Habitat Maintenance Fund Process

Chapter 1. Introduction

The Lower Colorado River Multi-Species Conservation Program (LCR MSCP) is a multi-stakeholder Federal and non-Federal partnership responding to the need to balance the use of lower Colorado River (LCR) water resources and the conservation of native species and their habitats in compliance with the Endangered Species Act. This is a long-term (50-year) plan to conserve at least 26 species along the LCR from Lake Mead to the Southerly International Boundary with Mexico through the implementation of a Habitat Conservation Plan (HCP) (LCR MSCP 2004). Most of the covered species are state and/or federally listed threatened or endangered species. The Bureau of Reclamation (Reclamation) is responsible for implementing the LCR MSCP over the 50-year term of the program.

The existing distribution and abundance of many of the covered species in the LCR MSCP planning area depends on the extent, distribution, and quality of existing habitat, much of which is under Federal and state management (HCP section 5.4.2, pg 5-8 to 5-9). The HCP requires the establishment of a Habitat Maintenance Fund (HMF) for the purpose of maintaining covered species habitat existing at the start of the LCR MSCP (2005) by implementing actions that will mitigate for the future degradation or loss of habitat resulting from continuation of the covered activities over the term of the MSCP. The HCP states, "The LCR MSCP will contribute to maintaining the condition of a portion of important existing habitat for *southwestern willow flycatcher, yellow-billed cuckoo, Yuma clapper rail,* and *California black rail* within the LCR MSCP planning area" (HCP pg 5-8).

The HCP provided a list of factors for consideration in developing detailed criteria for selection of HMF projects to be funded under the LCR MSCP (HCP pg. 5-9). Using these and other relevant factors identified during the planning process for implementing the HMF, Reclamation and the U.S. Fish and Wildlife Service (USFWS) would develop the detailed criteria that would ensure proposed projects were consistent with the goal of the HMF, goals for the four covered species, and overall goals of the LCR MSCP (HCP pg. 5-8).

Purpose

Maintenance of existing habitat areas is part of the strategy to offset adverse effects of ongoing and future covered activities and to contribute to the recovery of the covered species. Maintaining important existing habitat areas is necessary to help ensure the continued existence of these species in the LCR MSCP planning area. Additionally, maintaining existing habitat will also help ensure the continued existence of source populations from which individuals will be available to colonize LCR MSCP–created habitats as they develop.

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The purpose of this document is to provide Reclamation with a process (Figure 1) for soliciting potential projects and then evaluating and screening those projects to determine which would be funded under the LCR MSCP HMF. This document is intended to:

- Describe the criteria and rating factors to be used in the evaluation process by Reclamation;
- Provide guidance to interested parties on the application process (including application templates), priorities for HMF funding, and site requirements for projects that may be considered by Reclamation to be funded through the HMF;
- Provide information on the funding outlook for the 2015-2055 period of the MSCP.

Chapter 2. Criteria Development

Priorities

Priorities for the HMF are in the following order: 1) marsh habitat, 2) marsh and cottonwood-willow habitat, and 3) cottonwood-willow habitat. These priorities are primarily based on the vulnerability of the land cover type (Appendix C) to the continuing operation of the Colorado River by Reclamation. Current and future management of the river is not conducive to maintaining existing land cover types.

Riparian and marsh communities found historically along the LCR were adapted to a highly dynamic system characterized by annual flows that could change in volume and duration drastically within and between years. Seasonal flooding often occurred that provided the scarified, moist soils necessary for many riparian plants to become established. During the Twentieth Century, construction of large dams and channelization of the river were completed to limit flood events and provide a consistent source of water for development. These projects have largely precluded the dynamic forces necessary to create riparian and marsh communities. At the same time, other disturbance factors, such as wildfire, invasive species infestation, and groundwater depletion, have become more prevalent with the alteration of annual flow events. These disturbances have altered existing marsh and riparian communities to the point where much of the existing habitat is expected to be lost over the next fifty years unless intervention occurs.

Flow and non-flow related actions covered under the LCR MSCP were analyzed to determine the effects of these covered actions on land cover types that provide habitat for covered species. The LCR MSCP committed to replace 243 acres of marsh (HCP pg 5-15) that provided habitat for covered species at the start of LCR MSCP implementation that could be affected by covered actions with 512 acres of newly created marsh habitat. In addition, through the HMF, the LCR MSCP committed to maintaining other existing marsh habitat to ensure the continued existence of covered species in the LCR MSCP planning area and to allow for future increases in their abundance. Marshes are ephemeral and over time the buildup of dead vegetation and collected sediments raises their elevation and they dry out. Historically, flood events removed decadent marshes and created new open backwaters and sloughs which created

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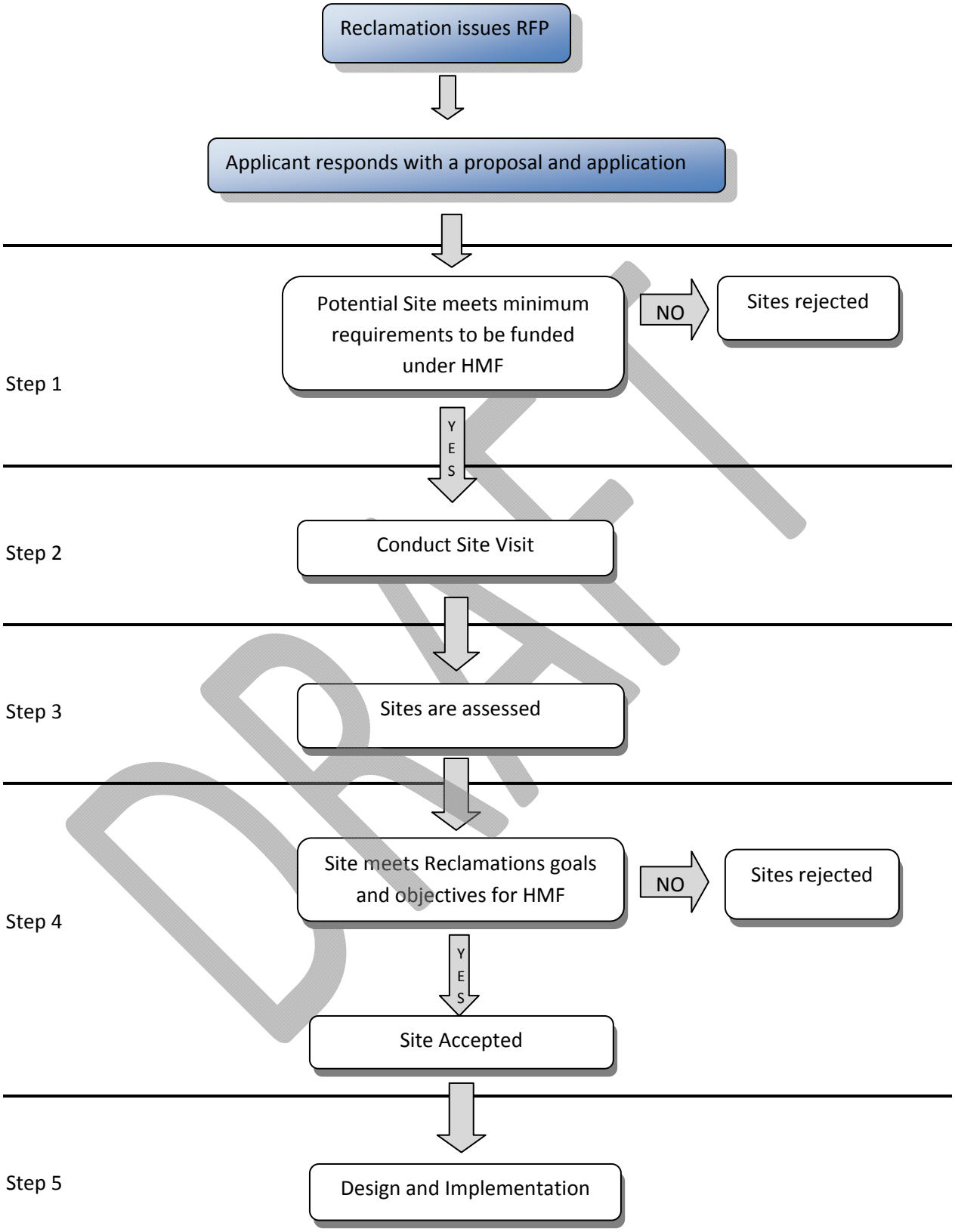

Figure 1. Habitat Maintenance Fund Process

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new marshes. This no longer happens along the Colorado River, and all extant marshes are senescing over time. Since marsh habitats are highly susceptible to future successional degradation, these important habitats have been given the highest priority for HMF funding.

Much of the senescence of cottonwood-willow habitats has already occurred due to changes in flows and channelization of the river. Where cottonwood-willow still exists, it is generally near the river where groundwater tables are high enough to support the mature trees even if regeneration is limited. The LCR MSCP included replacement of existing cottonwood-willow acres where the changes in point of diversion would drop the water table under those areas and result in their eventual loss. These areas may persist for many years until the groundwater drop occurs, but their long-term persistence is doubtful. The new 5,940 acres of cottonwood-willow land cover type was designed to fully offset that loss and increase the amount of this land cover type. Since the losses under this land cover type are already offset by the conservation program, additional efforts to preserve existing habitats have a lower priority than the marsh habitats.

Species Requirements under Land Cover Types

Sites selected under the HMF must have the potential to be restored to the minimum land cover type and specific requirements for at least one of the four target species. The target land cover types are marsh and cottonwood-willow riparian. The minimum requirements for land cover types described in Table 5-3 (Appendix B) of the HCP for the four target species are:

- Yuma clapper rail requires marsh with water depths no greater than 12 inches at a minimum of 5 acres,
- California black rail requires marsh with water depths no greater than 1 inch at a minimum of 5 acres,
- Southwestern willow flycatcher requires cottonwood-willow types I-IV with moist surface soil conditions during the breeding season at a minimum patch size of 10 acres, and
- Yellow-billed cuckoo requires cottonwood-willow types I-II at a minimum of 25 acres.

Basis for Site Selection

Section 5.4.2 (pg. 5-9) of the HCP provided a list of general criteria to be used in selection of HMF projects to be funded under the LCR MSCP. These would include, but are not limited to, documented evidence that the:

- Habitat has degraded following approval of the LCR MSCP,
- Habitat can be improved to meet the same standards as described for covered species habitats to be created under the LCR MSCP Conservation Plan (Table 5-3) [1],
- Extent of the habitat area encompassed by the project is sufficient to meet the needs of the covered species,

[1] Preference will be given to sites where the project results in habitat conditions for the target species that are higher than the minimum standards.

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- Project is economically justified, and
- Cost sharing from the applicant is sufficient[2].

Section 5.4.2 also provides special consideration for selecting projects that provide equipment and other items to support continuous maintenance programs on a broad scale to ensure HMF sites can continue to provide suitable habitat for the target species.

Detailed criteria to be used in the evaluation of potential existing habitat maintenance projects eligible for funding under the HMF were based on the five criteria listed above as well as the overall goals of the LCR MSCP as listed in the HCP. Based on new information (e.g., results of habitat monitoring and research may indicate potential additions or deletions of evaluation criteria) developed through the LCR MSCP adaptive management process, Reclamation may periodically revise these criteria to improve their efficacy.

The evaluation criteria are:

- The proposed action is within the boundaries of the LCR MSCP planning area;
- The proposed project is in marsh or cottonwood-willow riparian land cover types that met the minimum habitat requirements for one or more of the four target species in 2005;
- Proposed project is compatible with HMF funding priorities for marsh and cottonwood-willow;
- Habitat has degraded following approval of the LCR MSCP;
- Habitat can be restored to meet the same standards as described for covered species (Table 5-3), and/or as described in Reclamation's management guidelines for species habitat conditions;
- Extent of habitat area encompassed by the project is equal to or greater than the minimum patch size as described in Table 5-3;
- Project is economically feasible;
- Opportunities for cost sharing with the applicant or to support grant applications are identified; and
- Special consideration for selecting projects that provide equipment and other items to support continuous maintenance programs on a broad scale to ensure HMF sites can continue to provide suitable habitat for the target species.

Chapter 3. Habitat Maintenance Fund Application, Screening and Evaluation Process

[2]The amount and type of cost-sharing included with any particular project will vary according to the type of the project and details of implementation. In some cases, HMF funds may act as the project sponsor's cost share for grants or other funding avenues. Determination of "sufficiency" will be made on a case-by-case basis.

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Timeline for Funding

The LCR MSCP is required to establish a $25 million fund (in 2003 dollars) to be expended on assessing and implementing projects for maintaining existing habitat. The fund will be fully established within the first 10 years of the program. The funds will be kept in interest-bearing accounts held by the lead state agency for Arizona, California, and Nevada.

In order to provide a continuing source of project funding over the 50-year life of the LCR MSCP, Reclamation proposes to limit the amount of HMF funding available in any one 5-year block. At the start of each 5-year block, Reclamation, in conjunction with the USFWS, will determine how much money will be available from the HMF during that block, with the expectation that the balance of the HMF will be zero at the end of the LCR MSCP Program. Reclamation anticipates that the first 5-year block will begin in 2015 when the HMF is fully funded.

Application Process

Landowners/managers can propose projects for the HMF to Reclamation in response to Request for Proposals (RFP). To assist potential applicants, Reclamation has created a Draft Application Form (Appendix A) that identifies the information needed for the initial review and assessment of the proposed project. Through the template, the applicants can provide the information on the site and how the proposed project meets the evaluation criteria discussed in Chapter 2. Use of the template by all applicants will enable an equal level of review of each project by Reclamation. Reclamation may update the application as necessary.

The types of information that may be included in the application are:

- Name of project and land/water ownership status
    - If applicant is not the landowner; consent from the landowner in writing, should be submitted, stating that the landowner is committing to: allowing access to the proposed project property for development and/or maintenance; and to provide consent to applicant (or other) to conduct continued maintenance; and to the commitment of funds (if applicable), etc, for the term of the project.
    - If applicant is not the water right holder; consent in writing, from the water right holder, that they will commit the specific amount needed for the project development and maintenance, and will continue to provide the necessary water quantity for the term of the project.
- Description and map of proposed site location showing the property location within the LCR MSCP boundaries and in context to nearby roads, towns and other local features;
- Land cover type map showing acreage and habitat location(s) currently, and in 2005; specifically identifying the habitat type and acreage for marsh and riparian habitat that meets the minimum habitat requirements for one or more of the target species in 2005;
- Target species locations and population status currently and in 2005;
- Description of proposed habitat restoration concept and how it would restore habitat to physical conditions as described in Table 5-3 of the HCP;

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- Water availability currently, and in 2005;
- Soil conditions currently, and in 2005;
- Existing infrastructure map showing locations of canals, pumps, drains, roads and other infrastructure as appropriate;
- Description of any constraints;
- Identify permits, clearances, and/or authorizations that may be required;
- Detailed cost estimate that identifies the cost associated with each phase of the project;
- Cost Share that identifies any monetary and in-kind services ; and
- Provide a Conceptual Plan that will show Reclamation how the applicant plans to manage the restored site to maintain suitable conditions over time (this will used to develop the long-term maintenance plan).

Once Reclamation has received the application, the following steps will be taken to evaluate the proposed project for funding under the HMF.

Step 1: Initial Assessment

Upon receipt of a proposal and application, Reclamation will review the information provided and assess the initial suitability of the proposed project for funding under the HMF. This initial assessment will include a review of the proposal for completeness of the application, and determination of whether or not it meets the first four evaluation criteria. The four evaluation criteria listed in Chapter 2 are:

- The proposed action is within the boundaries of the LCR MSCP planning area;
- The proposed project is in marsh or cottonwood-willow riparian land cover types that met the minimum habitat requirements for one or more of the four target species in 2005;
- Proposed project is compatible with HMF funding priorities for marsh and cottonwood-willow; and
- Habitat has degraded following approval of the LCR MSCP (2005).

If this initial evaluation finds the project to have sufficient potential benefits, a more extensive evaluation is initiated.

Step 2: Conduct Site Visits

Following a positive initial evaluation as outlined in Step 1, Reclamation will conduct site visits to collect additional information necessary to further assess the sites for potential habitat benefit and, therefore, funding.

Sites visits will be conducted by an interdisciplinary team assembled by Reclamation for this purpose. Using the information contained in the proposal and application, the team will meet with the applicant to review site conditions.

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Step 3: Site Assessment

If Steps 1 and 2 both indicate sufficient potential benefit to habitat, Reclamation will use all available documentation provided by the applicant, and the information generated by Reclamation team's site visits to further assess if the site meets the requirements for funding under the HMF. This in-depth assessment will be based on the following site assessment factors:

- Habitat development potential;
- Initial habitat development costs; and
- Long-term maintenance obligation;

And may include:

- Infrastructure;
- Water availability;
- Soil condition; and
- Constraints.

Habitat Development Potential

The habitat development potential assesses the extent of habitat that can be restored on the site. Sites that can accommodate creation of habitat in patches larger than the minimum patch sizes and that are in close proximity to existing habitats will be assessed higher.

Initial Habitat Development Costs

Reclamation may assess the proposal's cost estimate in at least four categories:

- Conceptual design of proposed project
- Implementation
    - site preparation
    - water
    - plant species as needed
    - infrastructure improvement, construction, or installation
    - regulatory compliance
- Long-term maintenance
    - operation and maintenance
- Cost Share
    - available
    - amount of cost share
- Other cost categories as appropriate for each site

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Reclamation will use the best readily available sources to determine whether or not costs associated with design, implementation, and maintenance are consistent with similar projects within region and industry.

Long-term Maintenance

The long-term maintenance consideration qualitatively assesses the proposed site based on the sites ability to be maintained as target species habitat over the life of program with the applicant providing the best estimate of frequency for implementing "extraordinary" maintenance (re-set the habitat) necessary. It is expected that the applicant includes a proposed Conceptual Plan that provides an outline of what they intend to do to maintain habitat. The outline must include all pertinent aspects to maintain the site to provide suitable habitat for the targeted species. HMF funds shall be used only for design and construction of the project; the obligation for long-term maintenance and monitoring is the responsibility of the property owner or managing agency. It is expected that some projects, such as dredging a marsh, will require additional funds for "extraordinary" maintenance and the applicant will apply again following the HMF process.

Infrastructure

Reclamation will assess the suitability of existing infrastructure, including its condition for maintaining target species habitat. The assessed infrastructure may include:

- Irrigation and drainages systems (lined and unlined water canals and ditches);
- Pumps and diversions; and
- Support infrastructure (e.g., electric power supply).

Water Availability

The water availability factor assesses the suitability of the proposed site's water supply to provide for:

- The re-establishment of marsh target species habitat through sufficient water to maintain water depths, including surface and subsurface water;
- Sufficient flow through created marshes to maintain water quality necessary to maintain habit condition for covered species;
- Maintenance of existing cottonwood-willow riparian habitats, including moist surface soil conditions; and
- The ability to ensure ongoing irrigation of restored habitat(s) to maintain habitat values over the long-term

Elements of the water availability that will be considered under this factor include:

- Water entitlement: considerations include the certainty of water supply and the extent and types of habitat that can be created and maintained on a site based on the quantity of water available to the site.

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- Water quality: considerations may include potential contribution of selenium, salts, and other contaminants at levels that could affect biotic communities, including dominant vegetation in created covered species habitats based on the quality of the available water.

Soil Condition

The soil condition factor assesses the suitability of a site's soils to provide for the establishment and sustainment of habitats. Elements of soil conditions that may be considered under this factor include:

- Soil texture: considerations include the suitability of the soil to support dominant land cover type plant species and, depending on the habitat type, water retention or drainage requirements.
- Soil salinity: considerations include whether or not soil salinity is within the tolerance range for the land cover type.

Soil texture and salinity conditions at each site may be identified from Natural Resource Conservation Service soil survey reports and any additional information provided by the landowner/manager. The evaluation will also take into consideration the quantity of water available to mitigate effects of salinity on sites with high salinity.

Constraints

Reclamation will assess any site constraints that could preclude a project from being funded, completed, or result in cost overruns. Possible site constraints include but are not limited to:

- Water availability;
- Site conditions and access;
- Infrastructure;
- Future development;
- Environmental compliance; and
- Engineering costs.

Reclamation will assign, based on results of the technical and cost assessments conducted under Step 3, an overall habitat restoration rating of high, moderate, or low for each proposed site. These ratings would be assigned based on the relative ability of a site to achieve overall objectives of the LCR MSCP HCP, HMF and the likely costs associated with development, implementation and maintenance of the site. Preference will be given to sites where the proposed action results in habitat conditions for the target species that are higher than the minimum standards (Table 5-3).

Generally, sites rated high will be those that:

- Are the most cost effective to implement;
- Achieve LCR MSCP habitat objectives; and
- Support site conditions that are the most conducive to the successful establishment of high value habitat.

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Step 4: Site Selection and Acceptance

Applicant shall be notified in writing of acceptance or rejection. If project is accepted, Reclamation shall enter into a contract with the applicant to ensure the project is completed as the HCP intended.

Step 5: Project Implementation and Development of Long-term Management Plan

Design and Construction

Reclamation may provide technical assistance to the applicant with development of the implementation plan (including any construction plans) for the project.

Long-term Management Plan

Reclamation may provide technical assistance to the applicant during the development of the long-term management plan for the project to guide future activities to maintain the restored habitat in suitable condition for as long as feasible and reduce the need for multiple treatments at the same site. The plan is expected to include implementation of long-term management measures and monitoring to maintain and adaptively manage the habitat and ensure covered species goals are achieved over the term of the project. Long-term management activities may include but are not limited to: dredging, planting vegetation, irrigation, burning, and vegetation removal. Reclamation's responsibility concludes following contract closeout.

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REFERENCES

Lower Colorado River Multi-Species Conservation Program (LCR MSCP). 2004. Lower Colorado River Multi-Species Conservation Program, Volume II; Habitat Conservation Plan. Final. December 17. (J&S 004500.00) Sacramento, CA.

Lower Colorado River Multi-Species Conservation Program (LCR MSCP). 2004. Lower Colorado River Multi-Species Conservation Program, Funding and Management Agreement. April, 2005. Lower Colorado Region, Bureau of Reclamation, Boulder City, NV.

Lower Colorado River Multi-Species Conservation Program (LCR MSCP). 2004. Lower Colorado River Multi-Species Conservation Program, Implementing Agreement. April, 2005. Lower Colorado Region, Bureau of Reclamation, Boulder City, NV.

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Appendix A: Habitat Maintenance Fund Application

Lower Colorado River Multi-Species Conservation Program
Habitat Maintenance Fund
Draft Application Form

Applicant Name:	**Contact Name:**	
Address:	**Contact Number:**	**Email Address:**
	Proposed Site Name and Location:	
Date:	**Cost Estimate:**	

PG: 1 of 3

Provide a description of proposed site:

Is a map attached to the application showing proposed site that includes LCR MSCP boundaries, roads, towns other local features? Yes ☐ No ☐

Is the applicant the land owner? Yes ☐ No ☐ If not, please list land owner_____

Does applicant own or have an agreement with land/water owner? Yes ☐ No ☐

Does the applicant have the necessary permits? Yes ☐ No ☐

If no, can the applicant acquire the necessary permits? Yes ☐ No ☐ Please, explain
_____

Is the Conceptual Plan that describes how the project will be managed/maintained to provide suitable habitat (including Table 5-3 species minimum requirements) for targeted species attached to the application? Yes ☐ No ☐

What was the land cover type(s) (see Appendix C) and acreage in 2005? (e.g.,Marsh (M) I-VII and/or Cottonwood-willow (CW) I-VI)? Check the land cover type(s) box below and document the acreage(s).

☐ M-I: _____ac	☐ M-IV: _____ac	☐ M-VII: _____ac	☐ CW-III: _____ac	☐ CW-VI: _____ac
☐ M-II: _____ac	☐ M-V: _____ac	☐ CW-I: _____ac	☐ CW-IV: _____ac	☐ CW-VII: _____ac
☐ M-III : _____ac	☐ M-VI: _____ac	☐ CW-II: _____ac	☐ CW-V: _____ac	☐ Other: _____ac

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Lower Colorado River Multi-Species Conservation Program
Habitat Maintenance Fund
Draft Application Form

Applicant Name:	**Contact Name:**	
Address:	**Contact Number:**	**Email Address:**
	Proposed Site Name and Location:	
Date:		

PG 2 of 3:

What is the <u>current</u> land cover type(s) (see Appendix C)? (e.g.,Marsh (M) I-VII and/or Cottonwood-willow (CW) I-VI)? Check the land cover type(s) box below and document the acreage(s).

☐ M-I: _____ac	☐ M-IV: _____ac	☐ M-VII: _____ac	☐ CW-III: _____ac	☐ CW-VI: _____ac
☐ M-II: _____ac	☐ M-V: _____ac	☐ CW-I: _____ac	☐ CW-IV: _____ac	☐ CW-VII: _____ac
☐ M-III : _____ac	☐ M-VI: _____ac	☐ CW-II: _____ac	☐ CW-V: _____ac	☐ Other: _____ac

Is there species occurrence and use data available for 2005? Yes ☐ No ☐ If yes, please include with the application.

Is there any current species occurrence and use data available? Yes ☐ No ☐ If yes, please include with the application.

Are you providing any GIS data for the proposed site? Yes ☐ No ☐ This may include, site boundaries, land owners, infrastructure, constraint boundaries, soils type(s), hydrology, species occurrence, etc. If available, please provide data in UTM Zone 11, NAD83 horizontal datum, NAVD88 vertical datum.

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Applicant Name:	**Contact Name:**	
Address:	**Contact Number:**	**Email Address:**
	Proposed Site Name and Location:	
Date:		

PG 3 of 3:

What are the expected land cover type(s) (see Appendix C) and acreage goal following restoration activities? (e.g.,Marsh (M) I-VII and/or Cottonwood-willow (CW) I-VI)? Check the land cover type(s) box below and document the acreage(s).

☐ M-I: _____ac	☐ M-IV: _____ac	☐ M-VII: _____ac	☐ CW-III: _____ac	☐ CW-VI: _____ac
☐ M-II: _____ac	☐ M-V: _____ac	☐ CW-I: _____ac	☐ CW-IV: _____ac	☐ CW-VII: _____ac
☐ M-III : _____ac	☐ M-VI: _____ac	☐ CW-II: _____ac	☐ CW-V: _____ac	☐ Other: _____ac

Is a map attached showing existing infrastructure and the proximity to proposed site?

Yes ☐ No ☐

What are the current soils conditions, and in 2005?

Are there any site constraints? Yes ☐ No ☐ If yes, please describe them.

Are there current photos? Yes ☐ No ☐ If Yes, please include with application.

Are there photos from 2005? Yes ☐ No ☐ If Yes, please include with application.

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Appendix B: Table 5-3 with Highlighted Target Species

Table 5-3. Minimum Requirements for Achieving Covered Species Habitat Creation Goals

Species	Habitat Creation Goal (acres)	Created Land Cover Type that will Provide Species Habitat	Minimum Patch Size of Created Land Cover that will Provide Habitat (acres)[a]
Threatened and Endangered Species			
Yuma clapper rail	512	Marsh with water depths no greater than 12 inches	5[b]
Southwestern willow flycatcher	4,050	Cottonwood-willow types I–IV with moist surface soil conditions during the breeding season	10[c]
Desert tortoise	0	Not applicable	Not applicable
Bonytail	360	Backwaters that contain the physical, chemical, and biological conditions required to support native LCR fishes in a healthy condition	Not applicable
Humpback chub	0	Not applicable	Not applicable
Razorback sucker	360	Backwaters that contain the physical, chemical, and biological conditions required to support native LCR fishes in a healthy condition	Not applicable
Other Covered Species			
Western red bat (roosting habitat)	765	Combination of cottonwood-willow types I and II and honey mesquite type III	No minimum requirement[d]
Western yellow bat (roosting habitat)	765	Combination of cottonwood-willow types I and II and honey mesquite type III	No minimum requirement[d]
Desert pocket mouse	0	Not applicable	Not applicable
Colorado River cotton rat	125	Marsh	No minimum requirement[d]
Yuma hispid cotton rat	76	Cottonwood-willow with a moist herbaceous understory	No minimum requirement[d]
Western least bittern	512	Marsh with water depths no greater than 12 inches	No minimum requirement[d]
California black rail	130	Marsh with water depths no greater than 1 inch	5[e]
Yellow-billed cuckoo	4,050	Cottonwood-willow types I–III	25[f]
Elf owl	1,784	Combination of cottonwood-willow types I and II and honey mesquite type III	No minimum requirement[d]

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Table 5-3. Continued

Species	Habitat Creation Goal (acres)	Created Land Cover Type that will Provide Species Habitat	Minimum Patch Size of Created Land Cover that will Provide Habitat (acres)[a]
Gilded flicker	4,050	Cottonwood-willow types I–III	No minimum requirement[d]
Gila woodpecker	1,702	Cottonwood-willow types I–IV	50[g]
Vermilion flycatcher	5,208	Combination of cottonwood-willow types I–IV and honey mesquite type III	No minimum requirement[d]
Arizona Bell's vireo	2,983	Combination of cottonwood-willow types III and IV and honey mesquite type III	No minimum requirement[d]
Sonoran yellow warbler	4,050	Cottonwood-willow types I–IV	2.5[h]
Summer tanager	602	Cottonwood-willow types I and II	No minimum requirement[d]
Flat-tailed horned lizard	0	Not applicable	Not applicable
Relict leopard frog	0	Not applicable	Not applicable
Flannelmouth sucker	85	Backwaters that contain the physical, chemical, and biological conditions required to support native LCR fishes in a healthy condition	Not applicable
MacNeill's scotywing skipper	222	Honey mesquite type III created with quail bush to create honey mesquite–quail bush	No minimum requirement
Sticky buckwheat	0	Not applicable	Not applicable
Threecorner milkvetch	0	Not applicable	Not applicable

Note: Failure to achieve the minimum habitat creation requirements for each species could require implementation of remedial measures (see Section 5.12.3).

Not applicable = Habitat will not be created for this species under the LCR MSCP Conservation Plan and minimum habitat patch size requirements do not apply, or, if habitat will be created for the species, patch size is not a constituent element of the species habitat.

[a] Minimum extent of habitat patches that must be created to be considered species habitat. It is the intent, however, of the LCR MSCP to create habitat in the largest patch sizes possible within the site specific constraints that are associated with conservation areas.

[b] Minimum habitat patch size is based on research indicating that the density of Yuma clapper rail is independent of habitat patch size (Anderson and Ohmart 1985) and the subspecies will use relatively small patches of habitat. Habitat will be created in patches as large as possible but will not be created in patches smaller than 5 acres. Smaller patches are likely to support isolated nesting pairs and be within the range of habitat patch sizes used by the species for foraging and dispersal. Larger patches would be expected to support multiple nesting pairs.

[c] Minimum habitat patch size can vary widely (Sogge et al. 1997a; Spencer et al. 1996; Paradzick et al. 2000; McKernan 1997; U.S. Fish and Wildlife Service 2001). Saltcedar-dominated riparian vegetation at southwestern willow flycatcher breeding sites in the Grand Canyon ranged from 1.48 to 2.22 acres (Sogge et al. 1997a). The minimum habitat patch size was selected based on the assumption that up to a

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total of 10 acres of habitat may be required to sustain a nesting pair, accounting for variances in habitat quality among sites and years and periodic loss of habitat to wildfire and other unforeseeable factors.

[d] Minimum habitat patch size requirements for this species is not known or is not well understood. To meet the minimum patch requirements for species for which minimum habitat patch size requirements are established, however, created cottonwood-willow and marsh land cover types will be created, at a minimum, in the following patch sizes:

Land Cover Type	Total Extent of Land Cover Type to Be Created (acres)	Minimum Extent to Be Created by Patch Size (acres)			
		50-acre patches	25-acre patches	10-acre patches	5-acre patches
Cottonwood-willow	5,940	1,702	2,348	1,890	0
Marsh	512	0	0	0	512

[e] The minimum patch size requirements for the California black rail in the LCR MSCP planning area is not known. Tecklin (1999), however, found that in the foothills of the central Sierra Nevada the species used marshes as small as 0.5 acre and 32% of occupied wetlands were less than 0.75 acre. Habitat will be created in patches as large as possible but will not be created in patches smaller than 5 acres. Smaller patches are likely to support one to several nesting pairs and be within the range of habitat patch sizes used by the species for foraging and dispersal. Larger patches would be expected to support multiple nesting pairs.

[f] Recent research along the LCR has found that the minimum nesting habitat patch size provided by cottonwood-willow forest for the yellow-billed cuckoo was 25 acres (Halterman pers. comm.). Habitat will be created in patches as large as possible but will not be created in patches smaller than 25 acres, which at a minimum, is expected to provide suitable nesting habitat for 1–2 pairs. Creation of larger patches are expected to provide sufficient habitat to support multiple nesting pairs.

[g] Gila woodpeckers appear to need large blocks of woody riparian vegetation for nesting; isolated patches of woody riparian vegetation less than 49 acres do not support this species (Rosenberg et al. 1991).

[h] Grinnell (1914) reported observing from one to four Sonoran yellow warbler singing males per 2.5 acres in cottonwood-willow stands along the LCR. The smallest patches of cottonwood-willow land cover that will be created are 10 acres (to meet the minimum patch size requirement for the southwestern willow flycatcher) and, therefore, are expected to support several nesting pairs, with larger patches providing the capacity to support larger numbers of nesting pairs.

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Appendix C: Land Cover Types

Examples of Woody Riparian Land Cover Structural Types (HCP pg. 4-12)

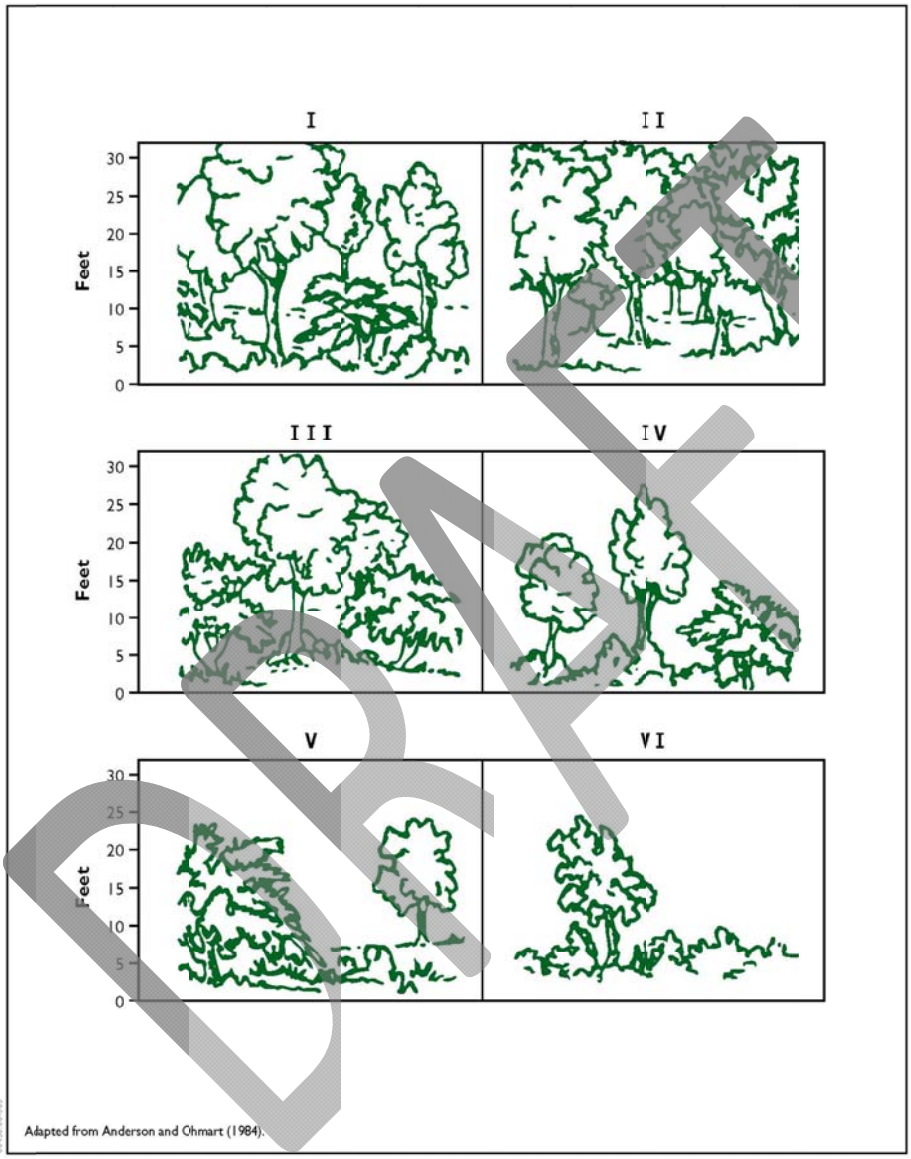

Figure 3-1
Examples of Woody Riparian Land Cover Structural Types

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Table 4-4 Riparian Vegetation Communities and Characteristics Used in Anderson and Ohmart Vegetation Classification System (HCP pg.4-12)

Community	Characteristics
Cottonwood-willow	*Salix gooddingii* and *Populus fremontii* (the latter usually in low densities) constituting at least 10 percent of total trees (remaining trees are usually saltcedar)
Saltcedar	*Tamarix* spp. constituting 80-100 percent of total trees
Honey mesquite	*Prosopis glandulosa* constituting 90-100 percent of total trees
Saltcedar-honey mesquite	*P. glandulosa* constituting at least 10 percent of total trees; rarely found to constitute more than 40 percent of total trees
Saltcedar-screwbean Mesquite	*P. pubescens* constituting at least 20 percent of total trees
Arrowweed	*Pluchea sericea* constituting 90-100 percent of total vegetation in area
Atriplex	*Atriplex lentiformis, A. canescens* and/or *A. polycarpa* constituting 90-100 percent of total vegetation in area

Source: Anderson And Ohmart 1984; and Younker and Anderson, 1986.

Table 4-4 Riparian Vegetation Structural Types and Characteristics Used in Anderson and Ohmart Classification System (HCP pg.4-12)

Structural Type	Characteristics
I	Mature stand with distinctive overstory more than 15 feet tall; intermediate class is 2-15 feet tall and understory is 0-2 feet tall
II	Overstory is more than 15 feet tall and constitutes more than 50 percent of the trees; little or no intermediate class present
III	Largest proportion of trees is 10-20 feet tall; few trees above 20 feet or below 5 feet tall
IV	Few trees above 15 feet tall; 50 percent of the vegetation is 5-15 feet tall and 50 percent is 1-2 feet tall
V	60-70 percent of the vegetation is 0-2 feet tall, the remainder is 5-15 feet tall
VI	75-100 percent of the vegetation is 0-2 feet tall

Source: Anderson And Ohmart 1984; and Younker and Anderson, 1986.

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Type	Characteristics
1	Nearly 100 percent cattail/bulrush; small amounts of *Phragmites australis* (common reed) and open water
2	Nearly 75 percent cattail/bulrush; many trees and grasses interspersed throughout cover
3	About 25-50 percent cattail/bulrush; some *P. australis*, open water, trees, and grass
4	About 35-50 percent cattail/bulrush; many trees and grasses interspersed throughout cover
5	About 50-75 percent cattail/bulrush; few trees and grasses interspersed throughout cover
6	Nearly 100 percent *P. australis*; little open water
7	Open marsh (75 percent water) adjacent to sparse marsh vegetation; sandbars and mudflats visible when the Colorado River is low

Source: Anderson And Ohmart 1984; and Younker and Anderson, 1986.

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