

**Annual Progress Report:**  
**Implementation of the**  
**Flat-tailed Horned Lizard Rangewide Management Strategy**  
**January 1, 2010 - December 31, 2010**

Prepared by the  
Flat-tailed Horned Lizard Interagency Coordinating Committee

**Final draft, July 2011**

## EXECUTIVE SUMMARY

The flat-tailed horned lizard is a small horned lizard that inhabits a narrow range within southeastern California, southwestern Arizona, and northwestern Mexico. Much of the species' historic habitat in the United States has been lost due to agricultural and residential development. A Conservation Agreement was signed by several federal and state agencies in 1997 to implement the Flat-tailed Horned Lizard Rangelwide Management Strategy. The Strategy is a long-term plan of action among signatory agencies to ensure persistence of the species. It continues to be implemented by the signatory agencies throughout the Management Areas, the Research Area, and other areas of flat-tailed horned lizard habitat.

Implementation activities during 2010 included regular coordination among the participating agencies through the Management Oversight Group and Interagency Coordinating Committee. Authorized surface impacts remained low in Management Areas. Outreach efforts continued to include the general public and other agencies, such as the U.S. Border Patrol and several Mexican agencies, as active participants in implementing the Strategy. Agencies conducted population inventories, trend monitoring, and research. New lands were acquired within the East Mesa and West Mesa Management Areas and the Anza-Borrego Desert State Park Management Area. Continued attempts will be made in 2011 to acquire additional lands in the California Management and Research Areas.

Biologists from the Alto Golfo Preserve in northern Sonora (Mexico) continue to be involved with the ICC. They have begun the process of creating a management strategy for FTHL in northern Mexico. They accomplished considerable outreach, education, and coordination during 2010 with various community groups, ejidos, government agencies, schools, off-road clubs, and ecotourism groups.

The participating agencies believe the Flat-tailed Horned Lizard Rangelwide Management Strategy as designed and implemented by the signatories of the Conservation Agreement continues to provide an effective management focus to conserve flat-tailed horned lizard habitat throughout its range. The majority of the tasks outlined by the Strategy are being completed on schedule.

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## INTRODUCTION

On June 7, 1997, a long-term Conservation Agreement was signed by several federal and state agencies to implement the *Flat-tailed Horned Lizard Rangewide Management Strategy* (RMS). The RMS is a plan of action to conserve the flat-tailed horned lizard (*Phrynosoma mcallii*) (FTHL) in the United States. The FTHL is a small horned lizard that inhabits creosote flats, sand dunes, and mud hills in southeastern California, southwestern Arizona, and northwestern Mexico. Much of the FTHL's historic habitat (possibly as much as 50%) in the United States has been lost due to agricultural and residential development. A revision of the RMS, with minor changes, was completed in 2003.

The following agencies are signatories to the Conservation Agreement:

- U.S. Fish and Wildlife Service (USFWS), Region 8
- USFWS, Region 2
- Bureau of Land Management (BLM), California State Office
- BLM, Arizona State Office
- Bureau of Reclamation (Reclamation), Lower Colorado Region
- Marine Corps Air Station, Yuma (MCAS-Yuma)
- Naval Air Facility, El Centro (NAF-El Centro)
- Arizona Game and Fish Department (AGFD)
- California Department of Fish and Game (CDFG)
- California Department of Parks and Recreation (CDPR)

The U.S. Border Patrol (BP) at times participates as guests in the Management Oversight Group (MOG) and the Interagency Coordinating Committee (ICC). BP elected not to sign the Conservation Agreement, but they continue to work closely with staff at BLM-El Centro.

The Conservation Agreement remains in effect today, and the RMS continues to be implemented by all Conservation Agreement signatory agencies. The RMS requires the ICC to prepare an annual report to monitor plan compliance (Planning Action 9.2.4). This is the 12<sup>th</sup> annual report and covers the period from January through December 2010.

The FTHL has been the subject of considerable activity within the Endangered Species Act and the federal courts. The 2003 Revision of the RMS summarized that activity through early 2003. Later that year, the Tucson Herpetological Society and others filed suit challenging the 2003 withdrawal to list the FTHL as a threatened species. In 2005, the U.S. District Court for the District of Arizona ruled in favor of the plaintiffs and set aside the 2003 withdrawal on the grounds that the withdrawal failed to determine whether the lost historical habitat for the FTHL is a significant portion of the range for this species and thereby violated the Endangered Species Act. On December 7, 2005, the USFWS published a Federal Register Notice vacating the 2003 withdrawal and restoring proposed status to the FTHL (70 FR 72776). The comment period was reopened on March 2, 2006, for two weeks (71 FR 10631) and on April 21, 2006, for two weeks (71 FR 20637). On June 28, 2006, USFWS published a notice in the Federal Register

withdrawing the proposed rule, based on the conclusion that the lost habitat is not a significant portion of the range of the FTHL (71 FR 36745). A lawsuit was filed by Defenders of Wildlife and others on December 11, 2006, in the Arizona District Court challenging the 2003 and 2006 decisions to withdraw the proposed rules to list the FTHL as threatened. In May 2009, the Ninth Circuit Court of Appeals decided in favor of the plaintiffs and in November 2009 ordered the FWS to reinstate the 1993 proposal to list the species as threatened. FWS reinstated the proposal on March 2, 2010 (75 FR 9379) and subsequently solicited public comment and held public meetings. The listing determination was due to be issued in November, 2010, but was postponed by FWS because of other priorities.

## **IMPLEMENTATION PROGRESS IN 2010**

Progress toward implementation of Planning Actions within the RMS during this period is summarized below.

### **Planning Action 1. Delineate and designate five FTHL Management Areas and one FTHL Research Area.**

The 1997 Conservation Agreement designates 5 Management Areas (MAs) and one Research Area (RA) and precisely described their boundaries. Maps and boundary descriptions are available in the 2003 RMS. All MAs and a portion of the RA were formally adopted within agency environmental and planning documents (see also Planning Action 6) as a result of the actions listed below. All agencies had applied RMS provisions to these areas prior to the formal adoption.

- Yuma Desert MA: In 2007, MCAS Yuma finalized an Integrated Natural Resource Management Plan (INRMP) that fully incorporates the RMS for its portion of the Yuma Desert MA. In 2004, Reclamation completed a Five-Mile Zone Resource Management Plan that incorporates the RMS for its portion of this MA.
- East Mesa, West Mesa, and Yuha Desert MAs: An Environmental Assessment (EA) proposing an amendment to the California Desert Conservation Area Plan to officially adopt these three MAs received no public protests and was signed on February 1, 2005.
- Borrego Badlands MA: In 2004, the Anza-Borrego Desert State Park's (ABDSP) General Plan was unanimously approved by the California State Parks and Recreation Commission providing long-range guidance and planning to the 600,000 acre park and acknowledging the FTHL RMS. A Natural Resources Management Plan to be completed in the near future will more specifically address FTHL management. Boundaries for the Borrego Badlands MA within ABDSP have been delineated in the Borrego Badlands and Clark Dry Lake areas.
- Ocotillo Wells RA: In 2003, the BLM portion of the Ocotillo Wells State Vehicular Recreation Area (OWSVRA) RA was designated in an amendment to the Western

Colorado Desert Ecosystem Plan. The California State Parks owns a portion of the RA that has not been incorporated into planning documents. The RMS requires no management conservation measures in the RA. However, management for the FTHL fall under guidelines incorporated by California State Parks to evaluate and sustain park resources. Data for the previous 5 years indicates a stable population for the FTHL in the RA. A General Plan process was initiated in 2009 for OWSVRA and, as of October 2010, incorporated the southeastern portion of the former Freeman Property as part of OWSVRA. The General Plan for Heber Dunes (HDSVRA) is close to completion and does not include a possible relocation project there has been abandoned. HDSVRA will continue to have no connection to the ICC.

- Coachella Valley: BLM-Palm Springs continues to participate in the Coachella Valley Multi-Species Habitat Conservation and Natural Communities Conservation Plan (CVMSHCP) which fully incorporates FTHL RMS measures. The CVMSHCP uses an ecosystem/habitat approach to identify natural communities and sensitive species known or expected to occur in the Plan area. The Plan is designed to ensure the long-term viability of sensitive-species populations within the Coachella Valley, including the FTHL.

**Planning Action 2. Define and implement management actions necessary to minimize loss or degradation of habitat.**

The international boundary pedestrian fence that was completed in 2008 along the entire border of the Yuma Desert appears to have greatly reduced impacts to FTHL habitat in the Yuma MA resulting from drug smuggling, illegal immigration, and associated law enforcement activities. Outreach efforts to inform and educate enforcement personnel on FTHL issues continue.

The habitat impacts authorized by managing agencies within the period are shown in Tables 1 and 2. Included in the remainder of this section is a narrative for each participating agency. For reference, the amount of land owned by each agency in the various MAs is shown in Table 3.

**BLM - El Centro Field Office.**

In the Yuha Desert MA, 92.9 acres were authorized for impact to Tessara Imperial Valley Solar for a transmission line.

BLM-El Centro organized and supervised 5 sessions to train biologists, mostly private consultants, who may work as monitors on projects that impact FTHL. They worked with other ICC agencies to train 67 FTHL surveyors. This was a monumental effort for all who participated in the organization, training and follow-up. The ICC began a process to transfer responsibility for future training sessions to the Southwest Partners in Amphibian and Reptile Conservation.

In the 2009 annual report, BLM-El Centro authorized a disturbance of 91.31 acres for a Right-of-way Grant to San Diego Gas and Electric (SDG&E) for the construction of the Sunrise Powerlink solar project. The project was subsequently down-sized to 46.41 acres of impact. The acreages in Tables 1 and 2 have been modified accordingly.

BLM Law Enforcement Officers regularly patrol the MAs. However, some illegal use and route proliferation continue to occur in Limited Use Areas because there is such a large area to cover. BLM continues to conduct signing, education, and restoration of illegal incursions in order to reduce these impacts.

#### **BLM - Palm Springs South Coast Field Office.**

No projects were authorized on FTHL habitat administered by BLM-Palm Springs.

#### **BLM - Yuma Field Office.**

No projects were authorized on FTHL habitat administered by BLM-Yuma.

#### **Marine Corps Air Station - Yuma.**

Projects described in the EIS for the Yuma Training Range Complex of 1995 are not subject to the RMS (Planning Action 2.2.1).

The Department of the Navy has approved construction of an F-35B Joint Strike Fighter (JSF) Expeditionary Airfield (EAF) on BMGR-West within the Yuma Desert MA. The EAF will be located within a portion of the MA that is comprised of high quality habitat with high-densities of FTHLs. The proposed site is located approximately 5 miles from the ASH and on the north side of Aux-2. The EAF and associated infrastructure will have a construction footprint of 126.7 acres. Construction will include the creation of a 0.75 mile access road to connect the EAF to Aux-2. Parking and a 0.92-acre staging area will be located near the intersection of Aux-2 and new access road. This extension and the creation of associated utilities would permanently remove 82.7 acres of FTHL habitat. This represents 0.07% of the total MCAS-Yuma administered lands within the Yuma Desert MA (115,130 acres). An additional 44 acres of FTHL habitat will be disturbed as a result of construction and equipment/materials storage and staging areas.

Potentially expensive mitigation is envisioned in the JSF Biological Opinion (BO), while evaluation of threats and success of FTHL mitigation measures remain preliminary. The BO specifies that:

1. MCAS will conduct a multi-year survey and monitoring of FTHL behavior, habitat use, effects of increased road traffic and exposure to noise prior to, during, and for 3 years after construction.

2. A barrier fence may be constructed at the ALF and access road, and FTHLs will be captured and relocated outside of the fence prior to construction activities, or
3. Biological monitors will be present during all surface disturbing activities construction to search for and remove FTHLs from the area.

The study will focus its efforts under (1) on issues related to (2) to provide guidance for this and future mitigation involving the FTHL. This project will be executed through the University of Arizona's School of Natural Resources and the Environment.

#### **NAF-El Centro.**

One project was approved in the Target 101 portion of the West Mesa MA in 2010. This was a geothermal resources exploratory test well which resulted in a total disturbance of 1.76 acres including test well pad and roadway. At this time, the Navy has not decided whether this resource will be developed for geothermal electrical generation. Therefore, the pad and road have only been minimally restored at this time. Once a development decision has been made, this area will be planned for further development and reported as permanent disturbance or the area will be restored as much as practical and reported as temporary disturbance. However, the disturbance is being reported as permanent in this and subsequent reports, until the area is restored and natural processes return.

#### **Anza-Borrego Desert State Park.**

No impacts were encountered or authorized within FTHL habitat in 2010. Inside the Borrego Badlands MA, 3.73 acres were identified for a temporary paleoseismic study, only a fraction of which would actually be excavated and refilled. As of 2010, this project had been permitted but not implemented. Outside of the MA, 3.84 acres were permitted for a project to restore land damaged by an illegal trespass of construction equipment by an adjacent land owner several years earlier. As of 2010, this project had not yet been implemented.

Table 1. Authorized projects with impacts to habitat within Flat-tailed Horned Lizard Management Areas, 1997-present.

Year	Authorizing agency	Project	Acres
<b>East Mesa</b>			
1999	BLM-El Centro	Observation wells	8.77
2001	BLM-El Centro	Level 3 Communications	7.6
2001	BLM-El Centro	Granite Construction sand and gravel	1
2002	BLM-El Centro	BLM mining	82.3
2002	BLM-El Centro	BLM geothermal piping	1
2003	BLM-El Centro	BLM API sand and gravel and Ormat	2.8
2008	BLM-El Centro	Drop 2 Reservoir	285
TOTAL			388.47
<b>West Mesa</b>			
1998	NAF-El Centro	Weapons Impact Scoring Set	1
2001	BLM-El Centro	Imperial Irrigation District R Line	31.42
2001	BLM-El Centro	Imperial Irrigation District L Line	75.69
2004	NAF-El Centro	NAF cleanup of targets 101 and 103	6
2010	NAF-El Centro	Navy geothermal exploratory test well	1.76
TOTAL			115.87
<b>Yuha Desert</b>			
1998	BLM-El Centro	Imperial Irrigation District dike	2
2001	BLM-El Centro	Caltrans ditching along Hwy. 98	16.1
2001	BLM-El Centro	Border Patrol blading of staging areas	14
2001	BLM-El Centro	Border Patrol maintenance of berms	2.1
2002	BLM-El Centro	Border Patrol cameras	0.6
2002	BLM-El Centro	La Rosita powerline	53
2004	BLM-El Centro	Powerpoles to Border Patrol camera	0.46
2008	BLM-El Centro	Powerpoles to Comsite	0.08
2009	BLM-El Centro	Sunrise Powerlink transmission line	46.41 <sup>1</sup>
2010	BLM-El Centro	Tessara Imperial Valley Solar transm. line	92.9 <sup>2</sup>
TOTAL			227.65

(Table 1 continued on next page)

Table 1 (continued). Authorized projects with impacts to habitat within Flat-tailed Horned Lizard Management Areas, 1997-present.

<b>Year</b>	<b>Authorizing agency</b>	<b>Project</b>	<b>Acres</b>
<b>Yuma Desert</b>			
1999	MCAS-Yuma	Harrier jet crash (temporary disturbance)	(6)
2001	MCAS-Yuma	Rifle range and runway repair	2
2001	Reclamation	Prison right-of-way and monitoring wells	1.3
2002	Reclamation	Reclamation observation wells	0.5
2003	MCAS-Yuma	Weapons familiarization training	2
2004	MCAS-Yuma	Dust control and ammo supply point	10.15
2005	Reclamation	Border easement	14
2010	MCAS-Yuma	Joint Strike Fighter airfield	126.7
TOTAL			156.65
<b>Borrego Badlands</b>			
2010	ABDSP	Paleoseismic study	3.73
TOTAL			3.73

<sup>1</sup>Reduced acreage from 91.31 acres to 46.41 acres due to project modifications.

<sup>2</sup>Construction has not begun.

Table 2. Acres of flat-tailed horned lizard habitat authorized for impact by RMS signatories from January to December 2010, and cumulative acres of impacts within the management areas.

Agency	Within MA		Outside MA (acres)	Total Acres	Acres Impacted to Date in MAs	
	MA	Acres			Total	Percent**
BLM-El Centro	East Mesa	0	0	0	388.47	0.36
	West Mesa	0	0	0	107.11	0.10
	Yuha Desert	92.9	0	92.9	227.65	0.40
NAF-El Centro	East Mesa	0	0	0	1.0	0.01
	West Mesa	1.76	0	1.76	8.76	0.03
Anza-Borrego Desert State Park	Borrego Badlands	3.73	3.84	7.57	3.73	0.01
Ocotillo Wells State Vehicular Recreation Area	*	*	30	30	*	
BLM-Palm Springs	*	0	0	0	*	
MCAS-Yuma	Yuma Desert	126.7	0	126.7	140.85	0.01
Reclamation	Yuma Desert	0	0	0	15.80	0.10
BLM-Yuma	*	0	0	0	*	
<b>Total Acres</b>		<b>225.09</b>	<b>33.84</b>	<b>258.93</b>	<b>893.37</b>	<b>0.17</b>

\* No land administered within an MA.

\*\* Based on the MA acreage for each agency, including acquisitions (see Table 3).

Table 3. Ownership of lands within Flat-tailed Horned Lizard Management Areas.

Management Area	Initial acreage (1997)			Acres purchased since 1997			Current acreage
	Signatory	Non-sig.	Total	Previous	2010	Total	
<b>East Mesa</b>							
BLM	99,741						102,990
NAF	8,455						8,455
Private		7,339		2,979	270	3,249 <sup>1</sup>	4,090
<b>TOTAL</b>	<b>108,196</b>	<b>7,339</b>	<b>115,535</b>				<b>115,535</b>
<b>West Mesa</b>							
BLM	78,787						86,125
NAF	33,056						33,056
State		2,678					2,678
Private		21,784		4,811	2,527	7,338 <sup>1</sup>	14,446
<b>TOTAL</b>	<b>111,843</b>	<b>24,462</b>	<b>136,305</b>				<b>136,305</b>
<b>Yuha Desert</b>							
BLM	57,341						57,341
Private		2,958					2,958
<b>TOTAL</b>	<b>57,341</b>	<b>2,958</b>	<b>60,299</b>				<b>60,299</b>
<b>Borrego Badlands</b>							
State Parks	38,228						40,980
Private		4,253		1,664 <sup>2</sup>	1,088	2,752 <sup>2</sup>	1,501
<b>TOTAL</b>	<b>38,228</b>	<b>4,253</b>	<b>42,481</b>				<b>42,481</b>
<b>Yuma Desert</b>							
MCAS	99,300						114,800
Reclamation	16,200						16,200
State		15,500		15,500 <sup>3</sup>			0
<b>TOTAL</b>	<b>115,500</b>	<b>15,500</b>	<b>131,000</b>				<b>131,000</b>

<sup>1</sup>Purchased by, and transferred to BLM.

<sup>2</sup>Includes 1,064 acres acquired by the Anza-Borrego Foundation; remainder purchased by California State Parks; entire acreage transferred to California State Parks.

<sup>3</sup>Purchased and administered by MCAS.

### **Bureau of Reclamation - Yuma.**

Construction activities for the DROP 2 project and the All-American canal lining were completed in 2010. No new projects that impacted FTHL habitat were authorized in 2010.

### **Ocotillo Wells State Vehicular Recreation Area.**

A 4x4 training track was constructed at OWSVRA on approximately 30 acres of heavily disturbed habitat. Approximately 10 acres of FTHL habitat was fenced within this project and either closed completely or designated as a pedestrian area. Approximately 5 additional acres were fenced as a future restoration site.

### **Total Habitat Disturbance from January through December 2010.**

As reported, BLM-El Centro authorized disturbance of 92.9 acres in the Yuha Desert MA, NAF-El Centro authorized disturbance of 1.76 acres in the West Mesa, ABDSP authorized disturbance of 3.73 acres in the Borrego Badlands MA and 3.84 acres outside the MA, MCAS-Yuma authorized disturbance of 126.7 acres in the Yuma Desert MA, and OWSVRA authorized disturbance of 30 acres within the RA.

### **Planning Action 3: Within the MAs, rehabilitate damaged and degraded habitat, including closed routes and other small areas of past intense activity.**

BLM-El Centro has been actively implementing the Western Colorado (WECO) route designation plan signed on January 31, 2003. Signage for the Yuha Desert, East Mesa, and West Mesa MAs is complete. BLM rangers make routine checks on signs and replace them as necessary. BLM-El Centro continues to update 12 interpretive kiosks within the Yuha Desert and West Mesa MAs with new maps, rider, and lizard information. In addition, BLM-El Centro continues to provide regular outreach by producing and distributing maps of the WECO route of travel designations. Finally, BLM-El Centro continues law enforcement patrol of all MAs under their jurisdiction and makes regular public enforcement and education contacts.

Through a series of multiple-year grants from the California OHV Motor Vehicle Commission, BLM is continuing work on an ambitious restoration program. BLM continued to work with the Student Conservation Association (SCA) to conduct restoration activities in the Yuha Desert, West Mesa, and East Mesa MAs. Archaeological surveys are necessary before implementing restoration and are ongoing, concurrent with restoration.

Attempts by OWSVRA to restore habitat were almost totally unsuccessful. There was zero success with desert willow, paloverde, and ironwood transplants. A handful of mesquites survived. It would appear that the success rate was 5 transplants out of 246 attempted.

### **Planning Action 4: Attempt to acquire through exchange, donation, or purchase from willing sellers all private lands within MAs.**

In-holdings within the Yuma Desert MA were purchased previously and all land remains federally owned.

In Anza-Borrego Desert State Park, land acquisitions within FTHL habitat continue in coordination with the Anza-Borrego Foundation (ABF). ABF seeks to acquire private in-holdings within ABDSP including acres within the FTHL MA. In 2010, ABF acquired 200 acres within the MA. This property is managed by ABDSP and will eventually be transferred into Park ownership.

BLM-El Centro continues to use compensation funding for acquisition of private lands throughout FTHL MAs. Acquisitions totaled 2527 acres in the West Mesa MA and 270 acres in the East Mesa MA. The amount or composition of the compensation used for these acquisitions was not reported.

Reclamation's Boulder City Regional Office, which is implementing the Multi-Species Conservation Program (MSCP), is in the process of acquiring 230 acres of FTHL habitat to meet Lower Colorado River MSCP mitigation requirements. Lands acquired by MSCP must be inhabited by FTHL and will be transferred to an appropriate land management agency. Reclamation plans to conduct surveys to identify appropriate parcels in 2011.

#### **Seek funds for land acquisitions in MAs.**

See previous section.

#### **Planning Action 5: Maintain or establish effective habitat corridors between naturally adjacent populations.**

BLM El Centro permitted the Imperial Valley Solar in October of 2010 which had the potential to obstruct FTHL movement between the Yuha and West Mesa MAs. BLM, Fish and Wildlife Service and California Energy Commission worked with the developer to incorporate design features to facilitate connectivity. The project applicant has since sold the project to another developer which will be making substantial changes to the project design.

No activities or projects have been permitted within the California MAs or Ocotillo Wells RA this year that would prevent or obstruct FTHL movement between adjacent populations in the MAs or RA.

#### **Planning Action 6: Coordinate activities and funding among the participating agencies and Mexican agencies.**

##### **Management Oversight Group.**

The MOG is comprised of managers from 12 signatory agency offices. It meets as necessary each year to coordinate implementation of the Conservation Agreement in response to ICC recommendations. The MOG met on the following dates during 2010:

11 March (MOG/ICC; BLM-Yuma)

14 October (BLM-El Centro)

Major items discussed by the MOG during 2010 were analysis of recent monitoring data, the development of a conservation plan in Mexico, proposals for various development projects, and tracking disturbance in relation to the 1% cap.

## **Interagency Coordinating Committee.**

The ICC is comprised of biologists from 13 signatory agency offices. It meets quarterly to exchange information on research results, develop proposals, and discuss technical and management issues. The ICC is responsible for compiling information for the annual ICC report which outlines accomplishments under the RMS, lists issues regarding management of the MAs and RAs, and details planned actions for the upcoming year. The ICC met on the following dates during 2010:

11 March (MOG/ICC; BLM-Yuma)

24 June (BLM-Yuma)

9 September (BLM-Yuma)

10 December (BLM-El Centro)

Major items that the ICC discussed in 2010 included maintaining a centralized database for monitoring data, analyzing recent monitoring data, revising the monitoring protocols, purchasing land in California MAs, development of a conservation strategy in Mexico, various projects that could impact FTHL habitat, the results of monitoring and research, updating the research and monitoring list, and training of FTHL monitors.

## **Coordination with Mexico.**

Staff of the Alto Golfo de California Biosphere Reserve (AGCBR) continued to participate in the ICC and to discuss the development of a Mexican management strategy and other issues of common concern. In 2007, a bi-national working group was formed to address FTHL conservation activities in Mexico and the development of a conservation management strategy. Rob Lovich, Natural Resources Specialist with the Department of Navy, headed a sub-team to facilitate coordination through the ICC and Mexico representatives. A funding agreement was initiated in 2008 that would transfer funding to Mexico to assist with the development of a conservation management strategy. AGCBR hired Alejandra Calvo Fonseca in 2008 to lead a project to “Promote the flat-tailed horned lizard conservation through involvement of the communities of the Upper Gulf of California and Colorado River Delta Biosphere Reserve”. She reports the following accomplishments for 2010:

- Worked with other projects involved with avitourism and ecotourism to promote the conservation FTHL habitat.
- Designed materials promoting FTHL conservation with participation of the outreach programs of the AGCBR.
- Worked with several environmental agencies of Sonora and Baja California Norte to promote FTHL conservation. These include CEDO and CEDES; Civil Protection of the municipality of San Luis Rio Colorado, Sonora; universities such as UNISON, CESUES and UABC; governmental organization CESPM (Water Treatment Plant “Las Arenitas”); the non-profit environmental organizations Sonoran Institute and AEURHYC; Department of Ecology of the City of San Luis Rio Colorado; Club

travesilleros (4x4 off road clubs); Federal government agency CONANP; Pronatura Noroeste (Ensenada Office); and representatives of Ejidos Vicente Guerrero, Luis Encinas Johnson, Samuel Ocaña, Lágrimas, and Carlos Salinas de Gortari.

- Worked with Sonoran Institute and with Wastewater Treatment Plant Las Arenitas CESPM (Comisión Estatal de Servicios Públicos en Mexicali) to design a refuge for desert pupfish and FTHL including the brochure and information required for the signs.
- Attended the juntas Ejidales (Legal assembly of the Ejido System) Luis Encinas Johnson, Estación el Doctor, Samuel Ocaña, and Rosa Morada to present our project.
- Implemented monitoring of FTHL and habitat using the ICC occupancy survey protocol.
- Participated in exhibitions platforms to increase the understanding of FTHL conservation.
- Met with several “travesilleros” off-road clubs to exchange information and discuss items for the management strategy for the conservation of the FTHL.
- Organized and conducted a workshop and symposium held in San Luis Rio Colorado Sonora on September 10-11, 2010, to educate the public and community leaders on FTHL biology and conservation and the efforts to develop a management strategy. Several members of the ICC from the U.S. attended and presented information.
- Trained volunteers, students, and land owners on survey techniques.

Special management areas, equivalent to the MAs in the U.S., need to be identified and managed as such. Additional signage and interpretive materials would be needed in support of these areas. In addition, MOG and/or ICC need to meet to focus management and research needs in Mexico and projects to support those needs. Ideally, the meetings should be held in Sonora and include representatives from AGCBR and El Pinacate y Gran Desierto de Altar Biosphere Reserves. A Spanish version of the RMS would be useful.

### **Conservation Agreement.**

The 10 agencies that are signatories to the Conservation Agreement to implement the FTHL RMS are listed in the introduction.

### **Incorporate RMS actions in ecosystem plans.**

See also Planning Action 1.

In January 2003, the BLM-El Centro Field Office completed the Western Colorado Routes of Travel Designation (WECO). This designated routes as open, closed, or limited. WECO specifically incorporates the guidelines of the RMS, and the BLM is managing its land under those guidelines. BLM-El Centro wrote an Environmental Assessment to amend the California Desert Conservation Area Plan to officially designate the FTHL MAs. The EA was signed on February 1, 2005, thus formally establishing all three MAs in the El Centro area.

Reclamation continues to implement the Five-Mile Zone Resource Management Plan, adopted March 18, 2004, for withdrawn lands along this zone that parallels the international border. This RMP incorporated the RMS and was further described in the 2004 FTHL Annual Report.

MCAS-Yuma continues to implement the INRMP (see Planning Action 1), which fully incorporates and implements the RMS.

BLM-Palm Springs continues to participate in the CVMSHCP that fully incorporates measures in the FTHL RMS.

### **Border Patrol.**

BLM-El Centro coordinates monthly meetings with 3 BP offices and sponsors regular FTHL orientation sessions to reduce BP impacts to FTHL habitat along the international border. In 2008, BP initiated fence construction in all flat-terrain and lowland areas for the entire California-Mexico border and portions along the Arizona-Mexico border. Several types of fencing (i.e., pedestrian and vehicular) were constructed. BLM conducts regular troop briefings to ensure they are aware of FTHL concerns in the desert. This coordination is viewed as a national model because it allows both the BLM and BP to accomplish their missions. BP is completing its mission while minimizing impacts in FTHL habitat as a result increased understanding of the FTHL and its habitat needs.

BLM-El Centro implemented an ambitious education strategy with BP to reduce impacts to FTHL habitat. This includes Detailer and Post Academy Orientation. Detailed staff and new employees assigned to the BP's El Centro Sector are given a 1-2 hour presentation on MA locations, desert ecology, sensitive species, archeology, and wilderness. Detrimental effects of off-route travel on FTHL habitat is discussed in relation to prey, ecology, and FTHL habits. This information is provided to all new BP field agents in the El Centro and Calexico as part of their new employee orientation. BLM recommends, and will assist with, similar training for enforcement staff in other MAs (e.g. Yuma Desert).

## **Planning Action 7: Promote the goals of the Strategy through law enforcement and public education.**

### **Law Enforcement.**

BLM-El Centro has continued to increase law enforcement patrols in FTHL habitat in Imperial County, particularly within the East Mesa MA (see description under Planning Action 3 above). Law enforcement officers report that the majority of recreational users in the MAs are now complying with the route designation requirements by staying on approved routes and camping in appropriate areas.

MCAS conducts daily ORV patrols within the Yuma Desert MA and adjacent habitat.

### **Public Information.**

BLM-El Centro continues to maintain informational kiosks and update and distribute the WECO area road map, which encompasses the Yuha Desert, and West Mesa and East Mesa MAs.

Furthermore, BLM-El Centro continues public contacts and information dissemination using Park Rangers and the Student Conservation Association crew. BLM-El Centro has extended these contacts into the West Mesa MA and has partnered with the Desert Protective Council in securing of a grant to produce and distribute an interpretive brochure of the Yuha area. Additionally, BLM-El Centro has expanded the environmental outreach program in the Imperial Sand Dunes. New interpretive panels that have information about FTHL and other wildlife in the dunes have been placed in the Cahuilla Ranger station. The 5 new kiosks locations include: Cahuilla Ranger station, Gecko Road, Wash Road, Buttercup Ranger station, and Dunebuggy Flats. These panels will rotate among the various kiosks to allow returning visitors see a variety of information. A FTHL panel is not currently on display but one will be made available in the future.

Recreation is allowed within a limited area of the MCAS portion of the Yuma Desert MA. MCAS has published a recreational use map depicting closed areas which is supported with on-the-ground signage. The Range Wardens and Facility Control monitor Range access in real-time for natural resource preservation, including the FTHL MA. In addition, MCAS includes a FTHL presentation to DOD, academic, and private contractors who will be accessing the BMGR via in person and online Range Briefs. Finally, MCAS provides BP with a FTHL brief prior to Weapons Tactics Instruction (WTI) training twice a year and in quarterly law enforcement meetings.

**Planning Action 8: Encourage and support research that will promote the conservation of FTHLs or desert ecosystems and will provide information needed to define and implement necessary management actions effectively.**

#### **Research Permitting and Funding.**

AGFD issued 9 permits for collecting or handling FTHL during 2010. CDFG issued no new scientific collecting permits during 2010; 48 Letters of Concurrence were issued to monitoring trainees. The following studies were funded by signatory agencies or other sources during this reporting period:

OWSVRA continues to self-fund all of its FTHL surveys which include the completion of the ICC-recommended occupancy survey and the FTHL component of OW's regular reptile surveys. All data has been collected and organized in a manner so that ecological and population questions can be examined over time.

Reclamation funded demographic surveys at 2 plots within the Yuma Desert MA, previously established and monitored in 2008. MCAS provided funding for one additional demographic plot in the Yuma Desert MA and for 56 occupancy plots. The Navy provided funding for surveys of one demographic plot in West Mesa.

**Planning Action 9: Continue Inventory and Monitoring.**

Implementation of variations of the current monitoring protocols began in 2002. Techniques were refined over subsequent years, culminating in a FTHL Monitoring Plan that was developed by the ICC in 2008. This plan described 2 types of standardized monitoring methods.

Occupancy surveys are large-scale efforts to document the presence (“occupancy”) of FTHL among numerous 4-ha survey plots broadly distributed within each MA. The number of plots per MA varies but is optimally at least 120. Typically, each plot is surveyed simultaneously for one hour by 4 observers working independently, though methods have varied. Occupancy results are intended to provide an overall assessment of FTHL distributional status within and among the MAs. Demographic surveys are localized intensive efforts within only a few (usually 2) 9-ha selectively chosen plots within each MA. Plots are surveyed by a team of 4-6 observers for 10 consecutive days. All FTHL GPS locations are recorded, a range of measurements are taken, and FTHL with snout-vent length greater than 55mm are PIT-tagged. Demographic results are intended to provide more-detailed assessments of FTHL abundance, density, survivorship, and recruitment within purportedly higher-quality habitats within each MA.

In 2010, BLM-EI Centro completed 50 occupancy plots on East Mesa, and continued demographic surveys on the East Mesa, Yuha, and West Mesa MAs. In cooperation with FWS-Carlsbad and AGFD, BLM-EI Centro also spent considerable time improving the FTHL monitoring database. Specific accomplishments were:

- Entered and quality-checked the 2010 occupancy and demographic data collected by BLM-EI Centro.
- Organized and inventoried the FTHL data for the years 2006-2010. Obtained missing data from FWS and made sure that both agencies had copies of all year’s data.
- Began entering into and quality-checked the master database those changes made within external spreadsheets extracted by FWS so that the database was consistent with those corrections.
- Created a FTHL Survey Notebook that contains all information on annual duties and activities and procedures for the annual data collection efforts.
- Enter the demographic and occupancy data for 2010 from the Yuma Desert MA into the master database.
- Worked with an AGFD intern to familiarize her with the database.
- Quality-checked the BLM-EI Centro demographic data for the years: 2003, 2004, 2007, 2008, 2009.
- Quality-checked the BLM-EI Centro occupancy data for 2008.

BLM-EI Centro also identified a need for additional data support to assure that the existing data is consistent and complete. This effort should continue to be a priority for the ICC. Suggestions are:

- Get data spreadsheets from OWSVRA and quality-check the data base with the raw data they have collected. This needs to be done for all years.
- Enter into the master database and quality check all data from the Yuma Desert MA.

- Gather any data from our Mexico counterparts for inclusion into the master database.
- Identify and facilitate a “gatekeeper” of the master database.

Finally, BLM-EI Centro identified some recommendations that would facilitate ease of data transfer from raw data collection to database input. These are:

- All data should be collected on standardized forms with the same measurement units. The agencies that are collecting data annually now are BLM-EI Centro, AGFD/Marines, and OWSVRA.
- Data should be entered into the master database as soon as feasible by the staff collecting the data to eliminate any confusion over entries or notes.
- While the use of spreadsheets for data extraction is useful, data changes should never be made to these but only in the master database after thoroughly checking the original data sheet. Any corrections, alterations, or interpretations to an existing entry should be carefully documented on the original data sheet in red pen with the date, person, and rationale.

OWSVRA conducted only occupancy plot surveys since previous demographic surveys did not produce sufficient results to allow any data analysis. They surveyed the same 160 plots within OWSVRA and the 21 within the Freeman Property as last year. All surveys were conducted by employees of OWSVRA. Please note for future reference that the plots within the Freeman Property will now be referenced as part of OWSVRA. Plots that are located within the Anza-Borrego Desert State Park portion of the Freeman Property will no longer be surveyed by OWSVRA employees.

AGFD, MCAS, Reclamation, and the San Diego County Museum of Natural History (contracted through the Navy) completed surveys on 3 demographic plots that were established in the Yuma Desert MA. One plot lies within the Reclamation portion and the other 2 within the BMGR portion. AGFD and MCAS completed surveys on 58 occupancy plots in the Yuma Desert MA.

Summaries of 2010 monitoring results from occupancy plots are given in Table 4 and from demographic plots in Table 5. Summaries of all monitoring results from 2002-present are given in Tables 6 and 7. Density estimates increased on each plot for the second year in a row and are dramatically higher on each plot than in 2008. We suspect that these increases are largely a result of 2 consecutive winters with above average rainfall, which resulted in a noticeable increase in the production of winter annual plants. We presume that this in turn increased the number and activity of harvester ants, the preferred diet of FTHL, which would favor higher reproduction and survival of FTHL.

Table 4. Number of occupancy plots surveyed in 2010 and percent that were found to be occupied.

<b>Management Area</b>	<b>Number of Plots</b>	<b>Naïve Occupancy Estimate</b>
Yuma Desert	58	60.0%
East Mesa	50	28.0%
Ocotillo Wells	160	45.6%

Table 5. Summary of flat-tailed horned lizard captures on demographic plots in 2010 (juveniles < 60mm SVL).

<b>Plot</b>	<b>Location Description</b>	<b>MA</b>	<b>Adults Captured</b>	<b>Juveniles Captured</b>
BMG (=YD1)	BMG Range	Yuma Desert	50	38
BOR (=YD2)	Reclamation 5-Mile Zone	Yuma Desert	55	77
315 (=EM1)	East of geothermals	East Mesa	46	- <sup>1</sup>
486 (=YU1)	Pinto Wash	Yuha Basin	41	- <sup>1</sup>
156 (=WM1)	SW of Superstition Mtn	West Mesa	15	- <sup>1</sup>
WM2	On Navy target	West Mesa	Discontinued	
WM3		West Mesa	49	- <sup>1</sup>
Squaw Peak	Near Squaw Peak	OWSVRA	Discontinued in 2009	
Mudhills	Mudhill area	OWSVRA	Discontinued in 2009	

<sup>1</sup> Data not available.

Table 6. Summary of monitoring estimates on Flat-tailed Horned Lizard Management Areas, with 95% confidence intervals. Estimates are of the total population in the Management Area (except where noted) or the probability of occupancy of lizards (L), scat (S), or both (B) on plots in the Management Area. Population estimates were based on mark-recapture data, except one case where trapping webs were used (TW) in 2003 in the Yuma MA.

	Yuma Desert	East Mesa	West Mesa	Yuha Basin	OWSVRA	Borrogo Badlands
2002	-	-	-	25,514 (12,761-38,970)	-	-
2003	16,328 (TW) (8,378-31,794) 25,855 (16,390-43,951)	42,619 (19,704-67,639)	10,849 (3,213-23,486)	-	19,222 (18,870-26,752)	-
2004	-	-	-	73,017 (4,837-163,635)	-	-
2005	22,120 <sup>1</sup> (19,962-25,357)	-	0.06 (0.02-0.14) L 0.48 (0.31-0.79) S	-	24,345 (14,329-69,922)	-
2006	-	0.44 (0.28-0.69) L 0.83 (0.76-0.89) S	-	-	1.00 (no CI) L 0.56 (0.43-0.72) S	-
2007	-	-	-	-	1.00 (no CI) L 0.74 (0.52-1.00) S	-
2008	16,185 <sup>1</sup> (12,840-20,285)	-	-	0.56 (0.29-1.00) L 1.00 (no CI) S	0.66 (0.42-1.00) L 0.74 (0.64-0.83) S	-
2009	19,422 <sup>1</sup> (13,703-24,925)	-	0.86 (0.53-1.00) L 0.87 (0.75-0.99) S	-	0.75 (0.50-1.00) L 0.88 (0.82-0.94) S	-
2010	27,946 <sup>1</sup> (24,871-31,183) 0.91 (0.39-0.99) L 1.00 (0.98-1.01) B	0.75 (0.22-0.97) L 0.83 (0.70-0.91) B	-	-	0.85 (0.49-0.97) L 0.90 (0.84-0.94) B	-

<sup>1</sup> Estimates are only for areas of optimal habitat, approximately 10% of the MA.

Table 7. Flat-tailed horned lizard demographic plot density estimates (adults) with 95% confidence intervals calculated from Huggins closed-capture abundance estimates and mean maximum distance moved (Wilson and Anderson 1985).

MA	Yuma Desert		East Mesa	West Mesa		Yuha Basin	OWSVRA	
Plot	YD1 (=BMG)	YD2 (=BOR)	EM1 (=315)	WM1 (=156)	WM2/ WM3 <sup>2</sup>	YU1 (=486)	Squaw Peak	Mudhills
2007	-	-	1.62 (1.26 – 1.97)	0.83 (0.48 – 1.18)	-	1.15 (0.88 – 1.43)	_1	_1
2008	2.24 (1.75 – 2.78)	0.98 (0.82 – 1.26)	1.23 (0.89 – 1.56)	0.33 (0.20 – 0.45)	2.34 (1.86 – 2.82)	1.11 (0.83 – 1.38)	_1	_1
2009	3.36 (2.41 – 4.24)	1.83 (1.24 – 2.41)	3.31 (2.64 – 3.98)	1.19 (0.83 – 1.55)	3.40 (2.71 – 4.08)	2.70 (2.13 – 3.27)	-	-
2010	5.54 (5.11 – 6.00)	4.82 (4.11 – 5.56)	5.54 (4.87 – 6.22)	2.02 (1.47 – 2.58)	6.26 (5.24 – 7.27)	5.16 (4.24 – 6.07)	-	-

<sup>1</sup>Surveys were conducted in 2007 and 2008 but sample sizes were too small for statistical analysis.

<sup>2</sup>Surveys were conducted on WM2 in 2008-2009 and on WM3 beginning in 2010.

Figure 1 is a summary of monitoring in the Coachella Valley conducted by the Center for Conservation Biology, University of California, Riverside. Surveys were conducted on 34 (stabilized sand field) and 15 (active dune) randomly located plots within the Thousand Palms Preserve from 2002-2011. The plots are 10 m × 100 m (0.1 ha) and each is surveyed six times between mid May and mid July. FTHL detections are made by identifying genus-specific tracks in areas where the only known horned lizards are FTHL. Elsewhere in the Coachella Valley, when evaluating lands for the presence of FTHL, tracking is always coupled with sightings to avoid confusion with desert horned lizards. An additional 18 (ephemeral sand field) and 17 (stabilized dune) plots are surveyed in the western Coachella Valley using the same methodology and while desert horned lizards are detected with some regularity, no FTHL have been found there.

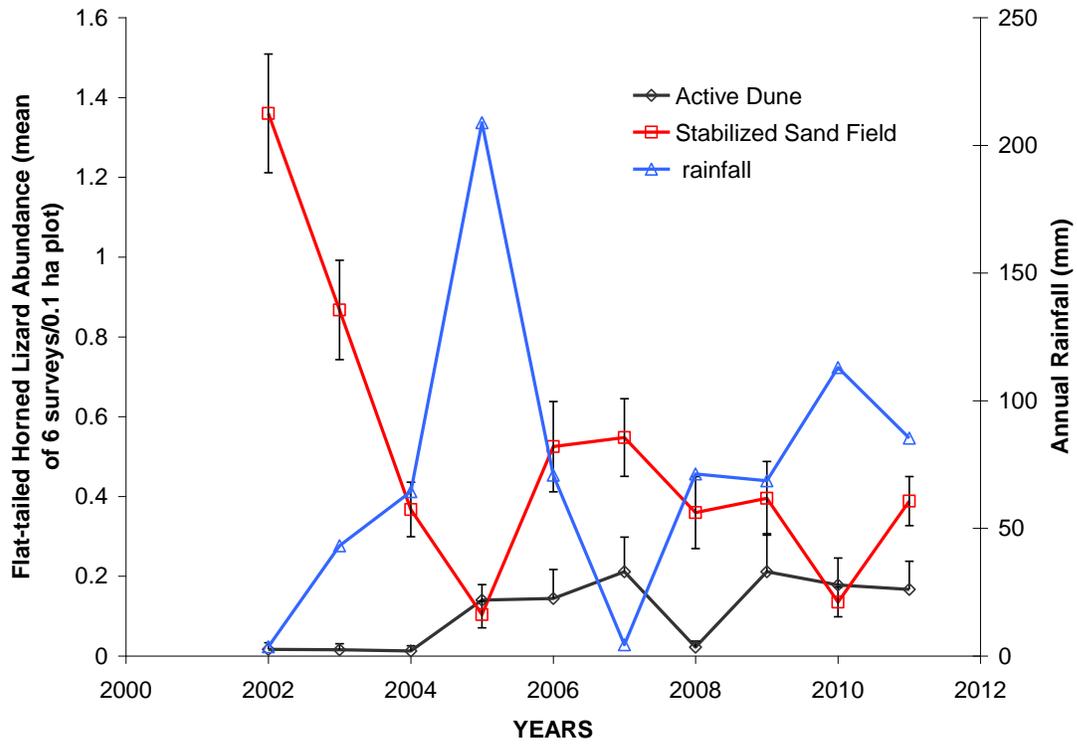


Figure 1. Results of monitoring in the Coachella Valley. Error bars indicate one standard error.

## TREASURY REPORT

Table 8. Expenditures and balances for compensation fund accounts through May 2010 (no updates were provided for the Yuma accounts).

	Yuma MA <sup>2</sup> (17.3% INC)	ASH intermediate acquisitions costs <sup>3</sup> (19% INC)	ASH land purchase cost <sup>4</sup> (19% INC)	East Desert MA <sup>5</sup> (% INC)	West Desert MA <sup>6</sup> (% INC)	Reclamation Drop 2 <sup>7</sup>	Sunrise Powerlink <sup>8</sup>
carryover	127,307.57	417,025.86	647,100.92	61213.52	53,520.43	485873.81	348,484
<b>Additions</b>							
<b>Subtractions</b>							
	6,319.39	112,729.04	828.21	0	41,095	722.03	137,301
<b>TOTALS</b>	120,988.18	304,296.82	646,272.71	61,213.52	12,425.43	485,151.78	211,182

<sup>2</sup>AZ 320 7122 5701

<sup>3</sup>AZ 320 7122 5808

<sup>4</sup>AZ 320 7122 6974

<sup>5</sup>CA 670 7122 6712

<sup>6</sup>CA 670 7122 6713

<sup>7</sup>LRORBX901700

<sup>8</sup>LVTFB10649LO

## CONCLUSIONS

Signatory agencies continue close cooperation and careful execution of their respective responsibilities as described in the 2003 updated version of the FTHL RMS. The signatory and cooperating agencies continue to implement the RMS throughout the MAs and other FTHL habitat. Regular coordination between the participating agencies continues through the MOG and ICC. The participating agencies believe the FTHL Conservation Agreement and RMS continue to provide an effective management focus for FTHL habitat conservation. During the past year, the aggressive RMS implementation has positively benefited FTHL conservation. Outreach efforts continue to include the general public, other U.S. agencies (e.g., BP), and Mexican agencies as active participants in RMS implementation. AGCBR and Pinacate Biosphere Reserves are working closely with U.S. agencies on research and conservation efforts to benefit the FTHL in Mexico. Authorized surface impacts have remained low in MAs. However, there is some concern the 1% development cap may be reached, and exceeded, in some MAs due to renewable energy development and navy projects.

The MOG and ICC continue to support the 2004 decision to allow distributing compensation funding among MAs, regardless of source state, since no land is available for purchase in the Yuma MA. This decision continues to focus on purchasing land available in any MA prior to private development. If there is no additional land available for purchase in a MA, the group will continue to use compensation funds for habitat restoration within MAs. Some signatory participants have been successful in securing funding for rehabilitation efforts from non-compensation funds. This supplements the compensation funds in providing management capability for RMS implementation.

Population inventories and the monitoring of trends continue, as does research in MAs and habitat areas. This information is useful in developing future management actions and providing direction on how best to implement current projects.

Public outreach and education continues. The informational videos produced in 2006 for the general public and the BP will help immensely in this effort. Public understanding of the FTHL, its habitat needs, and authorized activities in its habitat areas, is necessary to fully implement the RMS.

The 2003 updated version of the FTHL RMS continues to direct participating agencies towards ever more effective management and conservation of FTHL.

## RMS IMPLEMENTATION PROGRESS TO DATE (Updated schedule)

The following table displays the priority level, responsible agency, estimated cost, and schedule for completing each Planning Action. The priority levels indicated in the table are assigned the following definitions:

**Priority 1:** An action that must be taken in the near term to conserve the species and prevent irreversible population declines.

**Priority 2:** An action that must be taken to prevent significant declines in population or habitat quality.

**Priority 3:** All other actions necessary to meet the goals and objectives of this RMS.

The following abbreviations and symbols are used in the implementation schedule:

ABDSP	.....	Anza-Borrego Desert State Park
AGFD	.....	Arizona Game and Fish Department
BLM	.....	Bureau of Land Management
Reclamation	.....	Bureau of Reclamation
ICC	.....	Interagency Coordinating Committee
CDFG	.....	California Department of Fish and Game
OWSVRA	.....	Ocotillo Wells State Vehicular Recreation Area
USFWS	.....	U.S. Fish and Wildlife Service
USMC	.....	U.S. Marine Corps
USN	.....	U.S. Navy
<input checked="" type="checkbox"/>	.....	Task completed since 1997
<input type="checkbox"/>	.....	Task not completed
⇒, ∪	.....	Task ongoing, on schedule
➡, ∪	.....	Task ongoing, not on schedule

Management Strategy Implementation Schedule, 2008-2012											
Status	Priority	Action Number	Planned action	Duration (yrs)	Responsible agency	Total cost (\$000)	Cost estimates (\$000)				
							FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
		<b>1.</b>	<b>Delineate and designate FTHL MAs</b>								
☑	1	1.1	Designate Yuma Desert MA	2	RECLAMATION USMC	1	0	0	0	0	0
☑	1	1.2	Designate East Mesa MA	2	BLM USN	1	0	0	0	0	0
☑	1	1.3	Designate West Mesa MA	2	BLM USN	1	0	0	0	0	0
☑	1	1.4	Designate Yuha Desert MA	2	BLM	1	0	0	0	0	0
☑	1	1.5	Designate Borrego Badlands MA	2	ABDSP	1	0	0	0	0	0
☑	3	1.6	Designate Ocotillo Wells RA	1	BLM OWSVRA ABDSP	1	0	0	0	0	0
☑	1	1.7	Designate conservation areas in Coachella Valley	2	BLM USFWS CDFG	1	0	0	0	0	0
		<b>2.</b>	<b>Define and implement actions necessary to minimize loss or degradation of habitat</b>								
⇒	1	2.1.1	Apply mitigation measures	∞	ALL	5	1	1	1	1	1
⇒	1	2.1.2	Require compensation	∞	ALL	25	5	5	5	5	5
⇒	1	2.2.1	Limit discretionary land uses authorizations and rows to 10 acres and 1% total per MA	∞	ALL	5	1	1	1	1	1
⇒	1	2.2.2	Do not dispose of lands in MAS	∞	ALL	0	0	0	0	0	0
⇒	3	2.2.3	Continue maintenance in existing ROWS	∞	ALL	0	0	0	0	0	0
⇒	2	2.2.4	Require fencing along Yuma Desert MA boundary road	∞	ALL	50	0	50	0	0	0
⇒	2	2.3.1	Limit surface disturbance from mineral activities in MAS	∞	ALL	5	1	1	1	1	1
⇒	2	2.4.1	Reduce new roads to a minimum in MAS	∞	ALL	5	1	1	1	1	1
⇒	1	2.4.2	Designate routes "open," "closed", or "limited." Give route signing a priority	∞	BLM USMC BR	100	20	20	20	20	20
⇒	1	2.4.3	Reduce route density in MAS		See 2.4.2						
⇒	1	2.4.4	Coordinate with U.S.BP	∞	ALL	20	4	4	4	4	4
⇒	3	2.5.1	Allow OHV recreation in RA	∞	OWSVRA	0	0	0	0	0	0
⇒	1	2.5.2	No competitive recreational events in MAS	∞	ALL	0	0	0	0	0	0
⇒	2	2.5.3	Allow non-motorized recreational activities in MAS, but no new recreational facilities	∞	ALL	0	0	0	0	0	0
⇒	2	2.5.4	Limit camping in MAS	∞	BLM USMC	20	4	4	4	4	4

Management Strategy Implementation Schedule, 2008-2012												
Status	Priority	Action Number	Planned action	Duration (yrs)	Responsible agency	Total cost (\$000)	Cost estimates (\$000)					
							FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	
⇒	2	2.5.5	No new long-term visitor areas in MAS	∞	ALL	0	0	0	0	0	0	
⇒	3	2.6	Authorize limited use of flora in MAS	∞	ALL	5	1	1	1	1	1	
⇒	1	2.7	Allow military maneuvers and encampments only in designated sites in MAS	∞	USN USMC	5	1	1	1	1	1	
⇒	3	2.8	Suppress fires in MAS using limited fire suppression methods in MAS	∞	ALL	5	1	1	1	1	1	
⇒	1	2.9	Prohibit pesticide treatments in MAS	∞	ALL	5	1	1	1	1	1	
⇒	3	2.10	Limit other activities consistent with above	∞	ALL	5	1	1	1	1	1	
		<b>3.</b>	<b>Rehabilitate damaged and degraded habitat</b>									
⇒	2	3.	Rehabilitate damaged and degraded habitat in MAS	∞	BLM RECLAMATION ABDSP USMC USN	500	100	100	100	100	100	
		<b>4.</b>	<b>Bring all lands within MAS into public management</b>									
☑	3	4.1	Maintain prioritized list of parcels for acquisitions; and respect private rights	1	ALL	5	1	1	1	1	1	
⇒	3	4.2	Procure funds for land acquisitions in MAS (32,178 acres of private lands in California MAS)	∞	BLM CDFG ABDSP OWSVRA	22,525	4,505	4,505	4,505	4,505	4,505	
⇒	3	4.3	Use compensation funds to acquire key lands in MAS	∞	BLM CDFG ABDSP OWSVRA	20	4	4	4	4	4	
⇒	3	4.4	Exchange lands opportunistically	∞	BLM	20	4	4	4	4	4	
		<b>5.</b>	<b>Maintain or establish effective habitat corridors between naturally adjacent populations</b>									
⇒	2	5.1	Limit or mitigate activities in movement corridors	∞	ALL	25	5	5	5	5	5	
⇒	3	5.2	Coordinate with Mexico and INS	∞	ALL	10	2	2	2	2	2	
		<b>6.</b>	<b>Coordinate activities and funding among the participating agencies and Mexican agencies</b>									
☑	2	6.1.1	Establish FTHLMOG	∞	ALL	5	1	1	1	1	1	
⇒	2	6.1.2	Hold semi-annual ICC meetings	∞	ALL	5	1	1	1	1	1	
⇒	3	6.1.3	Establish forum for discussions with agencies and individuals in Mexico	∞	ALL	25	5	5	5	5	5	
☑	1	6.2	Develop Conservation Agreement	1	ALL	0						

Management Strategy Implementation Schedule, 2008-2012											
Status	Priority	Action Number	Planned action	Duration (yrs)	Responsible agency	Total cost (\$000)	Cost estimates (\$000)				
							FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
⇒	2	6.3.1	Incorporate actions in Western Colorado Desert ecosystem plan (Note: Other state and local agencies will fill key roles)	∞	ALL	50	10	10	10	10	10
☑	2	6.3.2	Incorporate actions in CVMSHCP (Note: Other state and local agencies will fill key roles)	3	BLM CDFG USFWS	0	0	0	0	0	0
⇒	2	6.3.3	Incorporate actions in Western Colorado Desert Route Designation	∞	BLM	20	4	4	4	4	4
⇒	1	6.4	Coordinate with U.S.BP and develop mutual agreements	2	BLM RECLAMATIO N USMC	6	2	2	2	0	0
⇒	2	6.4.1	Encourage use of techniques to minimize BPOHV activity	∞	BLM RECLAMATIO N USMC	5	1	1	1	1	1
⇒	2	6.4.2	Prepare educational briefing for BP agents	1	BLM BR	5	1	1	1	1	1
		<b>7.</b>	<b>Promote the purposes of the RMS through law enforcement and public education</b>								
⇒	1	7.1	Provide adequate law enforcement	∞	BLM CDFG AGFD USMC	750	150	150	150	150	150
⇒	3	7.2	Provide public information and education	∞	ALL	25	5	5	5	5	5
		<b>8.</b>	<b>Conduct research necessary to define and implement necessary management actions effectively</b>								
⇒	3	8.1	Require permits for research	∞	ALL	5	1	1	1	1	1
⇒	2	8.2	OWSVRA shall continue to fund research	∞	OWSVRA	200	40	40	40	40	40
☑	2	8.3.1	Test trapping as a population census technique	2	ALL	0	0	0	0	0	0
⇒	2	8.3.2	Test direct counting methods	2	ALL		Included in 8.2 and 8.3.1				
⇒	2	8.4	Determine life history and demographic data (sentinel plots)	5	BLM MCAS, RECLAMATIO N OWSVRA ABDSP	300 150 150 100	60 30 30 20	60 30 30 20	60 30 30 20	60 30 30 20	
⇒	2	8.5	Determine effects of conflicting activities	5	ALL	300	60	60	60	60	60
⇒	3	8.6.1	Determine genetic variation in population	5	ALL	40	0	20	0	20	0
⇒	3	8.6.2	Determine effects of non-natural barriers	∞	ALL	30	5	5	5	5	5
☐	3	8.6.3	Determine effects of natural barriers	5	ALL	15	3	3	3	3	3

Management Strategy Implementation Schedule, 2008-2012											
Status	Priority	Action Number	Planned action	Duration (yrs)	Responsible agency	Total cost (\$000)	Cost estimates (\$000)				
							FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
⇒	3	8.7	Determine effectiveness of mitigation measures	5	ALL	20	4	4	4	4	4
		<b>9.</b>	<b>Continue inventory and monitoring</b>								
⇒	2	9.1	Continue inventories	∞	ALL	125	25	25	25	25	25
⇒	2	9.2.1	Monitor implementation	∞	ICC	40	8	8	8	8	8
⇒	2	9.2.2	Monitor population trends (occupancy plots)	∞	BLM MCAS, RECLAMATION OWSVRA ABDSP	400 180 135 150	100 60 45 50	50  60 45 50	100  50 50	50  60 45 50	100 60 45 50
⇒	1	9.2.3	Document habitat disturbance and loss	∞	ALL	50	10	10	10	10	10
⇒	1	9.2.3.1	Conduct aerial reconnaissance and analysis of surface disturbance on the five MAs every five years	∞	ALL	100		100			
⇒	2	9.2.4	Prepare annual monitoring/implementation report	∞	ICC	20	4	4	4	4	4
⇒	1	9.2.5	Use new inventory, monitoring, and research data in evaluations and proposed changes	∞	ALL	10	2	2	2	2	2

## Appendix A: Report Abstracts

**Frery, V. J., D. J. Abbate, and L. Piast. 2011. Flat-tailed Horned Lizard demographic monitoring within the Yuma Desert Management Area: 2010 progress report submitted to U.S. Bureau of Reclamation, Yuma Area Office. Arizona Game and Fish Department Research Branch, Phoenix, Arizona.** We captured 127 and 93 FTHL (adults and juveniles) within the BR and BMG survey plots respectively (Tables 1 & 2). Of these, 50 total adults were captured on the BR plot and 55 total adults on the BMG plot. We recaptured 4 of 24 (17%) individuals that were marked as adults during 2008-09 survey years on the BR plot. We recaptured 5 of 57 (9%) of individuals marked as adults on the BMG plot during previous survey years. Using Huggins closed capture methods, we estimated 76 (95% CI 51-102) adult FTHL on the BR plot and 77 (95% CI 57-97) on BMG, for a total of 153 (95% CI 108-199) adult FTHL on both plots. We estimated 44 (95% CI 32-55) juveniles on the BMG plot but were unable to estimate juvenile abundance at the BR plot, likely due to a low number of recaptures. Pradel models indicated that generally, annual survival was low. We estimated population density as slightly higher for the BMG plot at 5.54 adult FTHL/ha than for the BR plot at 4.82 adult FTHL/ha (Table 8). These estimates correspond to a mean density of 5.18 FTHL/ha in what we consider to be high density habitat in the Yuma Desert MA. All analyses that we conducted in 2010 indicate that the abundance of FTHL on both sampling plots at the Yuma Desert MA has increased substantially since last year. Estimated abundance of adults was similar for both plots, and represents a 204% and 67% increase at the BR and BMG plots, respectively, from 2009. Individual adult captures in 2010 within the BR plot were 194% higher than 2009 and 233% above 2008. Captures at the BMG plot increased 67% over both 2008 and 2009. Although not as dramatic, this trend was also reflected in the FTHL population density estimates with population density increasing 104% and 26% at the BR and BMG plots, respectively from 2009 to 2010. We suspect that this increase is largely a result of two consecutive winters with above average rainfall, which resulted in a noticeable increase in the production of winter annual plants. We presume that this in turn increased the number and activity of harvester ants, the preferred diet of FTHL, which would favor higher reproduction and survival of FTHL. Recommendations include methods to include statistical rigor and monitoring covariates such as weather and vegetation data and populations of ants and predators.

**Root, Brian G. 2010. Flat-tailed Horned Lizard (*Phrynosoma mcalli*) 2005-2009 Occupancy and Demographic Survey Analyses. Occupancy surveys. FTHL occupancy probabilities were estimated for each single-year survey effort using patch occupancy models. Across all survey efforts, single-season FTHL occupancy estimates generally were relatively high (mostly > 0.6, many > 0.8), although estimates varied based on the data source. Because of low FTHL encounter rates and low detections, FTHL visual-only surveys tended to have the lowest occupancy estimates and/or the widest confidence intervals. The 2 scat-based data sources (scat-only and Visual + Scat) generally produced greater and/or less-variable FTHL occupancy estimates, because scats were more prevalent. Results from the combined Visual + Scat data sources had the highest FTHL occupancy estimates (all but one survey > 0.8). Statistical power to detect declines varied substantially between FTHL visual-only and scat-based data sources. Visual-only surveys had relatively poor power (the best survey results could only detect an ~70%**

decline; many were substantially poorer), compared with scat-based surveys (many surveys could detect declines < 40%). Expectedly, the combined Visual + Scat data sources produced the most-powerful estimates of FTHL occupancy (or “use”). In general, the more powerful FTHL occupancy surveys had the greatest survey effort (> 100 4-ha plots), and in addition had both greater FTHL occupancy and detection estimates. There was some support to indicate a slight increasing trend in FTHL occupancy at West Mesa plots, but modeling results indicating FTHL occupancy was constant during 2006-2009 were equally well supported. Demographic Surveys. During 2007-2009, 573 FTHL were captured at the 6 9-ha survey plots, including 308 adults (155 male, 153 female), and 265 juveniles (125 male, 137 female, 3 unrecorded age). This included 39 and 4 FTHL that were captured in >1 and >2 years, respectively. FTHL abundances (Huggins closed-capture models) varied among the survey plots and among years. Adult FTHL abundance estimates ranged from 6.0 to 46.5 per plot. At all plots, abundances were lowest during 2008 and increased substantially during 2009. Juvenile FTHL abundance estimates ranged from 0 to 142.8 per plot, with temporal trends similar to those of adults; numbers of hatchlings increased substantially during 2009. Adult FTHL densities extrapolated using the *ad hoc* MMDM method had similar spatial and temporal patterns to the Huggins abundance results. The calculated “effective survey area” of the survey plots was 20.3, 17.5, and 13.1 ha during 2007, 2008, and 2009, respectively. The Huggins abundance estimates were divided by these plot sizes to extrapolate FTHL densities (range = 0.3 to 3.3 FTHL/ha). The spatially indexed hierarchical models estimated somewhat greater FTHL densities (range = 0.7 to 4.4 FTHL/ha) compared to results from the MMDM method. Also, temporal patterns in FTHL densities differed with the hierarchical results, which suggested that FTHL densities were similar (rather than declining) between 2007 and 2008, but then increased in 2009. Results from the hierarchical models may be more realistic because they incorporated additional spatial information (e.g., the distribution of FTHL activity centers). Too few temporal data existed (maximum = 3 years) to measure meaningful trends in FTHL abundance or density, beyond indications that abundances were greatest in 2009 compared to 2007 and 2008. Results from both the Pradel and Robust Pradel models supported a generally increasing trend in FTHL abundances during 2007-2009, but with evidence for declines in 2008. Regardless of the analysis method, estimated individual FTHL detection probabilities during the surveys were low, ranging from 0.05 to 0.22 per visit. Adults had slightly greater detection probabilities (both *p* and *c*) than juveniles. Maximum cumulative initial detection probabilities, after 10 survey days, were 0.85 for adults and 0.68 for juveniles, suggesting that at least 15% and 32% of the adult and juvenile FTHLs on each plot, respectively, were missed during the 10-day survey efforts. Statistical power to detect changes (“effect size”; the % detectable difference between any 2 survey efforts) in adult FTHL abundances ranged from 40 – 84 % (median = 46%) for the Huggins closed-capture abundance estimates, but ranged from 36 – 420% (median = 82%) for the hierarchical density estimates.

**Young, Kevin V. 2010. Flat-tailed horned lizard pre-construction surveys on the Imperial Valley Solar Project site.** Pre-construction flat-tailed horned lizard (*Phrynosoma mcallii*) surveys were conducted for the Imperial Valley Solar (IVS) Project Site in 2010. The surveys are part of the Before-After Control-Impact (BACI) Occupancy Estimation Study requested by the agencies. The primary objective of the BACI Study is to determine the distribution and occupancy rates of the FTHL on the Project site before construction, and compare it with the

occupancy and distribution post-construction. Six desert horned lizards (*Phrynosoma platyrinos*) were observed during 2010 pre-construction surveys. No FTHLs were observed during the 2010 surveys at the IVS Project Site. However, two FTHLs were observed less than 10 miles south of the Project site within the Yuha DWMA during training sessions conducted in August 2010. Horned lizard scat was observed in approximately 32 percent of the plots surveyed. Based on the observation that during all years of surveys most of the horned lizard sightings have been DHL, and based on the best judgment of K and A Young concerning habitat suitability, it is believed that FTHLs occur only at very low densities on the Project site. Over the studied area, scats were detected over 32.3% of the plots, indicating that at least approximately one third of the sampled area was occupied by horned lizards. The mean estimated real abundance of scats corresponds to 1.63 ( $\pm 0.09$ ) scat per plot, with an estimated global abundance of 1770 scats over the area of study covered by the sampled plots, while the global probability of detecting a scat during a pass is equal to 0.52 ( $\pm 0.03$ ). Though the sampling time is short, the small plot samples yield much finer coverage than the current occupancy protocol of one hour on four hectares: trying to cover 78 square meters per minute of searching compared to 667 square meters per search minute on the large occupancy plots. Other advantages of these very small plots are 1) greatly increased sample size, 2) greater geographic sensitivity in analysis (since the habitat on a small plot is more uniform across the plot than on a large plot), 3) better estimation of detection probability by observer, and 4) easier for surveyor to stay focused for 16 minutes than 1 hour. Although crew members were all very experienced, talented field biologists, there were drastic differences in observer abilities to detect horned lizard scat, which we were able to estimate quite precisely.

## **Appendix B: 2011 Annual Work Plan for the Flat-tailed Horned Lizard Interagency Coordinating Committee**

### **1. Delineate and designate flat-tailed horned lizard MAs and a RA.**

**1.1-1.6.** All MAs and the RA have been delineated and officially designated. ABDSP will work to strengthen their official commitment in their new Natural Resources Management Plan.

**1.7. Encourage development of a MA in the Coachella Valley.** Signatories decided to support creation and management of the CVMSHCP instead. BLM-Palm Springs will continue to participate in the development of the CVMSHCP.

### **2. Define and implement management actions necessary to minimize loss or degradation of habitat.**

**2.1. Mitigate and compensate project impacts through humane and cost-effective measures.**

**2.1.1. Apply mitigation measures.** Appropriate mitigation measures will be enforced for all authorized projects that impact FTHLs or their habitat.

**2.1.2. Require compensation for residual impacts.** Agencies will continue to require compensation for projects that have residual impacts to FTHL habitat.

**2.2. Limit authorizations that would cause surface disturbance in MAs.**

**2.2.1. Attempt to locate projects outside MAs; limit discretionary land use authorizations and ROWs to 10 acres and 1% total per MA.** These limits will be observed.

**2.2.2. Federally owned lands in the MAs shall be retained in federal ownership.** No disposal of federal lands within MAs will occur.

**2.2.3. Maintenance in existing ROWs may continue.** No action required.

**2.2.4. Require fencing along Yuma Desert MA boundary road.** Agencies in Arizona will continue to coordinate with ADOT to ensure that they are committed to maintaining lizard barrier fencing along the Area Service Highway.

**2.3. Limit surface disturbance in MAs from minerals actions.**

**2.3.1. Allow approved minerals actions while applying applicable mitigation and compensation.** Applicable mitigation and compensation will continue to be applied.

**2.4. Limit vehicle access and route proliferation in MAs.** BLM-El Centro will continue to rehabilitate illegal routes and add signage to designated routes.

**2.4.1. Reduce new roads to a minimum in MAs.** BLM-El Centro: all designated routes within the MAs have been signed.

- 2.4.2. Designate routes “open,” “closed,” or “limited.” Give route signing a priority.** BLM-El Centro completed route designation for the Western Colorado Desert in January, 2003. All vehicle routes on BLM managed lands in Imperial County were designated as open, closed, or limited. BLM has completed initial signing of all of these routes and is routinely patrolling the area and replacing signs as necessary. BLM is also in the process of restoring closed routes to a natural condition. MCAS-Yuma’s INRMP includes a comprehensive effort to sign routes.
- 2.4.3. Reduce route density in MAs.** BLM-El Centro completed route designation for the Western Colorado Desert. All vehicle routes on BLM managed lands in Imperial County were designated as open, closed, or limited. BLM has successfully secured hundreds of thousands of grant dollars to restore closed routes throughout the Western Colorado Desert area, particularly in the FTHL Management Areas. The MCAS-Yuma INRMP includes most of the Yuma Desert MA and calls for closure of redundant routes; routes will be identified for closure within the MA.
- 2.4.4. Coordinate with USBP to ensure cooperation and enforcement of vehicle regulations.** ICC members will continue to hold FTHL orientation sessions with BP agents in the El Centro sector to reduce impacts to FTHL habitat along the International Border.
- 2.5. Limit impacts of recreational activities in MAs.** Recreational camping is limited in the Yuha Desert MA to designated camping areas. The MCAS-Yuma INRMP closes the portion of the Yuma Desert MA on the Barry M. Goldwater Range to all forms of recreation.
- 2.5.1. Allow vehicle-oriented recreation in RA.** No action required.
- 2.5.2. Permit no competitive recreation events in MAs.** Competitive races will not be permitted in MAs.
- 2.5.3. Allow non-motorized recreational activities in MAs, but limit new recreational facilities.**
- 2.5.4. Limit camping in MAs.** Recreational camping is limited in the Yuha Desert MA to designated camping areas. The MCAS-Yuma INRMP closes the portion of the Yuma Desert MA on the Barry M. Goldwater Range to camping.
- 2.5.5. No long-term camping areas shall be developed in MAs.** None will be developed.
- 2.6. Allow limited use of plants in MAs.** No plant sales, commercial collecting, or grazing will be allowed.
- 2.7. Allow military maneuvers and encampments only in designated sites in MAs.** Military training areas in the Yuma Desert MA are fenced or marked to identify their locations and limits so that adjacent areas will not be impacted.
- 2.8. Suppress fires in MAs and BLM lands in the RA using allowable methods.**

- 2.9. No pesticide treatments shall be applied within MAs.** No pesticide treatments will occur in MAs, except for specifically targeted herbicides. Herbicides are used on tamarisk removal projects, which improve FTHL habitat.
- 2.10. Within MAs, other activities not consistent with the RMS shall not be approved.** None will be approved.
- 3. Rehabilitate damaged and degraded habitat in MAs.** BLM-EI Centro will continue restoration and rehabilitation efforts in 2011 utilizing SCA interns. Efforts will focus on the East Mesa MA.
- 4. Attempt to acquire all private lands within MAs.**
- 4.1 Maintain prioritized list of parcels for acquisitions.** Lists identifying parcels for acquisition will be maintained by the California State Parks, State Parks OHMVR Division office headquarters in Sacramento, and by BLM-EI Centro. Ocotillo Wells District, through OHMVRD, will continue to acquire private in-holdings. Colorado Desert District will continue to acquire private in-holdings within ABDSP.
- 4.2. Seek funding to acquire key parcels in MAs.** Compensation funds will be banked for habitat acquisition.
- 4.3. Using compensation and other funds, acquire key lands in MAs.** Key lands in MAs will be acquired as opportunities arise. The ICC and MOG will continue to develop a more comprehensive approach regarding the use of funds.
- 4.4. Participate in exchanges to acquire key parcels in MAs.** This will occur as opportunities arise. At the moment, the primary tool for land acquisition is through purchases rather than land exchanges.
- 5. Maintain or establish effective habitat corridors between naturally adjacent populations.**
- 5.6. Limit or mitigate activities in movement corridors.**
- 5.7. Coordinate with Mexico and INS to ensure movement across the border.** Agencies will continue to consult with Department of Homeland Security on border fencing issues.
- 6. Coordinate activities and funding among the participating agencies and Mexican agencies.**
- 6.1.1. Maintain a FTHL MOG.** The MOG will continue to meet as needed to coordinate implementation of the conservation agreement in response to recommendations from the ICC. Meeting minutes will be provided to all MOG and ICC members to facilitate effective coordination.
- 6.1.2. Hold semi-annual meetings of the ICC.** The ICC has met quarterly since the inception of the RMS and will continue to do so to discuss implementation of Planning Actions under the RMS and issues and challenges regarding this

implementation. In addition to ICC meetings, subgroups of the ICC may meet on occasion to discuss specific issues.

**6.1.3. Develop a forum for discussions with agencies and individuals in Mexico.**

**6.2 Develop a conservation agreement.** The 2003 revision of the RMS has been finalized, printed, and distributed to all involved agencies and interested parties. The RMS may be revised as necessary to reflect new information.

**6.3.1. Incorporate actions into the Western Colorado Desert Coordinated Management Plan.** In 2005, the California Desert Conservation Area Plan was amended to formally adopt the Strategy and the FTHL MAs. This plan will continue to be implemented in 2011.

**6.3.2. Incorporate actions into the CVMSHCP.** BLM-Palm Springs will continue to participate in the development of the CVMSHCP.

**6.3.3. Incorporate actions into the Western Colorado Desert Route Designation.** See 2.4.2.

**6.4. Coordinate with U.S. BP to develop mutual agreements.** BP will continue to be invited to MOG meetings. ICC agencies will finalize the production of the BP training and education video and distribute it to BP offices for use in their training programs.

**7. Promote the goals of the RMS through law enforcement and public education.**

**7.1. Provide sufficient law enforcement.** MCAS and AGFD will continue to conduct ORV patrols within the Yuma Desert MA and adjacent habitat. BLM-El Centro has aggressively moved ahead to fill vacant law enforcement positions and apply for grants to add additional rangers. El Centro is currently almost fully staffed.

**7.2. Provide public information and education about the MAs and RA.** All users of BMGR will receive a briefing that includes information on the FTHL, via slides, pictures and/or descriptions. BLM-El Centro will continue to distribute FTHL brochures and maps to land users. Agencies on both sides of the border will continue to distribute the FTHL brochure that was developed by the Centro Intercultural de Estudios de Desiertos y Océanos. ICC agencies will finalize the production of the general public information video and distribute it to appropriate groups.

**8. Encourage and support research to promote conservation of FTHL and desert ecosystems.**

**8.1. Require permits for research.** AGFD and CDFG will continue to require scientific collecting permits for people who collect or handle FTHL. (New CDFG regulations enable monitors who move FTHL as mitigation for projects in California to do so with a letter of authorization from CDFG and not a collecting permit.)

- 8.2. OWSVRA shall continue to budget for surveys.** Depending on funding, planned monitoring (in house) is to complete 80 occupancy plots with 6 visits per plot as outlined in the newly established protocol.
- 8.3. Continue to refine cost-effective techniques for assessing FTHL abundance.**
  - 8.3.1. Test trapping and other techniques used to enumerate FTHLs directly.**
  - 8.3.2. Determine effectiveness of relative enumeration techniques and scat counts as an index of relative abundance.**
- 8.4. Determine life history and demographic data.** The sentinel plots proposed for each of the MAs will provide this data.
- 8.5. Determine effects of conflicting activities.**
- 8.6. Determine genetic variation among populations and effects of barriers.** The study to evaluate genetic variation across the range of FTHL has been completed.
  - 8.6.1. Determine genetic variation in MAs.**
  - 8.6.2. Determine effects of human-created barriers.**
  - 8.6.3. Determine effects of natural barriers.**
- 8.7. Determine effectiveness of mitigation measures.** The ICC will review the results of the relocation study to determine whether the RMS should be revised or whether additional information is needed on this issue.

## **9. Continue Inventory and Monitoring.**

- 9.1. Continue inventories.** BLM-El Centro will continue to monitor lizard populations in the MAs using the methods prescribed by the ICC. In the Coachella Valley Preserve, FTHL will continue to be surveyed by the Center for Natural Lands Management, with a focus on lizard-ant-small mammal interactions. The objective is to use a correlation approach as well as an experimental approach (small mammal enclosures with varying resource levels) to determine whether the small mammals restrict the growth of the ant populations and therefore impact FTHL. With funding from Reclamation and/or MCAS, AGFD will conduct 2 sentinel plots within the Yuma Desert MA as well as a baseline sample of occupancy plots. In addition, sentinel plots are proposed in the West Mesa, and Yuha Desert MAs. OWSVRA will survey its revised 80 occupancy plots in the RA, chosen from the original 160. Occupancy surveys are proposed for the Borrego Badlands MA and Yuha Desert MA. Pending funding, a mark-recapture survey is proposed for the Borrego Badlands MA.
- 9.2. Monitor habitat quality and population trends in the MAs.** BLM-El Centro conducts disturbance and vehicle track surveys as time and funding allow. The Student Conservation Crew conducting restoration in the Yuha Desert MA is

evaluating the level of disturbance within the MA before, during, and after the restoration.

- 9.2.1. Monitor implementation of the RMS.** The 2011 Work Plan describes how the 2003 RMS will be implemented. At the end of the year, the ICC will report accomplishments and significant deviations.
- 9.2.2. Monitor population trends.** Observations of FTHL during the course of biannual reptile surveys at OWSVRA will be recorded as part of regular monitoring. BLM-EI Centro will gather population data using occupancy and sentinel plots.
- 9.2.3. Document habitat disturbance and loss.** All authorized habitat impacts will be reported in the 2011 ICC Annual Report. BLM-EI Centro, AGFD, and USFWS will continue to quantify the level of vehicular impacts to FTHL habitat using a step-point method.
- 9.2.4. Prepare an annual report of monitoring results and implementation progress.** An annual report will be produced that summarizes monitoring and RMS implementation during 2011. The report will include a schedule of activities to be accomplished in 2012, budget needs for 2012, and projected budget needs for major projects in 2013 and 2014. The report shall also include a summary of monitoring results and a discussion of the likely causes of any noted declines in population.
- 9.2.5 New data shall be used in evaluations of the RMS and in assessing proposed changes.** New information resulting from ongoing research will be used to revise the RMS.