



**Coachella Valley Multiple Species Habitat Conservation Plan &  
Natural Community Conservation Plan**

# **Coachella Valley Stormwater Channel and Delta Conservation Area Reserve Management Unit Plan**



**Prepared by  
for the Coachella Valley Conservation  
Commission**

**Coachella Valley Multiple Species Habitat  
Conservation & Natural Community  
Conservation Plan**

**Coachella Valley Stormwater Channel  
and Delta Conservation Area  
Reserve Management Unit Plan**

**Prepared for:  
Coachella Valley Conservation Commission  
Palm Desert, CA**

**Prepared by:**

**May 2012**

# ***Reserve Management Unit Plan***

## ***Reserve Management Unit 5:***

### ***Coachella Valley Stormwater Channel and Delta Conservation Area***

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## **1.0 Purpose**

The Coachella Valley Multiple Species Habitat Conservation Plan/Natural Community Conservation Plan (CVMSHCP/NCCP) requires that the Coachella Valley Conservation Commission (CVCC) ensures adequate management of locally (Permittee) managed Reserve Lands. This, in turn, requires that CVCC, in coordination with the Reserve Management Unit Committees (RMUC), prepares a Reserve Management Unit Plan (RMUP) for each Reserve Management Unit (RMU) for review and approval by the Reserve Management Oversight Committee (RMOC) to define specific management actions, schedules, and responsibilities. The RMUPs are to be completed within 3 years of plan adoption. This RMUP fulfills this requirement for the Stormwater Channel and Delta RMU, which is one of the 6 RMUs identified in the CVMSHCP. An RMU may be comprised of just one of the Conservation Areas identified in the CVMSHCP or of multiple Conservation Areas. RMU 5 consists solely of the Stormwater Channel and Delta Conservation Area.

In addition to providing specific management actions, schedules, and responsibilities for Permittee managed lands, the RMUP is intended to provide a framework for and to facilitate the collaborative management by all the involved management entities (local, state and federal agencies and non-profit organizations) to provide for effective, efficient, and cooperative use of the combined resources available. While individual agencies remain responsible for managing their lands, the premise of the RMUP is that maximizing cooperation and coordination should result in the best management of all Reserve lands and facilitate each entity's management.

## **1.1 General Background**

The CVMSHCP establishes a structure for coordinating management in the Reserve System among the various entities involved through the establishment of an RMUC for each RMU. The CVMSHCP also provides for CVCC to retain a Land Manager to ensure management of the Permittees' mitigation lands and coordination with the RMUC for each RMU, and with the RMOC. Figures 1-1 and 1-2 show the relationship between the different managing entities and their role in the management of the RMUs. Land Managers and interested parties are referred to the following sections of the CVMSHCP for information regarding the identified topics.

Reserve Management Oversight Committee – Section 6.1.3

Reserve Management Unit Committees – Section 6.1.4

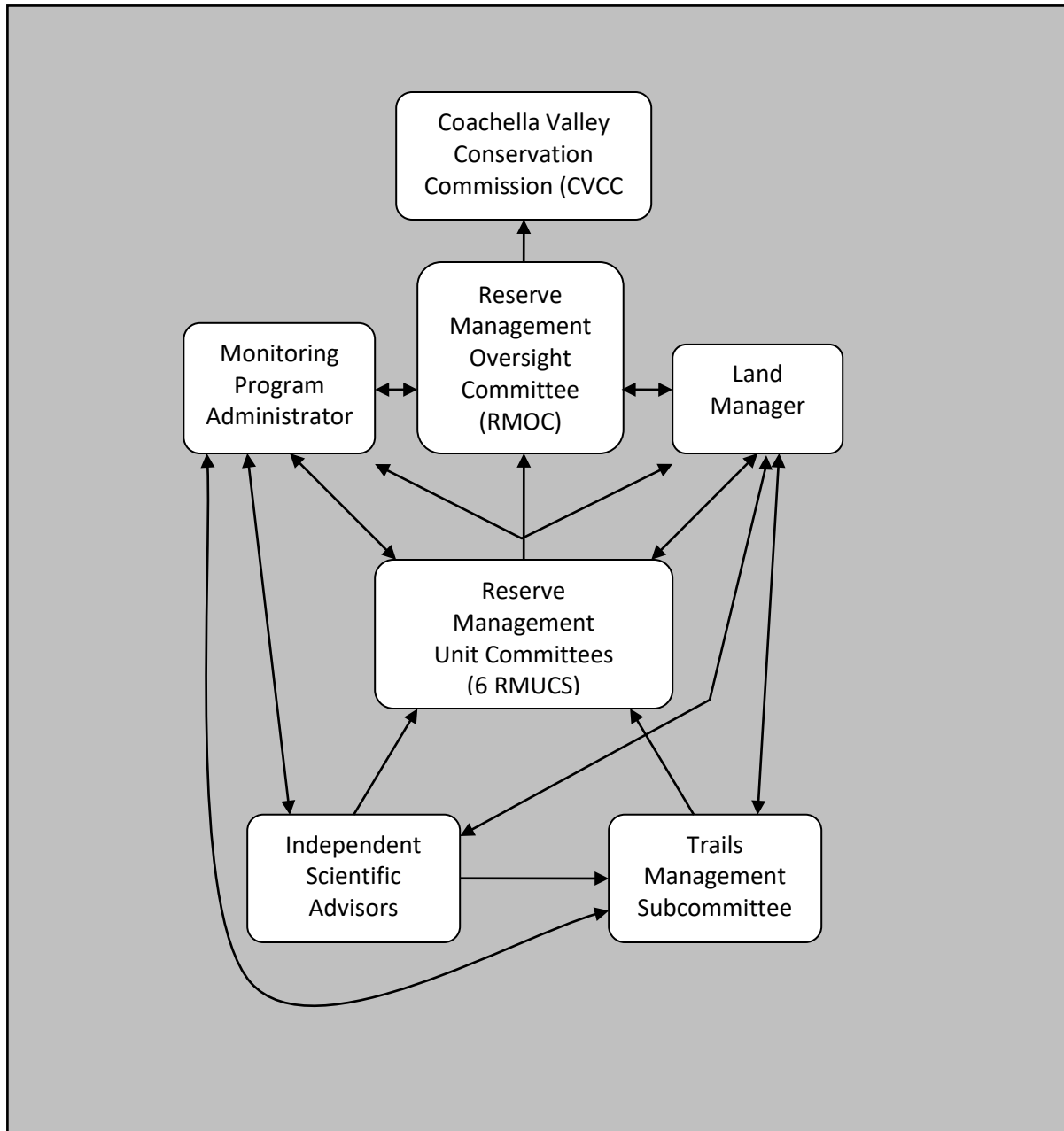
Land Manager – Section 6.1.5

Monitoring Program Administrator – Section 6.1.6

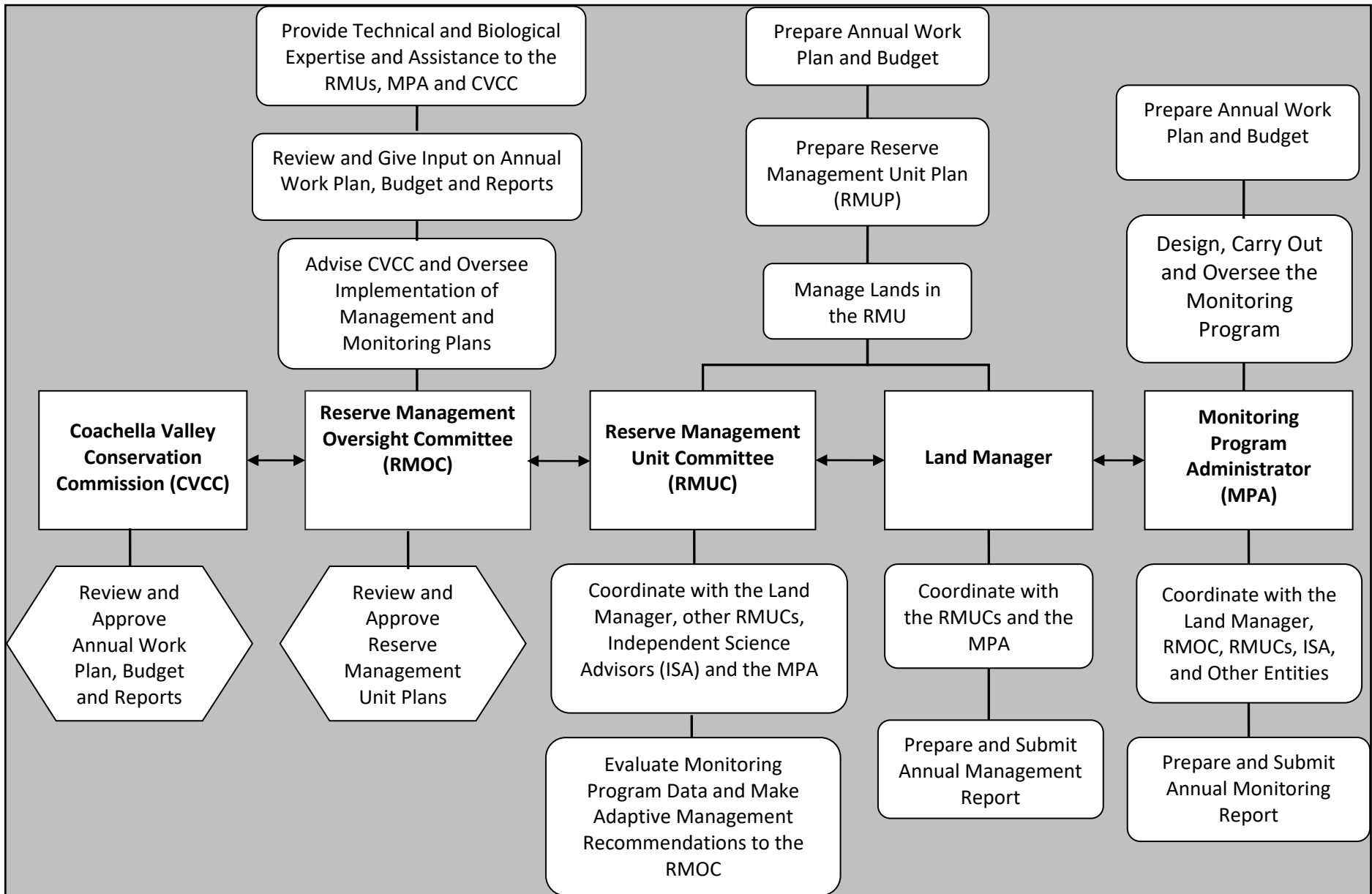
RMUP Requirements - Section 6.2

Reserve System Management and Monitoring Program – Section 8.0

**Figure 1-1: Organizational Structure & Decision Process for the Monitoring and Management Programs**



**Figure 1-2: Organizational Responsibilities for the Monitoring and Management Program**



## **1.2 Reserve Management Unit Background**

This unit consists of the Coachella Valley Stormwater Channel and Delta Conservation Area. Figure 1-3 depicts the location, boundaries and ownership for RMU 5. The Permittee and other Conservation lands within this Conservation Area are Coachella Valley Water District (CVWD), Imperial Irrigation District (IID) and BLM lands. The RMUC consists of the Land Manager, CVWD, IID, and BLM. BLM Lands Managed within this RMU are covered under the California Desert Conservation Area. There are scattered parcels of BLM land in the Coachella Valley Stormwater Channel and Delta Conservation Area totaling approximately 389 acres. These are multiple use lands. With implementation of the MSHCP, these lands will be managed as part of the Conservation Area.

Implementing all of the Conservation Objectives and Required Measures delineated in the CVMSHCP is a fundamental obligation of the Permittees acting through the CVCC, and, therefore, provide key guidance as to the management of the RMU. Land Managers and interested parties are referred to the following sections of the CVMSHCP for information regarding the identified topics. The Conservation Area sections include information on Covered Species, natural communities, land ownership, Conservation Objectives and Required Measures.

Stormwater Channel and Delta Conservation Area – Section 4.3.20

Current Management – Section 8.2.3, Reserve Management Unit 5

Adaptive Management – Section 8.2.4.

General Ongoing Management – Section 8.2.4.1

Monitoring for the MSHCP Reserve System – Section 8.3

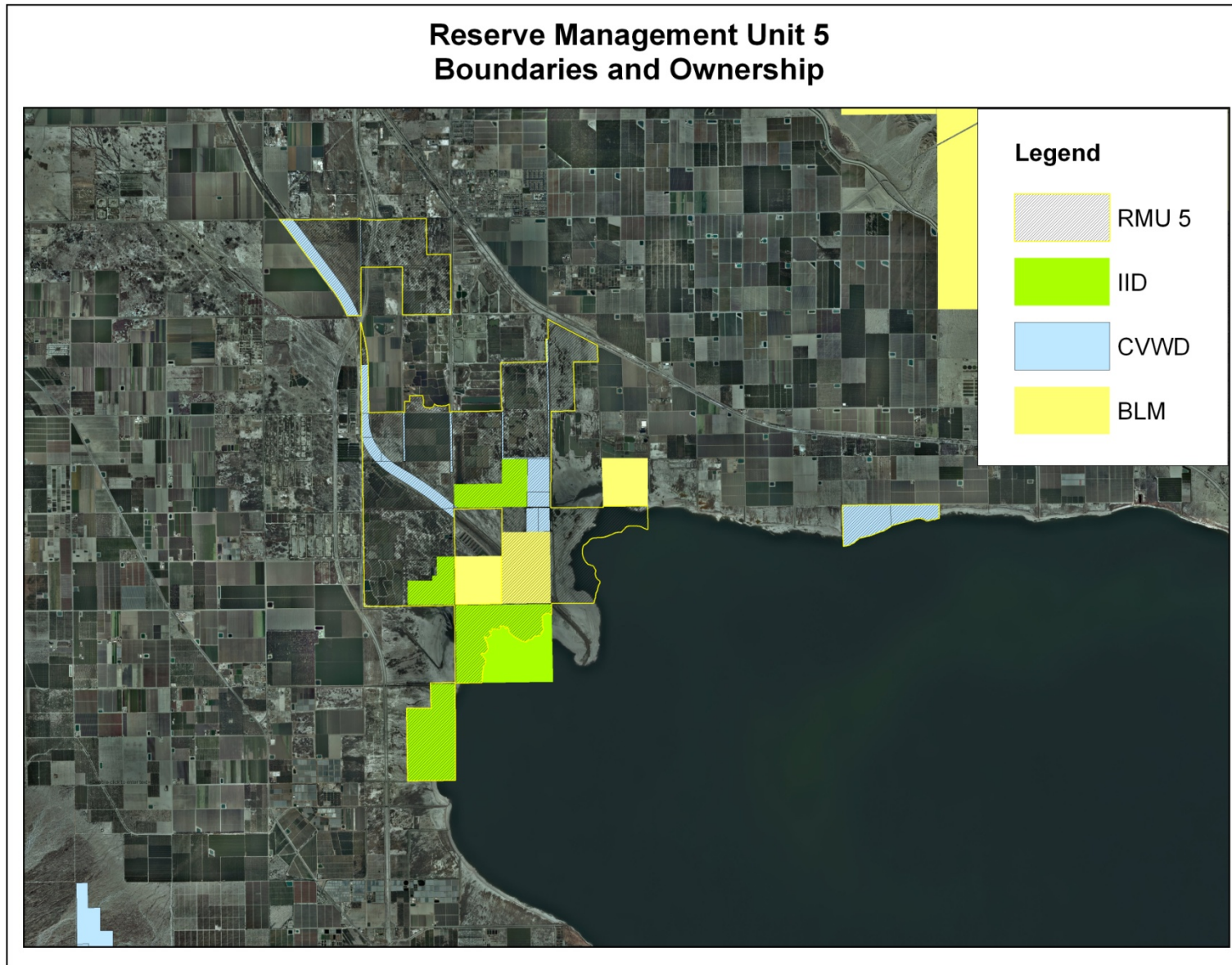
## **1.3 Current Management, Monitoring, and Public Access**

### Coachella Valley Conservation Commission

The CVCC currently owns no land in this RMU however it is involved as a coordinating entity on management activities at present. The three other public entities, BLM, CVWD and IID, own land for conservation purposes in this RMU and actively manage it. The management and monitoring activities among the other landowners within this RMU are described in Appendix I.



**Figure 1-3: Coachella Valley Stormwater Channel and Delta Location and Ownership**



## **2.0 Threats, Stressors, other Management Issues, and Recommended Management Measures**

There are a number of potential threats which could affect the Covered Species and natural communities found in the Stormwater Channel and Delta Resource Management Unit. The natural stochasticity (randomness) of weather events, long-term climatic trends, and anthropogenic stresses can all have impacts. Section 8 of the CVMSHCP includes Threats Models for a number of the community assemblages. These models list threats and impacts they can have on communities and species. Current and potential threats to the RMU and preventative and coordinated measures to address those threats are discussed in detail below. The threats are presented in order of severity to reflect that some threats have the potential to impact Covered Species so severely that the CVMSHCP's Conservation Goals and Objectives for a species might not be met if the threat is not adequately addressed. The severity of these threats dictates that they receive priority in the allocation of management resources by both CVCC and other land management entities, thus emphasizing the importance of cooperation and coordination among all management entities, as well as a close working relationship between the managers and the monitoring team to ensure that the nature of the threats are well understood and the efficacy of management actions is assessed so that adaptive management occurs. Responsibility for implementation of the management actions listed in this section will be the combined responsibility of the Land Manager, the other Reserve Management Unit Committee members and where applicable, the Monitoring Program Administrator (MPA). It should be noted that the threats and stressors discussed below are those known at present. Over time other issues may emerge and the degree of severity associated with current threats may change; thus, this plan must be regarded as dynamic and the RMUC should, in conjunction with adaptive management, ensure that the RMUP evolves as needed.

### **2.1 Invasive Species**

Invasive species occur in several natural communities within the Stormwater Channel and Delta RMU, being most prevalent in riparian, marsh, and aquatic habitats. Invasive species put pressure on the species, communities, and ecosystems of Stormwater Channel and Delta RMU, and in some cases they may pose a significant threat to them. They cause impacts through, competition, predation, physical alteration of the environment, or a combination of these and other factors.

Management Goal: Prevent the establishment of new infestations of invasive plants and animals and reduce or eliminate current infestations.

Specific recommendations for preventative and coordinated response management measures for individual invasive species or similar groups of invasive species are given below. However, there are general measures, applicable to all invasive species, which can help prevent their introduction and establishment or their future spread if already established. They are:

Recommended Management Actions:

1. Develop a coordinated program for the detection and control of new infestations of invasive species as part of the Annual Work Plans, including a requirement for the use of standards for cleaning and handling equipment, gear and supplies, to help prevent the spread of invasive species. A useful resource may be <http://www.invasivespeciesinfo.gov/aquatics/prevention.shtml>.
2. Conduct ongoing surveys/inspections for new infestations of invasive plants, animals, and pathogens (the frequency will need to be determined based on past experience and current conditions). Surveys should be for both previously undetected species, e.g., bufflegrass (*Pennisetum ciliare*) and new infestations of established species.
3. Control newly detected infestations of invasive plant species to prevent their establishment.
4. Document infestations and related control efforts, including collecting a standard set of data and submitting it for inclusion in the GIS database for the RMU and the CVMSHCP area.
5. Document invasive species control efforts/treatments including collecting standardized data and submitting it for entry into the GIS database for the RMU and the CVMSHCP area.
6. Clean (or replacing when applicable) all equipment, gear, and supplies prior to moving from one location to another during the conduct of management and monitoring activities.

***Tamarisk/Salt Cedar (Tamarix spp.)***

The deciduous species, *Tamarix ramosissima*, and *T. chinensis* and *T. parviflora*, collectively known as salt cedar, are highly invasive. They can displace native riparian trees such as mesquite, cottonwood, and willows; and stands of mature trees can effectively prevent the re-establishment of native species due to shading, elevated salinity, and other possible factors such as changes to soil biota. Large dense stands of salt cedar may consume more water than equivalent stands of native cottonwoods and other native species, potentially causing ground water levels to drop and less surface water to be available. Salt cedar may also promote more frequent and intense fire in some areas. Another species of tamarisk, *Tamarix aphylla*, known as athel tamarisk, is also present in the RMU in smaller numbers in various locations. While not known to be as invasive in the CVMSHCP area, its effects on the environment, where present, can be similar to those of salt cedar.

The CVCC will assist the RMUC members in obtaining future grant funds, and CVCC staff, as available staff and resources permit, will coordinate control and survey efforts with the other managing entities as appropriate.

Recommended management actions are:

1. Develop and maintain a map of the extent of current infestations and conduct annual inspections to locate and control new infestations. The *Draft Monitoring Protocols for the*

*Desert Wetland Communities and Covered Species* report, prepared by C.W. Barrows, M.F. Allen, J.T. Rotenberry, & R.A. Redak, University of California Center for Conservation Biology, 30 June 2009, discuss metrics for use in such monitoring. This report can be found at:

[www.cvmshcp.org/Management%20and%20Monitoring/20090630\\_Draft\\_Desert\\_Wetland\\_Protocols.pdf](http://www.cvmshcp.org/Management%20and%20Monitoring/20090630_Draft_Desert_Wetland_Protocols.pdf)

2. Identify, prioritize, and treat infestations of tamarisk in the RMU outside of the Coachella Valley Stormwater Channel (CVSC) and agricultural drainage system. Coachella Valley Water District (CVWD) operation and maintenance activities will address tamarisk removal within these channels. Control mechanisms include mechanical and chemical treatments. Where feasible, the Land Manager and the RMUC should recruit volunteers through schools, Scout programs, and community groups to assist with this effort. The Land Manager and the RMUC should also explore the potential to coordinate with the Sheriff's Department and the courts to use individuals in alternative sentencing programs and/or the use of appropriate inmates.
3. Evaluate whether there are locations where it may be important to enter into agreements with private land owners to remove tamarisk. Where feasible the Land Manager and the RMUC member entities should pursue approvals and funding.
4. Re-treat re-growth in treated areas.
5. Re-vegetate with native species in treated areas as needed.
6. Consider prescribed fire as an initial treatment in some areas (to facilitate access to infested areas) and follow-up with additional treatment actions.
7. A collaborative approach between the RMUC and the MPA to evaluate different treatment options could also help to advance control efforts.

### ***Sahara mustard (Brassica tournefortii)***

*Brassica tournefortii* (Sahara Mustard) can successfully compete with native annual forbs and grasses to the extent that there is very little growth and reproduction of native annuals in areas favorable to Sahara mustard in years when it is abundant. The loss of native annuals and a concomitant loss of native insects which utilize native forbs and grasses could affect populations of lizard species including the flat-tailed horned lizard by reducing their food supply. In the past, Sahara mustard was typically only abundant in the Coachella Valley during years of above average annual rainfall, allowing native plants to recover in other years. In recent years, including spring 2010, Sahara mustard has been abundant during years with average rainfall (Cam Barrows, personal communication). This trend is of concern to scientists and land managers, for if it continues, large areas of the Coachella Valley could lose much of its native annual vegetation. Type conversion to Sahara mustard and associated non-native annuals, e.g., red brome and common Mediterranean grass can occur. Also, Sahara mustard can form a physical or visual barrier to wildlife. Dense stands of Sahara mustard growing around burrowing owl burrows may prevent them from having sufficient sight distance to spot and avoid predators.

Sahara mustard infestations have been located in several areas of the RMU. No control efforts have been initiated to date. Early season applications of a non-specific herbicide, glyphosate, may be an effective management tool.

Recommended management actions are:

1. Map the extent of current infestations, and conduct annual inspections to locate and control new infestations. The *Draft Monitoring Protocols for the Aeolian Sand Communities and Covered Species* report, prepared by C.W. Barrows, M.F. Allen, J.T. Rotenberry, & R.A. Redak, University of California Center for Conservation Biology, 4 May 2009, discusses metrics for use in such monitoring.
2. Identify, prioritize, and treat infestations of Sahara mustard in the RMU. This approach would increase the effectiveness and efficiency of control efforts. Hand pull mustard before plants set seed where this method of control is feasible. Recruit volunteers through schools, Scout programs, and community groups to assist with this effort. Explore the potential to coordinate with the Sheriff's Department and the courts to use individuals in alternative sentencing programs and/or the use of appropriate inmate crews, e.g., those provided by the California Department of Forestry and Fire Protection.
3. A collaborative approach among the RMUCs for the Stormwater Channel and Delta and Valley Floor RMUs and the MPA to evaluate different treatment options could also help to advance control efforts, particularly in regards to assessing the efficacy and impacts of herbicide use.
4. Develop experimental programs using herbicides as soon as mustard plants germinate and before native annuals do. If this method proves successful and does not adversely impact Covered Species or the natural communities, target specific areas for treatment in annual work plans.
5. Monitor the experimental research focused on identifying an appropriate biological control agent for Sahara mustard and periodically assess the potential to use a biological control agent. As appropriate, the RMUC can make recommendations to the RMOC regarding the feasibility of employing any agent or conducting any research in the Stormwater Channel and Delta RMU.
6. Evaluate whether collection and storage of seeds of any native species is warranted as a contingency if Saharan mustard cannot be adequately controlled for many years and native species in some areas might not be able to produce seeds for the natural seed bank for an extended period of time.

### ***Cattails (Typha spp.)***

Cattails are a desirable habitat element for exotic species including crayfish. They can also be invasive, reducing available habitat for pupfish and other native aquatic species. For this reason, it may be desirable to remove or reduce them in some areas. This could be accomplished in combination with dewatering to control invasive aquatic animals. Because cattails are also a habitat element for Yuma clapper rail, California black rail, and other marsh birds, potential impacts to them will need to be assessed prior to cattail removal. Possible control techniques include mechanical removal, herbicides, and prescribed fire.

Recommended management actions are:

1. Map areas within the Stormwater Channel and Delta system where cattails are present

(or desired) as a component of the habitat and areas where they do or may occur but are not desired as a component of the habitat. Areas within the CVSC and agricultural drainage system are excluded from this group of management actions. CVWD contributions specified in the CVMSHCP will replace habitat that is periodically altered by flood control maintenance activities within these channels.

2. Where cattails are desired as part of the habitat, the Land Manager, develop management actions as part of the Annual Work Plans to maintain cattail stands in the appropriate condition (this may include cutting, prescribed fire or other means).
3. Where cattails are not desired, incorporate the appropriate removal actions into their Annual Work Plans (depending on the potential impacts, hand removal, mechanical removal, herbicide application, or prescribed fire may be suitable control methods).

### ***Buffelgrass (Pennisetum ciliare)***

Buffelgrass is a drought-tolerant, warm-season, perennial grass which reaches 1.5 feet in height and 3 feet in width. Inflorescences are brown to purplish. It is similar in appearance to fountain grass. Buffelgrass is an invasive species in the Sonoran Desert. Although it is drought tolerant, its spread into the Colorado Desert may be limited to areas which receive significant monsoon rains. However, it is thought to have the potential to become established in riparian areas of the Colorado Desert (USGS). Buffelgrass grows densely and crowds out native plants of similar size. Competition for water can weaken and kill larger desert plants. Its dense roots and ground shading prevent the germination of native plant seeds. Until recently, there were no reports of buffelgrass in the Coachella Valley; however, several specimens were recently discovered in Indio (USGS). This plant has a very low ignition threshold and can fuel wildfire even during the peak growing season.

Recommended management actions are:

1. Managers and field staff will familiarize themselves with the characteristics of this species so that it can be searched for and controlled, if found, as part of coordinated periodic surveys for new infestations of invasive plant species.

### ***Invasive Aquatic Plants***

#### ***Arundo (Arundo donax)***

This fire adapted species chokes out many riparian areas and one concern (with prescribed fire) would be pushing the system further toward mono-specific stands of arundo.

Recommended management actions are:

1. CVWD O&M activity will address this invasive if found in the CVSC and agricultural drainage system.
2. Properly clean gear and equipment before entering a new aquatic system, conduct regular inspections for infestations, and implement removal efforts if they are detected. Those removal efforts are likely to include mechanical removal and chemical control

methods as feasible based on the sensitivity of the site(s) in question, and the specifics should be defined in the annual work plans.

### ***Other Riparian Vegetation***

Date palms are present to some extent in the Stormwater Channel and Delta area, and this species impacts the desert pupfish by using significant volumes of water and attracting predators such as raccoons to the area.

Recommended management actions are:

1. Incorporate removal of these trees as a high priority action in the Annual Work Plans for areas as needed and appropriate. If feasible, the trees will be offered for removal for landscape purposes at no cost under the RMUP.

### ***Invasive aquatic animals***

Each species known to occur in the RMU is described below. Because many of the preventative and coordinated response measures involve the same actions and techniques, they will be discussed for the entire group at the end of this subsection.

#### ***Crayfish (*Procambarus clarkia*)***

Crayfish were accidentally and deliberately introduced into California. Crayfish can pose a serious threat to other aquatic species. They compete with and prey on a variety of native fish, amphibians and snails. They may also cause a significant reduction in the number of macro invertebrates.

### ***Invasive Fish***

There are a number of different non-native fish species found in the aquatic habitats of the Stormwater Channel and Delta RMU, including mosquitofish, *Gambusia affinis*; sailfin and shortfin mollies, *Poecilia latipinna* and *Poecilia Mexicana*; and Tilapias, *Tilapia* spp. Each of these species poses a threat to pupfish. The threat may be in the form of competition, predation, interference with reproduction, or a combination of these factors.



***Rio Grande Leopard Frog (Lithobates berlandieri) and Bullfrog (Rana catesbeiana)***

Both the Rio Grande leopard frog and bullfrog are reported to be in some aquatic areas in adjacent to the Salton Sea and have the potential for presence in the RMU. Monitoring and reporting of these species should be included during other routine or special studies if possible. Both species prey on pupfish and pupfish eggs at one or more stages of their life cycle. In addition, the tadpoles compete for food, particularly in the case of bull frogs. Salinity levels may potentially limit dispersal of these frogs.

***New Zealand Mudsail (Potamopyrgus antipodarum)***

New Zealand mudsnails (NZMS) occur in the Coachella Canal. NZMS is a highly invasive species tolerant of desiccation. It can reduce food resources and populations of native macroinvertebrates. They are very difficult if not impossible to eradicate once they become established in an aquatic system.

***Melania (Melanoides tuberculata and Melanoides granifera)***

These snails directly compete with both juvenile and adult pupfish for forage resources and they may also prey on pupfish eggs. Monitoring and reporting of these species should be included during other routine or special studies if possible.

***Asian clam (Corbicula fluminea)***

Asian clams are minor competitors with pupfish for food. According to the Invasive Species assessment prepared by ICF for the CVCC they are fairly common in the aquatic areas of the Stormwater Channel.

Recommended management actions are:

1. There are several preventative measures which have been or could be implemented cooperatively by RMUC member entities to prevent the introduction and spread of invasive aquatic animals. They include:
  - Limiting Public Access to Aquatic Habitats – Aquatic habitats in the RMU are generally not accessible by vehicle. Visitors must walk to these areas from parking areas at trailheads. Continuing to limit access in this way reduces the likelihood of visitors introducing exotic game fish and/or aquarium specimens. Consideration should be given to prohibiting or restricting fishing and swimming and posting signs accordingly. CVWD limits access to the CVSC and agricultural drainage system with gates and posted no trespassing signs.
  - Public Education - Interpretive panels at trailheads and other facilities in the RMU, brochures, presentations to school and community groups, and other initiatives aimed at informing the public of the impacts of invasive exotic species could be effective in reducing the potential for new infestations.



- Surveys for Invasive Species - Regular surveys by management and monitoring personnel for new infestations of invasive aquatic species and subsequent control, if feasible, could help to prevent their establishment and/or spread.
  - Properly cleaning gear and equipment before entering a new aquatic system – Snails, including New Zealand mudsnails can be unintentionally transported by people, as can exotic plants and pathogens.
2. Currently there are no ongoing efforts to control invasive aquatic species in the Stormwater Channel and Delta RMU (BLM and CDFG, personal communication) with the exception of CVWD operations and maintenance activities within the CVSC and agricultural drainage system. Future efforts should involve a coordinated response including the managing entity or entities, CDFG, and the USFWS (to address listed species issues), and the Monitoring Program Administrator (to develop and/or evaluate monitoring protocols and to evaluate monitoring results). Where water bodies are connected directly, control efforts should be coordinated to work from the upper end of the watershed in a downstream direction to the maximum extent feasible. Each of these methods may have applicability for some species and circumstances.

### Trapping

Trapping in RMU 5 would portend to be very challenging and costly given the expanse of channel networks. This practice should only be used in localized situations where it is determined that it would prevent the spread of a particular invasive species when its presence is detected early. Also, CVWD's no trespassing policy would preclude fishing as a viable management option within the CVSC and agricultural drainage system.

### Dewatering

Dewatering the CVSC and agricultural drainage system is not a viable option as these channels are critical for wastewater reclamation and agricultural drainage required to support community and agricultural needs within the Coachella Valley.

Clearing of vegetation such as 'choked' cattail areas in combination with dewatering may be appropriate in smaller isolated locations where the goal is to restore pupfish populations. Yuma clapper and California black rails also utilize cattails, so potential effects to them will need to be evaluated when considering cattail removal. As discussed above, a systematic evaluation of cattails as a component of the habitat will be made prior to any cattail removal efforts.

### Pesticides

The limited application of pesticides will be maintained as a potential management tool, but their use will be limited to occasions when all other options have been determined to be infeasible and adequate precautions have been taken to protect native species.

Recommended management actions are:

1. CVWD O&M activity will address this invasive if found in the CVSC and agricultural drainage system.
2. Incorporate the removal of cattails, arundo and tamarisk into applicable monitoring and management activities.
3. In addition to monitoring the species control efforts, include a native species monitoring component to determine the effects of management and natural processes on pupfish, Yuma clapper rail<sup>1</sup> and California black rail.

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<sup>1</sup> If control of crayfish in Yuma clapper rail habitat is necessary for any reason, the establishment of other suitable prey for the Yuma clapper rail shall be evaluated.

## ***Invasive Terrestrial Animals***

### ***Feral Dogs and Cats***

Domestic pets pose a potential threat to wildlife in the Stormwater Channel and Delta RMU. For example, loose dogs and cats can impact burrowing owls by digging out the nest and removing the chicks (Point Reyes Bird Observatory). While the occurrence of loose or feral domestic animals is quite high in the RMU due to its proximity to suburban development and lack of ordinances and enforcement of unrestrained pets. Future development along its boundaries could increase the level of this threat. Section 4 of the CVMSHCP includes Land Use Adjacency Guidelines. Guideline 4.5.6, Barriers, includes project design requirements such as the incorporation of barriers in project designs to, among other things, minimize domestic animal predation.

Recommended management actions are:

1. If future development occurs within the boundaries of or adjacent to the RMU, the RMUC should work with the CVCC and the Permittee during the environmental review process to ensure that Land Use Adjacency Guideline 4.5.6 is followed and to provide recommendations specific to it. Additional recommendations, such as providing homeowners with brochures about living adjacent to a reserve (including information about pets) and using Covenants, Conditions and Restrictions (CC&Rs) for multiple dwelling developments, will be incorporated as appropriate.

### ***Brown-headed Cowbirds (*Molothrus ater*)***

Cowbirds, while native to North America, are not native to the Coachella Valley, and this species may be supported in the area by a variety of human actions. Golf courses and horse stables are two activities with known potential to enhance cowbird populations in the Coachella Valley. As nest parasites, they do not raise their own chicks but instead lay their eggs in the nests of other species. These host species raise the cowbird chick rather than their own offspring, thus impacting productivity of the parasitized species. Because cowbirds have not yet been identified as a problem for Covered Species in this RMU, coordination between monitoring and management will be necessary to assess the current status.

Recommended management actions are:

1. Initiate periodic surveys of nesting birds within the Stormwater Channel and Delta system to determine if cowbird nest parasitism is causing unacceptable impacts to covered bird species.
2. Initiate a cowbird trapping in riparian areas found to have unacceptable levels of nest parasitism.

***Muskrats (*Ondatra zibethicus*)***

CDFG has reported that muskrats occur in some pond areas and may impact Covered Species.

Recommended management actions are:

1. Initiate periodic surveys to determine if muskrats are causing unacceptable impacts to any Covered Species.
2. Initiate a muskrat control program if necessary.

***2.2 Threats to Hydrological Regime/Processes***

Maintaining hydrological systems is essential to the conservation of several natural communities in the Stormwater Channel and Delta RMU and to the Covered Species which depend on them. The primary hydrologic source for the CVSC and the agricultural drains flowing directly to the Salton Sea within this Conservation Area is rising groundwater and irrigation return water from agricultural lands, fish farm effluent and flows from several municipal water reclamation plants. Secondly, there can be contributions during the occasional storm event from the ephemeral portion of the Whitewater River tributary to the CVSC.

Management Goal: Maintain essential hydrological processes to support Covered Species and Natural Communities.

Recommended management actions are:

1. Monitor water levels and flows and the condition of marsh and riparian vegetation, in close cooperation among BLM, CDFG, the United States Fish and Wildlife Service (FWS) to prevent the degradation and loss of aquatic, marsh, and riparian habitats.
2. CVWD will continue to monitor the hydrological function of the RMU as part of its operations and monitoring activities.
3. CVWD will continue to implement mitigation measures associated with the CVMSHCP through

***2.3 Climate Change and Habitat Fragmentation***

Climate change is an issue for the entire Colorado Desert including the Coachella Valley. Trends and predictions indicate that the area is gradually becoming more arid. The ability to move north to higher latitudes or up in elevation in response to this change will be essential for many species' prospects for persistence over time. In the Coachella Valley, areas in the northwest end of the Valley are cooler and wetter due to coastal influences in the Banning Pass area. Thus the ability of species to move northwest will be important. This need is being borne out by changes in the distribution of some species in response to recent climate

change, including the Coachella Valley Jerusalem cricket (Cam Barrows, personal communication).

Development adjacent to or within the Stormwater Channel and Delta RMU could result in indirect environmental effects. Commonly referred to as edge effects, they may include noise, lighting, drainage, intrusion of people, and the introduction of invasive plants and non-native predators such as dogs and cats. While there is currently only a small amount of development adjacent to or within the RMU, a successful restoration effort at the Salton Sea or other factors could result in significantly more development in the future. Such development could exacerbate habitat loss and fragmentation. There are many private non-conservation parcels in the Stormwater Channel and Delta RMU. If a number of them were developed, habitat loss and fragmentation could be substantial. For this reason, land acquisition for conservation is one of the most important measures to address this threat. Where development is proposed, The Land Manager and the other RMUC members will have the opportunity to work with the CVCC to ensure that future development proposals adhere to the Land Use Adjacency Guidelines and, when appropriate, make specific recommendations for measures and actions related to them.

Vulnerability to climate change in the marsh and riparian habitats of the Stormwater Channel and Delta RMU may be mitigated somewhat by rising groundwater and irrigation return flows from agricultural lands. Upland species and communities, which depend on rainfall, may be affected as the RMU becomes more arid. Climate change is resulting in increased frequency and intensity of wildfire in many areas. Given that lightning-caused fires would be expected to be rare in the Stormwater Channel and Delta, fire frequency is not likely to change substantially due to climate change alone. However, with the spread of invasive plant species and the predicted higher temperatures in the context of public access, fire frequency may increase, and fires can be expected to increase in intensity when they do occur. Higher fire intensity would result in increased mortality of native plants and animals and facilitate or exacerbate biological invasions of exotic grasses and Sahara mustard.

**Management Goal – Climate Change:** Ensure that species have the ability to shift their range in response to the effects of climate change on habitat and the distribution of natural communities.

**Management Goal – Habitat Fragmentation:** Avoid or minimize the potential for and effects of habitat fragmentation from causes including infrastructure and other development in the Conservation Areas, and edge effects from adjacent development.

Recommended management actions are:

1. CVWD's O&M in CVSC will be mitigated through created habitats which will be established within the RMU (location TBD).
2. Coordinate closely with the Monitoring Program to ensure that adequate monitoring and research is carried out to inform management actions that may be needed to address the

potential effects of climate change and to assess the efficacy of management actions that may be taken.

3. Provide input into the Joint Project Review process for projects in or adjacent to Conservation Areas to ensure that habitat fragmentation and edge effects are minimized.
4. Ensure that fencing that may be desirable to address other issues, such as off-highway vehicle trespass and dumping provide for the movement of wildlife. Interior fences should be removed where appropriate to facilitate wildlife access and movement.
5. Restore and enhance natural communities/habitats as needed to counter the effects of past disturbance and loss and to minimize habitat fragmentation and maximize the ability of Covered Species to shift their range in response to the effects of climate change.
6. Re-vegetate areas where exotic vegetation has been removed when natural regeneration of native vegetation is not sufficient to provide the desired composition and cover.
7. Remove vegetation in pupfish habitat as necessary to maintain optimal habitat conditions.<sup>2</sup> Evaluate the potential use of prescribed fire (including efficacy and feasibility) as a tool to periodically revitalize marsh habitats.
8. Implement periodic translocation of desert pupfish to and from the Stormwater Channel and Delta RMU as called for by the CDFG and or FWS (a pupfish refuge management plan is currently being drafted by CDFG) to maintain healthy, genetically diverse pupfish populations.
9. Create new habitat where appropriate and/or required to support the Covered Species at the levels anticipated by the CVMSHCP.

## **2.4 Wildfire Management**

**Management Goal:** Prevent damaging wildfires that reduce the ability of the RMU to support Covered Species and Natural Communities.

Recommended management actions are:

1. Work with the applicable fire suppression agencies to develop a fire management plan for the RMU to address pre-suppression and suppression issues in consideration of the needs of Covered Species to the extent feasible.
2. Implement pre-suppression measures as called for in the Fire Management Plan, in particular in areas subject to the potential for repeated wildfires, as part of the Annual Work Plan activities.
3. Provide fire suppression agencies with maps and other information (including the Fire Management Plan when completed) prior to and during wildfire incidents.
4. Obtain training in the Incident Command System for the Land Manager, other RMU land managers and key staff as needed, as soon as their schedules allow.

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<sup>2</sup> Sharon Keeney, a biologist with CDFG is developing a management plan for pupfish refuges in California which will include protocols for managing vegetation in pupfish habitat.

5. Within 3 years of approving the RMUP, ensure that key personnel have received wild land firefighter training to enable them to provide onsite, real time advice to suppression personnel during wildfire incidents.
6. As feasible and appropriate, provide for staff to participate in the suppression of wildfires in the RMU as part of the resource allocation associated with the annual work plans. As feasible, this should include sending one or more RMUC land management representatives to wildfire incidents to provide information and assistance. If available, place one or more “Red Card” holding field observers with fire suppression agency field personnel (Division or Battalion Chiefs).
7. Include the development and implementation of post fire rehabilitation actions as part of the Annual Work Plans following fire incidents.
8. Evaluate the feasibility and efficacy of prescribed burning to reduce the potential for catastrophic wildfire and/or as a means of restoring and enhancing habitat. Conduct prescribed burns if they are determined to be beneficial.

## **2.5 Other Management Issues**

A number of other management issues also occur in the Stormwater Channel and Delta RMU. These include potential impacts from off-highway vehicle trespass, geocaching, dumping and hazardous materials, power and gas lines, and public use and access. The potential impacts of these, at least at present, are considered to be less severe than those of invasive species; climate change, habitat fragmentation, and wildfire; thus, these other impacts are accorded a lower management priority. This is not to say they should be ignored, but as management resources are allocated, priorities need to be considered. These issues are discussed below.

### **Off-Highway Vehicle (OHV) Trespass**

Illegal OHV use occurs at various locations throughout the CVMSHCP area including the Stormwater Channel and Delta RMU. The managing agencies report several discrete locations in the RMU where unauthorized OHV use is a problem. In addition, an analysis of high resolution aerial imagery of the RMU revealed a number of off-road vehicle tracks extending from the primary public access roads.

OHV use may impact individual members of some Covered Species directly by running over them or crushing their burrows, and indirectly by degrading habitat through impacts to vegetation, erosion, noise, potential introduction of exotic species. Significant use in some areas could cause habitat fragmentation.

Recommended management actions are:

1. Develop and periodically update a map of the most severe impact areas.
2. Prioritize areas for active management as described in the following measures for incorporation into the Annual Work Plans.
3. Install and maintain perimeter fences and gates where needed, to prevent unauthorized vehicle use that can result in wildlife mortality and habitat degradation.

4. Post and maintain boundary/regulation signs at key locations along property lines including pedestrian and vehicle access points.
5. Install directional and regulatory signs as needed on access roads to assist visitors and reduce off-road vehicle travel.
6. Inventory access roads and, where feasible, re-route and/or close those which are redundant and/or causing significant resource impacts.
7. Install barriers to preclude access to closed routes and/or add vertical mulching to obscure previously used unauthorized routes to discourage future use.
8. Install additional visitor information kiosks and interpretive panels at trailheads and access points where needed. The Land Manager and the RMUC member entities should also outreach to local communities, including North Shore, to try to educate local ORV users about the resource values of the RMU and the importance of protecting them.
9. Maintain, and increase as needed and as resources allow, regular law enforcement patrols of the Stormwater Channel and Delta RMU as part of the Annual Work Plans.

### **Dumping and Hazardous Materials**

Dumping is widespread in the RMU due to its relative proximity to rural population centers. The potential exists for hazardous materials spills or release in the Stormwater Channel and Delta RMU from agricultural operations or illegal disposal giving the extensive road network and limited visibility.

Recommended management actions are:

1. Include specific measures in the annual work plans to prevent and respond to dumping, including the strategic placement of fencing and barricades, signing, and communication between and within agencies about dumping issues, including communication between law enforcement personnel and Riverside County Code Enforcement.
2. Organize periodic cleanup events as needed involving volunteers from the local community could to clean-up and help prevent dumping and to build a local constituency in support of the RMU.
3. For hazardous material spills, work with the County of Riverside Hazardous Materials Response (HAZMAT) Team to ensure that the appropriate contingencies are in place for incidents involving hazardous materials as part of the first annual work plan. The HAZMAT team possesses the necessary technical expertise and capability to mitigate hazardous spill emergencies.
4. The Land Manager and current RMUC agency personnel should attend Hazardous Materials Awareness training as soon as their schedules allow, and new staff should receive this training within their first year. Note that California Water Environment Association (CWEA) offers classes on source control and HAZMAT. Evaluate whether RMUC members would benefit from obtaining a 40Hr HAZMAT certificate.

### **Power and Gas Lines**

There high voltage electrical transmission lines in the interior or along the boundary of the Stormwater Channel and Delta RMU are covered projects under the CVMSHCP. They still



pose a potential threat in the following ways: 1) they provide perches for raptors which could be used to prey on Covered Species such as the flat-tailed horned lizard, 2) raptors perching on the power lines could potentially be electrocuted, 3) a downed power line could be the ignition source for a wildfire. Maintenance or repairs within the right-of-way, however, are covered activities under the CVMSHCP. A one mile long stretch of a gas line traverses the southwest corner of the RMU. As with electrical transmission lines, maintenance activities could result in environmental impacts. In addition, its rupture could result in an explosion and possibly a wildfire, resulting in impacts to communities and species.

Recommended management actions are:

1. Work cooperatively with the IID and any other non-Permittee utility companies to ensure that utility response plans for addressing the threats posed by power lines and gas lines appropriately consider the needs of Covered Species and Natural Communities, and to provide all personnel with the names and numbers of the relevant utility company contacts in the event a problem, such as a gas leak or downed or arcing power line/transformer, is detected. Measures to avoid and mitigate potential impacts from ongoing operations and maintenance of power and gas lines may include:
  - Modifying specific fuels under the power lines to reduce the potential for wildfire.
  - Modifying the power poles to discourage raptors from perching.
  - Identifying sensitive resources, if any, under (or in the case of the gas line, on top of) the utility lines and incorporating site-specific measures to avoid, minimize, and mitigate impacts to them during maintenance and repairs.

#### **Public Access and Recreation Activities**

There is very little public access in RMU 5 due to CVWD access restrictions and the fact that the remaining public BLM is 'landlocked' to large extent by adjacent private parcels.

### **3.0 Processes and Structure for Management, Adaptive Management, and Integration with Monitoring.**

The preceding section identifies the recommended management actions by threat/stressor for the Stormwater Channel and Delta RMU. More specific management goals, actions, and priorities, including thresholds for success, should be determined each year and listed by agency and entity in the Annual Work Plan, recognizing that the number and prioritization of management actions will change over time as a result of changing conditions. To ensure the success of projects, the Annual Work Plan should identify and commit staffing and funding (to the extent possible) to those projects which will require multi-year funding to complete, including initial and follow-up actions. The outcome of each planned action should be reported in the Annual Report for the RMU.

While the management plan is intended to be comprehensive for the RMU, it is recognized that each participating agency and entity will be responsible for its implementation on the Reserve Lands which they manage. As such, implementation will be affected by each agency's and entity's mission, mandates (as defined by applicable regulations, land use plans and other documents), and the amount of resources, i.e., staffing and funding, they have available.

Implementation of a comprehensive plan for the entire RMU will provide an opportunity to reinforce and build upon the existing close coordination and cooperation in management of the reserve lands within the RMU. As additional Conservation Lands are acquired by CVCC and other agencies and entities, management of these lands will be the responsibility of the acquiring entity, but should be integrated with the management of Existing Conservation Lands such that the entire RMU is addressed comprehensively. The RMUC will play a crucial role in providing a mechanism for the Land Manager and RMUC member entities to coordinate and collaborate in developing and implementing their respective annual work plans.

Linking the Monitoring Program with Adaptive Management actions will inform reserve managers of the status of Covered Species, natural communities, and Essential Ecological Processes, as well as the effectiveness of management actions, in a manner that provides data to allow informed management actions and decisions.

The Monitoring Program Administrator (MPA) is responsible for coordinating with reserve managers to facilitate the exchange of Monitoring Program data. Likewise, the Land Manager has the responsibility to facilitate the exchange of information regarding all completed and proposed management and Adaptive Management actions.

Facilitating Adaptive Management is a primary reason for coordination between the monitoring and management programs. The essence of Adaptive Management is the integration of design, management, and monitoring to test assumptions systematically in order to adapt and learn. An active Adaptive Management strategy utilizes an experimental approach to address the need for new knowledge about the nature of a threat, or the affect

of a variable, or a new active management strategy or to reduce uncertainty about an ecological question.

New and modified management actions will periodically be necessary as indicated by the results of the Monitoring Program in regard to unanticipated changes in the needs of species, natural communities, and ecological processes. They will also be necessary in response to information from the monitoring program about the effectiveness of current management techniques and actions. The Adaptive Management Conceptual Model from Section 8-5 of the CVMSHCP is shown in Figure 3-1 below. It illustrates the Adaptive Management process.

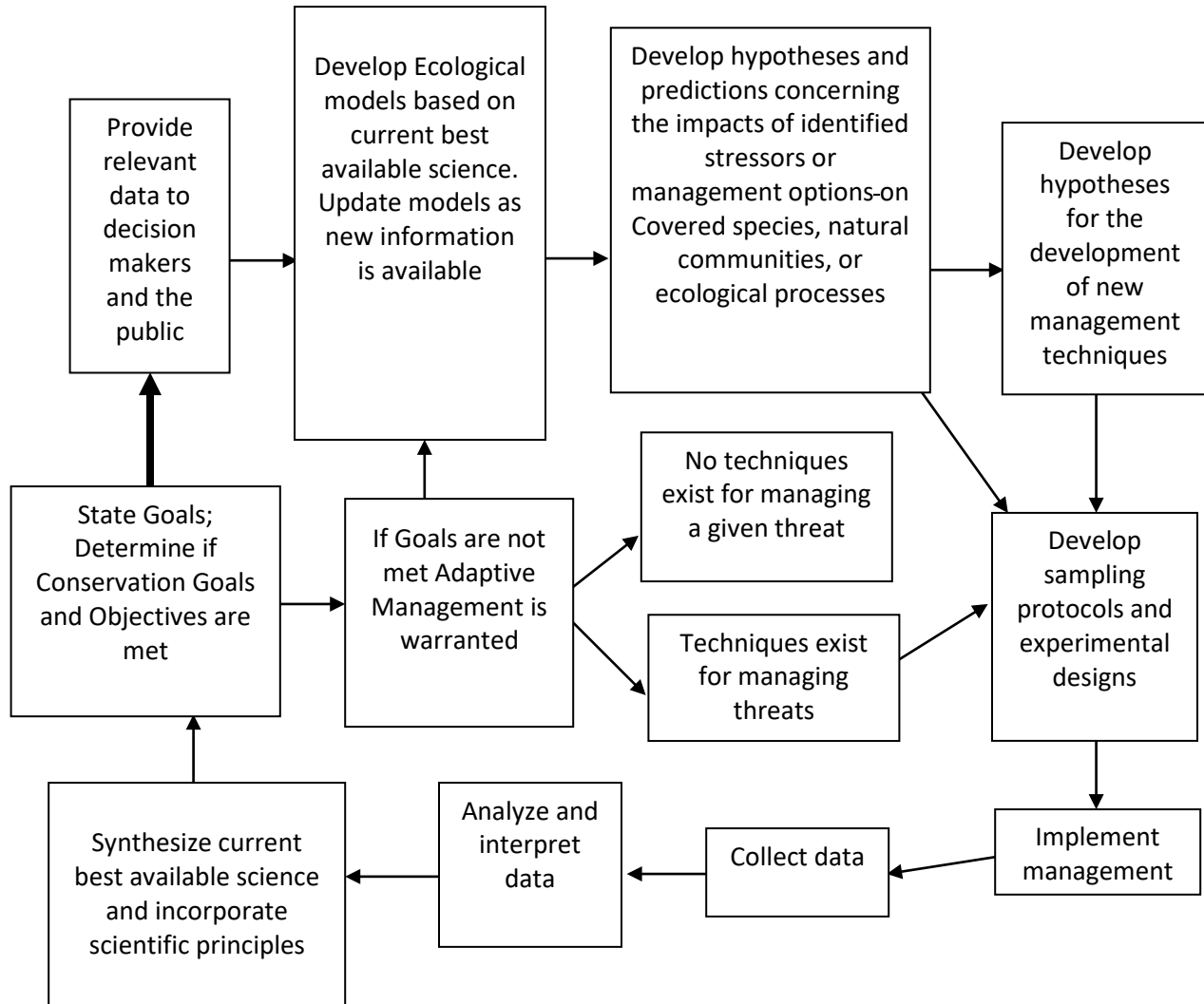
Goal: Provide for an ongoing, dynamic system of information gathering and exchange between the MPA and the RMUC (the Land Manager and Reserve Managers) to facilitate close coordination between the Management and Monitoring programs, including the identification, implementation, and evaluation of Adaptive Management Measures.

Recommended actions are:

1. The Land Manager and the MPA should coordinate on a regular basis to ensure an adequate two-way flow of information regarding information being generated by the Monitoring Program, the results of various management actions, and information and research needs. The Land Manager can coordinate with the RMUC member entities to ensure the full flow of information.
2. Coordinate with the MPA to evaluate the efficacy of Adaptive Management actions and associated experiments; both those which are proposed and those which have been implemented.
3. In addition to the preceding informal collaboration, the MPA, Land Manager and the Reserve Managers should discuss the results of the Annual Monitoring and Management efforts at an RMUC meeting. Based on the results they should:
  - Identify a list of needed Adaptive Management actions, experiments to test alternative responses, and associated monitoring needs.
  - Identify current research needs and make recommendations for their implementation.
  - Evaluate current Adaptive Management measures for further use or modification.
  - Develop a list of Adaptive Management recommendations for the Annual Management and Monitoring Work Plans.
  - Review the Threats Models and make recommendations for their updating.
4. Finalize their Adaptive Management recommendations and submit them to the RMOC for review and approval.
5. Per Section 8 of the CVMSHCP, as needed, or every 5 years, the RMOC may empanel a group of Independent Science Advisors (ISAs), which will, in coordination with the MPA, provide scientific expertise and recommendations on specific reserve management and monitoring issues. This process will help to ensure that the best available scientific information and methods are employed in the Monitoring and Management programs, including Adaptive Management.

6. The CVMSHCP provides for a research component that will be funded and implemented by the Permittees. Research needs will evolve over time and will be identified by the same process used to evaluate monitoring and management protocols and results.

**Figure 3-1: Adaptive Management Conceptual Model**



## **4.0 Responsibilities for Implementation**

The CVCC, its Land Manager, and the other Reserve Management Unit Committee members (Reserve Managers) are responsible for the implementation of the Reserve Management Unit Plan. This commitment to collaboratively manage Reserve Lands is articulated in the CVMSHCP, and in the pending Memorandum of Understanding for Management of the Reserve Management Units. Specific responsibilities and commitments for each year will be articulated in the Annual Work Plan.

### **4.1 Work Plan and Schedule**

The Land Manager, in coordination with the RMUC, will prepare an Annual Work Plan to be reviewed and commented on by the RMOC, and then submitted to the CVCC for budget approval. The Annual Work Plan will specify CVCC's responsibilities and identify anticipated actions by other RMUC member entities. Appendix II contains an Annual Work Plan template. The Annual Work Plan will describe the conserved lands, the potential threats and proposed management prescriptions, a work schedule for management actions, and a budget. It will be outcome based, with each agency and entity setting measureable management goals.

### **4.2 Personnel, Equipment, and Supplies**

Each of the RMUC members is expected to provide personnel, equipment and supplies to implement the management actions identified in the RMUP. The specific contribution of each member should be delineated in the Annual Work Plan. It should be noted that the term "Reserve Manager" used in this document refers to RMUC member agency staff other than the CVCC. As identified below, CVCC management staff are referred to as "Reserve Land Manager" and "Assistant Reserve Manager".

#### Coachella Valley Conservation Commission

The CVMSHCP Management Program Budget identifies the following personnel and categories of equipment and supplies:

##### Personnel (for the entire Reserve System)

- Reserve Land Manager
- Assistant Reserve Manager (4)
- Ranger-Warden (2)
- Field Crew Labor (contract)
- Administrative Assistant (0.25-0.5)

##### Equipment and Supplies

- Site Protection and Maintenance
- Habitat Maintenance and Restoration
- Field Equipment and Supplies
- Office Equipment

A line item budget amount is associated with each position and with each equipment and supply category. Initially, only one Assistant Reserve Manager is funded, with the additional three positions phased in over time.

A portion of the CVCC staff, equipment, and supply resources will be dedicated to the Stormwater Channel and Delta RMU. This will occur as the CVCC acquires Conservation Lands in the RMU and/or if it becomes a partner in one or more cooperative management efforts. The amount of CVCC staffing, equipment, and supplies necessary to implement the Stormwater Channel and Delta RMUP will be determined over time as lands are acquired and partnership opportunities become available.

#### Other Agencies and Entities

Staffing levels for BLM, CDFG, and CNLM are expected to vary over time depending on the management needs of the plan and the ability of each agency and entity to contribute to meeting them.

See Appendix III for a three year management cost estimate for the RMU. It includes personnel equipment, and supply estimates for each management action.

### **4.3 Law Enforcement**

Three agencies with land management responsibilities in the RMU have law enforcement personnel: BLM, CDPR and CDFG. In addition, the Riverside County Sheriff and Code Enforcement have jurisdiction over private lands. The law enforcement capability of the three agencies in the RMU varies. CDPR has personnel on staff at the Salton Sea State Recreation Area, BLM has a contingent of rangers responsible for patrolling BLM lands within the South Coast, Palm Springs Field office, including the Stormwater Channel and Delta, and CDFG has a game warden based in the El Centro area. Patrol areas can be very large, particularly in the case of the CDFG warden, making it difficult to provide a regular patrol presence in the RMU. Position vacancies and the inability to fill them in a timely manner due to budget constraints and other factors can aggravate the problem. BLM law enforcement personnel patrol the Stormwater Channel and Delta at least weekly.

As stated above, the CVMSHCP provides for the funding of two ranger/warden positions. It is anticipated that a portion of their time will be dedicated to patrolling the Stormwater Channel and Delta RMU in coordination with other agencies with law enforcement responsibilities in the area. See Appendix III for a three-year management cost estimate for the RMU, including an estimate of law enforcement costs.

## **4.4 Program Cost Estimates**

An accurate determination of the program costs for the life of the plan is not possible due to unknown factors, including the ultimate acreage and composition of the Reserve Lands which will be managed by the CVCC and its partners, and to uncertainties concerning future conditions, e.g., the number and extent of threats and stressors. A cost estimate of near term costs, those expected in the next 3 years, can be found in Appendix III. This portion of the plan will be reviewed and revised by the RMUC every three years to reflect current management needs and costs.

## **4.5 Funding for Implementation**

### CVCC Reserve Lands

The Permittees (CVCC) will fund the annual costs for the Monitoring and Management Program, and Adaptive Management for the 75-year term of the Permits. During the 75-year term of the Permits, an endowment will be established to fund the Monitoring Program, the Management Program, and Adaptive Management in perpetuity. Funding sources for CVCC's obligations include but are not limited to:

- Local Development Mitigation Fees
- Fees on the importation of waste into landfills in Riverside County
- Transportation project mitigation
- Mitigation for regional infrastructure projects
- Eagle Mountain Landfill Environmental Mitigation Trust Fund<sup>3</sup>

Table 5-3b in Section 5 of the CVMSHCP provides revenue and expenditure projections for the 75 year life of the plan. Due to the recent economic downturn, funding amounts for monitoring and management are less than projected.

### Other Conservation Lands

The CVCC through the Land Manager and the reserve managers, i.e., BLM, CDFG, CDPR and CNLM have agreed to cooperatively manage the Stormwater Channel and Delta RMU consistent with the Conservation Goals and Objectives of the CVMSHCP. A cooperative and collaborative approach should result in greater management efficiency by eliminating redundancy and providing the opportunity to pool resources. It should also create funding opportunities through the grant application process that might not otherwise be available, e.g. grant funds which are targeted to Natural Communities Conservation Planning areas.

Goal: Cooperatively manage the Stormwater Channel and Delta RMU consistent with the Conservation Goals and Objectives of the CVMSHCP.

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<sup>3</sup> The Eagle Mountain Landfill was expected to provide a significant source of management funds; however, the landfill project may not occur, in which case CVCC will have to identify or develop replacement funding sources.

Recommended actions are:

1. As part of their annual budgeting process, the Reserve Managers should coordinate with the Land Manager to identify management funding needs and responsibilities for the coming year. This information may be used by Reserve Managers to make their respective annual funding requests. Their annual management budget for the RMU and the associated goals, outcomes, and targets, will be included in the Annual Work Plan.
2. Every three years the Land Manager and the Reserve Managers will develop a cost projection, for managing the RMU over the next (following) three years.
3. Utilize the three year management cost estimate and subsequent revisions to help obtain funding for implementation by providing information which can be used in advance budget planning and the preparation of competitive grant applications.

### Grants

A number of grant opportunities are available which could potentially provide management funding. They include but are not limited to:

- Wildlife Conservation Board Grants
- Cal-Fire Vegetation Management Grants
- California Recreational Trails Program Grants
- California Off-Highway Motor Vehicle Recreation Division Grants
- CDPR (State Parks) Stewardship Grants (Internal to CDPR)
- North American Wetlands Conservation Act Grants
- U.S. Neotropical Bird Conservation Act
- National Fish and Wildlife Foundation Grants<sup>4</sup>

Detailed information about grant opportunities can be found in Appendix IV

It is recommended that the RMUC, with the Land Manager serving as coordinator, meet at least annually to identify grant opportunities and timing, to determine grants it wishes to pursue and to assign responsibility for grant preparation and receipt.

## **4.6 Partnership Opportunities**

There are a number of partnership opportunities in Stormwater Channel and Delta, some of which are already in place.

Additional cooperative efforts in the future could include:

- Apply for additional invasive species control grants including from the California Department of Agriculture, NAWCA, or other entities in partnership with the Southern Low Desert RC&D and other entities.

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<sup>4</sup> These grants are targeted to specific areas, natural communities, and species, so they may or may not be applicable to the Stormwater Channel and Delta RMU in a given year.



- Partner with various entities including Riverside County Community Improvement Department, waste disposal companies, and non-profit conservation groups to sponsor volunteer clean ups in the RMU.
- Organize additional volunteer events including invasive species control, e.g. Sahara mustard and tamarisk, and planting native vegetation.
- Work with the OHV task force to focus some of its time on illegal off-road vehicle use in the RMU.
- In coordination with the MPA, partner with universities or other entities to conduct applied and basic research with the purpose of obtaining information useful to management.
- Pool funds between its members for signing, fencing, and other items.
- Share equipment and/or personnel to maintain facilities, monitor resources, patrol the RMU, and accomplish larger projects.

The CVCC is working with the LDWMA to become a signatory to the LDWMA MOU and participate in related activities such as invasive species control grant applications.

#### **4.7 Data Storage and Analysis**

The collection and storage of data in a manner which facilitates its easy retrieval and analysis is crucial to the success of both the monitoring and management programs. It should enable managers and wildlife agencies to evaluate the efficacy of conservation measures, and to develop and implement Adaptive Management measures as needed.

Section 8.6 of the CVMSHCP, Data Storage and Analysis, addresses data management, including database consolidation, data handling and storage, data availability, and data compilation and analysis.

Key aspects of the data management program for land managers in the RMU are anticipated to be the development of standard and comprehensive data forms which facilitate the collection of consistent and robust data, and the ability to easily retrieve the data for analysis to assist in the development and evaluation of management actions.

The CVCC has applied for grants to fund the development of a robust, standardized database for the CVMSHCP. CVCC staff will work with the MPA, the Land Manager and the other members of the RMUC, the RMOC, and other entities to develop the reserve management and monitoring portion of the database.

Goal: Develop a land management database which is integrated with the monitoring database, which provides open access and easy data retrieval and transfer, which contains an easy to use field user interface, and which complies with applicable standards, e.g., the North American Invasive Plant Mapping Standard.

Actions:

1. Develop a land management database which is integrated with baseline and monitoring data and which provides for robust data queries and analysis.
2. Develop standardized data entry formats and forms for field personnel.
3. Identify who is responsible for data management tasks.
4. Identify the process for access to and communication of data.

## **4.8 Reporting**

An Annual Report will be prepared by the Land Manager in cooperation with the other Reserve Managers which summarizes management activities in the previous year. It will include completed and proposed management actions, including Adaptive Management actions. It will also discuss any significant issues encountered during implementation of the management program. This will be incorporated in the CVCC's Annual Report.