rapid Assessments</b>															
13.1 • Complete immediately prior to initial flow release										■	■				
<b>14. Illustrated River Restoration Strategy</b>															
14.1 • Outline topics to coincide with implementation	■														
14.2 • Develop and Distribute Newsletters		■		■		■		■		■					
14.3 • Establish vision for river evolution and endpoint	■	■	■												
14.4 • Determine distribution method	■														
14.5 • Develop Illustrated Strategy Document		■	■	■	■	■	■	■	■						
14.6 • Final Illustrated Strategy Document										■	■	■			
<b>15. Data Warehouse</b>															
15.1 • Final system and software requirements				■											
15.2 • Access, administration and security issues				■	■										
15.3 • Final schematic structure, file naming				■	■										
15.4 • Initiate and populate data warehouse					■	■	■	■			■		■		■
<b>16. Range Trend/Grazing Management</b>															
16.1 • Complete baseline data acquisition in upland and riparian pastures as needed															
16.2 • Compile data for data warehouse population															
16.3 • Distribute and review grazing management plans with lessees as needed															
<b>17. Final Baseline Monitoring Methods</b>															
17.1 • Workshop with City and County to review and finalize methods						■	■								
17.2 • Review adaptive management procedures and improve as necessary							■	■							
17.3 • Evaluate endpoints and thresholds for trend analysis							■	■	■						
<b>18. IKONOS Satellite Mapping Assessment</b>															
18.1 • Assess needs for baseline map modification	■														
18.2 • Develop comprehensive basemap	■	■	■	■	■										
18.3 • Determine aerial photo needs		■	■	■											