

ROOSEVELT HABITAT CONSERVATION PLAN

ANNUAL REPORT

2011



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Cover photo: Stillinger Preserve, San Pedro River, Pinal County, AZ. Photo provided by EcoPlan Associates, LLC.

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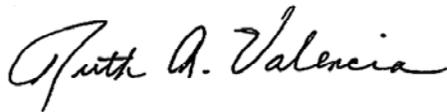
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¹Locations of endangered species are sensitive data considered confidential by U.S. Fish and Wildlife Service.

²Property boundaries overlaid on aerial photographs are approximate due to slight distortions on the aerial photography.

CERTIFICATION

Under penalty of law, I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete.



January 20, 2012

Ruth A. Valencia
Principal Environmental Scientist
Environmental Planning, Management & Compliance
Salt River Project

Date

I. INTRODUCTION

In February 2003, the U.S. Fish and Wildlife Service (FWS) issued an Incidental Take Permit (ITP) pursuant to Section 10(a)(1)(B) of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended, to Salt River Project (SRP) for southwestern willow flycatcher (*Empidonax traillii extimus*) (“flycatcher”), yellow-billed cuckoo (*Coccyzus americanus*) (“cuckoo”), bald eagle (*Haliaeetus leucocephalus*) and Yuma clapper rail (*Rallus longirostris yumanensis*) (“clapper rail”). The activity covered by the ITP is the continued operation by SRP of Roosevelt Dam and Lake up to an elevation of 2,151’. The ITP is conditioned upon SRP’s implementation of the Roosevelt Habitat Conservation Plan (“Roosevelt HCP”) (Salt River Project 2002). The Roosevelt HCP provides measures to minimize and mitigate incidental take of the four species listed above “to the maximum extent practicable and ensures that incidental take will not appreciably reduce the likelihood of the survival and recovery of these species in the wild” (FWS 2002a).

SRP is in its ninth year of implementing the Roosevelt HCP. This report documents all mitigation and minimization efforts conducted over the past water year, November 1, 2010 through October 31, 2011, including a summary of reservoir operations, management activities, monitoring results, status reports and planned future activities.

II. ANNUAL REPORTING COMPLIANCE

Obligation: SRP is required to submit an annual report to FWS, Bureau of Reclamation (USBR) and the Tonto National Forest (TNF) describing all Roosevelt HCP activities occurring during the past year. A draft report must be sent to FWS prior to the annual meeting in October/November of each year. The report is to be finalized by February 1st of the following year.

Actions: SRP submits this report to FWS, USBR and the Tonto Basin District Office of the TNF to fulfill the annual reporting requirement.

III. ROOSEVELT LAKE AREA COMPLIANCE

A. Summary of Reservoir Operations - Water Year 2011

Obligation: Data on reservoir elevations are used in conjunction with habitat monitoring information to determine permit compliance. Impacts to covered species will primarily occur from effects on occupied vegetation resulting from changes in water levels and duration of inundation or desiccation in Roosevelt Lake.

Action: SRP monitors lake levels throughout the year to evaluate impacts and ITP compliance.

Discussion The La Niña this winter had the greatest influence on Salt and Verde reservoir operations this past water year. The strongest indicator, El Niño Southern Oscillation (ENSO), shifted last winter from El Niño to La Niña conditions. Conditions all winter indicated a moderate to strong La Niña event with Equatorial Pacific sea surface temperatures well below normal. Since 1950, there have been eighteen La Niña winters. The majority of those eighteen winters have been dry with six being normal and four being above normal on the SRP watershed.

2011 forecasts from National Weather Service and the Climate Prediction Center calling for a greater likelihood of a dry winter and early summer were verified. The runoff this winter was only 42% of median. The precipitation this monsoon season on the Salt and Verde watersheds was 76% of normal but runoff volumes from the monsoon season typically do not impact operations. The seasonal river swap from the Salt System to Verde System was initiated on November 21, 2010, slightly later than usual due to maintenance requirements at Roosevelt Dam.

Winter Precipitation: Sea surface temperatures across the Equatorial Pacific during the Fall of 2010 were cooler than normal indicating that the Southern Oscillation was in a moderate-to-strong La Nina phase going into the winter of 2010/2011. Typically, this condition is associated with below normal cool-season precipitation across the Southwestern United States with the biggest impact in Arizona usually observed during the months of December – March.

Compared to recent autumns, precipitation events across Northern Arizona were frequent during October and November 2010, and the Salt/Verde watershed recorded an average precipitation accumulation of 2.53” or 82% of normal for the first two months of water year 2011. December began on a relatively dry track, but a significant change in the weather pattern across the western United States occurred around mid-month and led to a series of three productive storm systems affecting Arizona during the latter half of the month. Combined, these systems yielded the winter’s and water year’s only “wet” month by producing a Salt/Verde watershed average accumulation of 3.11” by the end of December which is 186% of the normal monthly total.

Although the productivity of these weather systems raised uncertainty in seasonal forecasts that were overwhelmingly calling for below normal precipitation across the southwestern United States during the cool season, any doubts quickly evaporated as the third driest January on record was observed on the Salt/Verde watershed. An average precipitation accumulation of only 0.06”, which is 3% of normal for the month, was recorded across the Salt/Verde watershed during January 2011, and although much wetter in comparison, the average watershed accumulations for February and March were also convincingly below normal.

All totaled for the period from December 1, 2010, through March 31, 2011, the Salt/Verde watershed received an average precipitation accumulation of 5.40” which is 66% of normal. One interesting aspect of this period is that the Verde River Basin, which received an average precipitation of 6.17” or 75% of normal was substantially favored compared to the Salt River Basin that received an average precipitation of 4.65” or 57% of normal.

Summer Precipitation: After the typically dry months of April, May and June, the North American monsoon spread northwards and into most of Arizona during the first few days of July. A persistent influx of moisture supported widespread thunderstorms around the state for the first two weeks of the month before the first monsoon break occurred around mid-month. This break was relatively short-lived with moisture returning and supporting another burst in monsoonal thunderstorms during the latter part of July. Two smaller bursts that were separated by short breaks were observed in the first half of August, but after mid-August, the monsoonal circulation over the southwestern United States broke down with westerly winds returning aloft. Disturbances within the westerlies interacted with moisture pushed into the region from decaying tropical storms on at least two occasions in September, but July, with an average accumulation of 2.05” or 96% of normal, was the only summer month in which the average precipitation accumulation across the Salt/Verde watershed approached the long-term normal amount.

For the summer months of July through September, the Salt/Verde watershed as a whole received an average accumulation of 4.88” which is 76% of normal. As opposed to the cool season months, precipitation during the summer months was nearly equally distributed between the Salt River Basin, which received an average accumulation of 4.83” or 75% of normal, and the Verde River Basin, which received an average accumulation of 4.91” or 76% of normal.

For the water year, October 1, 2010, through September 30, 2011, the Salt/Verde watershed average precipitation accumulation was 13.96” or 71% of normal with the Salt side receiving 12.3” or 62% of normal versus the Verde’s 15.7” or 79% of normal. (See figure 1.)

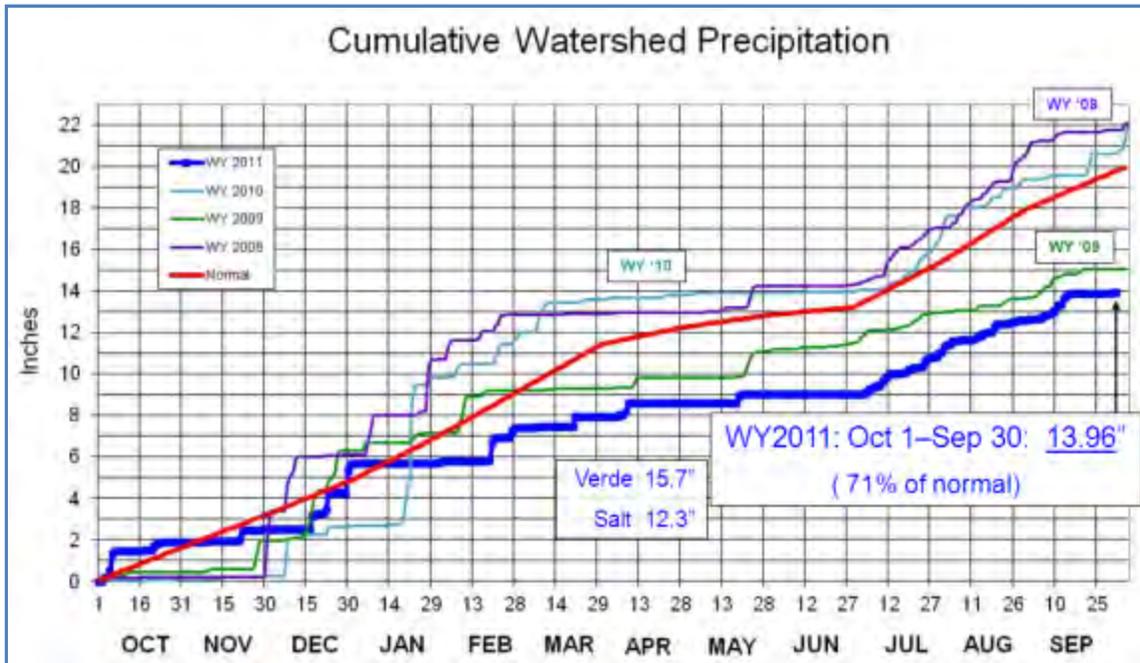


Figure 1. Cumulative watershed precipitation, October 1, 2010 through September 30, 2011.

Reservoir Status: The reservoir system was 88% of capacity heading into water year 2011 due to above median runoff from the 2010 winter season and near normal precipitation from the 2010 monsoon season. The winter season began favorably with December precipitation being 186% of normal. However, the wet December was an anomaly given the moderate La Niña (below normal sea surface temperatures over the equatorial Pacific). Total runoff this winter (January-May) was approximately 222,000 acre-feet which is 42% of median and ranked as the 22nd driest winter on record. Total runoff from the monsoon (July-September) produced about 72,000 acre feet. (See figure 2.) Total storage decreased from 88% of capacity to 68% capacity during water year 2011.

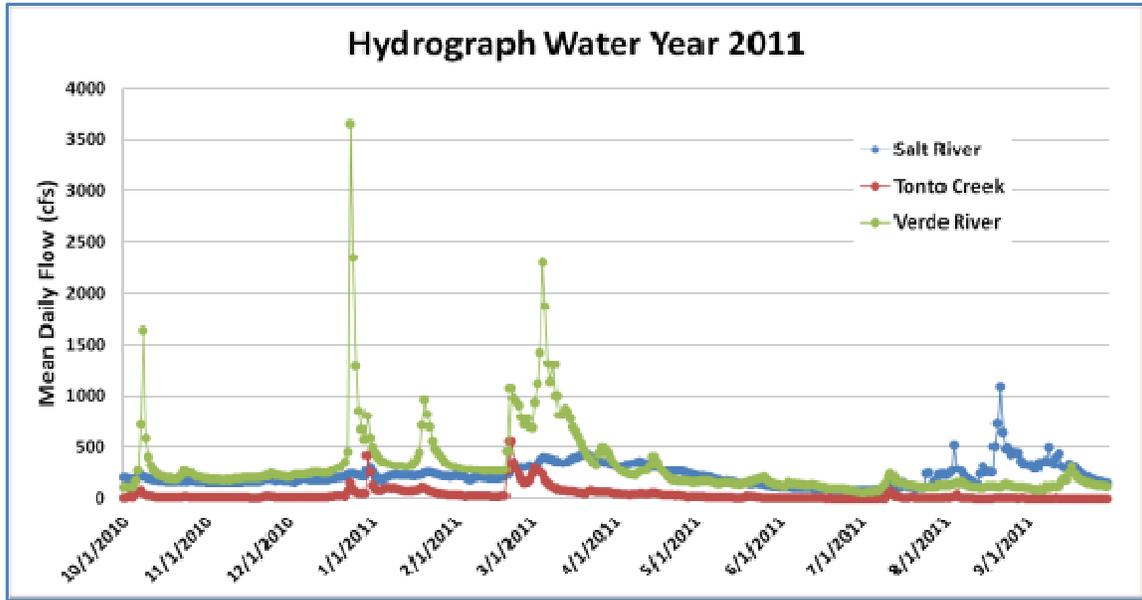


Figure 2. Hydrograph for Salt River, Tonto Creek and Verde River, Water Year 2011.

Roosevelt Operations: Roosevelt operations were most influenced by the lack of winter runoff. Even with La Niña conditions in place, there was potential for Roosevelt Dam to fill and force water releases over Granite Reef Diversion Dam due to the abundant runoff from the previous year. However, the winter of 2012 produced only 77,000 acre feet of runoff into Roosevelt Lake. The elevation at Roosevelt Dam varied little through the winter with the water order

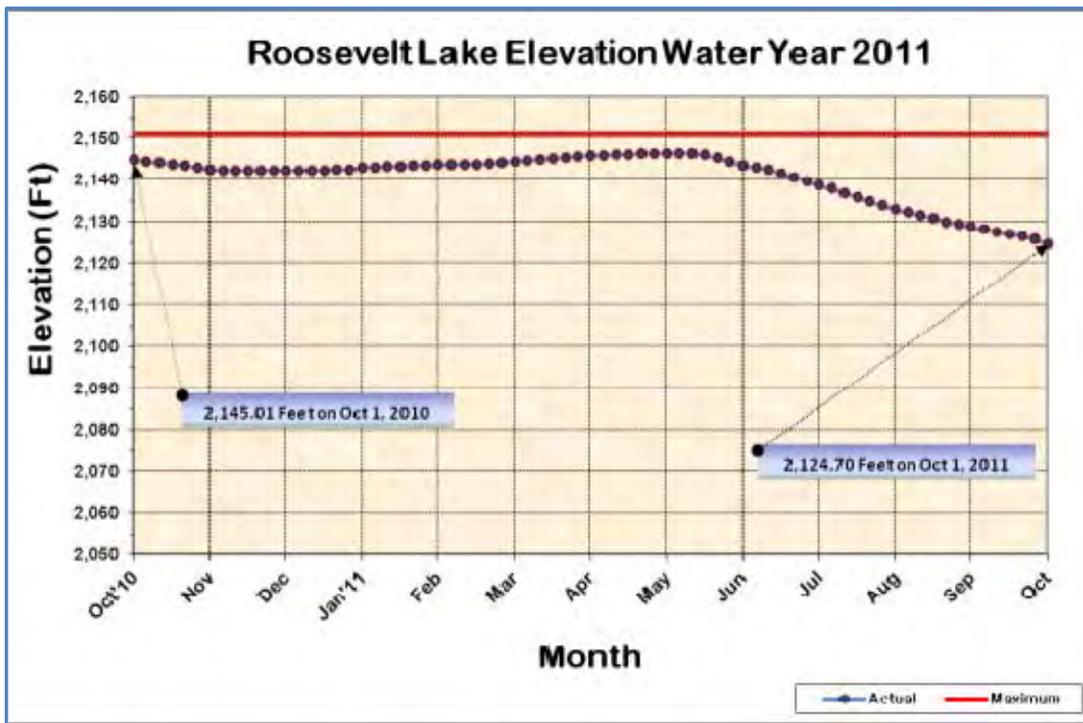


Figure 3. Roosevelt Lake elevations, Water Year 2011.

on the Verde system and meager inflows through the winter season. On May 4th the water order transitioned back to the Salt system and reservoir levels began to decline. (See figure 3.) The transition took place later in the season than normal this year due to a maintenance outage at Roosevelt Dam in late April 2011 that delayed the transition to the Salt system this spring. The water order switched back to the Verde system on November 21, 2011.

Weather Outlook: Currently, La Niña conditions are again present and expected to continue. The Climate Prediction Center is predicting La Niña conditions to continue into the winter. If so, another dry winter appears imminent in Arizona's near future (figure 4). Preliminary reservoir storage projections indicate the total system would be at about 55% of capacity if the forecast for another dry winter is correct.

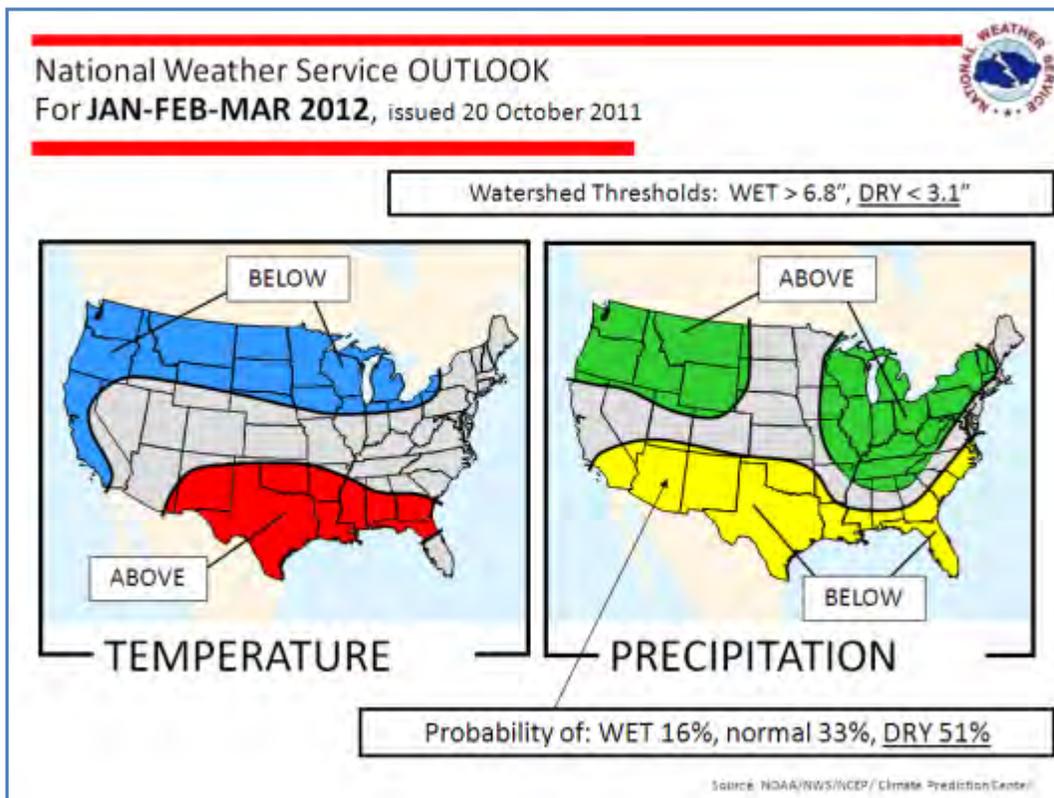


Figure 4. Temperature and precipitation outlooks for January through March 2012.

B. Incidental Take Permit (ITP) Compliance Monitoring

The Roosevelt HCP states that SRP will periodically collect and evaluate information on occupied habitats and population status of flycatchers, clapper rails, cuckoos and bald eagles at Roosevelt Lake to monitor compliance with the ITP. Vegetation monitoring is to be conducted to ensure that adaptive management thresholds or permit limits are not exceeded. In addition, populations of flycatchers, cuckoos and rails will be monitored for ITP compliance and to identify long-term trends using appropriate field survey techniques or protocols.

1. Roosevelt Lake Habitat Monitoring

Obligation: To ensure that permit limits or adaptive management thresholds are not exceeded, SRP will monitor riparian vegetation at the Salt River and Tonto Creek arms of Roosevelt Lake on an annual basis beginning in 2007, continuing for the life of the permit. SRP will use a method to estimate tall dense vegetation likely to be occupied by flycatchers using satellite imagery information (calculations of relative density of vegetation).

2011 Actions: SRP uses a multi-scaled flycatcher breeding habitat model to monitor habitat compliance at Roosevelt Lake. Results are presented in section B.2. of this report.

2012 Actions: We are on target to conduct a demonstration project adding LIDAR data into our evaluation of model results to enhance our ability to identify potential flycatcher breeding habitat at Roosevelt Lake. Cooper Aerial has been hired to collect LIDAR data over the Salt and Tonto arms of Roosevelt Lake in January/February 2012. These data will be used in conjunction with the GIS breeding habitat model to generate an enhanced breeding habitat map for the 2012 reporting period. We will continue to refine and work on this methodology to improve our ability to map and forecast potential occupied breeding habitat.

Obligation: The extent of cattail marshes will be monitored by helicopter survey each year that there is a potential for more than 3 acres of marsh below elevation 2,151'. If more than 3 acres exist, Yuma clapper rail surveys will be conducted to determine ITP compliance.

2011 Actions: High water levels in the lake eliminated any development of cattail marsh below 2151' in 2011. Therefore, clapper rail surveys were not conducted.

2012 Actions: Lake elevations and development of cattail marsh habitat will be monitored. If more than 3 acres of habitat develop below 2151', SRP will conduct clapper rail surveys.

Obligation: Periodic surveys for flycatchers and cuckoos will be conducted to determine ITP compliance. The trigger to initiate surveys is when the habitat model identifies 500 or more acres of potential breeding habitat.

2011 Actions: SRP did not conduct flycatcher or cuckoo surveys in 2011 on the Salt and Tonto arms of Roosevelt Lake because the reservoir was full or nearly full throughout the year. TNF biologists conducted limited flycatcher surveys in 2011, both above and below the 2151' elevation mark on the Salt River and Tonto Creek.

2012 Actions: SRP will initiate surveys when the amount of tall, dense vegetation below 2151' elevation identified by habitat modeling nears or exceeds 500 acres. Results of habitat monitoring suggest that approximately 85.18 acres of potentially suitable habitat existed in 2011, so SRP will not be conducting flycatcher or cuckoo surveys in 2012 (see Habitat Monitoring Results below).

2. Habitat Monitoring Results

Methods: Each year, SRP monitors the amount of potential flycatcher breeding habitat that exists below the 2151' elevation mark at Roosevelt Lake using a multi-scaled habitat model. The model uses a Landsat TM satellite image and evaluates four predictor variables: (1) width of floodplain, extracted from a digital elevation model; (2) relative density and biomass of green riparian vegetation within 900-m² cells (NDVI); (3) amount of densest vegetation within 4.5 ha (11.1 acre) neighborhoods, and (4) variation in vegetation density within 4.5 ha neighborhoods. The GIS-based model produces in a spatially explicit manner the probability of flycatcher breeding site occurrence (1-98%) for each cell.

The output files (ArcView shapefile polygons, grid cells) identify breeding habitat probability classifications (1 through 5) in a summary table of acres within each probability class for the Tonto Creek and Salt River arms. Each habitat probability class identifies a probability range indicating the likelihood that vegetation potentially suitable for flycatcher breeding exists in that grid cell. Habitat probability class 1 grid cells identify areas with the lowest probability (0-20%) for locating flycatcher breeding areas, whereas class 5 grid cells indicate areas with highest probability (80-98%).

In the past, we made the decision to consider habitat probability classes 3 through 5 as potentially occupied habitat because much of class 3 was clustered around class 4 or 5 cells. By evaluating the data set in this way, we are taking a conservative approach. Model results were field checked by SRP staff from a helicopter. No ground-truthing was conducted this year because we felt we could adequately verify model results from the air.

Model Results: SRP ran the multi-scaled habitat model using a Landsat TM satellite image taken on June 22, 2011 at lake elevation 2140.33 feet (figure 5). These results are compared to those developed from the June 19, 2010 image when lake elevation was at 2149.69 feet (table 1).

Using 2011 imagery and acreages from classes 3 through 5, SRP estimates that 85.18 acres of potentially suitable flycatcher and cuckoo breeding habitat existed below the 2151' elevation at Roosevelt Lake during the 2011 breeding season. Results suggest an increase of 9.12 acres from 2010 estimated potential habitat. Taking the potential for error into consideration, the amount of breeding habitat essentially stayed the same from 2010 levels.

Table 1. Multi-scaled Southwestern willow flycatcher breeding habitat probability model results, 2010 versus 2011.

Habitat Probability Class	Probability Range	Acres Below 2151' Elevation					
		Salt Arm		Tonto Arm		Total Acres	
		2010	2011	2010	2011	2010	2011
1	0-20%	287.29	254.65	81.27	82.89	368.56	337.54
2	21-40%	23.83	29.29	7.86	6.46	31.68	35.74
3	41-60%	22.91	22.82	9.25	21.93	32.16	44.75
4	61-80%	20.44	26.38	4.89	1.17	25.33	27.55
5	81-98%	15.52	12.67	3.05	0.22	18.57	12.89
Total 3 thru 5	41-98%	58.87	61.87	17.19	23.31	76.06	85.18
Total 4 and 5	61-98%	35.96	39.05	7.94	1.38	43.90	40.44

¹ 2010 satellite imagery was taken on June 19, 2010 when lake elevation was at 2149.69'.

² 2011 satellite imagery was taken on June 22, 2011 when lake elevation was at 2140.33'.

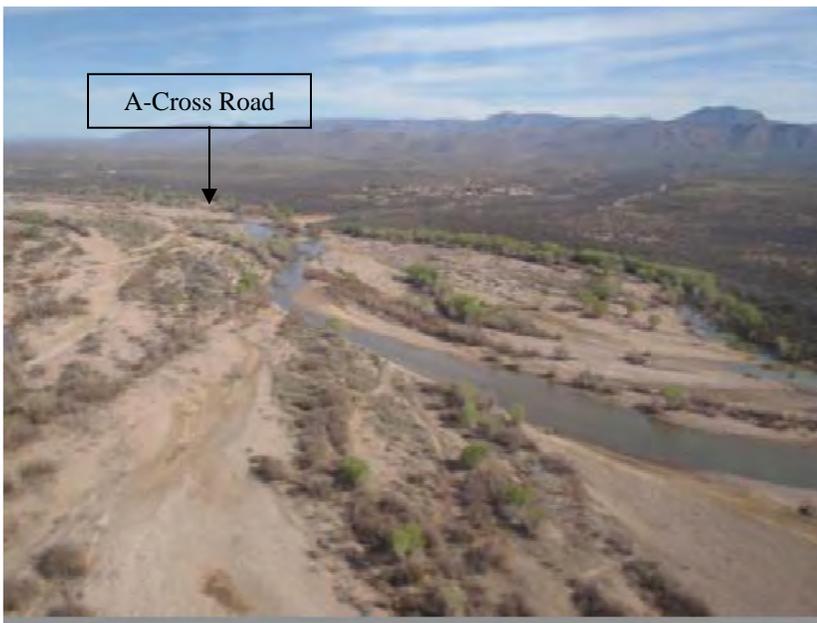
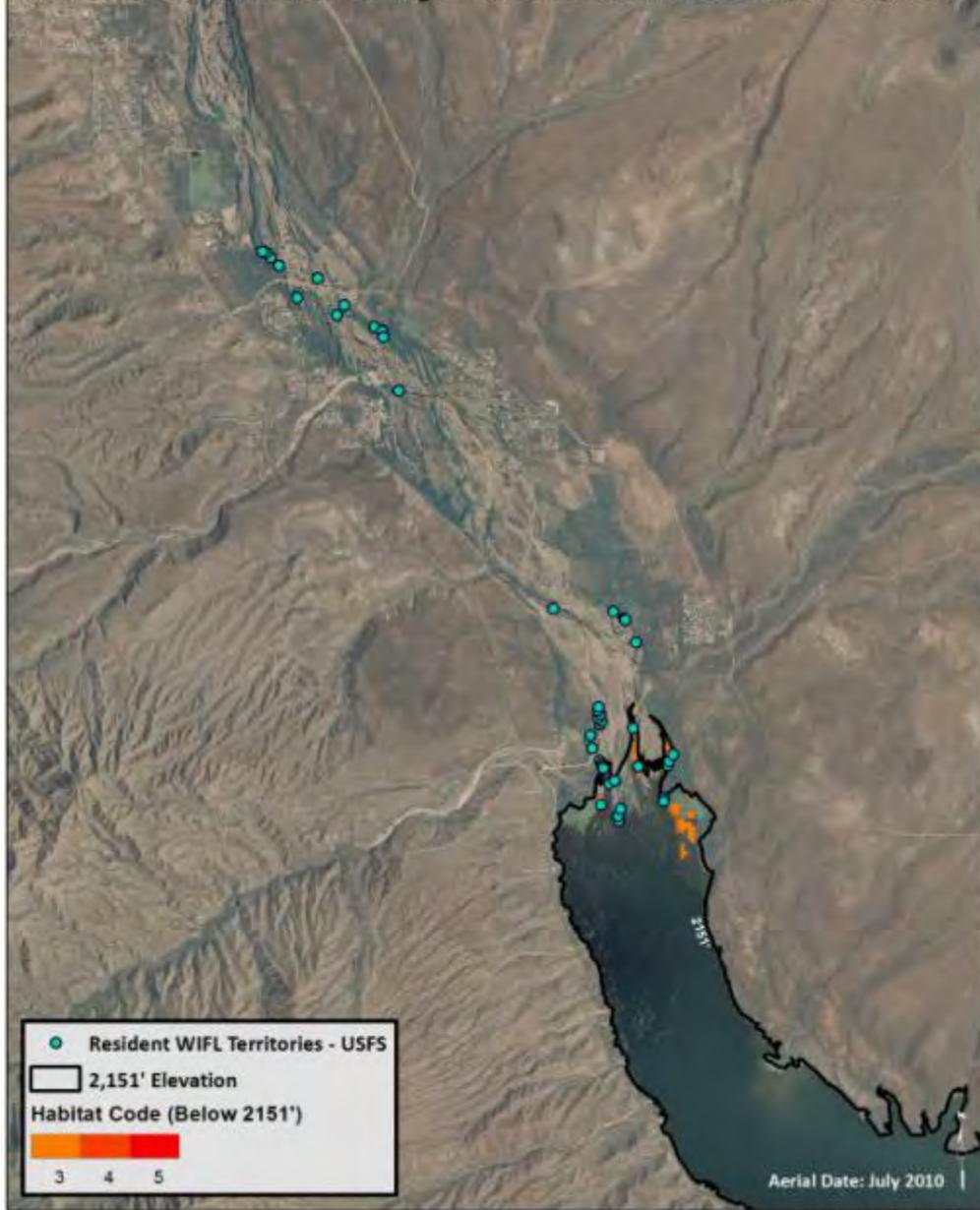


Figure 5. Vegetation at A-Cross Road, looking upstream. The 2151' elevation is adjacent to A-Cross Road on the downstream side. Photograph was taken on March 14, 2011 at lake elevation 2145.14' (93% full). Photo by R. Valencia.

Tonto Creek Arm Willow Flycatcher Habitat Model Results, 2011



Salt River Arm Willow Flycatcher Habitat Model Results, 2011

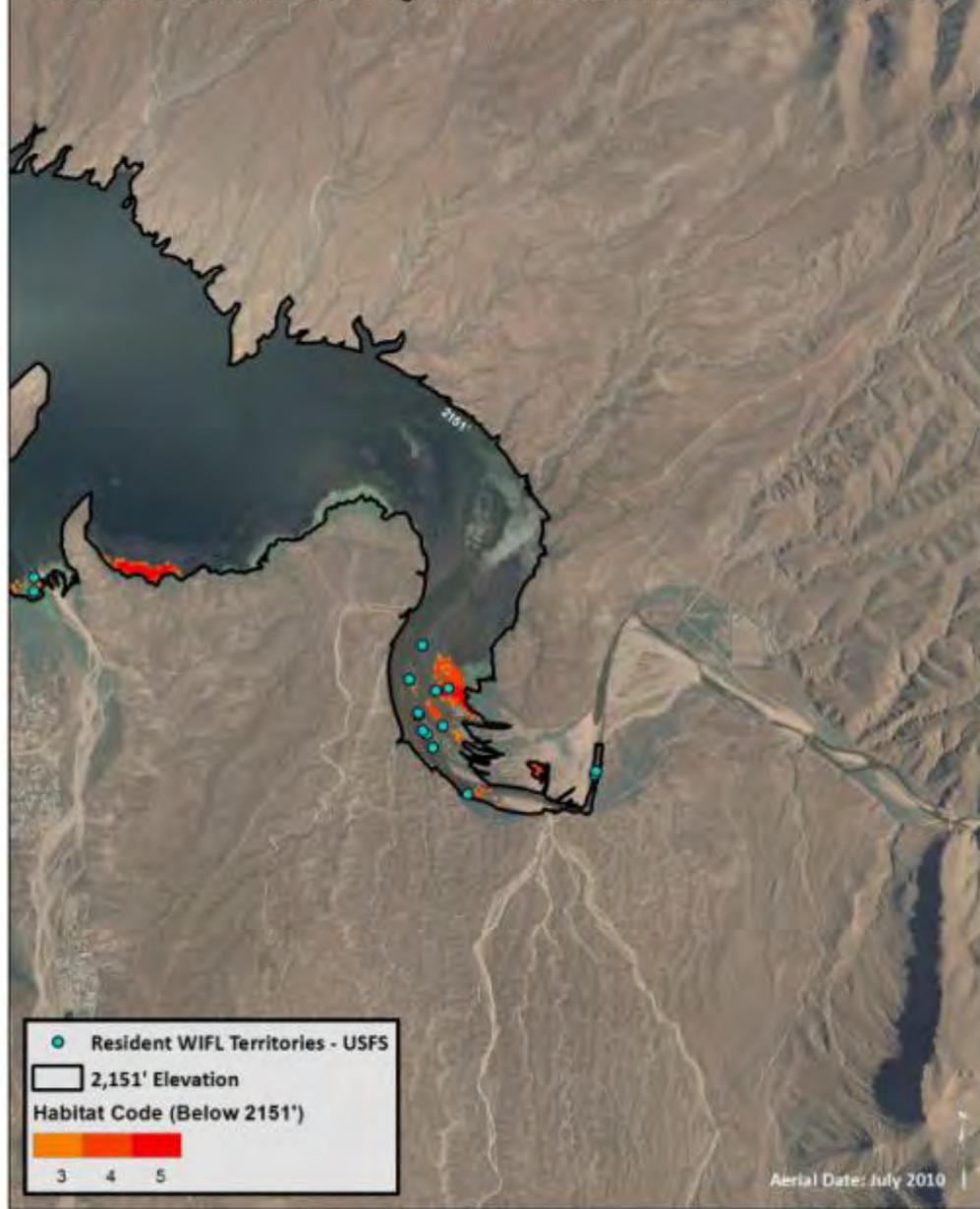


Figure 6. Salt River and Tonto Creek arms of Roosevelt Lake showing 2011 flycatcher habitat model results and flycatcher territory locations as provided by Tonto Basin Ranger District, Tonto National Forest. Satellite image was taken on June 22, 2011 at lake elevation 2140.33' (87% full). The aerial photo was taken in July 2010 when the lake was 95% full.



Figure 7. Tonto Creek arm of Roosevelt Lake looking downstream from A-Cross Road. March 14, 2011. Photo by R. Valencia.



Figure 8. Inundated vegetation at Tonto Creek inlet to Roosevelt Lake. March 14, 2011. Photo by R. Valencia.

Figure 9. Occupied flycatcher habitat at the Salt River inlet (Cottonwood Acres) looking upstream. Photograph taken October 17, 2011 at lake elevation 2122.79' (67% full).



Figure 10. Habitat at the mouth of Pinto Creek. October 17, 2011.

Figure 11. Exposed lake bottom upstream from the confluence of Pinto Creek. October 17, 2011.



3. Bald Eagle Program

Obligation: SRP is required to provide annual funding for a pair of seasonal bald eagle nest watchers through an existing Arizona Bald Eagle Nestwatch Program.

2011 Actions: SRP provided \$18,400 to fund a pair of bald eagle nestwatchers during the 2011 breeding season.

2012 Actions: The agreement between SRP and AGFD allows AGFD to invoice for the 2012 Nest Watch Program in November 2011.

Obligation: Each year, SRP will assist with three Occupancy and Reproduction Assessment and nest search helicopter events and will provide funding for coordination and attendance by existing bald eagle management personnel. In addition, a maximum of three flights for rescue and management efforts will be provided.

2011 Actions: SRP provided seven flights totaling \$17,640 worth of helicopter service to the AGFD during this period.

2012 Actions: Provide helicopter service as described.

Obligation: SRP will develop a coordinated plan with AGFD and FWS to rescue any bald eagles, eggs or nestlings at Roosevelt Lake that may be threatened by rising reservoir levels.

2011 Actions: Completed. Contact list was updated in October 2011.

2012 Actions: Implement plan, if necessary. Update contact list in October 2012.

2011 Breeding Status: AGFD monitors bald eagle productivity at five breeding areas (BA) associated with Roosevelt Lake. The results of the 2011 breeding season are shown below in Table 2. AGFD reported that, statewide, the 2011 breeding season was a record breaking year, with a record number of breeding areas occupied, a record number of eggs laid and a record number of nestling eagles fledged.

Table 2. Comparison of bald eagle breeding productivity, 2009 - 2011, Roosevelt Lake

Breeding Area	2009		2010		2011	
	# of Eggs	# Fledged	# of Eggs	# Fledged	# of Eggs	# Fledged
Tonto	3	3	2	2	2	2
Pinal	1+	Failed	1	1	2	2
Pinto	2+	2	1+	Failed	1	Failed
Rock Creek	Unoccupied		Unoccupied		Unoccupied	
Dupont @ Sierra Anchas	Unoccupied		Unoccupied		Unoccupied	
TOTALS	6+	5	4+	3	5	4

Source: Unpublished data, Southwest Bald Eagle Management Committee, AGFD (2009, 2010, 2011)

This year, at least 79 eggs were laid, a record 55 breeding areas were occupied, and 56 nestlings fledged. AGFD biologists point to these record breaking numbers as an indication that the bald eagle breeding population in Arizona continues to grow.

C. Tonto Forest Protection Officer (FPO)

Obligation: Fund a Forest Protection Officer at the Tonto Basin Ranger District (TNF) to protect, enhance and manage habitat at Roosevelt Lake in support of the Roosevelt HCP, including posting and maintaining signs and fences in restricted areas, contacting individuals found in those areas and issuing citations, public education and planning and implementing management activities in regard to threatened and endangered species.

2011 Actions:

The following report has been provided by Amy Madara-Yagla, Forest Protection Officer, Tonto National Forest.

Enforcement Activities:

A gate was placed on the Meddler Point/ 333 Road in January 2010. It is currently “dummy locked” until a proper agreement can be made for private property access. The gate has basically eliminated unauthorized use of the 333 Road. It is likely that the pressure in that area will increase as the lake level drops and provides better fishing opportunities in the Cottonwood Acres area.

There is an ongoing problem near Pinto Creek and the Roosevelt Mound. Its proximity to Roosevelt Estates and Resort makes it more accessible to motorized vehicles and therefore difficult to patrol. ATV and UTV riders are the primary violators. Often, signs are removed, broken off, or run over.

Madara-Yagla issued 21 citations this year. She issued one to an individual driving into the Southwestern Willow Flycatcher restricted area south of the A-Cross Road in Tonto Creek and one to an individual driving up Tonto Creek from A-Cross Road on a non-user created road. Within the Upper Salt River recreation area, a group of individuals were sighted for abandoning a campfire and littering, another individual was also cited for littering. Seasonal fire restrictions accounted for 16 citations. The area is more than adequately signed once restrictions go into effect.

Bald Eagles:

Madara-Yagla worked closely with the Arizona Game and Fish Department (AGFD) contracted Nestwatchers to ensure protection of the bald eagle nest closure areas. The Forest Service also provided transportation and storage of the AGFD motorboat during the breeding season.

The Tonto nest bald eagles occupied the one remaining nest (number 2) in the same tree that they had been previously using. AGFD personnel placed closure buoys around the Tonto nest this year. Three chicks successfully hatched and were monitored until fledging. In the beginning of May one of the nestlings fell out of the nest and landed in the dead trees below. It was old enough that it was eventually able to hop back up into the nest. The Tonto Nestwatchers had many boaters violate the closure. Violations often occurred by fishermen/women who allowed

their boats to drift into the buoys. The Gila County Sheriff's Department also assisted with enforcing the closure area.

The Pinto bald eagle pair occupied the same nest as last year (nest number 7). After only a short incubation period it was determined that the Pinto nest had failed of unknown causes. Madara-Yagla periodically checked in on the nest for about a month after, but no attempts to re-nest were observed.

Outreach activities:

Madara-Yagla continued her outreach efforts with the third grade classes at Dr. Charles A. Bejarano Elementary School in Miami, Arizona for a third year, and it will likely recur in the spring of 2012. This school has been under-performing at the state level, and this nine week program improves the quality of their education. Many students at this school are economically disadvantaged. Outreach activities include teaching curriculum from Project WET, Project WILD and Focus: Wild Arizona (AGFD) as well as a variety of other novel resources to educate children about natural resources and to compliment Arizona's third grade curriculum.

Two volunteers and Madara-Yagla cooperated to create a new exhibit for the Roosevelt Lake Visitor Center. It is geared toward all ages and includes information on a variety of wildlife species, including butterflies, insects, birds and mammals, as well as some plants and heritage items. Visitors to the Visitor Center can read clues to what the subject is and then open up a door to see a photo or an actual object and then read more about the item.

In September, Madara-Yagla was invited to do a presentation to the 7th and 8th graders at the annual Gila County Sheriff's Department and Miami School District's "Fishing With Attitude" event. She spoke with 3 groups of approximately 20 students about local wildlife with an emphasis on careers in wildlife and the importance of riparian areas. She brought furs, skulls, wildlife calls and photos to increase their participation.

Approximately 60 Boy Scouts and their families attended an environmental education program at the Grapevine Group Site at Roosevelt Lake. The attendees participated in a question/answer talk involving local animal furs, skulls, and tracks as well as negative animal encounters.

Other Activities:

Madara-Yagla conducted surveys for the endangered southwestern willow flycatcher and the yellow-billed cuckoo (candidate), with occasional assistance from other Forest Service biologists. With only a few exceptions, areas were only surveyed once this year. There was an increase of territories/pairs in the Rye Creek area; a pair was also found at the mouth of Pinto Creek even as the habitat dried throughout the summer. Two visits to the Gleason Flat area on the Salt River resulted in the detection of 5 pairs and 7 other territories.

There were only 4 yellow-billed cuckoo detections this year, likely due to the reduction in survey time and locations. One was detected in Pinto Creek downstream of the Henderson Ranch, and the other 3 were detected in Tonto Creek and Rye Creek.

While conducting flycatcher surveys south of A-Cross Road, Madara-Yagla encountered one Mexican gartersnake. It was located on a mudflat near the receding water of Roosevelt Lake. Voucher photos and locations were sent to AGFD.

There was one lightning caused fire within the flycatcher restriction area on the Tonto Creek arm of Roosevelt Lake. The fire burned less than a tenth of an acre, mostly consisting of a dead

cottonwood tree. The tree was located well below the 2151' elevation, therefore no existing flycatcher habitat was affected.

Activities also included hundreds of campsite visits on the Upper Salt River throughout the year. These contacts also allow an opportunity to educate people about local wildlife, and an opportunity to enlighten campers to the value of resources around them. It also allows for an opportunity to remind them to properly dispose of their trash and fully extinguish their fires when not in attendance.

D. Rockhouse Riparian Demonstration Project

Obligation: Develop a pilot project to establish and manage approximately 20 acres of riparian vegetation suitable for the listed and candidate species encompassed by the Roosevelt HCP on the Salt arm of Roosevelt Lake.

Actions: Installation completed. Site operation and maintenance continues.

2011 O&M Activities:

Operations and Maintenance. SRP continued to contract with Tim Wheeler (Maratimo Construction) to conduct irrigation and site maintenance. Irrigation intervals varied depending on rain events, soil moisture levels and temperature, but were performed according to the following general schedule. Regular flood irrigation of the site began at the end of April and continued every 10 to 18 days through the end of September, after which irrigation intervals were reduced to monthly.

During the week of September 26, SRP performed ditch maintenance work on the irrigation canal that supplies water to the Rockhouse riparian restoration site. Work consisted of removal of vegetation encroaching on the ditch and was followed by manual removal of problem tamarisk and an application of herbicide. This maintenance work has effectively improved water conveyance through the irrigation system.

Beavers continue to be active within the project site but are not impacting the quality of the habitat. SRP and their contractor will continue to monitor tree damage and other beaver related issues.

Summary Document. A report summarizing the history of project construction and monitoring was drafted in 2009 but has not been completed at this time.

2012 Actions:

Operations and Maintenance. SRP will continue with the same general irrigation schedule. General monitoring of tree growth and health will continue. Regular maintenance of the irrigation system will be conducted. We will remove vegetation, both mechanically and chemically, from the ditch areas, as necessary.

Summary Document. The project summary report will be finalized in 2012.



Figure 12. Rockhouse Project, looking southeast (upstream). Photo taken October 17, 2011. Photo by C. Paradzick.



Figure 13. Completed ditch maintenance work, September 2011. Photo by M. Wicke.



Figure 14. Interior of planting at the Rockhouse site. Photo taken May 2011 by R. Valencia.

IV. STATUS OF MITIGATION COMPLIANCE

Obligation: Acquire 2,250 acre-credits by February 2006 including acquisition and management of at least 1500 acres of riparian habitat by fee title or conservation easement, as well as 750 acre-credits of “other” habitat conservation measures.

Actions: Completed.

SRP has accrued 2,591 acre-credits, as follows.

- 1,842 acres of riparian habitat
- 429 acre-credits for buffer lands and water rights
- 20 acres of created habitat
- 300 acre-credits for Tonto FPO

Table 3. Mitigation property information.

Mitigation Property Name	River System	County	Size (acres)	Mitigation Credits	Ownership	Management
Camp Verde Riparian Preserve	Verde	Yavapai	124	124	Owned by SRP	SRP
Fort Thomas Preserve	Upper Gila	Graham	1,054	1054	250 acres – Conservation Easement w/ Freeport McMoRan 308 acres – Owned by SRP 496 acres – Owned by USBR	SRP
Adobe Preserve	San Pedro	Pinal	154	131	Owned by SRP	SRP
Black Farm Preserve	San Pedro	Pinal	137	95	Owned by SRP	SRP
Stillinger Preserve	San Pedro	Pinal	40	40	Owned by SRP	SRP
Spirit Hollow Preserve	San Pedro	Pinal	204	204	154 acres – Owned by SRP w/ USBR conservation easement 50 acres – Owned by USBR	SRP
San Pedro River Preserve	San Pedro	Pinal	623	623	TNC with USBR conservation easement	TNC w/ USBR endowment
Arlington Wetland/Cell 4	Lower Gila	Maricopa	5	5	Owned by AGFD	AGFD under contract to SRP
Rockhouse Demonstration Project	Salt River	Gila	20	15	Owned by USBR; leased to SRP	SRP

TNC = The Nature Conservancy; USBR = Bureau of Reclamation; AGFD = Arizona Game & Fish Department.

V. MITIGATION PROPERTIES – Monitoring and Management

A. Monitoring

SRP monitors both the bird species of interest as well as habitat condition on each of the mitigation properties. Monitoring obligations for each property are detailed in the HCP document and are summarized briefly below.

Obligation: Flycatcher, cuckoo and clapper rail populations will be surveyed in the first two years following acquisition of the mitigation site for purposes of establishing a baseline. After that, trend surveys will be conducted every other year on average, but not less than every third year. The specific frequency of survey for each site is to be determined during the annual meeting.

2011 Actions: Clapper rail surveys were conducted at the Arlington Wetland in the spring of 2011 by SRP biologists.

Flycatcher and cuckoo surveys were conducted on all San Pedro River mitigation properties in 2011 by EcoPlan Associates under contract to SRP.

2012 Actions: Flycatcher and cuckoo surveys will be conducted on the Camp Verde Preserve (Verde River), on the Fort Thomas Preserve (Gila River) and at the Rockhouse Project site.

Tables 4 through 6 provide a summary of the past six years when bird surveys were conducted on Roosevelt HCP mitigation properties, along with projections for 2012 and 2013.

Table 4. Flycatcher survey schedule

	Purchase Date	2006	2007	2008	2009	2010	2011	2012	2013
SAN PEDRO									
Adobe	Sep-02			SRP			SRP		SRP
Stillinger	Jun-04	SRP*		SRP			SRP		SRP
Spirit Hollow	Jul-04	SRP*		SRP			SRP		SRP
Annex	Dec-06		SRP*	SRP*			SRP		SRP
VERDE									
Camp Verde	Jan-04		SRP		SRP			SRP	
GILA									
McEuen	Aug-04	SRP*	SRP		SRP			SRP	
PD CE	Feb-05	SRP*	SRP		SRP			SRP	
BR/Hancock	Oct-05	SRP*	SRP*		SRP			SRP	
BR/Bellman	Dec-06		SRP*	SRP*	SRP			SRP	
ROCKHOUSE	n/a			Evaluate	SRP	SRP		SRP	
ROOSEVELT	n/a	BR/GF	TNF	TNF	TNF	TNF	TNF		

* Denotes baseline survey. BR = Bureau of Reclamation; GF = Arizona Game and Fish; TNF = Tonto Nat'l Forest

Table 5. Yellow-billed cuckoo survey schedule

	Purchase Date	2006	2007	2008	2009	2010	2011	2012	2013
SAN PEDRO									
Adobe	Sep-02			X			X		X
Stillinger	Jun-04	X*		X			X		X
Spirit Hollow	Jul-04	X		X			X		X
Smith-Doherty	Dec-06		X*	X*			X		X
VERDE									
Camp Verde	Jan-04		X		X			X	
GILA									
McEuen	Aug-04	X*	X		X			X	
PD CE	Feb-05	X*	X		X			X	
BR/Hancock	Oct-05	X*	X*		X			X	
BR/Bellman	Dec-06		X*	X*	X			X	
ROCKHOUSE	n/a			Evaluate	X	X		X	
ROOSEVELT	n/a								

* Denotes baseline survey. Note: All cuckoo surveys are conducted by SRP or their contractors.

Table 6. Yuma clapper rail survey schedule

	Creation Date	2008	2009	2010	2011	2012	2013
Arlington WMA	Feb-06	SRP/AGFD*	SRP/AGFD*		SRP/AGFD		SRP
Roosevelt	n/a					SRP**	SRP**

*Denotes baseline survey. ** Surveys will be conducted only if cattail habitat exceeds threshold amount.

Obligation: Habitat conditions on mitigation properties will be monitored using the following means.

Baseline Inventories. Complete a baseline inventory for each property within one year of acquisition.

Aerial Photography. Acquire aerial photography to establish a vegetation/habitat baseline and retake every 5 years or when vegetation is altered by a catastrophic event.

Documentation of Habitat Condition. Document habitat conditions in occupied flycatcher, cuckoo and clapper rail habitat when bird surveys are conducted. Permanent photo points will be established and retaken periodically to monitor habitat condition.

2011 Actions:

Aerial Photography. New georeferenced aerial photographs were taken of the Fort Thomas Preserve, June 2011.

Permanent Photo Points. SRP repeated fixed point photography in 2011 for all conservation properties. Photos are presented in Appendix D of this report.

Documentation of Habitat Conditions. Habitat conditions were evaluated and photo documented during 2011 flycatcher and cuckoo surveys on San Pedro River properties. See Appendix C for habitat photos. Habitat conditions at mitigation sites are described in section C of this report.

Table 7. Habitat monitoring schedule

	2007	2008	2009	2010	2011	2012
SAN PEDRO						
<i>Adobe</i> Baseline Inventory	Completed					
Photo points	X	X	X		X	
Aerial photos		X				
<i>Stillinger</i> Baseline Inventory	Completed					
Photo points	X	X	X		X	
Aerial photos		X				
<i>Spirit Hollow</i> Baseline Inventory	Completed					
Photo points	X	X	X		X	
Aerial photos		X				
VERDE						
<i>Camp Verde</i> Baseline Inventory	Completed					
Photo points	X	X	X		X	
Aerial photos	X		X			
GILA						
<i>Fort Thomas</i> Baseline Inventory				Completed		Update
Photo points		X	X		X	
Aerial photos					X	
ROCKHOUSE						
Project Summary			Drafted			Complete
Photo points	X	X	X		X	
Vegetation monitoring	X	Evaluation	X		X	
ARLINGTON						
Photo points	X	X	X		X	
Aerial photos	X					X

2012 Actions: Table 7 contains a summary of habitat monitoring activities scheduled for 2012.

Baseline Inventories. SRP will update several of the documents to reflect changes in property boundaries.

- Spirit Hollow Preserve - update boundary to include USBR-acquired property (Annex) and the 10-acre buffer parcel acquired from Skeen.

- Camp Verde Preserve – update maps to show adjustment made to northeast boundary (sale of 0.17 acres to Contreras).
- Fort Thomas Preserve – document will be updated to include the Horseshoe-Bartlett HCP properties.

Permanent Photo points. Fixed point photos will not be repeated in 2012 unless there is a need to document a significant event or change in conditions on one or more of the properties.

Documentation of Habitat Conditions. Documentation of habitat conditions typically coincides with bird surveys. See Tables 4 through 6 for time schedules.

If flycatchers return to the Rockhouse site, SRP will document vegetation conditions within territories after the breeding season.

B. Monitoring Results

In 2011, SRP contracted with EcoPlan Associates, Inc. to conduct protocol surveys for flycatchers and cuckoos on all San Pedro River properties. The results of these surveys are summarized below. The full survey report can be found in Appendix C.

Clapper rail surveys were conducted by SRP biologists at the Arlington Wetland site. Results are summarized below.

1. Southwestern Willow Flycatcher Surveys

San Pedro River Mitigation Properties

A total of 24 resident adult flycatchers (8 pairs and 8 unpaired males) were detected at 16 territories on SRP’s San Pedro River properties (“study area”) (Table 8). An additional 3 non-resident flycatchers were detected. Flycatchers were detected on all properties, however, the portion of the Spirit Hollow Preserve, known as the “Annex” had no flycatcher detections. No banded birds were detected during the 2011 surveys.

Nest searching was conducted on these properties to determine the impact of brown-headed cowbird parasitism on flycatchers (SRP 2005). Nests of surrogate species were also checked if researchers were unable to locate an adequate number of flycatcher nests. A total of 66 nests were checked for parasitism by cowbirds: 4 flycatcher nests and 62 surrogates. Cowbird parasitism was documented in 6 cases, all surrogate nests. Parasitized nests were found on all properties: one on Adobe; 2 on Stillinger; and, 3 on Spirit Hollow. The parasitism rate (number of nests found parasitized divided by the total number of nests checked) was 9.1%, well below the 30% rate that would trigger additional management actions.

2. Western Yellow-billed Cuckoo Surveys

San Pedro River Mitigation Properties

Fourteen cuckoo detections (Table 9) were recorded on the San Pedro study area during protocol surveys. Four incidental detections were recorded. Based on a summation of the survey and incidental detections, an estimated 7 pairs were present in the study area, with 3 at Adobe Preserve, 1 at the Stillinger Preserve, and 3 at the Spirit Hollow Preserve.

Table 8. Summary of flycatcher territories by property, San Pedro River study area, Arizona, 2011.

Parcel	Resident WIFLs	Pairs	Territories	Nests	Non-resident WIFLs
Adobe Preserve ¹	12	5	7	2	0
Stillinger Preserve	8	1	7	0	1
Northern Areas Total	20	6	14	2	1
Spirit Hollow Preserve	4	2	2	2	2
Spirit Hollow Preserve Annex	0	0	0	0	0
Southern Areas Total	4	2	2	2	2
All Sites Total	24	8	16	4	3

¹ One nest on the Adobe Preserve was inferred through the detection of flycatcher fledglings in a territory.

Table 9. Summary of cuckoo detections by property, San Pedro River study area, Arizona, 2011.

Parcel	Incidental	Survey 1	Survey 2	Survey 3	Survey 4	Survey 5	Total
Adobe Preserve	2	1	2	3	0	0	8
Stillinger Preserve	1	0	1	0	0	0	2
Spirit Hollow	1	0	0	1	0	0	2
Spirit Hollow Annex	0	0	6	0	0	0	6
Total	4	1	9	4	0	0	18

3. Yuma Clapper Rail Surveys

Arlington Wetlands, Arlington Wildlife Area (AWA).

SRP biologists surveyed the Arlington Wetlands on April 11 and May 27, 2011 using the Standardized North American Marsh Bird Monitoring Protocol (Conway 2008) for the central Arizona region (Appendix E). The central Arizona protocol uses a multi-species surveying approach for Black rails, Least bitterns, Sora, Virginia rails, and Yuma clapper rails. Surveyors are also asked to record data for Pied-billed grebes, American bittern, Common moorhen, and American coot.

SRP surveys were conducted on all 3 ponds at the Arlington site using 5 stops. The April survey found 1 Least Bittern, 1 Virginia rail, 8 Yuma clapper rails, 10 Common moorhen, 1 Sora, and 6 American coots. The May SRP survey found 5 Least bitterns, 7 Virginia rails, 9 Yuma clapper rails, 8 Common moorhens, 2 Soras, and 6 American coots. Four pairs of clapper rails were documented during the April survey. Only Soras were detected in the SRP basin.



Figure 15. SRP's cell 4 at the Arlington Wetlands, Arlington Wildlife Area.

C. Management Obligations

The primary goal for management of these properties is to provide ecological and conservation benefits to the flycatcher, cuckoo, clapper rail and bald eagle. SRP focuses management activities on minimizing or eliminating identified threats to riparian habitat, such as wildfire, groundwater pumping, surface water depletion, trespass livestock grazing, cowbird parasitism and vandalism. We also take actions to enhance the quality of habitat on a property or reverse past damage, where warranted.

General management activities required for each property are listed below:

- SRP will identify a manager for all acquired properties.
- A management plan will be developed for each property within one year of acquisition in coordination with FWS and will be updated annually.
- Management activities identified in the management plan will be implemented, including construction and maintenance of boundary fencing and development of wildfire abatement plans.
- Cowbird management will occur on properties that are agreed to by SRP and FWS during the annual Roosevelt HCP meeting.
- Conservation easements will be placed on all riparian habitat and other land used for mitigation to ensure permanent protection, management and monitoring of these lands consistent with the provisions of the Roosevelt HCP.

Table 10. Status of management obligations for mitigation properties

Mitigation Area	Site Manager	Mgmt Plan	Fire Plan Status	Fencing	Water Rights	Conservation Easement
Adobe	SRP - contractor	C	Update contacts	C	In process	
Black Farm	SRP - contractor	C	Update contacts	C	In process	
Spirit Hollow	SRP - contractor	Update	Update	C	NR	Completed, USBR
Spirit Hollow Annex	SRP - contractor	C	Update	C	NR	n/a, USBR land
Stillinger	SRP - contractor	C	Update contacts	C	NR	
Camp Verde Riparian	SRP - contractor	Update	Update contacts	C	NR	
Fort Thomas	SRP - contractor	Update	In process	C	NR	Partial
Rockhouse	SRP - contractor			C	C	n/a USBR land
Arlington Wetland	AGFD	AGFD	AGFD	C	C	n/a AGFD land
San Pedro Preserve	TNC	C	C	C	In Process	Completed w/ USBR

C = Completed; NR = Not required; n/a = Not applicable to the HCP; TNC = The Nature Conservancy

1. Management Actions – Common to All Properties

2011 Actions:

Site Management. All mitigation properties are being managed by SRP, except for the Arlington wetland site, which is operated by AGFD, and the San Pedro River Preserve, which is owned and managed by The Nature Conservancy (TNC).

Management Plans. All management plans have been drafted and are revisited annually. SRP needs to revise maps in several of the documents. See Appendix B for updated management activity implementation matrices.

General Site Maintenance. There have been no changes in SRP’s contracts for site maintenance and field management. SRP contracts with the following entities:

Contractor

Tim Wheeler, Maratimo Construction
 Dick Hauser, Hauser & Hauser Farms
 Dan Wolgast, The Nature Conservancy
 Arizona Game & Fish Department

Property

Rockhouse Project
 Camp Verde Riparian Preserve
 San Pedro & Gila River properties
 Arlington Wetland

The following management and maintenance activities were conducted on each property over the past year:

- Properties are patrolled regularly to deter trespass by people, vehicles and livestock; to identify and eliminate fire hazards; to identify any management issues that may need to be addressed; and, to monitor general habitat conditions and stream flow.
- Fences and gates are patrolled and repaired when necessary to maintain a secure boundary.
- If trespass livestock are present, we work to get them removed from the property and we attempt to find where they entered the property and repair any fence line breach.
- Weed management and control are on-going activities. We use both chemical and mechanical methods to minimize the problem. Use of mowers and brushcutters is preferred, but application of herbicides and pre-emergents is sometimes necessary.
- Site managers identify and eliminate potential fire hazards on a regular basis. Much of this is accomplished with weed management efforts. All contractors and SRP employees working on the properties are familiarized with fire abatement and response protocols.

Cowbird Management. All cowbird management activities remain at the Tier 1 level, as described in SRP's cowbird management plan (SRP 2005). Tier 1 activities include:

- Fencing riparian areas to exclude livestock to prevent the formation of trails and to eliminate grazing pressure on riparian habitat.
- Revegetating or allowing natural recovery of trails and livestock- or human-disturbed areas.
- Minimizing human activity on mitigation properties and limiting activities to small areas away from riparian zones.

Conservation Easements. No additional conservation easements were placed on mitigation properties this past year.

Other Conservation Activities. A 20'x 20' hoop-style greenhouse was constructed at Black Farm to allow for the propagation of plants in support of revegetation efforts on SRP's mitigation properties.

2012 Actions:

Site Maintenance: Regular patrols of properties and fences will continue weekly, on average. All other activities listed in 2011 actions will continue through 2012.

Site Management: We anticipate all management arrangements will remain unchanged in 2012.

Cowbird Management. Based on results of cowbird parasitism estimates, all cowbird management activities remain at the Tier 1 level, as described in SRP's cowbird management plan (SRP 2005).

The following sections address actions taken to meet management objectives as described in the management plan for each Preserve. A brief description of current habitat conditions on each property is presented, followed by a summary of specific management actions accomplished in 2011 and a discussion of proposed actions for 2012.

2. Management Actions – San Pedro River

General Watershed Conditions. During the winter of 2010-11, the lower San Pedro River received a minimal amount of precipitation, with only one storm delivering more than 0.25” (0.33” on February 27), ending with a total of 0.56” for the quarter. Temperatures were generally mild, except for the period of February 2-5, when the overnight low hit 13°F (Feb. 4), and the high was 39°F (Feb. 3).

La Nina-induced dry conditions prevailed during the spring and early summer in southeast Arizona, allowing for several wildfires to break out in the San Pedro watershed. Three wildfires were of immediate concern to the San Pedro SRP properties: the Stanley Fire, started on the west flank of Mount Turnbull on the San Carlos Apache Reservation and ultimately reaching over 8000 acres; the Copper Creek Fire in the Galiuro Mountains east of Mammoth, which reached 620 acres; and a small 120-acre fire on the south rim of Aravaipa Canyon in the Hell’s Half Acre area. The first San Pedro Valley-wide rainfall came on July 4, with 0.35” recorded at Black Farm, and 1.00” reported at both Bingham-Sacaton Ranch and at the San Pedro River Preserve.

Drier-than-average conditions persisted through the monsoon season. Rainfall totals for the season, recorded at Black Farm, were 1.58” for July, 0.80” for August, and 1.39” for September, giving a three-month total of 3.77”. The last appreciable rainfall of the monsoon season was on September 15, with 0.45”. After that date, only trace amounts were recorded.

Water Rights. SRP’s effort to sever irrigation water rights associated with the Adobe and Black Farm Preserves and transfer them to instream flows continues. After fulfilling the Arizona Department of Water Resources’ (ADWR) request for additional documentation regarding historic river flows and water uses applicable to the Adobe Preserve, the notice of application for severance and transfer was advertised according to state law. SRP received objections filed by several interested parties and is in the process of resolving those objections. The notice of application for the Black Farm Preserve has not yet been advertised by ADWR.

Piezometers. SRP installed a series of piezometers and deep observation wells at three locations on the mainstem San Pedro River and at one location at the lower end of Aravaipa Creek. These wells are part of a larger effort by SRP and others to better understand the hydrology of the lower San Pedro River.

SRP installed two shallow piezometers and one deeper observation well cross-channel on the Adobe, Black Farm and Stillinger Preserves. One well was installed on the Spirit Hollow Preserve. Because Aravaipa Creek flows only intermittently, a permanent channel cross-section was established across Aravaipa Creek to estimate depth to water in the channel from readings at the closest piezometer. At the Adobe Preserve, a station was established for stream flow measurements.

Piezometers are being used to monitor long-term trends in water depth in the alluvial aquifer and to assist with identification of water table slope toward the river along with seasonal changes in that slope. In addition, these data will assist with refinement of a water budget for riparian vegetation. Sediment samples collected during the drilling process provided information on stratigraphy of stream alluvium and allowed us to better evaluate texture of layers and permeability of alluvium.

Depth to water measurements are taken monthly and recorded in a spreadsheet format at SRP. Instream flow measurements are taken in the San Pedro River at the Adobe Preserve on the same schedule. Presence of surface water is noted at all other mitigation properties. SRP will be working with TNC in the coming year to merge our data sets and share data collected along the lower river.



Figure 16: Drill rig installing piezometer in the river bottom at Adobe Preserve. Photo by Dan Wolgast.

Wet-dry mapping. On June 18th, TNC conducted their annual Wet/Dry Mapping of the San Pedro River. Dan Wolgast once again participated in the exercise, covering the river stretch from Carlos Zuniga's crossing down to the north boundary of the Adobe Preserve, as well as the stretch on Spirit Hollow, including the Annex. As in previous years, water resurfaces near the Wheatfields complex and, once on the surface, flows continuously through Stillinger, Aravaipa Crossing, Adobe, and Cook's Lake. Six beaver dams were noted in the stretch from the emergence of surface water to Putnam Wash, and it is believed that there were two additional dams which were unreachable at the time of mapping. Wolgast noted that the Spirit Hollow Preserve was entirely dry on this day.

Building Community Support. General activities on the San Pedro River include:

- Participation in the Lower San Pedro Partnership, a group of conservation landowners on the lower river working cooperatively toward a strategic conservation plan for the area.
- Participation in the Lower San Pedro Working Group, a group of conservation land managers collaborating and cooperating on best management practices.
- Coordination with ranchers and neighbors on fencing issues, with the ultimate goal of reducing the amount of cross-fencing on the river.

Other Conservation Activities.

- Wolgast participated in the Dudleyville Christmas Bird Count on January 2nd, covering Black Farm, Aravaipa Creek, the ASARCO lands from Highway 77 to the upstream end of the farm fields, and the hills and high bluffs east to the boundary of the Tribal Allotments in Aravaipa Creek. Notable sightings include a Peregrine falcon (*Falco peregrinus*) seen tearing apart a dove atop a power pole, Crissal thrasher (*Toxostoma crissale*), Red-naped sapsucker (*Sphyrapicus nuchalis*), and a flock of approximately 100 Lark sparrows (*Chondestes grammacus*).
- Ruth Valencia, Celeste Andresen and Wolgast participated in the Statewide Riparian Bird Survey organized by AGFD by surveying 2 plots: one on Aravaipa Creek and the other on the San Pedro River just upstream of Carlos Zuniga's crossing (the AGFD flycatcher Cap Gage site).
- Wolgast participated in the North American Migration Count on May 14th, covering the area from TNC's Aravaipa Crossing property down to and including the Cook's Lake property. Forty-five species were detected, including large numbers of Yellow warblers, Lucy's warblers and Bell's vireos. Notable sightings included Wilson's snipe (*Gallinago delicata*) at the Adobe Preserve and twelve Southwestern willow flycatchers over the whole count area.

a. Adobe Preserve, San Pedro River, Pinal County

Habitat Conditions: This reach of the river still supports a diverse Fremont cottonwood-Goodding's willow riparian forest community exhibiting an array of habitat types from open patches of sandy/cobbly alluvium to well developed gallery forests. The gallery forest is dominated by a nearly even-aged stand of Goodding's willows, representing a few major recruitment events that occurred in the early to mid-1990s. Willow trees have matured past the optimum size and density preferred by flycatchers. Mid-story development is increasing in patches where canopy has opened as a result of tree mortality. Mortality is due primarily from trees falling over due to force of flood waters.

The seep area along the eastern side of the channel remains dominated by a diverse and dense native riparian forest. Patches of tamarisk and mesquite persist on drier channel bars throughout the active channel, but the amount of tamarisk does not appear to be increasing.

Flycatchers were heard regularly, often throughout the day during the spring. A turkey was spotted near the observation well, and bear tracks were seen leading from the area of the seep toward the active river channel. A pair of Zone-tailed hawks (*Buteo albonotatus*)

returned to Adobe to nest in the same location they have been in since we acquired the property in 2003.

Bill Sparklin with U.S. Department of Agriculture's Wildlife Services Division visited Adobe Preserve and Cook's Lake in December 2010 to look for signs of feral pigs. Pig sign, though not fresh, was found on both properties, mostly in the form of pits dug by the pigs. The properties will continue to be monitored for signs of feral pig activity.



Figure 17. San Pedro River at southern end of the Adobe Preserve, looking upstream. Photo by Dan Wolgast.

2011 Actions:

Trespass Livestock. Trespass by cattle and horses were identified during the winter of 2010-11. Both the horses and cows were successfully removed from the property.

Invasive Weed Control. Weed control took the form of clearing around the house, maintaining a fire lane between the Adobe property and the neighboring Cook's Lake property and between the upland terrace and the riparian area within the Adobe property.

Restoration Activities. Wolgast has been monitoring the experimental plantings of giant sacaton and sand dropseed grasses that were placed in swales on the upland pastures last year. Most plants survived and are thriving. SRP plans to expand this planting as time allows.

2012 Actions:

Trespass/Vandalism/Livestock. SRP will continue to work cooperatively with USBR, TNC, AGFD and other conservation landowners along the river to reduce occurrences of trespass livestock grazing. SRP will also continue to notify and work with neighboring ranchers to promptly remove their livestock. Fortification of fences is an on-going activity. We will continue to explore options with our neighbors to reduce the amount of fencing in the river. SRP remains concerned about AGFD's fencing plans for the adjacent property they will be acquiring from ASARCO, LLC.

Invasive Weed Control. Mowing and manual clearing of roads, areas around infrastructure and abandoned pastures will continue on an as needed basis.

Restoration Activities. SRP and TNC will continue to implement a plan to introduce demonstration plantings and get more native grasses established on the eastern terrace. Additional experimental small-scale plantings using Galleta and Tobosa grasses are planned for these abandoned pasture lands.

Monitoring. Depth-to-water measurements at each of the three piezometers and stream flow measurements at the established station will be recorded on a monthly basis.

b. Black Farm Preserve, Aravaipa Creek, Pinal County

Habitat Conditions: This is the fifth year that native grasses have received no supplemental water. Though rainfall was spotty and weak at Black Farm during the monsoon season, higher portions of the Aravaipa watershed received substantially more moisture. With the first storm of the season occurring on July 4, Aravaipa Creek at Black Farm ran continuously throughout most of the summer.

2011 Actions:

Infrastructure. The San Carlos Irrigation Project (the utility supplying electricity to Black Farm) completed tree trimming under the electrical distribution lines that service the residence.

Invasive Weed Control. . Weed management in the native grass fields requires a constant effort. Control efforts are focused mainly on Russian thistle (*Salsola* spp.), but include nettleleaf goosefoot (*Chenopodium murale*), careless weed (*Amaranthus palmeri*), and crownbeard (*Verbesina encelioides*). Whole fields or portions of fields were mowed three times this year. In mid-June, the entire south field, the northern-most portion of the east field, and portions of the west field with the densest growth of Russian thistle ("tumbleweed") were mowed to six inches. This included any native grasses and saltbush. This effectively eliminated most of the nettleleaf goosefoot in the south field, but the tumbleweed came right back, requiring a second mowing in mid-August. This time, only patches of weeds were mowed; specifically, the same dense portions of the west field, the east, south and west edges of the south field, and the south third of the east field, including the five-acre piece seeded in 2010. The final mowing was in mid-October, to coincide with the end of the Russian thistle growth trajectory.



Figure 18: South field looking west, showing healthy tufts of *Hilaria jamesii* and *Sporobolus airoides*.

As a preventative measure, *Plantago minor* and *Encelia farinosa* seeds were spread in areas with some of the most pernicious growth of tumbleweed. These species have been found to compete against some of the early-germinating tumbleweeds.

In addition to mowing with the John Deere 1517 rotary mower, field edges and smaller interior patches were mowed with the ATV-pulled mower, patches of scattered individuals were removed by shovel, and small, dense, internal patches were mowed using a hand scythe.

Seeding. The last portion of Black Farm to be planted, a triangular piece of about five acres in the southeast corner of the property, was prepared and seeded in September 2010. Initially, London rocket (*Sisymbrium irio*), Indian wheat (*Plantago minor*) and Green sprangletop (*Leptochloa dubia*) made a strong showing. The London rocket seemed to form a thick, protective cover for the young grasses in the south-half of the field. With the onset of warm weather in early summer 2011, the London rocket died off, while tumbleweed came in thick in the north-half of the field. Despite this heavy growth of weeds, the planted grasses are doing very well, especially in the areas with thick London rocket.

After a year in the ground, many of the species in the original mix have germinated and are now identifiable. These include Sideoats grama (*Bouteloua curtipendula*), Green sprangletop, Plains bristlegrass (*Setaria macrostachya*), Purple threeawn (*Aristida purpurea*), Cane beardgrass (*Botriochloa barbinodis*), and Galleta (*Hilaria jamesii*).



Figure 19: 5-acre field, looking east. Grasses visible here are Botriochloa, Leptochloa and Aristida spp.

The field edges that were seeded in September 2010 did not fare as well, with only very sparse germination mainly in areas where rainfall tended to puddle. Much of the *Plantago* that had grown up over the fall and winter was killed off by the extreme cold of early February 2011, while many of the grass seedlings didn't survive the extremely dry conditions this spring. Some of these edges were re-seeded in fall 2011 with both *Plantago* and the grass mix, with the hope that some individuals will survive.

In mid-September, four species of grass seed were harvested from the fields for use on this and other SRP mitigation properties. Several bags of Alkali sacaton, Sideoats grama, Plains bristlegrass and Galleta were collected with the assistance of four graduate students from the University of Arizona's Landscape Architecture program.

2012 Actions:

Native Grasses. In an attempt to increase native grass coverage in sparsely covered areas, we will be implementing, for the first time, a technique that is typically used on pasturelands. Grasses will be mowed and baled in the south field where native grasses are vigorous. Bales will be spread in the east field and other sparsely covered field edges. This will bring desirable native seed to the very sparsely vegetated areas of the Farm, while also adding a mulch layer to increase moisture retention and provide organic material. We hope to also increase grass species diversity in these areas.

As an additional measure, we will be collecting seed from outside the Farm, and broadcasting this seed with hay from the south field so that native plant species better suited to survival in the different micro-habitats can be added at little expense. These species might include Feather fingergrass (*Trichloris mendocina*), Spike pappusgrass (*Pappophorum mucronulatum*), Tanglehead (*Heteropogon contortus*), Spidergrass (*Aristida ternipes*), Giant sacaton (*Sporobolus wrightii*), and Arizona cottontop (*Trichacne californica*).



Figure 20: Aravaipa Creek at Black Farm, looking east toward Table Mountain, July 15, 2011. Photo by D. Wolgast.

Invasive Weed Control. SRP will continue to monitor fields for presence of tamarisk, Russian thistle and other unwanted plants. We will use mechanical or chemical removal methods as necessary. Specifically, we will continue mowing and removing tumbleweed, goosefoot and amaranth. This will be done, to the greatest extent possible, without heavy equipment, to avoid excessive soil disturbance and compaction, and to avoid damaging existing grass crowns. In addition, shallow-rooted shrub species like Brittlebush and Triangle-leaf bursage (*Ambrosia deltoides*) will be added to field edges and ditch banks to suppress tumbleweed.

Monitoring. Depth-to-water measurements will be recorded monthly at all piezometers. We will record time periods when Aravaipa Creek has surface flow and take occasional stream flow measurements when there is enough surface flow to allow for this.

c. Stillinger Preserve, San Pedro River, Pinal County

Habitat Conditions. Several high flows progressively reshaped the sediment wedge at Putnam Wash. This wedge had been holding-back river flow, causing the Stillinger stretch of the river to remain high and slow. The water now flows relatively unimpeded past this now-truncated wedge, dropping the level of the river at the north end of Stillinger. This remains a perennial reach of the San Pedro.

2011 Actions:

Fencing. SRP contracted with N&B Fence to construct wildlife-friendly four-strand wire fencing around the entire property boundary. Two dirt roads that traverse the property on the west side of the river were left open to travel, primarily for use by the Triangle Bar ranch manager and workers. Fences were constructed along both sides of each road to protect the remainder of the property from trespass activities. Cross-river break-away fencing was also constructed, but we will need to monitor its effectiveness. Fence construction was completed in early May.

Trespass Livestock. Trespass cattle and horses were removed from the property shortly after completion of the fence. However, by June the water level in the river had dropped sufficiently to allow cattle from outside the property to pass under the bottom strand of the south gap-fence. A lower bottom strand was added to that gap and the rest of the fence was tightened.

Coordination Efforts. Some of the lands that AGFD will be receiving from Asarco in a natural resources claim settlement lie just upstream of the Stillinger property. SRP initiated discussions with AGFD about cooperative management in the area. We have been informed that AGFD has developed a draft restoration plan for these lands, including plans for fencing, but SRP has not yet seen a copy of the plan. We will continue to attempt to coordinate with AGFD as they proceed through their acquisition and management process.

2012 Actions:

Trespass Livestock Grazing. We will continue to work cooperatively with neighboring ranchers to minimize impacts from trespass livestock in this river corridor.

Restoration. If we are successful in keeping trespass livestock off the property with the newly constructed boundary and cross-river fences, we will begin spreading native grass seed on some of the upper terrace lands. The decision to seed will depend on the amount of rain received during the winter and on soil moisture levels.

Coordination Efforts. SRP will work to coordinate conservation and management efforts with AGFD.

Monitoring. Monitoring of the newly installed piezometer will continue on a monthly basis.



Figure 21: Newly constructed fencing at Stillinger Preserve. Photo by Ben Grantham, N&B Fence.

d. Spirit Hollow Preserve and Annex, San Pedro River, Pinal County

Habitat Conditions. River flows remain intermittent but it appears this reach is becoming drier. In the past few years, some surface water or moist soil persisted in channel pools during the driest times of the year. This past year, there was no surface flow at Spirit Hollow from January through March 2011 and pools in the secondary channel on the east side of the river remained dry until monsoon season. It is unclear why this is occurring but may be due to reduced precipitation in this portion of the watershed.

The main channel remains in the middle of the river, with multiple overflow channels persisting across the floodplain. The channel bottom is covered with a dense growth of grasses, forbs and shrubs. The absence of a scouring flood flow has limited the opportunity for cottonwood and willow recruitment on the property. The Goodding's willows that supported many of the flycatcher territories in the past appear stressed due to lack of moisture.

It has become a regular occurrence to see coatimundi (*Nasua narica*) at Spirit Hollow. They've been spotted on four separate occasions, the first three being singletons treed on approach, and the last being a troop of 12 to 15 of varying sizes, apparently foraging in the dry cottonwood leaves under a strand of trees next to the main channel. A waypoint

was made at the location of this last sighting, and all future sightings will likewise be marked and, if possible, photographed.

2011 Actions:

Trespass Livestock and ATV's. ATVs have been accessing the property through the dry channel on Spirit Hollow. As a result, the fence along the southern (upstream) boundary of the main parcel was rebuilt and posted "No Trespassing." Signs were also posted at the north end of the Annex parcel, though no cross-river fence will be built.

Trespass cattle were also found to be entering the property via the south fence on the Annex. An additional top strand was added to that fence line, and a trigger gate was installed to allow trespass cattle to be lured out using hay and water. This has been moderately successful, and will be continued until the property is free of cattle.

Fencing. Unpredictable high flows in the river made fence maintenance impossible for the duration of the monsoon season. However, since the end of the rains in mid-September, gap fences have been repaired.

Infrastructre. A piezometer was installed on the property in January at the north end of the clearing near the storage shed. It was drilled to a depth of 95 feet, making it a piezometer-observation well-hybrid.

2012 Actions:

Baseline Inventory. Baseline inventory will be updated to include acreage acquired by USBR and an additional 10 acres of upland acquired from the Skeens.

Wildfire Abatement. SRP will work with USBR on updating the fire management plan for these properties. Because the Annex is federal land, USBR must have agreements in place for wildfire response.

Monitoring. SRP is proposing to install additional piezometers at this location to monitor groundwater levels. Depth-to-water at the existing piezometer will be measured on a monthly basis and presence or absence of surface flows and standing water in the river channel will be noted.

e. Camp Verde Riparian Preserve, Verde River, Yavapai County

Habitat Conditions: The condition of riparian habitat has remained unchanged on this property. Only moderate flood flows were experienced over the past year, with none large enough to cause any changes in channel morphology. Numerous beaver dams persist along the channel, especially at the downstream end of the property, resulting in pooling and marshy conditions. These are the areas where flycatchers have been observed.

We continue to notice a drying of vegetation in the tamarisk stand that was originally occupied by flycatchers on the southeastern portion of the property. Goodding's willow, Fremont cottonwood and tamarisk saplings continue to mature along the edges of the active channel. A few Russian olive trees are also present. Terrace understory continues

to be dominated by exotic weedy annuals such as kochia (*Kochia scoparia*) and pigweed (*Amaranthus* spp.).

2011 Actions:

Bird Surveys. No protocol surveys were conducted for flycatchers or cuckoos this past year.

Trespass/Vandalism. The area under the I-17 bridge continues to attract unwanted activity and litter is a problem. We have also had occasional trespass by horseback riders looking for a trail along the river.

Hunting. SRP has decided to close the property to hunting because of numerous negative experiences with hunters over the past few years. No hunting signs have been posted according to ARS 17-304.

Invasive Weed Control/ Wildfire Abatement. Areas adjacent to I-17 were mowed several times to reduce fire potential. On the north terrace (left bank), glyphosate (Roundup) was used to control Kochia and to keep a wide trail open through these dense weeds.

In an attempt to monitor the extent of and changes in presence of invasive weeds on the property, SRP mapped locations of Tamarisk (*Tamarix* sp.), Russian olive (*Eleagnus angustifolia*), Giant reed (*Arundo donax*), and Tree-of-heaven (*Ailanthus altissima*). We are in the process of reviewing data and developing a map. This information will assist us in making future management decisions about woody invasive plants.

SRP is an active participant in the Friends of the Verde Greenway's Comprehensive Invasive Plant Management Program and on its Interim Steering Committee.

Coordination with Neighbors and Community. SRP remains active in supporting river conservation, research and educational efforts in the Verde Valley. Some of the activities we participated in this past year include the following:

- SRP participated in the Verde Valley Birding and Nature Festival (VVBNF). SRP led a birding field trip to Arizona State Park's Rockin River Ranch.
- SRP provided funds to the VVBNF for printing a booklet about wildlife and river ecology to be used to educate fourth graders in Verde Valley schools.
- SRP had an educational booth at Verde River Days.
- SRP's property manager, Dick Hauser, maintains regular contact with neighbors and community members. He is able to resolve most issues at this level.

2012 Actions:

Trespass/Vandalism. We will continue to patrol the property and work with the community to minimize instances of malicious trespass and vandalism.

Invasive Weed Control/Wildfire Abatement: Mowing adjacent to Interstate 17 will be continued, as necessary, and the property will be patrolled regularly to identify and minimize fire hazards. We will continue to use a combination of mowing and herbicide application on the north (left) terrace to minimize weed growth.

Coordination with Neighbors and Community: SRP will continue to coordinate with local community leaders and citizens' groups, Arizona State Parks, AGFD, Prescott National Forest, TNC and neighbors to ensure that the ecological goals for the property are met.

We plan to participate again in the Verde Valley Birding and Nature Festival, the Verde Canoe and Kayak Challenge, and at Verde River Days. SRP will continue our participation in the invasive weed management planning efforts and other planning efforts that will assist in protecting the riparian ecosystem.

f. Fort Thomas Preserve, Gila River, Graham County

Habitat Conditions. Vegetation on this parcel is comprised of a patchwork of dense tamarisk stands and mixed native and exotic riparian vegetation (Fremont cottonwood, Goodding's willow, coyote willow, tamarisk, seep willow). Several large stands of Fremont cottonwood-Goodding's willow gallery forest occur on this parcel. Large patches of coyote willow occur along edges between dense vegetation and open riparian strand. The river flows continuously in this reach except for short periods during the growing season when water is diverted to agricultural fields. When that occurs, channel pools still contain water but riffles are dry.

Two wildfires occurred on this reach of the river in 2011. The first, the River 3 and 4 Fire, began on the afternoon of Friday, February 11 on private property adjacent to SRP's northernmost conservation easement with Freeport-McMoran. Dan Wolgast, SRP's contractor, happened to be patrolling the property when he saw the smoke. Fort Thomas Fire District personnel were on site by the time Wolgast got to the area. Wolgast immediately notified Ruth Valencia at SRP. The Fort Thomas Fire District was unable to stop the fire because it had moved into a dense stand of tamarisk and was burning at a high intensity. By Monday, the fire had burned 92 acres, 46 of which were on the SRP mitigation lands. Valencia kept in touch with the Graham County Sheriff's Office and Wolgast over the weekend to monitor the situation. By Sunday, February 13, the fire was reduced to a few hot spots. On Monday, Valencia received briefings from the Fort Thomas Fire Chief and the Bureau of Land Management (BLM) Fire Management Officer (FMO). BLM Fire Crews were assisting Fort Thomas FD because the fire had been moving in the direction of BLM lands.

By Monday afternoon, the BLM FMO contacted Valencia to inform her that wind speeds had increased and the fire was flaring up again, moving in the direction of BLM lands. By Tuesday, the fire burned an additional 40 acres on BLM and SRP lands, bringing the total area burned on SRP mitigation lands to 58 acres: 46 acres on Roosevelt HCP land; 12 acres on Horseshoe-Bartlett HCP land. (See figure 20.)

On Tuesday, February 15, Valencia, Chuck Paradzick (SRP) and Wolgast visited the site and met with Scott Cooke, the BLM Safford District Field Manager to get a status on fire fighting efforts. At the time, both BLM and U.S. Forest Service crews were on site putting out a few hot spots. The fire was extinguished by the end of that day. It was determined that the fire was human caused, likely from farm workers burning weeds along irrigation drains.

The second wildfire occurred on the east side of the Preserve, also likely caused by weed burning activities. SRP refers to this fire as Hancock II. On Wednesday, March 2, Valencia received a phone call from Phillip Elliott, Arizona State Forestry Fire Officer, to inform her that a small fire had occurred on the Fort Thomas Preserve and adjacent private lands. Approximately 6 acres of USBR lands (Hancock parcel) were burned. Alex



Figure 22. The River Fire looking north. February 11, 2011. Photo by D. Wolgast.

Smith, USBR biologist, was notified. Wolgast visited the site on Friday, March 4 to investigate the extent of the damage.

Fortunately, the fire occurred outside of flycatcher breeding season and did not spread into known flycatcher nesting areas. SRP was able to map the extent of the River 3 and 4 fires on aerial photography using data files received from BLM. We overlaid flycatcher territory and nest locations on the map to determine whether any occupied habitat had been burned. Fortunately, the fires stopped short of burning a large patch of tamarisk that contained an estimated 10 nests in 2010. On the parcel acquired for the Horseshoe-Bartlett HCP, the fire stopped just short of a 2010 nest location. Nest locations were in tamarisk located on lower river banks so there may have been more moisture in that vegetation, making it less susceptible to burning.

Most of the vegetation burned was dominated by tamarisk, intermixed with coyote willow, seepwillow, Johnson grass and kochia. However, two stands of Fremont cottonwood trees were burned in the River Fire and one stand was burned in the Hancock II fire. A cottonwood tree containing an occupied Great horned owl nest was burned and the owl was observed on the nest for at least a month after the fire. Biologists assumed that the nest failed because no nestlings were ever observed.

Within weeks of the fire, biologists noted that Johnson grass, tamarisk and coyote willow were re-sprouting. Some of the cottonwood trees appear to have survived, but we are waiting to see if they leaf out next year. We were encouraged by the rapid return of much of the coyote willow that burned. Vegetation in the area that burned during the 2007 fire on the Fort Thomas Preserve returned as a monoculture of tamarisk and kochia.

River 3 and 4 Fires- Roosevelt and Horseshoe-Bartlett HCP Properties, 2011

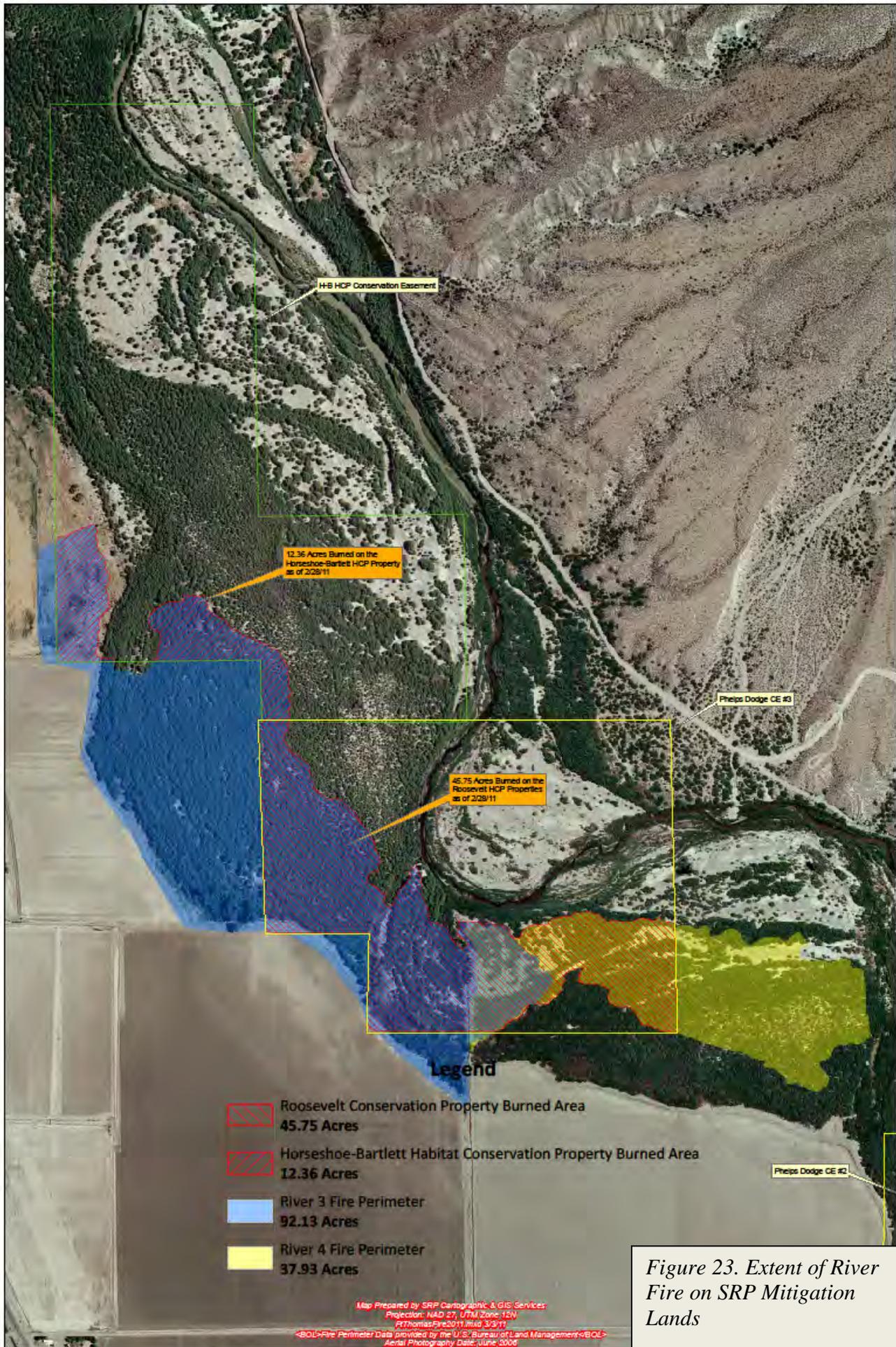


Figure 23. Extent of River Fire on SRP Mitigation Lands



*Figure 24. Aerial view of the River Fire looking downstream. February 15, 2011.
Photo by C. Paradzick.*

SRP is utilizing the areas burned by the 2011 fire to conduct a small-scale experiment to see if we can successfully introduce native plant species onto these sites before they turn into a tamarisk-kochia monoculture. We intend to test several restoration approaches, with various planting techniques and species. As a quick test, we seeded a mix of native grasses in a few areas where we were able to take advantage of irrigation run-off to see if grasses would establish before kochia returned. We also planted 21 one-gallon alkali sacaton grasses in the same area. We had excellent survival of potted grasses and have observed germination of seeded grasses in areas that retained moisture, but kochia still returned and is shading out the native grass.

SRP is developing a restoration plan for the other test plots and we plan to begin implementation in November 2011. Our objective is to identify planting techniques and plant species that can be used to restore tamarisk dominated areas to a more native vegetative composition. If successful, we hope to encourage more large-scale experimentation with the ultimate outcome being the restoration of patches of native vegetation within the large tamarisk stands along the edges of the Gila River throughout the Safford Valley in preparation for the possibility of tamarisk beetle infestation and to reduce the frequency and intensity of wildfire on the river.



*Figure 25.
Stand of burned
Fremont
cottonwoods at
Fort Thomas
Preserve.
February 15,
2011. Photo by
R. Valencia.*



*Figure 26. Coyote
willow (Salix
exigua) resprouting
after the fire.
April 14, 2011.
Photo by R.
Valencia.*

Property Boundaries and Fencing. SRP contracted with N&B Fence, LLC to construct 4 miles of four-strand wire fencing along property boundaries of the BR/Bellman and BR/Hancock parcels. These parcels had not previously been fenced because there were no issues with livestock or human trespass. However, it became apparent that adjacent agricultural activities had the potential to encroach on the protected habitat so the decision was made to demarcate boundaries with fencing. In addition, the northeast corner of the Freeport-McMoran conservation easement #1 was fenced to deter trespass. A locked gate was installed to provide access to SRP and its contractors. Fencing was completed in November 2010.

Tamarisk: SRP remains concerned about impacts to the flycatcher population on this Preserve should tamarisk beetles (*Diorhabda* sp.) be transported to the area. Last February, SRP personnel attended the Tamarisk Coalition Conference in Tucson, AZ. We intend to stay apprised of the latest information on tamarisk beetle biology and range.

2012 Actions:

Restoration: A restoration plan will be completed and implemented for the test plots that have been established in the burned areas. The test plots will be monitored and periodically photographed to track planting success.

Wildfire Response Plan. SRP will continue to work with USBR to complete the Wildfire Response Plan for the entire Preserve.

g. Created Wetlands, Arlington Wildlife Area

Habitat Conditions: This past year marks the fourth full growing season for the plantings in this wetland basin. The wetland remains completely grown in with riparian emergent vegetation, primarily cattail, with a small amount of giant bulrush and sedges persisting along the eastern margin of the basin. Project staff report routinely observing Yuma clapper rails in or near the wetland basin.

2011 Actions:

Operational Status. Over the past year, water delivery was accomplished primarily from surplus irrigation water from the neighboring agricultural fields. The operational objective has been to maintain a standing water depth of 4 to 10 inches, with a very small continuous flow of water through the cell. However, we have been challenged by changes to the basin morphology that occurred as a result of last year's flood. Flood-deposited silt and matting of cattails has resulted in a less uniform bottom surface and more variability of water depth. To offset this, basin one is kept at a higher static water level than basin 4, allowing water to flow continuously into basin 4, even without well or irrigation inputs. In addition, the water regulating structure for basin 4 was raised to compensate for the new higher silt levels and vegetation debris that have accumulated across the basin floor.

A variety of maintenance activities occurred at the site this past year.

- The levee roadways were routinely watered to maintain packed conditions, prevent erosion and hold down dust.

- Weed control was conducted with grading equipment, a brush mower and some hand labor. Rototilling of some areas was required to remove heavy weed infestations down to the roots.
- Work was conducted to repair or retard erosion around the water control structures.

2012 Actions:

We plan to continue normal operations and maintenance activities in 2011-12. AGFD is investigating the use and installation of water measurement transducers similar to those used at AGFD dam installations, allowing continuous monitoring of water depths through a wireless data link.

VI. MANAGEMENT AND COORDINATION

Obligation: SRP will establish a full-time staff position in its Environmental Services Department to manage and coordinate implementation of the Roosevelt HCP.

Actions: Completed.

VII. PERMANENT NON-WASTING FUND

Obligation: No later than 5 years after the ITP is issued, SRP will ensure that permanent funding is available to meet its continued obligations under the Roosevelt HCP.

Actions: Completed. Irrevocable grantor trust was funded in May 2008.

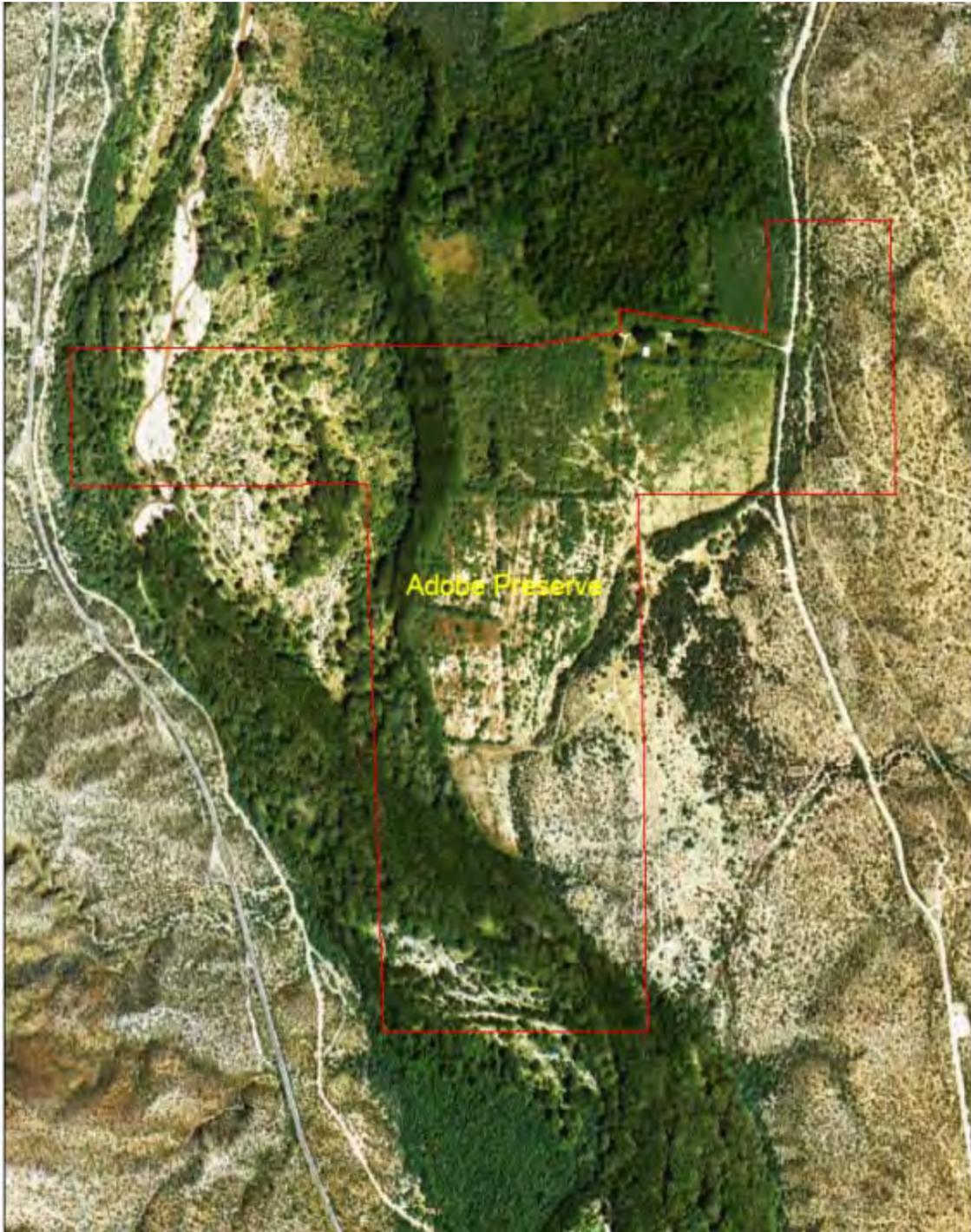
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APPENDIX A

**AERIAL PHOTOGRAPHS
OF
MITIGATION PROPERTIES**

ADOBE PRESERVE, SAN PEDRO RIVER, PINAL COUNTY, AZ
153 ACRES



Aerial photo taken September 2008

Property boundaries overlaid on aerial photographs are approximate due to slight distortions on the aerial photography

BLACK FARM PRESERVE, ARAVAIPA CREEK, PINAL COUNTY, AZ

137 ACRES



Aerial photo taken September 2008

Property boundaries overlaid on aerial photographs are approximate due to slight distortions on the aerial photography

STILLINGER PRESERVE, SAN PEDRO RIVER, PINAL COUNTY, AZ
40 ACRES

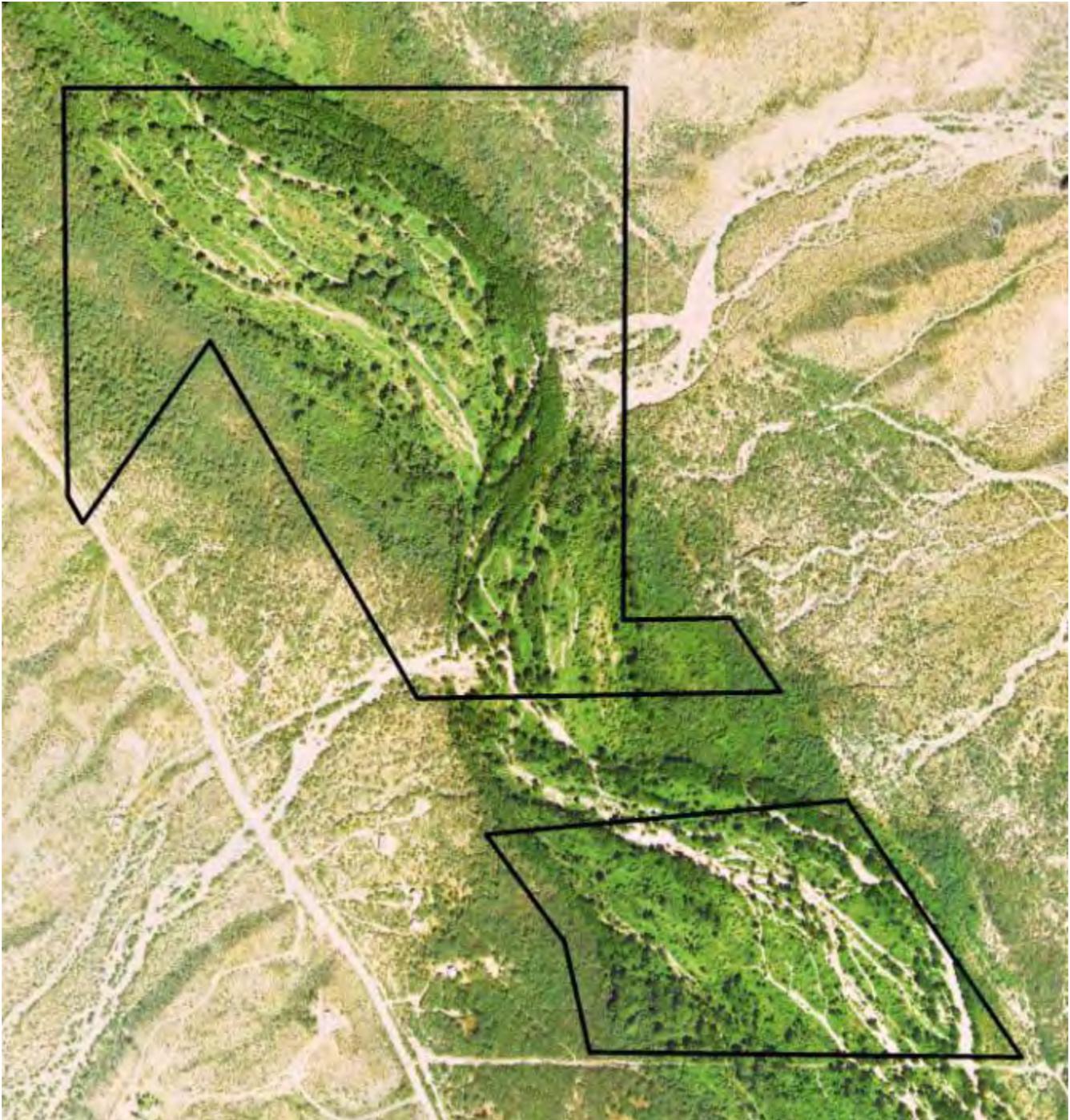


Aerial photo taken September 2008

Property boundaries overlaid on aerial photographs are approximate due to slight distortions on the aerial photography

SPIRIT HOLLOW PRESERVE and ANNEX, SAN PEDRO RIVER, PINAL COUNTY, AZ

154 ACRES



Aerial photo taken September 2008

Property boundaries overlaid on aerial photographs are approximate due to slight distortions on the aerial photography

**CAMP VERDE RIPARIAN PRESERVE, VERDE RIVER, YAVAPAI
COUNTY, AZ**

124 ACRES



Aerial photo taken October 2009.

Property boundaries overlaid on aerial photographs are approximate due to slight distortions on the aerial photography

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APPENDIX B

MANAGEMENT ACTIVITY IMPLEMENTATION MATRICES

ADOBE PRESERVE – Management Activity Implementation Matrix

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
Baseline Inventory and Management Plan			
Baseline Inventory	Completed		SRP Env. Svc.
Management Plan	Completed		SRP Env. Svc.
Water Rights and Use:			
Submit water rights claim form to ADWR	Completed		SRP Water Rights
Complete the transfer of water rights on property, except for domestic use	In process	SRP is addressing objections to filing	SRP Water Rights
Install piezometers	Complete	January 2011	SRP
Monitor Piezometers and Stream Flow	Ongoing	Monthly	SRP
Cowbird Management:			
Apply nest searching protocol	Complete	2011 breeding season	SRP
Livestock grazing and recreational disturbance:			
Remove all trespass livestock	On-going	Patrol conducted regularly	SRP contractor Livestock owner(s)
Fire Management:			
Develop a fire management plan in coordination with fire management agencies	Completed	October 2004	SRP Env. Svc. Contractors
Maintain close coordination with wildfire response agencies; Update local contact	Pending	April 2012	SRP Env. Svc. SRP contractor
Patrol site regularly to identify and eliminate potential fire hazards; clearing, mowing, etc.	On-going	Conducted weekly, on average	SRP contractor
Fencing and Gates:			
Conduct regular fence patrol to check for breaches. Inspect fence line after every flood event.	On-going	Conducted weekly, on average	SRP contractor

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
Restoration of Upland Fields:			
Develop a plan to begin restoration of upland fields	In process	1 st quarter of 2012	Env. Svc. SRP contractor
On-Site Management			
Maintain and repair existing fences and roads	On-going	As needed	SRP contractor
Conduct general maintenance	On-going	As needed	SRP contractor
Invasive Plant and Animal Control:			
Survey the property to determine presence and extent of invasive elements	Completed	October 2008	Env. Svc. Contractor
Develop plan to minimize or eliminate problem species	In process	See "Restoration of upland fields"	Env. Svc. SRP contractor
Facilities Management:			
Implement actions for domestic well	On hold	TBD	SRP Env. Svc. Contractor
Conservation Easement:			
Locate an entity to hold the conservation easement	On hold	TBD	Env. Svc. Land
Community Support:			
Contact neighbors, maintain working relationships	On-going	On-going	SRP SRP contractor

BLACK FARM PRESERVE – Management Activity Implementation Matrix

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
Baseline Inventory and Management Plan:			
Finalize baseline inventory	Completed		Env. Svc.
Finalize management plan and distribute to cooperators	Completed		Env. Svc.
Water Rights and Use:			
Submit water rights claim form to ADWR	Completed		SRP Water Rights
Complete the transfer of water rights on property, except for domestic use	In process	Pending ADWR action	SRP Water Rights
Cease irrigation of fields	Completed	March 2007	SRP
Install piezometers	Complete	January 2011	SRP
Monitor Piezometers	Ongoing	Monthly	SRP
Fire Management:			
Develop a fire management plan in coordination with fire management agencies	Completed	October 2004	Env. Svc. Contractor
Patrol site regularly to identify and eliminate potential fire hazards	On-going	Conducted weekly, on average	SRP contractor
Make initial contact with local fire-fighting org. and wildfire response agencies; Update local contact info	Pending	April 2012	Env. Svc. SRP contractor
Familiarize SRP employees with protocols	On-going	As necessary	Env. Svc.
Restoration of Upland Fields:			
Plant native grasses and forbs on 101 acres of agricultural fields	Completed	September 2005	Agric. contractor SRP contractor
Seed 5 acres at southeast corner of property	Completed	September 2010	SRP contractor
On-Site Management:			
Hire a property maintenance technician	Completed		Env. Svc.
Patrol property and fence lines	On-going	Weekly, on average	SRP contractor

BLACK FARM (cont'd.)

Conduct general maintenance activities	On-going	As necessary	SRP contractor
MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
Invasive Plant Control:			
Conduct mechanical removal of weeds from agricultural fields seeded with native grasses; contact SRP to coordinate need for herbicide spraying	On-going		SRP SRP Groundwater SRP contractor
Coordination with Neighbors and Community:			
Coordinate activities with adjacent landowners	On-going		SRP Env. Svc.

SPIRIT HOLLOW PRESERVE – Management Activity Implementation Matrix

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
Baseline Inventory and Management Plan			
Baseline Inventory – add new properties	In-process	May 2012	SRP Env. Svc.
Management Plan – add new properties	In-process	May 2012	SRP Env. Svc.
Cowbird Management:			
Apply nest searching protocol	Complete	Second application of method during 2011 surveys	SRP Env. Svc. Cooperators
Livestock grazing and recreational disturbance:			
Remove all trespass livestock	On-going	As necessary	SRP contractor Livestock owner(s)
Wildfire Abatement:			
Develop a fire management plan in coordination with fire management agencies	Completed	October 2004	SRP Env. Svc. Contractors
Patrol site regularly to identify and eliminate potential fire hazards; clearing, mowing, etc.	On-going	Conducted weekly, on average	SRP contractor
Make initial contact & maintain coordination w/ wildfire response agencies, update local contact info	Pending	April 2012	SRP Env. Svc. SRP contractor
Update fire plan to include USBR lands and protocols	In-process	October 2012	SRP Env. Svc. USBR
Fencing:			
Conduct regular fence patrol to check for breaches. Inspect fence line after every flood event.	On-going	Conducted weekly, on average	SRP contractor
Monitoring:			
Install piezometers	Complete	January 2011	SRP
Monitor piezometers	On-going	Monthly	SRP

SPIRIT HOLLOW (cont'd.)

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
On-Site Management			
Hire a property maintenance technician	Completed		SRP Env. Svc.
Maintain and repair existing fences and roads	On-going	As needed	SRP contractor
Conduct general maintenance	On-going	As needed	SRP contractor
Invasive Plant and Animal Control:			
Survey the property to determine presence and extent of invasive elements	Completed	September 2008	Env. Svc. Contractor
Conservation Easement:			
Complete conservation easement	Completed	October 2006	Env. Svc.
Community Support:			
Contact neighbors, maintain working relationships	On-going	On-going	SRP Env. Svc.

STILLINGER PRESERVE – Management Activity Implementation Matrix

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
Baseline Inventory and Management Plan			
Baseline Inventory	Completed	September 2005	SRP Env. Svc.
Management Plan	Completed	September 2005	SRP Env. Svc.
Cowbird Management:			
Apply nest searching protocol	Complete	Second application of methods during 2011 surveys	SRP Env. Svc. Cooperators
Livestock grazing and recreational disturbance:			
Remove trespass livestock	On-going	On-going	SRP contractor Livestock owner(s)
Wildfire Abatement:			
Develop a fire management plan in coordination with fire management agencies	Completed	October 2004	SRP Env. Svc. Contractors
Patrol site regularly to identify and eliminate potential fire hazards; clearing, mowing, etc.	On-going	Conducted weekly, on average	SRP contractor
Make initial contact and maintain close coordination with wildfire response agencies, Update local contact info	Pending	April 2012	SRP Env. Svc. SRP contractor
Fencing:			
Conduct regular fence patrol to check for breaches;	On-going	Conducted weekly, on average	SRP contractor
Maintain and repair existing fences and gates	On-going	As needed	SRP contractor
Construct fences along property boundary; repair fences on left bank.	Complete	May 2011	SRP contractor
Monitoring:			
Install piezometers	Complete	January 2011	SRP
Monitor piezometers	On-going	Monthly	SRP

STILLINGER PRESERVE (cont'd.)

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
On-Site Management			
Hire a property maintenance technician	Completed		SRP Env. Svc.
Conduct general maintenance	On-going	As needed	SRP contractor
Invasive Plant Control:			
Survey the property to determine presence and extent of invasive elements	Not necessary at this time		Env. Svc. Contractor
Develop plan to minimize or eliminate problem species	Not necessary at this time		Env. Svc. Contractor
Conservation Easement:			
Locate an entity to hold the conservation easement	On hold	TBD	Env. Svc. Land
Community Support:			
Contact neighbors, maintain working relationships	On-going	On-going	SRP contractor SRP Env. Svc.

CAMP VERDE RIPARIAN PRESERVE – Management Activity Implementation Matrix

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
Baseline Inventory and Management Plan			
Baseline Inventory	Completed	September 2005	SRP Env. Svc./Contractor
Management Plan	Completed	September 2005	SRP Env. Svc./Contractor
Cowbird Management:			
Apply nest searching protocol	Pending	Apply during 2012 survey if nest is present	SRP Env. Svc. Cooperators
Livestock grazing and recreational disturbance:			
Minimize human, vehicular and livestock trespass	On-going	On-going	SRP contractor Livestock owner(s)
Wildfire Abatement:			
Develop a fire management plan in coordination with fire management agencies	Completed	December 2004	SRP Env. Svc. Contractors
Patrol site regularly to identify and eliminate potential fire hazards; clearing, mowing, etc.	On-going	Conducted weekly, on average	SRP contractor
Make initial contact and maintain close coordination with wildfire response agencies, send plan	Completed	On-going	SRP Env. Svc. SRP contractor
Mow vegetation to create fire break along I-17 boundary	On-going as necessary	After each winter and monsoon rainy season	SRP
Boundary Issues / Fencing:			
Install wildlife friendly barbed wire fencing along the southern boundary of property.	Completed	December 2004	Contractor
Conduct regular fence patrol to check for breaches. Inspect fence line after every flood event.	On-going	Conducted weekly, on average	SRP contractor
Invasive Plant Control			

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
Map invasive woody plants of concern	In-process	May 2012	SRP
Boundary Issues/Fencing (cont'd.)			
Install signage at I-17 bridge and along fence lines	Completed	July 2005	Env. Svc., Contractor
Install 'no hunting' signes	Complete	October 2011	SRP
On-Site Management			
Hire a property maintenance technician	Completed		SRP Env. Svc.
Maintain and repair existing fences and roads	On-going	As needed	SRP Env. Svc.
Conduct general maintenance	On-going	As needed	SRP Env. Svc. Contractors
Conservation Easement:			
Locate an entity to hold the conservation easement	On hold	TBD	Env. Svc. Land
Community Support:			
Contact neighbors, maintain working relationships	On-going	On-going	SRP Env. Svc.
Support display and trip at Verde Birding and Nature Festival	Annually	April 2012	SRP Env. Svc.
Information display at Verde River Days	Annually	September 2012	SRP Env. Svc.
Verde River Planning w/ TNC , ASPB, FVG, USFS and others	On-going	On-going	SRP Env. Svc.
Support Verde Comprehensive Invasive Plant management Program	Currently		SRP Env. Svc.

FORT THOMAS PRESERVE - Management Activity Implementation Matrix

MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
Baseline Inventory and Management Plan			
Baseline Inventory	Completed	February 2009	SRP Env. Svc./Contractor
Management Plan	Completed	November 2008	SRP Env. Svc./Contractor
Cowbird Management:			
Test nest searching protocol	Completed	2006 and 2007 breeding season	SRP Env. Svc. Contractor
Conduct nest searching protocol	Repeat	2012 survey season	SRP Contractor
Livestock grazing and recreational disturbance:			
Install signage to deter human and vehicular trespass	Completed	September 2008	SRP Env. Svc.
Wildfire Abatement:			
Develop a fire management plan in coordination with fire management agencies and USBR	Initiated	October 2012	SRP Env. Svc. USBR
Patrol site regularly to identify and eliminate potential fire hazards; clearing, mowing, etc.	On-going	Conducted weekly, on average	SRP contractor
Make initial contact and maintain close coordination with wildfire response agencies	On-going		SRP Env. Svc. SRP contractor
Send copies of fire management plan to fire management agencies	Initiated	After completion of plan, maps have been sent	SRP Env. Svc.
Post-fire restoration plan development and implementation	Initiated	Spring 2012	SRP Env. Svc.
Boundary Issues / Fencing:			
Evaluate the property to determine fencing, signage and access needs	Completed	June 2007	SRP
Install fencing, signage on Hancock, Bellman boundary	Complete	February 2011	SRP
On-Site Management			
Hire a property maintenance technician	Completed	March 2004	SRP Env. Svc.

Maintain and repair existing fences and roads	On-going	As needed	SRP Env. Svc.
MANAGEMENT ACTIONS	STATUS	TARGET DATE	DEPARTMENT
On-Site Management (cont'd.)			
Conduct general maintenance	On-going	As needed	SRP Env. Svc. SRP contractor
Conservation Easement:			
Locate an entity to hold the conservation easement	On hold	TBD	Env. Svc. Land
Community Support:			
Contact neighbors, maintain working relationships	On-going	On-going	SRP Env. Svc.

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APPENDIX C

Southwestern Willow Flycatcher and Yellow-billed Cuckoo Surveys at the SRP-Managed Properties along the San Pedro River, Pinal County, Arizona: 2011 Summary Report

This report contains sensitive data, which is considered confidential by the U.S. Fish and Wildlife Service. Therefore, it has been removed from this version of the report. The full survey report was sent to the USFWS Ecological Field Services Office in Phoenix, AZ.

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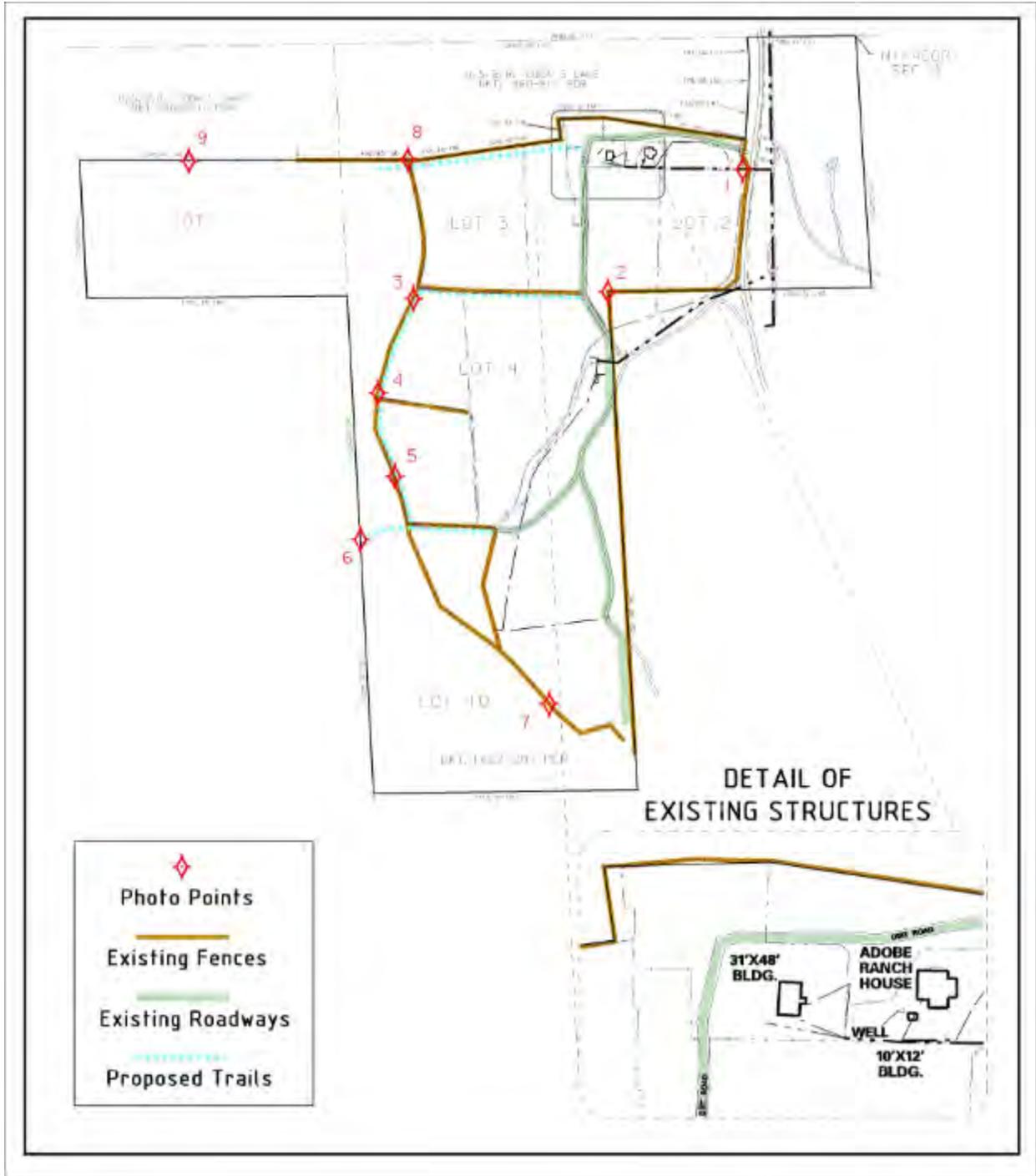
APPENDIX D

PHOTO POINT MONITORING RESULTS

PHOTO POINT MONITORING RESULTS

ADOBE PRESERVE

Photo Point Locations Adobe Preserve



Adobe Preserve Photo Point Record
Photo Point 1- View 1



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 1- View 2



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 2- View 1



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 2- View 2



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 3- View 1



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 3- View 2



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 3- View 3



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 4- View 1



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 4- View 2



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 5- View 1



October 9, 2003

NO PHOTO TAKEN IN 2011

Adobe Preserve Photo Point Record
Photo Point 6- View 1



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 6- View 2



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 7- View 1



October 9, 2003



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 8- View 1



October 20, 2004



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 8- View 2



October 20, 2004



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 8- View 3



October 6, 2005



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 9- View 1



October 20, 2004



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 9- View 2



October 20, 2004



October 5, 2011

Adobe Preserve Photo Point Record
Photo Point 9- View 3



October 20, 2004

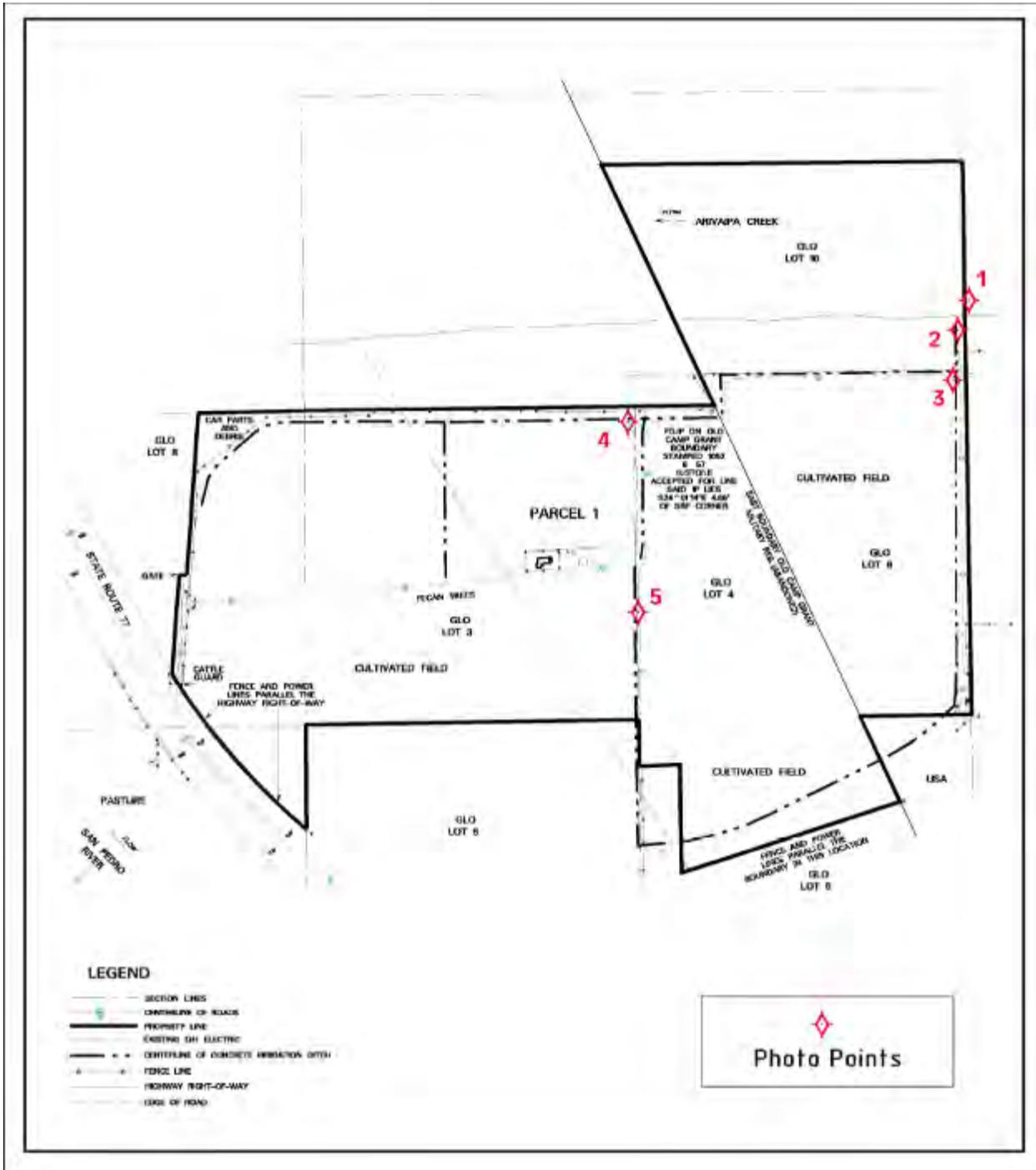


October 5, 2011

PHOTO POINT MONITORING RESULTS

BLACK FARM PRESERVE

Photo Point Locations Black Farm Preserve



Black Farm Preserve Photo Point Record
Photo Point 1- View 1



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 1- View 2



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 2- View 1



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 2- View 2



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 3- View 1



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 3- View 2



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 3- View 3



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 4- View 1



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 4- View 2



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 5- View 1



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 5- View 2



June 17, 2004



October 5, 2011

Black Farm Preserve Photo Point Record
Photo Point 5- View 3



June 17, 2004

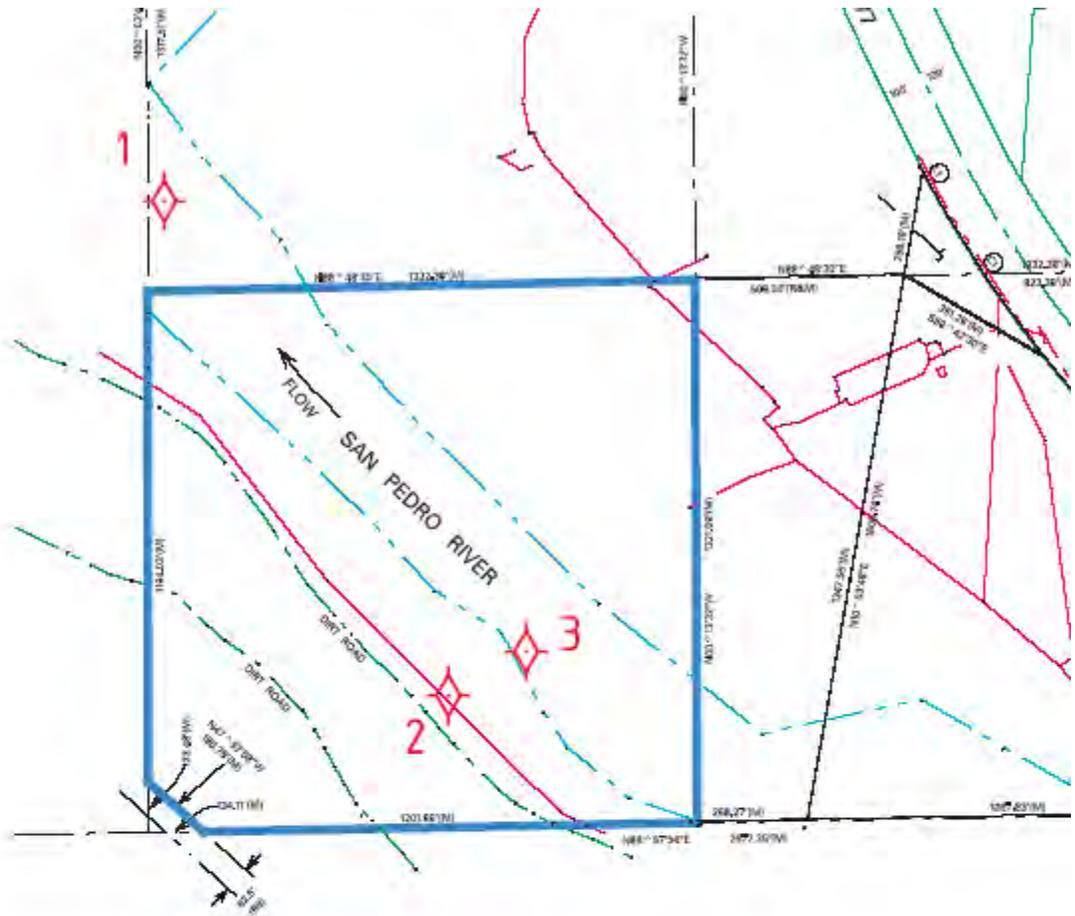


October 5, 2011

PHOTO POINT MONITORING RESULTS

STILLINGER PRESERVE

Photo Point Locations Stillinger Preserve



Stillinger Preserve



Photo Points

Stillinger Property Photo Point Record
Photo Point 1- View 1



June 21, 2005 *** Located off property; near edge of active channel***



October 1, 2009 NO PHOTO TAKEN IN 2011

Stillinger Property Photo Point Record
Photo Point 1- View 2



June 21, 2005



October 1, 2009 NO PHOTO TAKEN IN 2011

Stillinger Property Photo Point Record
Photo Point 1- View 3



June 21, 2005



October 1, 2009 NO PHOTO TAKEN IN 2011

Stillinger Property Photo Point Record
Photo Point Established in 2006
Photo Point 1B-1



October 19, 2006 *** Located on property corner ***



October 1, 2009 NO PHOTO TAKEN IN 2011

Stillinger Property Photo Point Record
Photo Point Established in 2006
Photo Point 1B-2



October 18, 2006



October 1, 2009 NO PHOTO TAKEN IN 2011

Stillinger Property Photo Point Record
Photo Point 1B-3



October 19, 2006



October 1, 2009 NO PHOTO TAKEN IN 2011

Stillinger Property Photo Point Record
Photo Point 2- View 1



June 21, 2005



October 27, 2011

Stillinger Property Photo Point Record
Photo Point 2- View 2



June 21, 2005



October 27, 2011

Stillinger Property Photo Point Record
Photo Point 3- View 1



June 21, 2005



October 27, 2011

Stillinger Property Photo Point Record
Photo Point 3- View 2



June 21, 2005



October 27, 2011

Stillinger Property Photo Point Record
Photo Point 3- View 3



June 21, 2005

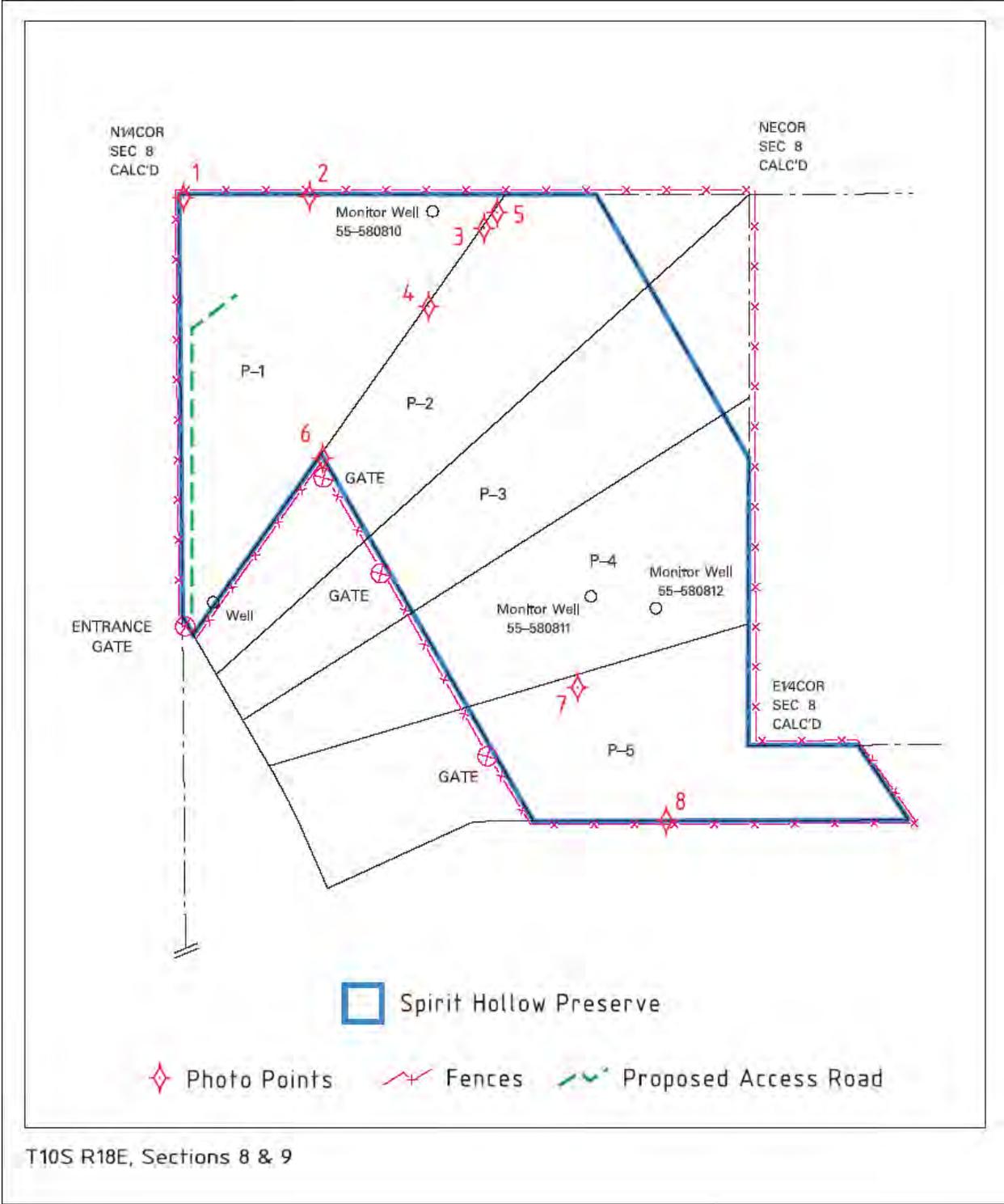


October 27, 2011

PHOTO POINT MONITORING RESULTS

SPIRIT HOLLOW PRESERVE

Photo Point Locations Spirit Hollow Preserve



Spirit Hollow Preserve Photo Point Record
Photo Point 1- View 1



September 21, 20



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 1- View 2



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 2- View 1



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 2- View 2



September 21, 2005

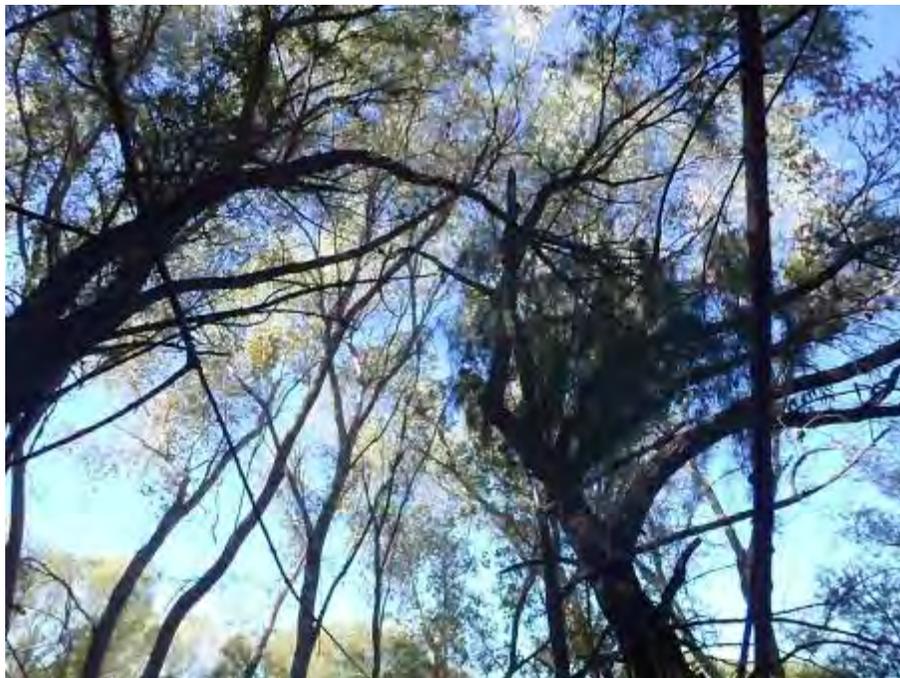


November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 2- View 3



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 2- View 4



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 2- View 5



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 3- View 1



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 3- View 2



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 3- View 3



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 3- View 4



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 3- View 5



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 3- View 6



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 4- View 1



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 4- View 2



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 4- View 3



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 4- View 4



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 5- View 1



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 5- View 2



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 5- View 3



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 5- View 4



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 6- View 1



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 6- View 2



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 6- View 3



September 21, 2005



November 8, 2011

Spirit Hollow Preserve Photo Point Record
Photo Point 7- View 1



September 21, 2005



November 8, 2011 Not Actual Site, Vicinity of Photo Point Location

Spirit Hollow Preserve Photo Point Record
Photo Point 7- View 2



September 21, 2005



November 8, 2011 Not Actual Site, Vicinity of Photo Point Location

Spirit Hollow Preserve Photo Point Record
Photo Point 8- View 1



September 21, 2005



November 8, 2011 Not Actual Site, Vicinity of Photo Point Location

Spirit Hollow Preserve Photo Point Record
Photo Point 8- View 2



September 21, 2005



November 8, 2011 Not Actual Site, Vicinity of Photo Point Location

Spirit Hollow Preserve Photo Point Record
Photo Point 8- View 3



September 21, 2005



November 8, 2011 Not Actual Site, Vicinity of Photo Point Location

PHOTO POINT MONITORING RESULTS

CAMP VERDE RIPARIAN PRESERVE

Photo Point Locations
Camp Verde Riparian Preserve



AirPhotoUSA 2004
T14N R4E, Sections 24 & 25

◆ Photo Points ~ Preserve Boundary

b

Camp Verde Riparian Preserve Photo Point Record
Photo Point 1- View 1



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record

Photo Point 1- View 2



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record

Photo Point 1- View 3



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 1- View 4



June 7, 2005

NO PHOTO TAKEN IN 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 2- View 1



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 2- View 2



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 2- View 3



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 2- View 4



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 3- View 1



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 3- View 2



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 3- View 3



June 7, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 3- View 4



August 10, 2007 (photo point was moved from 2005 location)



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 4- View 1



August 25, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 4- View 2



August 25, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 4- View 3



August 25, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 5- View 1



August 25, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 5- View 2



August 25, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 5- View 3



August 25, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 6- View 1



August 25, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 6- View 2



August 25, 2005



October 19, 2011

Camp Verde Riparian Preserve Photo Point Record
Photo Point 6- View 3



August 25, 2005



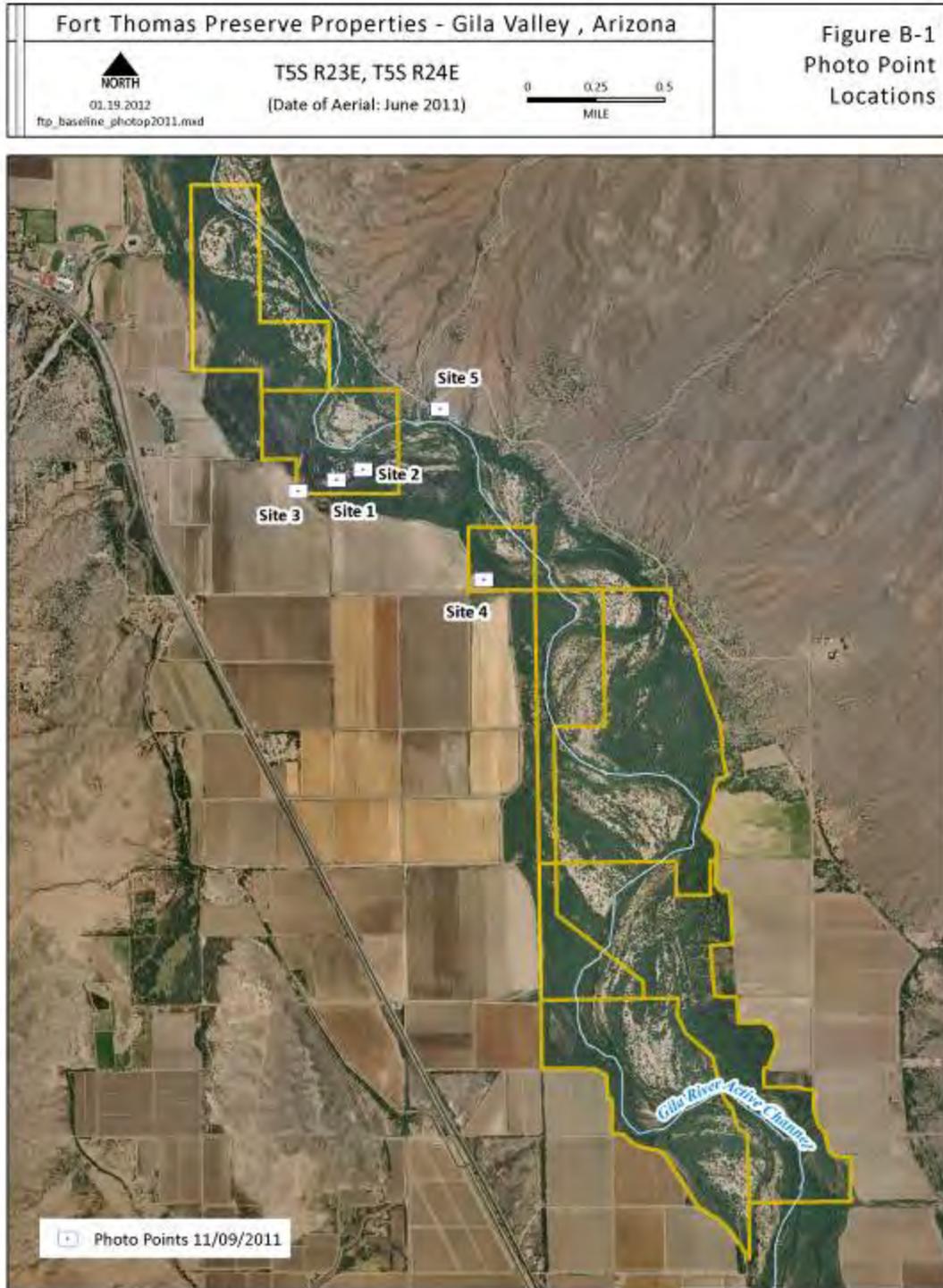
October 19, 2011

PHOTO POINT MONITORING RESULTS

FORT THOMAS PRESERVE

Photo Point Locations

In 2011, photo point locations were re-established for the Fort Thomas Preserve. Photo points for the newly acquired Indian Springs Ranch Parcel will be added in 2012. The map below indicates the locations of the newly established points.



Fort Thomas Photo Point Record
Photo Point 1 – View 1



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 1 – View 2



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 1 – View 3



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 2 – View 1



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 2 – View 2



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 2 – View 3



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 3 – View 1



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 3 – View 2



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 3 – View 3



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 4 – View 1



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 4 – View 2



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 4 – View 3



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 5 – View 1



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 5 – View 2



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 5 – View 3



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 5 – View 4



November 9, 2011

Fort Thomas Photo Point Record
Photo Point 5 – View 5



November 9, 2011

PHOTO POINT MONITORING RESULTS

ROCKHOUSE PROJECT

Photo Point Locations
Rockhouse Project



Rockhouse Photo Point Record
Photo Point 1- View 1



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 1- View 2



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 1- View 3



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 1- View 4



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 2A- View 1



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 2A- View 2



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 2A- View 3



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 2A- View 4



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 2A- View 5



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 2A- View 6



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 2A- View 7



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 2B- View 1



October 13, 2005

NO PHOTO POINT TAKEN IN 2011

Rockhouse Photo Point Record
Photo Point 2B- View 2



October 13, 2005



September 27, 2011

Rockhouse Photo Point Record
Photo Point 3- View 1



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 3- View 2



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 3- View 3



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 4- View 1



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 4- View 2



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 4- View 3



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 4- View 4



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 4- View 5



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 4- View 6



October 13, 2005



September 11, 2009

Rockhouse Photo Point Record
Photo Point 5- View 1



May 3, 2004



September 27, 2011

Rockhouse Photo Point Record
Photo Point 5- View 2



May 3, 2004



September 27, 2011

APPENDIX E

**Yuma Clapper Rail Survey Data Sheets
Arlington Wetlands, Maricopa County, AZ**

