YUMA CROSSING NATIONAL HERITAGE AREA

AVIFAUNA AND BUTTERFLY (LEPIDOPTERA) RECOVERY IN RESTORED WETLAND AND RIPARIAN HABITATS

FINAL REPORT

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EXECUTIVE SUMMARY

The goal of most ecological restoration projects is to restore the ecosystem to the pre-disturbed state in terms of ecological integrity, structure, function and composition (Hobbs and Norton 1996). While many restoration projects evaluate the structural ecosystem components, few evaluate the ecosystem function and wildlife composition recovery. Invertebrates can quickly respond to ecological changes and provide essential functions within an ecosystem such as decomposition, energy transfer and pollination (Recher et al. 1993, Andersen and Sparling 1997). Butterflies, in particular, are amenable to research, because many larvae have specific host plants, while as adults they are nectar generalists. They quickly respond re-colonize areas, and therefore occupy a broad range of ecological niches. These broad life history traits make butterflies good ecological indicators of herbaceous community health (Scoble 1992), other herbivorous arthropods (Brown 1991, Scoble 1992, Beccaloni and Gaston 1995) and even other taxonomic groups (Wilcox et al. 1986). The avifaunal community, like butterflies, has shown to quickly re-colonize areas that have experienced changes in habitat quality, particularly when habitats are restored (Passell 2000, Gardali et al. 2006). The relatively rapid positive response to habitat restoration and specific habitat requirements for many avifaunal species makes this group ideal for evaluating ecosystem health and function. Migratory and residential avifaunal communities have declined on the lower Colorado River due to loss of habitat and invasion of exotic saltcedar (Anderson and Ohmart 1984, Hunter et al. 1988). Few studies have looked at the recovery of avifaunal communities (Fred Phillips Consulting 2009). Recovery of the avifaunal community is an essential metric to evaluate restoration project success.

The Yuma East Wetlands (YEW) on the Lower Colorado River is bound on the north and south by Colorado River levees; on the west by the Ocean-to-Ocean Bridge; and on the east by the Gila–Colorado River confluence. This area covers approximately 909 acres in Yuma County, Arizona. The project area has been extensively modified by almost a century of flow control activities, channelization, agricultural manipulation, timber harvesting, non-native species invasion, and unregulated dumping. As a result, the YEW was dominated by monotypic stands of exotic saltcedar (*Tamarix pentandra* and *ramosissima*) and common reed (*Phragmites* sp.). The remaining native wetland habitat was threatened by sedimentation, lack of water, and invasive plants. In an effort to revitalize the natural ecosystem in this area, the *Yuma East Wetlands Restoration Plan* (YEWP) (Phillips Consulting 2001) was designed to restore and enhance over 900 acres of native riparian, wetland, and aquatic habitats on the lower Colorado River immediately upstream from Yuma, Arizona. Currently, there are over 350 acres of restored aquatic, wetland, and riparian habitats in the YEW, with over half approaching maturity (restored 5-7 years ago). The hypothesis of this project is that avifaunal and butterfly richness and abundance will be different in restored riparian and wetland habitats than control habitats dominated by invasive species.

The results from this study indicated that both bird and butterfly species preferred restored riparian and wetland habitats to control riparian and wetland habitats. A higher richness and density of resident birds was detected using the restored riparian habitats than the control riparian habitats, however the results were not statistically significant. No correlations were detected between resident or migratory riparian bird richness or abundance and environmental characteristics. Bird richness and abundance was significantly higher in restored wetland habitats

as compared to the control wetland habitats, with yellow-headed blackbirds being the most common species detected. Eight endangered Yuma clapper rail were detected in the restored wetland habitats, which was higher than previous years. Butterfly species richness and abundance was significantly higher in the restored riparian habitats as compared to the control riparian habitats, which was likely due to the diversity of flowering plants detected in restored habitats. Butterfly species richness was correlated with flowering plant richness and abundance, vegetation species diversity and percent herbaceous cover. This indicates that in order to attract a variety of butterfly species, a diversity of flowering herbaceous vegetation should be planted at restoration sites.

1.0 INTRODUCTION

The goal of most ecological restoration projects is to restore the ecosystem to the pre-disturbed state in terms of ecological integrity, structure, function and composition (Hobbs and Norton 1996). While many restoration projects evaluate structural ecosystem components few evaluate ecosystem function and wildlife composition recovery. Invertebrates can quickly respond to ecological changes and provide essential functions within an ecosystem such as decomposition, energy transfer and pollination (Recher et al. 1993, Andersen and Sparling 1997). Despite the important functions invertebrates provide within an ecosystem, few restoration projects monitor the recovery of invertebrates (Holl 1996, Andersen and Sparling 1997, Majer 1997, Davies et al. 1999, Waltz and Covington 2004). Butterflies, in particular, are amenable to research, because many larvae have specific host plants, as adults they are nectar generalists, they quickly respond re-colonize areas, and therefore occupy a broad range of ecological niches. These broad life history traits make butterflies good ecological indicators of herbaceous community health (Scoble 1992), other herbivorous arthropods (Brown 1991, Scoble 1992, Beccaloni and Gaston 1995) and even other taxonomic groups (Wilcox et al. 1986).

The avifaunal community, like butterflies, has shown to quickly re-colonize areas that have experienced changes in habitat quality, particularly when habitats are restored (Passell 2000, Gardali et al. 2006). Also, many avifaunal species are reliant on specific habitats for foraging and nesting. The relatively rapid positive response to habitat restoration and specific habitat requirements for many avifaunal species makes this group ideal for evaluating ecosystem health and function. Migratory and residential avifaunal communities have declined on the lower Colorado River due to loss of habitat and invasion of exotic *Tamarix* spp. (Anderson and Ohmart 1984, Hunter et al. 1988). Habitat restoration on the lower Colorado River has been conducted primarily to recover endangered avifaunal species, including the southwestern willow flycatcher and Yuma clapper rail, however few studies have looked at the recovery of avifaunal communities (Fred Phillips Consulting 2009). Recovery of the avifaunal community is an essential metric to evaluate restoration project success.

The Yuma East Wetlands (YEW) on the Lower Colorado River is bounded on the north and south by Colorado River levees; on the west by the Ocean-to-Ocean Bridge; and on the east by the Gila–Colorado River confluence. This area covers approximately 909 acres in Sections 19, 21, 22, 23, and 24, Township 8 South, Range 22 and 23 West, of the Gila Salt River Base and Meridian, in Yuma County, Arizona. The project area has been extensively modified by almost a century of flow control activities, channelization, agricultural manipulation, timber harvesting, non-native species invasion, and unregulated dumping. As a result, the YEW was dominated by monotypic stands of exotic saltcedar (*Tamarix pentandra* and *ramosissima*) and common reed (*Phragmites* sp.); and the remaining native wetland habitat was threatened by sedimentation, lack of water, and invasive plants. In an effort to revitalize the natural ecosystem in this area, the *Yuma East Wetlands Restoration Plan* (YEWP) (Phillips Consulting 2001) was designed to restore and enhance over 900 acres of native riparian, wetland, and aquatic habitats on the lower Colorado River immediately upstream from Yuma, Arizona. Currently, there are over 350 acres of restored aquatic, wetland, and riparian habitats in the YEW, with over half approaching maturity (restored 5-7 years ago). The specific goals of this project was to 1) to compare avifaunal and butterfly community richness and abundance in restored versus control wetland and riparian habitats in the Yuma East Wetlands on the lower Colorado River, and 2) to build on

previous research and provide more detailed information of the breeding avifaunal species and migrating and resident butterfly species present at the YEW. The objectives of the project included: 1) to compare richness and abundance of avifauna and butterflies in restored versus exotic vegetation-dominated (control) riparian and wetland habitats; 2) compare restored versus control riparian and wetland habitat quality, nesting habitat and nectar availability; 3) involve the local community in surveying techniques for interpretation and educational purposes; and 4) develop performance standards to optimize wetland and riparian restoration efforts on the lower Colorado River.

2.0 METHODS

2.1 Bird Surveys

2.1.1 Riparian Birds

Riparian birds were surveyed using a modified intensive area search method following the protocol outlined by the "Nevada Bird Count: Intensive Area Searches and Spot-Mapping (Great Basin Bird Observatory 2010)" and the "Arizona Riparian Bird Surveys Field Manual for Rapid Surveys (Bart et al. 2010)." Intensive area searches in riparian areas provide unbiased density estimates and bird use of a particular habitat or area, which can also be used to correct data collected by rapid area searches or point counts (Bart and Earnst 2002). The goal of the area searches was to determine the number of breeding territories/pairs for each species within the plot and to identify habitat uses of migrating species. If sufficient evidence was available after all the surveys area were completed territories of each individual bird/pair was delineated. Birds that were detected in the plot three times or had observed nesting evidence were considered resident birds.

Ten plots were systematically located in mature riparian habitats (Appendix A and B). Five plots were dominated by native species (primarily cottonwood and willow) and five plots were dominated by invasive species (primarily tamarisk). Plots ranged in size from 2-7 acres (1-3 ha) to include several breeding territories of land birds. Area searches were conducted during the time period of the highest breeding activity for most riparian birds: early April- June. Six riparian bird surveys were conducted over four days. Surveys were initiated 0.5 hours before sunrise, at day break, and were finished by 1030 hr. Also, since species detections decline in inclement weather conditions, surveys were not conducted when wind speeds exceeded 12 miles per hour (mph) and under heavy rainfall. Area search field datasheets are located in Appendix C and non-breeder datasheets are located in Appendix D.

<u>Conducting Area Searches</u>

Initial surveys were conducted to identify the number of breeding pairs for each species within a plot. The subsequent visits helped add new individuals/territories, confirmed previously identified territories and detected early and late breeders. The entire plot was surveyed for birds, with an effort to pass within 20m of every point. More time was spent in areas of high bird activity.

Breeding Status

For each detection the breeding status of the individual or pair was determined and the highest level of breeding evidence that was detected was recorded. The highest level of breeding activity included occupied nests with eggs or young. Migrating species using the plots were also recorded. Birds that were observed in the plot and using the plot as part of their breeding territory, but were not nesting in the plot had their entire territory delineated both inside and outside the plot boundary.

Recording Locations on the Map

For each sighting location, the number of individuals in the group was recorded on an aerial photo, including sex (if possible). For each individual, either the best evidence of nesting was recorded or an individual was marked as incidental (migrating). Priority was given to nesting status (i.e. carrying nest material or food to nest, eggs, nestlings, dependent young). Species territories were identified over subsequent visits (Appendix E).

2.1.2 Marsh Bird Surveys

Marsh bird surveys were conducted three times over the typical marsh bird breeding season, March 15- May 31, in 8 restored wetland and 8 control wetland areas for a total of 16 sites. Points were located 200m apart in order to prevent double counting. A combination of methods was used to detect nesting activities of birds that breed in wetlands, which included 1) the National Marsh Bird Monitoring Program protocol developed by USFWS to monitor marsh birds (Conway 2005), and 2) variable circular plots to detect other nesting birds. Surveys consisted of visiting each site 0.5hr before sunrise and were finished by 1030 to capture the most active time period for marsh birds. The National Marsh Bird Monitoring Protocol consists of playing a recording at each site consisting of 5 minutes of silence followed by 30 seconds each of recordings of California Black Rail, Least Bittern, Virginia Rail, and Yuma Clapper Rail, each of which were followed by 30 seconds of silence. Marsh bird survey datasheets are located in Appendix F.

Along with the marsh bird survey protocol, variable circular plots were utilized to record other species detected nesting and migrating in the wetland habitats. The variable circular plot surveys were conducted at the same time within the same locations as the marsh bird surveys. Birds were measured in 10m increment bands around the center of the plot up to 100m for a total of 5 minutes (Reynolds et al. 1980). The behavior of each detected species was recorded, including singing, calling, nest building, foraging, etc. Only the avifaunal species actively utilizing the habitat were counted. It was more difficult determining what individuals were residents of marsh habitats, therefore birds that were seen over multiple visits during the breeding season were considered residents as well as if breeding activities were detected. Variable circular plot datasheets are located in Appendix G.

2.2 Butterfly Sampling

2.2.1 Field Collection Techniques

Butterflies were sampled four times during May, June, July and September 2011 in riparian habitats. Five transects were established in each of the control and restored riparian habitats for a

total of 10 transects. These transects coincided with the avifaunal plots discussed above. The length of the transect varied, depending on the size of the habitat being monitored. Diurnal butterflies are very sensitive to cool and windy conditions, which reduces chance of observation (Waltz and Covington 2004). Therefore, butterflies were sampled between 0700 and 1400 hrs, on days warmer than 17'C with winds less than 10 mph (Pollard 1977).

Butterfly species encountered along the transect were identified during timed searches. One minute per every 20m along a transect was spent searching for butterflies. This time did not include the time in pursuit of a butterfly. Butterfly species encountered on each transect were recorded, with the location along the transect (in meters) and the lateral distance from the transect (perpendicular to the transect) (Waltz and Covington 2004). Multiple individuals of one species detected in the same location conducting the same activity were counted and the number of individuals were recorded on the datasheet. If a butterfly could not be identified by sight, the individual was captured with a sweep net, identified in the field, and released. In addition to the observation, behavior was recorded for the butterfly, including basking, flying, nectaring, etc. If a butterfly was nectaring, the plant species was identified. Butterfly field datasheets are located in Appendix H.

2.3 Habitat and Nectar Resource Sampling

2.3.1 Habitat and Butterfly Host Plan Sampling

Riparian habitat characteristics and butterfly host plant frequency and abundance were measured during July, after riparian avifaunal surveys were completed, and wetland habitats were surveyed in September. Butterfly host plant frequency and abundance was evaluated for the most common butterfly species. Habitat characteristics were evaluated within the areas established to survey avifauna and along the transects established to survey butterfly species.

Thirty randomly selected points were used to measure vegetation characteristics and species composition within the riparian habitats and 20 points were established in the wetland habitats. Since more (16) wetland areas were monitored for marsh birds, 20 points per area provided a total of 320 vegetation sampling points as compared to a total of 200 vegetation points for riparian areas. A GPS coordinate was collected at each point. Care was taken so that individual vegetation survey areas did not overlap. Riparian habitat and host plant datasheets are located in Appendix I, and wetland habitat datasheets are located in Appendix J.

Total vegetation volume (TVV) measures the number of 10 cm radius cylinders above a given point that have woody vegetation in them and has been a useful measure of habitat quality for breeding birds (Mills et al 1991). Efforts were made to encompass all vegetation types present at the sampling area by foregoing randomness to capture the overall picture. TVV was measured for herbaceous and woody vegetation. TVV was measured at each randomly selected location by extending an 8 meter pole vertically through the vegetation. All vegetation touching the pole and within 0.1 meter radius was recorded for each decimeter section (Rotenberry 1985, Mills et al. 1991). The cover class of the vegetation was also identified as herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m).

Total vegetation volume was calculated for each sampling location as h/10p; where h=the total number of hits summed over all sections at all points measured, and p= the number of points at

which vegetation volumes were measured (Mills et al. 1991). Foliar diversity (FHD) was also calculated using this method. The FHD will be calculated for meter long sections using the standard Shannon-Weiner index H'= -∑pilnpi, where pi= the proportion of total vegetation hits found in the i^{th} meter layer.

After TVV was measured, a three meter radius circle for riparian areas and two meter radius circle for wetland areas was measured around each point and species cover was estimated using a modified Daubenmire scale (Table 1). Cover was estimated for each of the following vegetation strata classes, including: herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m). This was conducted by extending a 2 or 3 meter long string from the measuring pole location and walking in a circle around the center point with the string extended. Percent cover was estimated for each species present within the plot. This was conducted by looking over the plot area and estimating how much of the area was covered by a species' growth or how much of the ground was shaded by that species.

Cover Class	Range of Cover	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Table 1: The Daubenmire Cover Scale

Other variables that were recorded in the plots included distance to water and temperature (ºC). The distance to water was measured by extending a metric tape, or if the water was visible from the point the rangefinder was used to determine distance, to the nearest surface water source. Also, photographs were taken of the typical vegetation occurring at a sampling site. At a minimum a photograph was taken within the site and at a vantage point that overlooked the site. Photographs were representative of all vegetation communities or densities existing at a site (Appendices K and L).

Host plant frequency for butterflies was assessed for all the species detected at the project area. The frequency of host plants was compared between riparian restored and control sites.

2.3.2 Nectar Resources and Blooms

Abundance of nectar plants and blooms have shown to directly affect butterfly distribution (Steffan-Dewenter and Tscharntke 1997). In order to estimate the availability of nectar plants and blooms for butterflies, 3m diameter plots were established every 10m along the transect. A random number table was used to select whether the plot was placed to the right (even) or left (odd) and the next two numbers determined how many paces to walk in that direction to establish the plot. At each plot the plants with blooming flowers were tallied by species and the number of inflorescence counted within the 3m plot. These data were collected after each butterfly survey was completed (May, June, July and September) for a total of 4 times during the survey season. The nectar resource data was compared between the two habitat types, including restored versus control riparian. Nectar resource field datasheets are located in Appendix M.

3.0 RESULTS

3.1 Presentation and Publication Activities

The results of this project discussed below were presented at the 2012 Colorado River Terrestrial and Riparian (CRTR) Meeting on January 25, 2012 in Laughlin, NV. The presentation was titled "Bird and Butterfly Recovery at the Yuma East Wetlands," and is provided in Appendix N. This is a regional meeting focusing on all biological monitoring activities and research on the Lower Colorado River hosted by the Multi-Species Conservation Program (MSCP) at the Bureau of Reclamation. A copy of the agenda for this meeting is included in Appendix O. Due to the time constraints of this project an article for publication in a professional journal was initiated but not completed.

3.2 Bird Surveys

3.2.1 Riparian Birds

A total of 72 species were detected at both restored and control riparian and wetland sites. A total of 46 species were detected in the restored riparian sites, 15 were resident birds and 31 were migrating birds. In the control riparian sites a total of 38 birds were detected, including 9 resident birds and 29 migrating birds. Birds were considered residents if there were detected in the habitat during three surveys or if there were detected nests. There were 15 species unique to the restored habitats, including one resident species, Bell's vireo, and 14 migrating species, including American goldfinch, black-headed grosbeak, Hermit thrush, hooded oriole, lesser goldfinch, Lucy's warbler, MacGillivray's warbler, Nashville warbler, Ruby-crowned kinglet, Townsend's warbler, Western tanager, Western Wood Peewee, white-crowned sparrow, and yellow warbler. Four migratory species were unique to the control sites, including: hermit warbler, house wren, Northern harrier, great-horned owl and sharp-shinned hawk. While not detected during the survey period, these species have been incidentally observed using the restored riparian sites.

<u>Riparian Bird Multi-Response Permutation Procedure (MRPP) Analysis</u>

Spatial ordination of resident riparian bird assemblages by nonmetric multidimensional scaling (NMS) show a slight distinction between restored and control riparian habitats (Figure 1). Despite the perceived spatial difference between habitats, the Multi-Response Permutation Procedure (MRPP) analysis supported the hypothesis that no difference existed between restored and control resident bird communities: T-statistic= -0.1545 p= 0.389. The A (Agreement) statistic was provided in the MRPP analysis as a descriptor of within group similarity, A=1 when all items within a group are identical. The A=0.004, which we interpret that the bird assemblages within restored units had low similarity, which is likely the cause of the lack of difference detected between restored versus control sites.

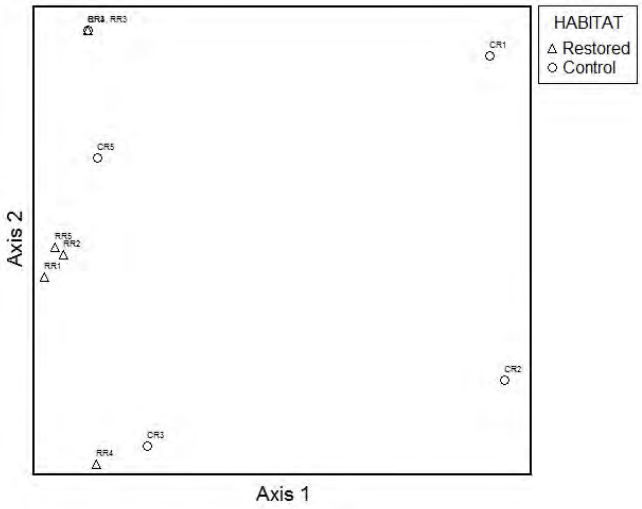

Figure 1. Non-metric multidimensional scaling ordination of resident riparian bird assemblages in restored and control habitats, n=5 per habitat, for 2011 at the Yuma East Wetlands. No significant difference was detected between restored versus control riparian sites (MRPP test, T=-0.1545, p= 0.389, A=0.004).

Spatial ordination of migrating riparian bird assemblages by nonmetric multidimensional scaling (NMS) show a distinction between restored and control riparian habitats (Figure 2). The MRPP analysis supported the hypothesis that a difference existed between restored and control migrating avian communities: T-statistic= -1.596, p= 0.043. A-statistic values less than 0.1 are common in community data. However, the value of A=0.069 is fairly low which indicates that the bird assemblages within each group had low similarity. The NMS graph shows high similarity between migrating birds at control riparian sites however migrating birds in restored riparian sites have low similarity within group and distances are more spread out (Figure 2).

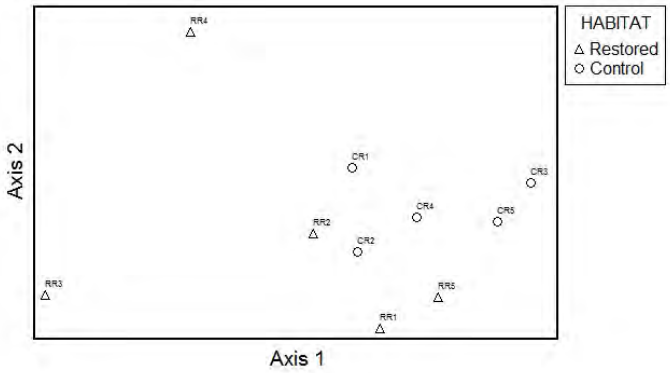

Figure 2. Non-metric multidimensional scaling ordination of migratory riparian bird assemblages in restored and control habitats, n=5 per habitat, for 2011 at the Yuma East Wetlands. A significant spacial separation from restored versus control riparian sites was observed based on avifaunal density (MRPP test, T=-1.596, p= 0.043, A=0.069).

Riparian Bird Density

The restored riparian habitats had a four-fold higher total resident bird density than the control riparian habitats, however the non-parametric Mann-Whitney test indicated that there was no significant difference in density between restored (Mean rank= 6.8, N=5) and control sites (Mean rank= 4.2, N=5) (Mann-Whitney U (MWU)= 0.175, p=0.175, Figure 3, Table 2). Migrating bird

densities were 1.3 times higher in control (Mean rank= 59.59, N=5) versus restored riparian habitats (Mean rank= 49.41, N=5) (MWU=1183, p=0.088, Figure 4). Restored riparian habitats showed to have significantly higher resident birds than control riparian habitats for a two-tailed distribution, α= 0.10 (Figure 4). The higher density of migrants detected in the control habitats was likely due to the high number of mourning doves detected in the control sites (Table 3).

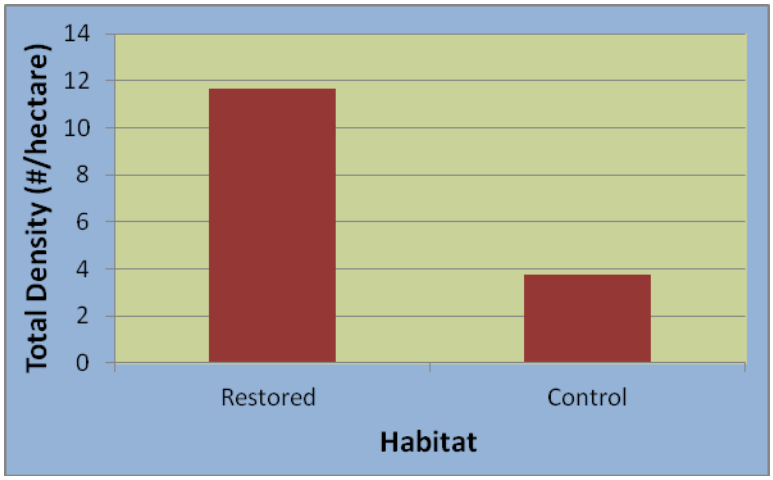

Figure 3. Riparian Birds- Total resident bird density (#/hectare) in restored versus control riparian habitats in the Yuma East Wetlands (MWU= 0.175, p=0.175) for 2011.

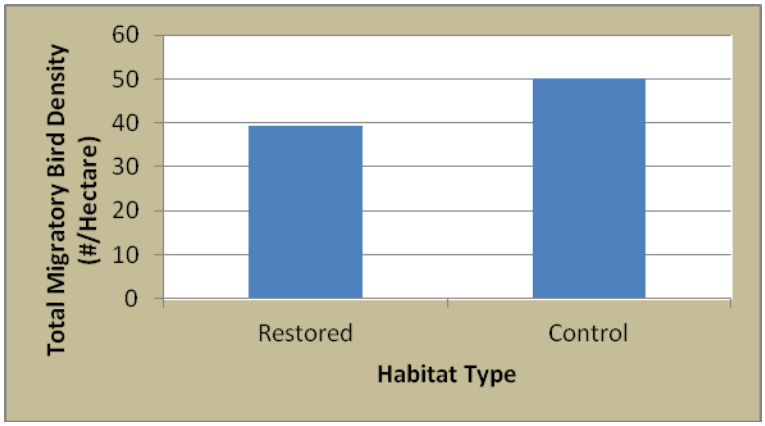

Figure 4. Riparian Birds- Total migratory bird density (#/hectare) in restored versus control riparian habitats in the Yuma East Wetlands (MWU=1183, p=0.088) for 2011.

Genus species	Common Name	Total Number Detected		Density (#/hectare)	
		Restored Riparian	Control Riparian	Restored Riparian	Control Riparian
Pipilo aberti	Abert's Towhee	10	0	1.03	0.00
Calypte anna	Anna's hummingbird	2	0	0.21	0.00
Myiarchus cinerascens	Ash throated flycatcher	0	2	0.00	0.26
Vireo bellii	Bell's vireo	1	0	0.10	0.00
Polioptila melanura	Black-tailed gnatcatcher	2	3	0.21	0.39
Geothlypis trichas	Common yellowthroat	1	0	0.10	0.00
Toxostoma crissale	Crissal thrasher	1	0	0.10	0.00
Callipepla gambelii	Gambel's quail	9	0	0.93	0.00
Melanerpes uropygialis	Gila woodpecker	3	0	0.31	0.00
Quiscalus mexicanus	Great-tailed grackle	2	0	0.21	0.00
Carpodacus mexicanus	House finch	11	2	1.14	0.26
Picoides scalaris	Ladder-backed woodpecker	2	0	0.21	0.00
Chordeiles acutipennis	Lesser nighthawk	0	2	0.00	0.26
Zenaida macroura	Mourning Dove	26	6	2.69	0.78
Mimus polyglottos	Northern mockingbird	3	0	0.31	0.00
Melospiza melodia	Song sparrow	0	1	0.00	0.13
Auriparus flaviceps	Verdin	36	6	3.72	0.78
Tyrannus verticalis	Western kingbird	0	2	0.00	0.26
Zenaida asiatica	White winged dove	4	5	0.41	0.65

Table 2. Riparian Birds- Total number of resident birds detected and density (#/hectare) in the restored and control riparian habitats in the Yuma East Wetlands.

Genus species	Common Name	Total Number Detected		Density (#/hectare)	
		Restored Riparian	Control Riparian	Restored Riparian	Control Riparian
Pipilo aberti	Abert's Towhee	11	15	1.14	1.95
Carduelis tristis	American goldfinch	1	0	0.10	0.00
Calypte anna	Anna's hummingbird	18	9	1.86	1.17
Myiarchus cinerascens	Ash throated flycatcher	4	15	0.41	1.95
Vireo bellii	Bell's vireo	1	0	0.10	0.00
Archilochus alexandri	Black-chinned hummingbird	6	5	0.62	0.65
Pheucticus melanocephalus	Black-headed grosbeak	3	0	0.31	0.00
Polioptila melanura	Black-tailed gnatcatcher	4	5	0.41	0.65
Dendroica nigrescens	Black-throated grey warbler	6	3	0.62	0.39
Passerina caerulea	Blue grosbeak	1	5	0.10	0.65
Molothrus ater	Brown-headed cowbird	20	38	2.07	4.95
Icterus bullockii	Bullock's oriole	3	1	0.31	0.13
Petrochelidon pyrrhonota	Cliff swallow	46	1	4.75	0.13
Columbina passerina	Common ground-dove	2	1	0.21	0.13

Genus species	Common Name	Total Number Detected		Density (#/hectare)	
		Restored Riparian	Control Riparian	Restored Riparian	Control Riparian
Geothlypis trichas	Common yellowthroat	1	3	0.10	0.39
Empidonax occidentalis	Cordilleran flycatcher	4	1	0.41	0.13
Toxostoma crissale	Crissal thrasher	0	1	0.00	0.13
Streptopelia decaocto	Eurasian collared-dove	0	1	0.00	0.13
Callipepla gambelii	Gambel's quail	6	3	0.62	0.39
Melanerpes uropygialis	Gila woodpecker	5	1	0.52	0.13
Bubo virginianus	Great-horned owl	0	1	0.00	0.13
Quiscalus mexicanus	Great-tailed grackle	13	0	1.34	0.00
Catharus guttatus	Hermit Thrush	4	0	0.41	0.00
Dendroica occidentalis	Hermit warbler	0	1	0.00	0.13
Icterus cucullatus	Hooded oriole	3	0	0.31	0.00
Carpodacus mexicanus	House finch	5	15	0.52	1.95
Troglodytes aedon	House wren	0	1	0.00	0.13
Picoides scalaris	Ladder-backed woodpecker	11	8	1.14	1.04
Carduelis psaltria	Lesser goldfinch	5	0	0.52	0.00
Chordeiles acutipennis	Lesser nighthawk	1	10	0.10	1.30
Oreothlypis luciae	Lucy's warbler	2	0	0.21	0.00
Oporornis tolmiei	MacGillivray's Warbler	1	0	0.10	0.00
Zenaida macroura	Mourning Dove	38	143	3.93	18.62
Vermivora ruficapilla	Nashville warbler	8	0	0.83	0.00
Circus cyaneus	Northern harrier	0	1	0.00	0.13
Mimus polyglottos	Northern mockingbird	6	0	0.62	0.00
Stelgidopteryx serripennis	Northern rough-winged swallow	4	1	0.41	0.13
Vermivora celata	Orange-crowned warbler	11	4	1.14	0.52
Agelaius phoeniceus	Red-winged blackbird	0	1	0.00	0.13
Regulus calendula	Ruby-crowned kinglet	1	0	0.10	0.00
Accipiter striatus	Sharp-shinned hawk	0	1	0.00	0.13
Melospiza melodia	Song sparrow	4	1	0.41	0.13
Dendroica townsendi	Townsend's Warbler	4	0	0.41	0.00
Auriparus flaviceps	Verdin	10	23	1.03	2.99
Vireo gilvus	Warbling Vireo	7	2	0.72	0.26
Tyrannus verticalis	Western kingbird	7	7	0.72	0.91
Piranga ludoviciana	Western tanager	6	0	0.62	0.00
Contopus sordidulus	Western wood pewee	3	0	0.31	0.00
Zonotrichia leucophrys	White-crowned sparrow	5	0	0.52	0.00
Zenaida asiatica	White-winged dove	27	34	2.79	4.43
Empidonax traillii	Willow Flycatcher	15	3	1.55	0.39
Wilsonia pusilla	Wilson's Warbler	25	11	2.58	1.43
Dendroica coronata	Yellow-rumped warbler	11	8	1.14	1.04

Genus species	Common Name	Total Number Detected		Density (#/hectare)	
		Restored Riparian	Control Riparian	Restored Riparian	Control Riparian
Dendroica petechia	Yellow Warbler	1	0	0.10	0.00

Table 3. Riparian Birds- Total number of migrating birds detected and density (#/hectare) in the restored and control riparian habitats in the Yuma East Wetlands.

Riparian Bird Richness

In the restored riparian habitats 15 species were identified as residents, while 9 species were identified as resident species in the control habitats (Table 2). Despite the greater number of species detected in the restored riparian sites no significant difference was detected in species richness between restored (Mean rank= 6.6, N=5) and control sites (Mean rank= 4.4, N=5) (MWU= 7, p=0.242, Figure 5). Migrating species richness was slightly higher in the restored riparian habitats (n=46) versus the control habitats (n=37), however no significant difference was indicated (MWU= 11, p=0.753).

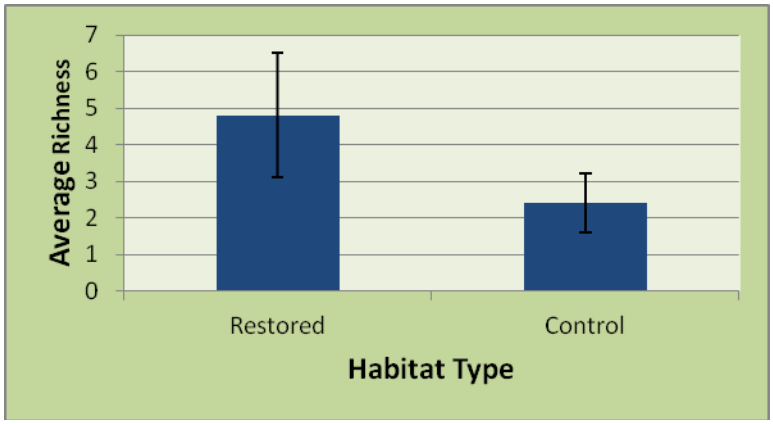

Figure 5. Riparian Birds- Average richness in restored versus control riparian sites within the Yuma East Wetlands (MWU=7, p=0.242). Error bars indicate standard error.

3.2.2 Marsh Birds

A total of 32 species were detected in wetland habitats, however 15 species were regarded as migratory, wintering or riparian breeding species. Since evidence of breeding was not confirmed at marsh habitats, residency was assumed if a bird was known to nest in wetland habitats along the Lower Colorado River. There were 14 resident species detected in restored wetland sites and 10 resident species detected in control wetland sites. Five species were unique to restored wetland habitats including: song sparrow, snowy egret, black-necked stilt, clapper rail, and killdeer. Restored wetland habitats are adjacent to more open grassland or shoreline habitat, which is preferred habitat for black-necked stilts and killdeer. The three species that were unique to the control habitats were indicative of more open water available at these sites, and included: canvasback, common moorhen and pied-billed grebe. Species that were only detected in the wetland habitats, but not included in the analyses, included: black phoebe, lesser yellowlegs, tree swallow, and spotted sandpiper.

Marsh Bird MRPP Analysis

Spatial ordination of resident marsh bird assemblages by nonmetric multidimensional scaling (NMS) show a distinction between restored and control marsh habitats (Figure 6). The MRPP analysis did not support the hypothesis that no differences existed between restored and control resident avian communities: T-statistic= -3.486 p= 0.0048. The A=0.063, which indicates that the avian assemblages within restored units had similarity. One restored site showed overlap with the control sites which may have resulted in the lower within group similarity.

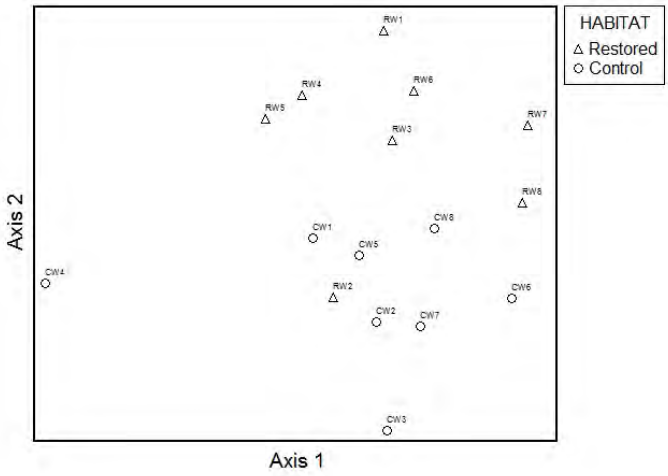

Figure 6. Non-metric multidimensional scaling ordination of resident wetland bird assemblages in restored and control habitats, n=8 per habitat, for 2011 at the Yuma East Wetlands. A significant difference was detected between restored versus control wetland sites (MRPP test, T=-3.486, p= 0.00048, A=0.063).

Marsh Bird Richness and Abundance

The non-parametric Mann-Whitney test indicated that restored wetland habitats had two-fold higher total resident bird richness than the control wetland habitats (MWU=156.5, p=0.006; Figure 7). Restored wetland sites had three-fold higher wetland bird abundance than control sites, however the Mann-Whitney test did not indicate a significant difference (MWU=210.5, p=0.108; Figure 8, Table 4). The high abundance detected in the restored sites was due to the high abundance of yellow-headed blackbirds and marsh wrens. American coots had high abundances at one site in the control wetland habitats. Area searches were not conducted in the wetland habitats because of the disruption of the habitat during breeding season, therefore evidence of residency was assumed if a bird was known to nest in wetland habitats in the area. The results of the marsh bird surveys were added to the richness and abundance data for the given results. Migrating bird richness and abundance was not calculated since the migrating birds detected were minimal and nesting or breeding was not confirmed.

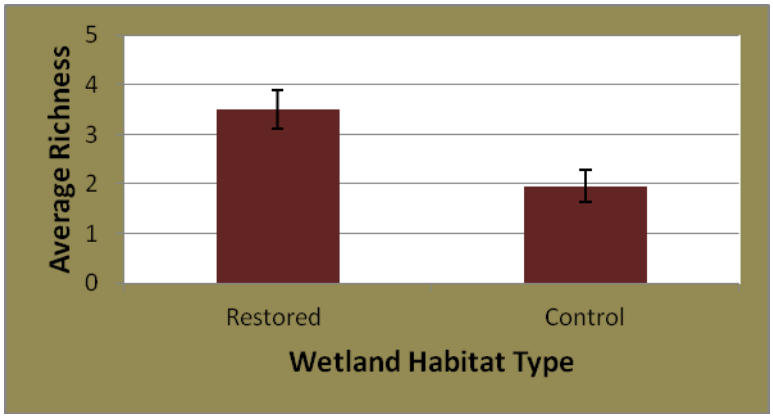

Figure 7. Marsh Birds- Average marsh bird richness in restored versus control wetland sites within the Yuma East Wetlands (MWU=156.5, p=0.006). Error bars indicate standard error.

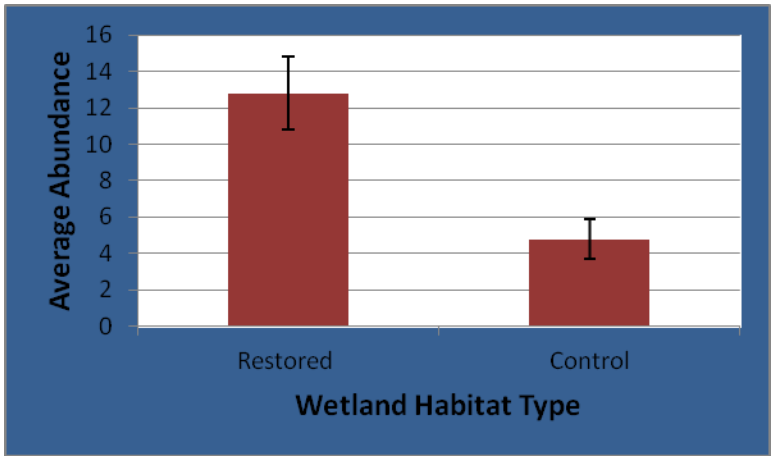

Figure 8. Marsh Birds- Average bird abundance in restored versus control wetland habitats in the Yuma East Wetlands (MWU=210.5, p=0.108). Error bars indicate standard error.

Genus species	**Common Name**	**Total Number Detected**	
		Restored Wetland	**Control Wetland**
Fulica americana	American coot	6	39
Himantopus mexicanus	Black-necked Stilt	4	0
Aythya valisineria	Canvasback	0	1
Anas cyanoptera	Cinnamon teal	12	0
Rallus longirostris	Clapper rail	6	0
Gallinula chloropus	Common Moorhen	0	6
Geothlypis trichas	Common yellowthroat	12	8
Ardea herodias	Great blue heron	1	1
Charadrius vociferus	Killdeer	10	0
Ixobrychus exilis	Least bittern	1	1

Genus species	Common Name	Total Number Detected	
		Restored Wetland	Control Wetland
Cistothorus palustris	Marsh wren	22	4
Podilymbus podiceps	Pied-billed grebe	0	2
Agelaius phoeniceus	Red-winged blackbird	1	0
Egretta thula	Snowy egret	3	0
Melospiza melodia	Song Sparrow	10	0
Porzana carolina	Sora	1	3
Xanthocephalus xanthocephalus	Yellow-headed blackbird	54	19

Table 4. Marsh Birds- Total number of resident birds detected in the restored and control wetland habitats in the Yuma East Wetlands.

3.3 Riparian Vegetation Characteristics

The Mann-Whitney non-parametric test indicated that restored riparian habitats had significantly higher vegetation species diversity (MWU=2.0, p=0.028; Figure 9) and percent herbaceous cover (MWU=2.5, p=0.019) than the control riparian sites. The restored habitats had a diversity of herbaceous, shrub and medium tree species, including mesquite (*Prosopis pubescens* and *glandulosa*), cottonwood (*Populus fremontii*), four-wing saltbush, western sea purslane, and wild heliotrope. Saltcedar (*Tamarix* sp.) and arrowweed (*Pluchea sericea*) dominated the habitats of the control riparian sites with the occasional mesquite and cottonwood. The Mann-Whitney tests showed no significant difference for other vegetation characteristics, including total vegetation volume (MWU=12, p=0.917), percent shrub cover (MWU=12, p=0.917), and percent mid-tree canopy cover (MWU=12, p=0.917) between restored and control riparian habitats.

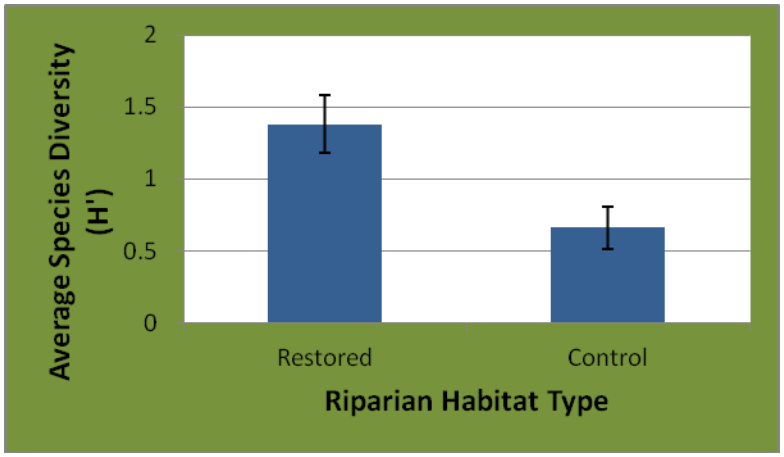

Figure 9. Habitat Characteristics- Average vegetation species diversity (H') for restored versus control riparian habitats in the Yuma East Wetlands (MWU=2, p=0.028). Error bars indicate standard error.

Native plant species diversity was three times higher in restored versus control riparian sites (MWU=1.0, p=0.016, Figure 10). Percent native herbaceous cover was 15 times higher (MWU=2.5, p=0.019) and percent native middle-canopy tree cover (MWU=0.0001, p=0.016)

was 18 times higher in restored versus control riparian sites (Figure 11). These results are not surprising considering restored sites were planted with native species and are actively managed for exotic vegetation species removal. There was no difference detected in percent native shrub cover between restored and control sites, which is likely due to the high density of arrowweed (*Pluchea sericea*) occurring in the control sites. This species is native to the Lower Colorado River, however it is weedy and often dominates open habitats within the YEW.

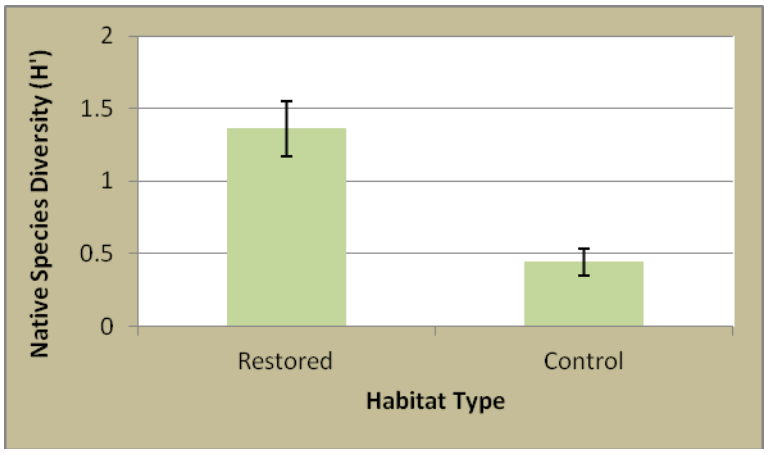

Figure 10. Native species diversity (H') in restored versus control riparian habitats in the Yuma East Wetlands during 2011. Error bars indicate standard error.

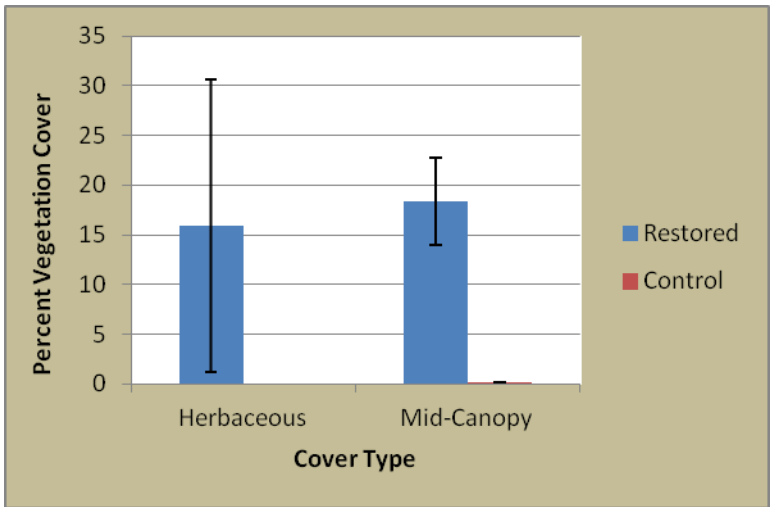

Figure 11. Average percent herbaceous and mid-canopy tree cover for restored versus control riparian habitats in the Yuma East Wetlands during 2011. Error bars indicate standard error.

3.3.1 Riparian Vegetation Characteristics and Bird Correlations

Despite the differences detected in vegetation species diversity and percent herbaceous cover in restored versus control riparian habitats, Pearson correlations did not detect any correlations with resident or migrating bird density and richness and vegetation characteristics, including: total vegetation volume, species diversity, percent herbaceous cover, percent shrub cover, and percent middle tree canopy cover. No correlations were detected among resident or migrating bird density and richness and native species diversity, percent native herbaceous cover, percent native

shrub cover or percent native middle canopy tree cover. These results indicate that vegetation characteristics did not appear to be responsible for the differences detected between resident and migratory bird density and richness in control versus restored habitats during the 2011 survey season.

3.4 Marsh Habitat Characteristics

The Mann-Whitney non-parametric test indicated that restored wetland habitats had seven times higher percent herbaceous cover (MWU=5.0, p=0.004; Figure 12) than the control wetland sites. Native herbaceous and grass cover was planted at the restored sites and is thriving adjacent to the restored wetland, including species such as: inland saltgrass (*Distichlis spicata*), yerba mansa (*Anemopsis californica*), alkali sacaton (*Sporobolus airoides*), salt heliotrope (*Heliotropium curassavicum*), and western sea purslane (*Sesuvium verrucosum*). These species were detected within the wetland vegetation surveys.

Control wetland sites had four times higher percent open water than the restored wetland sites (MWU=9.5, p=0.013; Figure 13). The majority of the control wetland habitats were comprised of smaller patches of wetland vegetation surrounded by deep open water (>1m); whereas most of the restored wetland sites had continuous wetland vegetation with shallow standing water underneath (<1m). The open water habitats at the control sites catered to bird species that prefer this habitat type and were more common in control versus restored sites, including: American coots, canvasback, common moorhen, and pied-billed grebes. The Mann-Whitney tests showed no significant difference for other vegetation characteristics, including total vegetation volume (MWU=32, p=1.00), vegetation species diversity (MWU=24, p=0.401), and percent shrub cover (MWU=20, p=0.208) between restored and control riparian habitats.

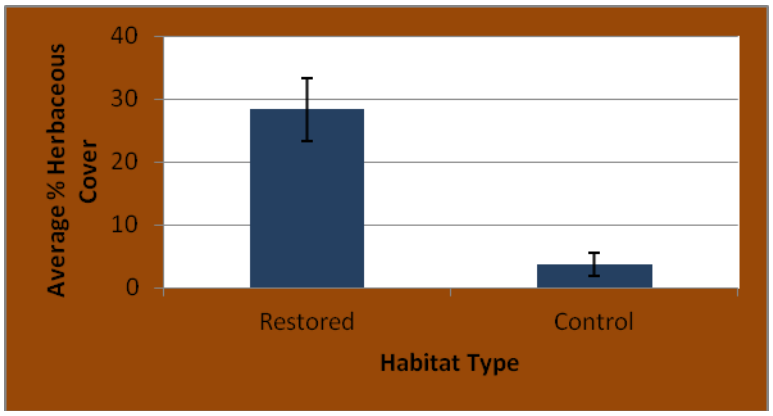

Figure 12. Average percent herbaceous cover for restored versus control wetland habitats in the Yuma East Wetlands during 2011(MWU=5.0, p=0.004). Error bars indicate standard error.

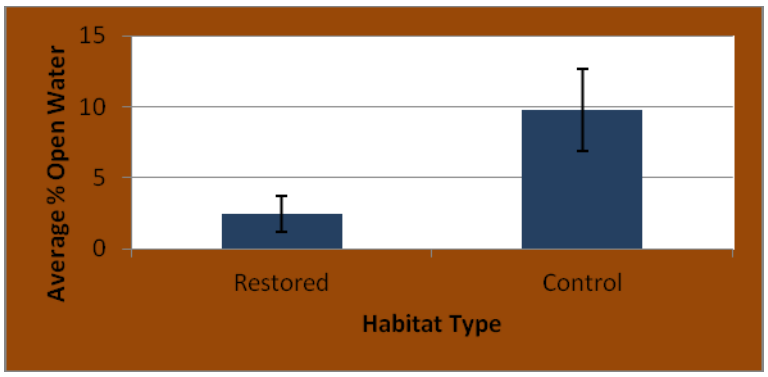

Figure 13. Average percent open water for restored versus control wetland habitats in the Yuma East Wetlands during 2011(MWU=9.5, p=0.013). Error bars indicate standard error.

Restored wetland sites had significantly higher native plant diversity (MWU=8, p=0.012, Figure 14) and percent native shrub cover (MWU=15, p=0.074, Figure 15) than the control wetland sites. Restored wetland site shrub cover was dominated by native bulrush species and cattail, while control wetland sites were dominated by invasive common reed (*Phragmites* sp.). Common reed is increasingly out-competing native cattail in the control wetland sites. Percent native herbaceous cover was significantly higher in restored versus control sites, and is discussed above.

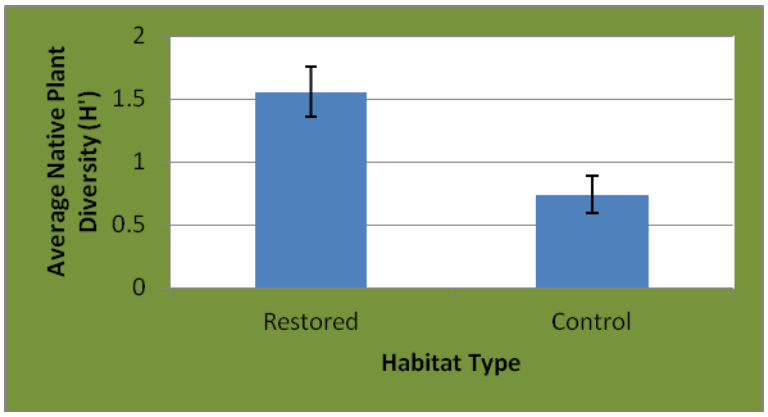

Figure 14. Average native plant diversity for restored versus control wetland habitats in the Yuma East Wetlands during 2011(MWU=8, p=0.012). Error bars indicate standard error.

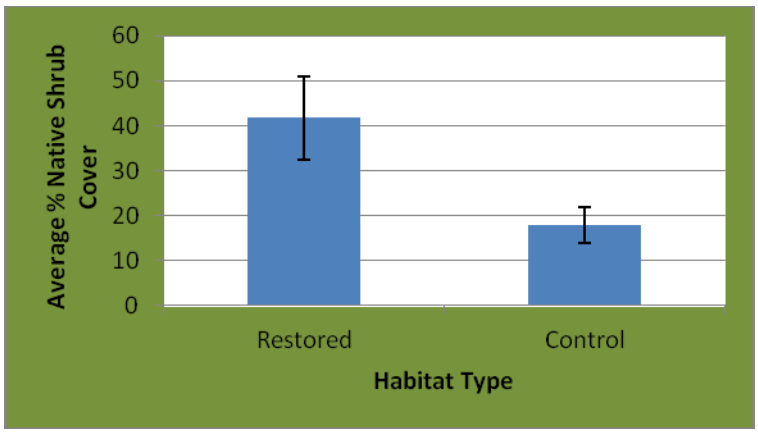

Figure 15. Average percent native shrub cover for restored versus control wetland habitats in the Yuma East Wetlands during 2011(MWU=15, p=0.074). Error bars indicate standard error.

3.4.1 Marsh Habitat Characteristics and Bird Correlations

Despite the differences detected in percent herbaceous cover and percent open water in restored versus control riparian habitats, Pearson correlations did not detect any correlations with resident wetland bird density and richness and vegetation characteristics, including: total vegetation volume, species diversity, percent herbaceous cover, and percent shrub cover. No correlations were detected among resident wetland bird density and richness and native vegetation species diversity, percent native herbaceous cover, or percent native shrub. These results indicate that vegetation characteristics did not appear to be responsible for the differences detected between resident and migratory bird density and richness in control versus restored habitats during the 2011 survey season.

3.5 Butterflies

Butterfly MRPP Analysis

Spatial ordination of butterfly assemblages by nonmetric multidimensional scaling (NMS) show a distinction between restored and control riparian habitats (Figure 16). The MRPP analysis did not support the hypothesis that no differences existed between restored and control butterfly communities: T-statistic= -2.527, p= 0.0234. The A=0.17, which is a relatively high value for ecological data and it is interpreted that the butterfly assemblages within restored and control units had similarity. The Control Riparian Points 2, 4, 5 (CR2, CR4, CR5) had the same coordinates on the NMS graph because no butterflies were detected at these sites. PC Ord cannot run an analysis with 0 data so a column for no data was created on the analysis spreadsheet and the value=1 was placed in the column if no individuals were detected. The graph indicates equal values for the three points discussed above and hence the overlap for the three values.

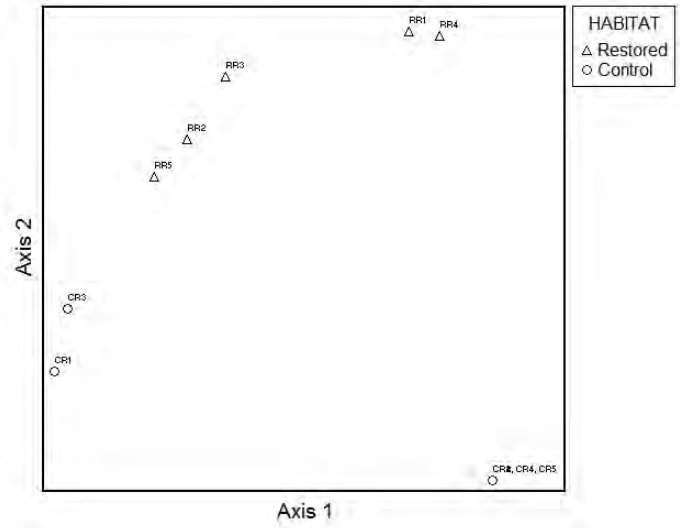

Figure 16. Non-metric multidimensional scaling ordination of butterfly assemblages in restored and control riparian habitats, n=5 per habitat, for 2011 at the Yuma East Wetlands. A significant difference was detected between restored versus control wetland sites (MRPP test, T=-2.527, p= 0.0234, A=0.17).

Butterfly Richness and Abundance

The non-parametric Mann-Whitney test showed that both butterfly richness (MWU=48, $p<0.0001$; Figure 17) and abundance (MWU=44, $p<0.0001$; Figure 18) was significantly higher in the restored versus control wetland habitats. Eight species were detected using the restored riparian habitats, while only two species were detected in the control riparian habitats. Western pygmy blue (*Brephidium exile*) was the most abundant butterfly using the restored habitats (Table 5). This species is associated with alkali soils and the host plant species includes western sea purslane and species in the Chenopodiaceae family. Western pygmy blues can breed all year round if their host plants are present and alive. The Ceraunus blue (*Hemiargus ceraunus*) was the second most abundant species occurring in the restored riparian sites. This is a common species in desert flats with a host plant of woody legumes, including mesquite (Table 5). Mesquites are common in the restored riparian habitats, providing an abundance of host plants for this species.

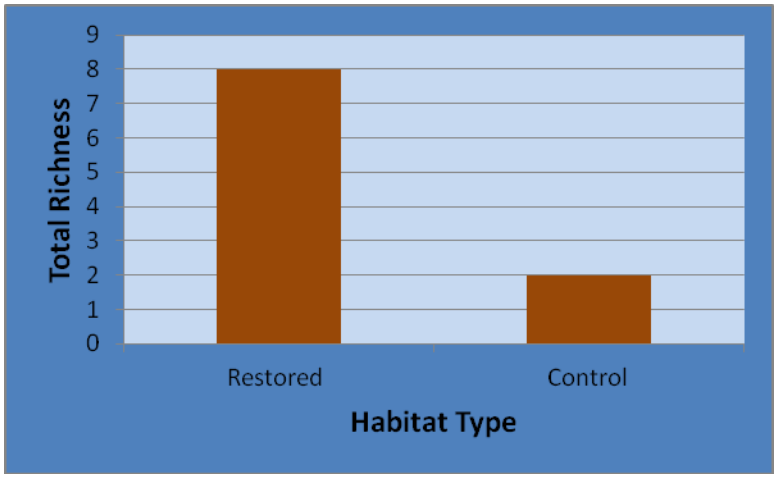

Figure 17. Butterflies- Total butterfly richness in restored versus control riparian habitats in the Yuma East Wetlands (MWU=48, $p<0.0001$). Error bars indicate standard error.

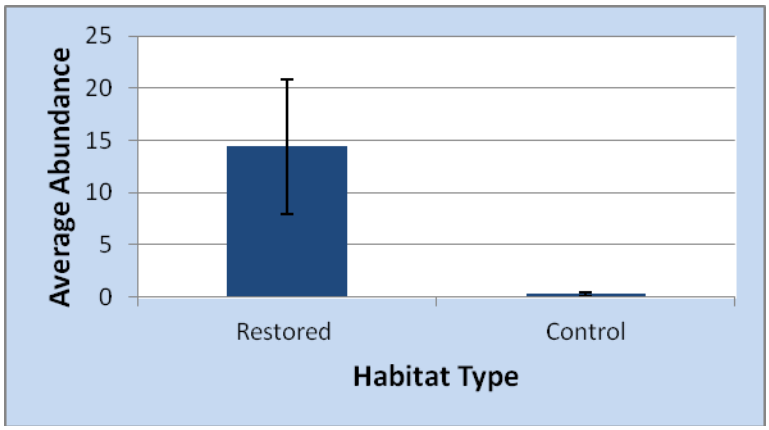

Figure 18. Butterflies- Average butterfly abundance in restored versus control riparian habitats in the Yuma East Wetlands (MWU=44, p<0.0001). Error bars indicate standard error.

Family	Genius species	Host plant family	Restored observations	Control Observations
Hesperiidae	*Pyrgus communis*	Malvaceae	1	0
Lycaenidae	*Brephidium exile*	Chenopodiaceae	245	0
Lycaenidae	*Hemiargus ceraunus*	Fabaceae	26	0
Lycaenidae	*Leptotes marina*	Fabaceae	1	0
Lycaenidae	*Strymon melinus*	Fabaceae and Malvaceae	1	0
Pieridae	*Pieris rapae*	Brassicaceae	1	1
Pieridae	*Nathalis iole*	Asteraceae (Tagetes)	5	0
Pieridae	*Colias eurytheme*	Fabaceae	6	5

Table 5. Butterflies- Total cumulative observations for butterfly species detected in the restored and control riparian sites in the Yuma East Wetlands.

3.6 Host Plant Abundance

The non-parametric Mann-Whitney test showed that there was no significant difference between the host plant family abundance (MWU=10.5, p=0.673, Figure 19) or frequency (MWU=10.5, p=0.673) in the restored versus control riparian sites. The only host plant families detected during the vegetation surveys in both restored and control sites, included Asteraceae and Fabaceae. The primary species detected in the Asteraceae family included *Pluchea sericea* and *Baccharis* spp. and in the Fabaceae family included *Prosopis pubescens* and *P. glandulosa.* Species in the Malvaceae and Chenopodiaceae families, including *Sphaeralcea ambigua*, *Atriplex canescens*, and *Atriplex lentiformis*, exist in restored upland areas adjacent to the monitored restored riparian habitats. *A. lentiformis* (0.12% cover) and *A. canescens* (0.27% cover) were detected in the 3m cover estimates within the restored riparian habitats. Butterflies that rely on these families for host plants likely utilized the plants located adjacent to the riparian habitats during larval stages and migrated to the flowering plants within the monitored habitats to nectar as butterflies. Butterfly species that rely on host plants in the Brassicaceae family likely

migrated from agricultural fields where plants in that family abound. *Strymon melinus* relies on herbaceous species found in the Fabaceae and Malvaceae families for its host plant. The most abundant crop adjacent to the restored habitats of the YEW is alfalfa (*Medicago sativa*, Fabaceae), which was likely the host plant source for this species.

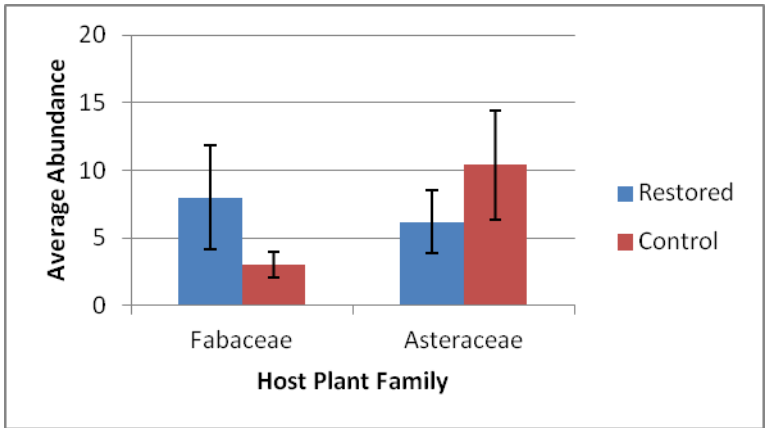

Figure 19. Average abundance of host plant families detected in restored versus control riparian sites during 2011 in the Yuma East Wetlands. Error bars indicate standard error.

3.6.1 Nectar Resource Richness and Abundance

The non-parametric test indicated that there was no seasonal significant difference for flowering species richness (χ^2=3.378, p=0.337) or inflorescence abundance (χ^2=3.849, p=0.278). However, there was a seasonal difference detected in flowering species abundance (plant) (χ^2=10.496, p=0.015, Figure 20). May had four times higher flowering species abundance than the next highest month (June). Since no seasonal difference was detected in inflorescence abundance, it is assumed that the same amount of flowering species resources were available to butterflies during the sampling period.

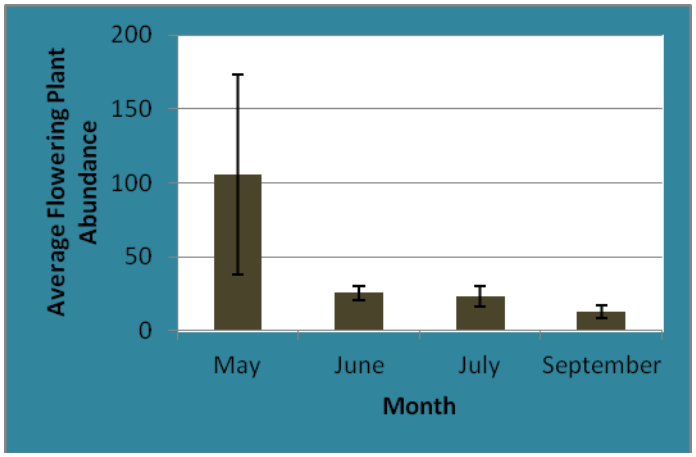

Figure 20. Average flowering species abundance for the four sampling periods, May, June, July and September during the 2011 survey season at the Yuma East Wetlands (χ^2=10.496, p=0.015). Error bars indicate standard error.

Mann-Whitney non-parametric tests indicated that there was four times more total flowering species richness in the restored versus control sites (MWU=49.5, p<0.0001, Figure 21).

However, no significant difference was indicated in flowering species abundance (Mann-Whitney U= 145, p=0.137, Table 6) and inflorescence abundance (Mann-Whitney U=194, p=0.871) in the restored versus control sites. Native species planted in the restored riparian sites, including Mexican evening primrose (*Oenothera mexicana*), wild heliotrope (*Heliotropium curassavicum*), and sandbar willow (*Salix exigua*) had the highest abundances of blooming individuals. However, many recruiting native and invasive weeds were also detected blooming in the restored areas, including lamb's quarter (*Chenopodium album*), horseweed (*Conyza Canadensis*), white sweet clover (*Melilotus alba*), yellow sweet clover (*Melilotus officinalis*), saltmarsh fleabane (*Pluchea odorata*), silverleaf nightshade (*Solanum elaeagnifolium*), common sowthistle (*Sonchus oleraceus*), arrowweed (*Pluchea sericea*), and saltcedar (*Tamarix* spp.). Arrowweed (*Pluchea sericea*) and saltcedar (*Tamarix* spp.) were the two most abundant flowering individuals in the control riparian habitat (Table 6).

The primary vegetation species that butterflies were observed using for nectar sources in the restored riparian habitats, included: western sea purslane (*Sesuvium verrucosum*), screwbean mesquite (*Prosopis pubescens*), wild heliotrope (*Heliotropium curassavicum*), and four-wing saltbush (*Atriplex canescens*). Only one individual butterfly was observed nectaring on saltcedar in control riparian sites, the other individuals detected in the control sites were observed flying.

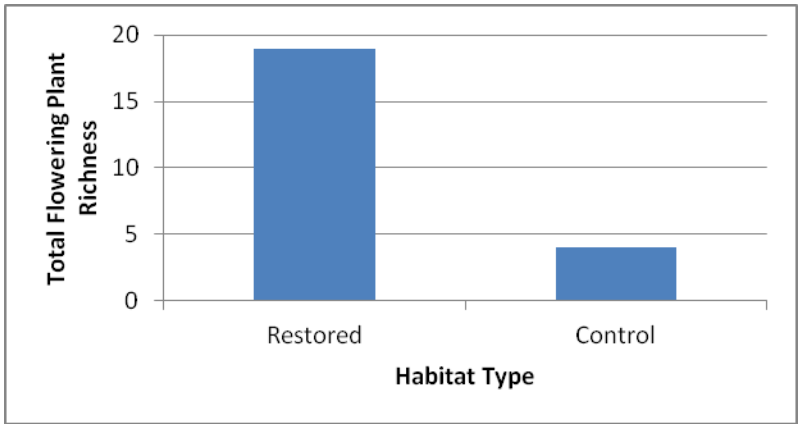

Figure 21. Total flowering plant richness during 2011 at restored versus control riparian sites at the Yuma East Wetlands (MWU=49.5, p<0.0001).

		Restored Riparian		Control Riparian	
		Total Blooming Plant Abundance	Total Inflorescence	Total Blooming Plant Abundance	Total Inflorescence
Herbs	*Baileya multiradiata*	3	3		
	Chenopodium album	6	2		
	Conyza canadensis	12	78		
	Heliotropium curassavicum	160	1399		
	Melilotus alba	56	464		
	Melilotus officinalis	19	144		
	Oenothera mexicana	690	1529		
	Pluchea odorata	5	120		
	Sesuvium verrucosum	34	2710		
	Solanum elaeagnifolium	1	2		
	Sonchus oleraceus	12	105		
	Viola sp.	1	7		
Shrubs	*Baccharis spp.*	14	569		
	Pluchea sericea	82	552	190	1972
	Salix exigua	101	226		
	Tamarix spp.	11	834	178	13636
Trees	*Prosopis glandulosa*	35	336	1	10
	Propsopis pubescens	44	403	5	39
	Salix gooddingii	1	10		
Total		1287	9493	374	15657

Table 6. Total blooming individuals and inflorescences for restored versus control riparian sites during 2011 at the Yuma East Wetlands.

3.6.2 Habitat Characteristics and Butterfly Correlations

Butterfly species richness was correlated with flowering species richness, flowering species abundance, vegetation species diversity, and percent herbaceous vegetation (Table 7). This indicates that butterfly species prefer a diversity of flowering herbaceous species for nectaring. The habitat characteristics discussed under riparian birds indicated that restored riparian habitats had higher vegetation species diversity and % herbaceous vegetation than control riparian sites. Butterfly species abundance was not correlated with any environmental variables.

Variable	Pearson Correlation	p-value
Flowering species richness	0.611	0.061
Flowering species abundance	0.639	0.047
Vegetation species diversity	0.581	0.078
% herbaceous vegetation	0.621	0.055

Table 7. Pearson Correlation values for butterfly richness versus nectar plant richness, nectar plant abundance, vegetation species diversity, and % herbaceous vegetation for riparian sites at the YEW during 2011.

4.0 DISCUSSION

This project successfully accomplished the objectives proposed in the 2010 Research Application, including 1) To compare richness and abundance of avifauna and butterflies in restored versus exotic vegetation-dominated (control) riparian and wetland habitats; 2) Compare restored versus control riparian and wetland habitat quality, nesting habitat and nectar availability; 3) Involve the local community in surveying techniques for interpretation and educational purposes; and 4) Develop performance standards to optimize wetland and riparian restoration efforts on the lower Colorado River. The results above and the discussion below provide a detailed evaluation of the comparisons detailed in Objectives 1 and 2. During the project, the Ecology class from Northern Arizona University Yuma campus visited the Yuma East Wetlands for a bird watching tour through the restored riparian and wetland areas. This project was discussed and many of the resident and migrating birds were detected by the students during the tour. This project provided additional information for the "Bird Checklist of the Yuma East Wetlands" that is distributed to Yuma residents and visitors alike furthering the local community involvement in this project. Finally, this project helped develop performance standards to optimize wetland and riparian restoration efforts on the lower Colorado River (Objective 4) by identifying the preferred habitat characteristics of resident and migratory birds and butterflies. By identifying these habitat preferences, the riparian and wetland restoration techniques will be adjusted to benefit these species.

The results indicate that both bird and butterfly species prefer restored riparian and wetland habitats to control riparian and wetland habitats. A higher richness and density of resident birds was detected using the restored riparian habitats than the control riparian habitats, however the results were not statistically significant. Verdins and mourning doves had the highest densities of resident birds in the restored habitats. Verdins are present year-round in the desert southwest. While they are common in the Yuma area, they are threatened due to habitat destruction and may be extirpated in areas around San Diego (Webster 1999). Mourning doves are colony nesters and are often detected in large numbers. They create flimsy nests on the ground, tree branches, and sometimes in human infrastructure. Mourning doves were detected in high densities (n= 143) in control habitats, and are considered residents however were not used in the analyses. It is difficult to determine how many mourning doves are nesting in a colony and how many pairs exist. This species is typically tallied in area search surveys, but not used in analyses. Brown-headed cowbirds were detected in high numbers in both the restored and the control habitats. These species may have been residents in these habitats; however, because they do not construct

their own nests, their nesting status was undeterminable in the surveyed area. This species lays eggs in occupied nests of other species and pushes out the other eggs. The adults of the other species feed the hatched cowbirds, which are often much larger and are able to out-compete the other nestlings.

No correlations were detected between resident or migratory riparian bird richness or abundance and environmental characteristics, which was likely due to the small sample size. Riparian habitats in the YEW are still maturing so minimal sampling areas were available to conduct area searches. However, these surveys should be conducted in the future, adding additional sites as the habitats mature. In order to increase the sample size and compare results on a more regional scale, these data can be compared with the bird surveys conducted by the Multi-Species Conservation Program (MSCP) of the U.S. Bureau of Reclamation in riparian habitats along the Lower Colorado River. It was expected that due to the visual differences in habitat quality and higher vegetation species diversity in the restored versus control habitats, that the differences detected in resident and migratory riparian and wetland bird richness and abundance would have been attributed to the vegetation characteristics.

Bird richness and abundance was also higher in restored wetland habitats as compared to the control wetland habitats. Yellow-headed blackbirds and marsh wrens had the highest abundance in the restored wetland habitats. Yellow-headed blackbirds are also colony nesters so it is not surprising to see high abundances. This species is very aggressive and often displaces smaller nesting species such as the red-winged blackbird, which may be why red-winged blackbirds were not detected in high abundances. American coots were the most abundant species detected in the control wetland habitats, which was likely due to the presence of open water habitat. Three of the eight control wetland points are located in a large backwater channel. The restored habitats have some open water habitat, however it is primarily dominated by vegetated wetlands. Endangered Yuma clapper rails were detected in higher abundances in the restored habitats than in previous years, which indicates that the habitat quality was high and sufficient in size. Six clapper rails were detected during the final breeding survey (May), and none were detected during the previous surveys. This species is secretive and may have been present during the March and April surveys, but not responding to the play-black calls. Therefore, presence during the final survey indicates that Yuma clapper rails were nesting in the restored wetlands during the 2011 breeding season.

Percent herbaceous cover, percent native plant diversity, and percent native shrub cover was significantly higher in restored versus control marsh habitats, whereas percent open water was significantly higher in control habitats. Native herbaceous and grass cover was planted at the restored sites and is thriving adjacent to the restored wetland, including species such as: inland saltgrass (*Distichlis spicata*), yerba mansa (*Anemopsis californica*), alkali sacaton (*Sporobolus airoides*), salt heliotrope (*Heliotropium curassavicum*), and western sea purslane (*Sesuvium verrucosum*). The majority of the control wetland habitats were comprised of smaller patches of wetland vegetation surrounded by deep open water (>1m); whereas most of the restored wetland sites had continuous wetland vegetation with shallow standing water underneath (<1m). The open water habitats at the control sites catered to bird species that prefer this habitat type and were more common in control versus restored sites, including: American coots, canvasback, common moorhen, and pied-billed grebes. Despite the difference detected in marsh bird species

richness and abundance and marsh habitat characteristics, no correlations between these factors were detected. In the future, more environmental factors should be monitored including depth of water and habitat patch size.

Butterfly species richness and abundance was significantly higher in the restored riparian habitats as compared to the control riparian habitats. This may be due to the diversity of flowering plants available in the restored sites as compared to the control sites. Control sites were dominated by saltcedar and arrowweed, which have shown to provide a nectar source for some species. Only one individual was detected using saltcedar as a nectar resource during the surveys. The most abundant butterflies occurring in the restoration sites included the Western pygmy blue and the Ceraunus blue. The Western pygmy blue is associated with alkali soils and the host plant species includes western sea purslane and species in the Chenopodiaceae family. The Ceraunus blue is a common species in desert flats and its host plants include woody legumes, including mesquite. Despite the overall lack of difference between host plants in restored versus control sites, mesquites and species in the Chenopodiaceae family (four-wing saltbush and quailbush) were more dominant in the restored riparian sites.

Butterfly species richness was correlated with flowering plant richness and abundance, vegetation species diversity and percent herbaceous cover. This indicates that in order to attract a variety of butterfly species, a diversity of flowering herbaceous vegetation should be planted at restoration sites. The primary vegetation species that butterflies were observed using for nectar sources in the restored riparian habitats, included: western sea purslane, screwbean mesquite, wild heliotrope, and four-wing saltbush.

Many of the butterflies detected during the survey are agricultural pests and are residents to the area. In order to detect more species, butterflies should be sampled in future monitoring efforts. Invertebrate sampling occurred during a separate study conducted during 2007-2008, where a greater diversity of butterfly species were detected utilizing the habitat at the Yuma East and West Wetlands than were detected during the 2011 survey season. The paucity of butterfly species detected during the 2011 survey season may have been due to cooler than average winter and spring temperatures experienced during the 2010- 2011 winter season. These cooler temperatures resulted in plants flowering later in the season. Butterfly species that rely on earlier plant blooms or that were collected earlier during the 2007-2008 sampling period may not have utilized the YEW during this survey period due to the lack of flowers.

4.1 Recommendations for Future Projects

In order to determine patterns and detect more species utilizing restored habitats, a continuation of this study is recommended. Surveys should be conducted every five years for a two year period. This will allow for comparisons of butterfly and bird community changes as restored habitats mature. The MSCP is funding additional riparian obligate bird area search surveys in the YEW for 2012 and beyond. The data collected from this study can be compared to these future efforts.

This study indicates the importance of native herbaceous and grass understory species to riparian restored sites for butterfly and bird species. Understory vegetation species provide an important nectar resource and cover for butterflies and other invertebrates, which provide an important

food source for many bird species. Understory plants can also discourage recolonizing invasive species. Riparian restoration projects should consider planting a diversity of native understory species to support habitat complexity, food resources, and the diverse food web for all wildlife species.

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Appendix A. Yuma East Wetlands Sampling Site Location Map

Fred Phillips Consulting, LLC
401 SOUTH LEROUX STREET
FLAGSTAFF, AZ
86001
TEL 928 773 1530
FAX 928 774 4166
Ecosystem Restoration Land Planning

DESIGNED FOR:
Yuma Crossing National Heritage Area
180 West First Street,
Suite E Yuma,AZ 85364

YEW Monitoring Locations

11-172 WPF Research Proposal Avifauna and Butterfly (Lepidoptera) Recovery in Restored Wetland adn Riparian Habitats

YUMA, ARIZONA

Aerial Map

Scale: 1" = 1000'

0' 250' 500' 1000' 1500' NORTH

DATE: APRIL 4, 2011
JOB NO.: 11005-2
DRAWN BY: KI
DESIGNED BY: HT
CHECKED BY:

APPENDIX A

Appendix B. Yuma West Wetlands Sampling Site Location Map

Fred Phillips Consulting, LLC
401 SOUTH LEROUX STREET
FLAGSTAFF, AZ
86001
TEL 928 773 1530
FAX 928 774 4166
Ecosystem Restoration Land Planning

DESIGNED FOR:
Yuma Crossing National Heritage Area
180 West First Street,
Suite E Yuma,AZ 85364

YWW Monitoring Locations

11-172 WPF Research Proposal Avifauna and Butterfly (Lepidoptera) Recovery in Restored Wetland adn Riparian Habitats

YUMA, ARIZONA

Aerial Map

Scale: 1" = 500'

0' 125' 250' 500' 750'

NORTH

DATE: APRIL 4, 2011
JOB NO.: 11005-2
DRAWN BY: KI
DESIGNED BY: HT
CHECKED BY:

FIGURE 2

Appendix C. Bird Area Search Datasheets

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 1 **Surveyor(s):** L. Diest, R. Wayne

		Date 1: 4/1/11	Date 2: 4/18/11	Date 3: 5/2/11	Date 4: 5/22/11	Date 5: 6/1/11	Date 6: 6/13/11	In/Out
Time	Start :	0730	0627	0626	0571	0727	0605	
	End:	0956	0829	0814	0646	0838	0706	
Temp	Start:	73.1	69	60.0	69.0	70	69.6	
	End:	85.2	77.8	70.0	66.7	82	73.0	
% Cloud Cover:		0 - 0	5 - 5	0 - 0	10% - 20%	85 - 40	0 - 0	
Wind (mph):		0 - 1.3	5.2 - 4.0	2.5 - 0.0	0 - 0	0 - 0	0 - 0	
Species Full Name	**Terr./Ind. Code**							
VERDIN	VERD - 1	NY	P - Near Nest		U - SI			IN
Abert's Towhee	ABTO - 1	P	P	P	P		P	IN
Black tailed Gnatcatcher	BTGN - 1	U - Silent	P	P				IN
Verdin	VERD - 2	U - Silent						"
Mourning Dove	MODO - 1	U - Silent						"
Mourning Dove	MODO - 2	U - Silent						"
Verdin	VERD - 3	U - SI						"
Mourning Dove	MODO - 3	P	P					"
Ash Throated Flycatcher	ATFL - 1	U -						"
Song Sparrow	SOSP - 1	P						"

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#)juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RB1 **Surveyor(s):**

Species Name	Terr./Ind. Code	Date 1: 4/1/11	Date 2: 4/18/2011	Date 3: 5/2/11	Date 4: 5/22/11	Date 5: 6/1/11	Date 6: 6/13/11	In/Out
								Out
Rough winged swallow	RWSW-1	2-U - possible pair						IN
Verdin	VERD-4	ON	U	P, NY		ON		"
Bullock's Oriole	BUOR-1	M - Silent						IN
Abert's Towhee	ABTO-2		U					"
Verdin	VERD-5	U-SI		NE	P. ON			
Brown Headed Cowbird	BHCO-1		M-SI					"
Brown Headed Cowbird	BHCO-2		P					"
Ladder Backed Woodpecker	LBWO-1		U-SI		P.			"
Verdin	VERD-6		U					"
Verdin	VERD-7		U ? VERD 5					
Verdin	VERD-8		U					Out
House Finch	HOFI-1		3 M 1 F					Out
Verdin	VERD-9		P, ON ? VERD-3	P				IN
Black Tailed Gnatcatcher	BTGN-2		P may be same pair as BTGN-1					"
Cliff Swallow	CLSW-1			10 individuals flyover using plot				
Abert's Towhee	ABTO-3			M - SI				

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR1 **Surveyor(s):** L. Piest, K. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/1/11	Date 2: 4/18/11	Date 3: 5/2/11	Date 4: 5/22/11	Date 5: 6/1/11	Date 6: 6/13/11	In/Out
White Winged Dove	WWDO-1			U-SI				IN
Northern Mockingbird	NOMO-1			M-SI				Out
Brown Headed Cowbird	BHCO-3			M-SI				Out
Lesser Goldfinch	LEGO-1			M-SI				IN
Verdin	VERD-10			(1 ad?) P, 2 dep. young	P(1) dep young			"
Mourning Dove	MODO-4			U-				"
Western Kingbird	WEKI-1				U			"
Ladder Backed Woodpecker	LBWO-2				U			"
White Winged Dove	WWDO-2				U			Out
Anna's Hummingbird	ANHU-1				2 ANHU's - P?			IN
Brown Headed Cowbird	BHCO-2				P.			"
White Winged Dove	WWDO-3				U			"
Ash Throated Flycatcher	ATFL-2				P			"
Mourning Dove	MODO-5				P(1) dep young			"
Mourning Dove	MODO-6				U			Out
Brown Headed Cowbird	BHCO-4					M-SI		IN

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RB1 **Surveyor(s):** L. Piest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/1/11	Date 2: 4/18/11	Date 3: 5/2/11	Date 4: 5/22/11	Date 5: 6/1/11	Date 6: 6/13/11	In/Out
Northern Mockingbird	NOMO-2					JUV.-U		IN
White Winged Dove	WWDO-4					P		"
Anna's Hummingbird	ANHU-2					U		"
Lesser Goldfinch	LEGO-2					U-SI		"
Abert's Towhee	ABTO-4					U		"
Rough Winged Swallow	RWSW-2					P		"
Verdin	VERD-11					P, NE		"
Morning Dove	MODO-7					P		"
Great Tailed Grackle	GTGR-1					U-SI		OUT
Great Tailed Grackle	GTGR-2						M-C	IN
Great Tailed Grackle	GTGR-3						P(1)	"
Great Tailed Grackle	GTGR-4						3-U	OUT
Gila Woodpecker	GIWO-1						U-C	OUT
White Winged Dove	WWDO-4						M-SI	IN

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR2 **Surveyor(s):** L. Piest, R. Wayne

		Date 1: 4/1/11	Date 2: 4/19/11	Date 3: 5/3/11	Date 4: 5/23/11	Date 5: 6/3/11	Date 6: 6/14/11	In/Out
Time	Start :	0912	0707	0538	0524	0512	0601	
	End:	1007	0838	0704	0632	0623	0652	
Temp	Start:	86.6	62.4	40.0	67.5	57	68.2	
	End:	91.5	80.7	59.0	66.0	59	70.0	
% Cloud Cover:		0 - 0	25 - 15	0 - 0	0 - 0	0 - 0	0 - 0	
Wind (mph):		1 - 3	0.0 - 0.8	0 - 0	2.0 - 1.5	0 - 0	0 - 1	
Species Full Name	**Terr./Ind. Code**							
Black-tailed Gnatcatcher	BTGN - 1	M - Silent						IN
Verdin	VERD - 1	P	P, NE, P					"
Mourning Dove	MODO - 1	ON						"
Verdin	VERD - 2	M-SI; Likely F-SI pair						"
Anna's Hummingbird	ANHU - 1	M-SI	M					"
Abert's Towhee	ABTO - 1	P		P, (1) dep young		P	P	"
Verdin	VERD - 3	NE - Possible nest of VERD 2	U - SI.	P		P		"
Mourning Dove	MODO - 2		P		U			IN
Anna's Hummingbird	ANHU - 2		F					IN
Hooded Oriole	HOOR - 1		M					Out
Brown-Headed Cowbird	BHCO - 1		2 BHCO's - Possible pair		P			IN

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#)juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: BR2 **Surveyor(s):** L. Piest, B. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/1/11	Date 2: 4/19/11	Date 3: 5/3/11	Date 4: 5/23/11	Date 5: 6/3/11	Date 6: 6/14/11	In/Out
Mourning Dove	MODO-3		U					IN
Mourning Dove	MODO-4		U					"
Brown Headed Cowbird	BHCO-2		M-SI					"
Bells Vireo	BEVI-1			M-SI	M-SI	M-SI	M-SI	Out
Annas Hummingbird	ANHU-3			F	F			"
Brown Headed Cowbird	BHCO-3			P				"
Black Chinned Hummingbird	BCHU-1			M	-			"
Mourning Dove	MODO-5			ON				"
Annas Hummingbird	ANHU-4			M-SI				"
Mourning Dove	MDOO-6			U				"
Ash Throated Flycatcher	ATFL-1			U				Out
Blue Grosbeak	BLGR-1			M-SI		M-SI		Out
Mourning Dove	MDOO-7			U				In
Ash Throated Flycatcher	ATFL-2				U			Out
Ladder Backed Woodpecker	LBWO-1				U-SI			IN

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR 2 **Surveyor(s):** L. Priest, B. Wayne & Choate

Species Name	Terr./Ind. Code	Date 1: 4/1/11	Date 2: 4/19/11	Date 3: 5/3/11	Date 4: 5/23/11	Date 5: 6/3/11	Date 6: 6/14/11	In/Out
White Winged Dove	WWDO-1				U			IN
Morning Dove	MODO-8				U			"
Verdin	VERD-4				P, NY - feeding		P possibly, 1 adult, 1 def. juvs	IN
Brown Headed Cowbird	BHCO-4					M-SI		"
Morning Dove	MODO-9					U		"
White Winged Dove	WWDO-2					U		"
Morning Dove	MODO-10					ON	ON, NE	"
Great Tailed Grackle	GTGR-1					U		"
Morning Dove	MODO-11					NE		"
Brown Headed Cowbird	BHCO-5					F-C		"
Verdin	VERD-5					P, NE	P(1)	"
Morning Dove	MODO-12					U		"
White Winged Dove	WWDO-3					U		"
Morning Dove	MODO-13					U		"
Brown Headed Cowbird	BHCO-6						P	Out
Verdin	VERD-6						U-C	IN

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR2 **Surveyor(s):** L.Priest, R.Wayne, C.Choate

Species Name	Terr./Ind. Code	Date 1: 4/1/11	Date 2: 4/14/11	Date 3: 5/3/11	Date 4: 5/23/11	Date 5: 6/3/11	Date 6: 6/14/11	In/Out
Great Tailed Grackle	GTGR-2						P	IN
Great Tailed Grackle	GTGR-3						F	IN
Ladder Backed Woodpecker	LBWO-2						U-C	"
Morning Dove	MODO-14						U	"

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR3 Lin Chase **Surveyor(s):** L. Priest, R. Wayne, C. Choate

		Date 1: 2-Apr-11	Date 2: 4/19/11	Date 3: 5/3/11	Date 4: 5/23/11	Date 5: 6/2/11	Date 6: 6/14/11	In/Out
Time	Start:	0616	0545	0707	0636	0634	0503	
	End:	0719	0702	0810	0738	0745	0557	
Temp	Start:	70-77.5	65.5	59	66.0	59	68.4	
	End:	77.5	65.3	72	72.5	74	68.2	
% Cloud Cover:		30-30	35-20	0-0	0-0	0-0	0-0	
Wind (mph):		0-0	0.5-0.0	2.0-2.0	1.5-2.4	0-3	0-0	
Species Full Name	**Terr./Ind. Code**							
Abert's Towhee	ABTO-1	M-SI		U				IN
Abert's Towhee	ABTO-2		P-SI					Out
Ash Throated Fly Catcher	ATFL-1		U					IN
Common Yellowthroat	COYE-1			M-SI	M-SI	M-SI	M-SI	
Abert's Towhee	ABTO-3			P				
Mourning Dove	MODO-1			U				
Verdin	VERD-1				(No adults obs) JUV-SI			out
Blue Grosbeak	BLGR-1				M			Out
Hummingbird	HUMM-1				2-possible pair			IN
Anna's Hummingbird	ANHU-1					F or JUV.?		IN

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#)juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR 3 **Surveyor(s):** L. Piest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/2/11	Date 2: 4/19/11	Date 3: 5/3/11	Date 4: 5/23/11	Date 5: 6/2/11	Date 6: 6/14/11	In/Out
White Winged Dove	WWDO-1					ON		
White Winged Dove	WWDO-2					U		
Morning Dove	MDOO-2					ON	ON	IN
Morning Dove	MDOO-3					ON	NE	"
Annas Hummingbird	ANHU-2						F	"
Annas Hummingbird	ANHU-3						P	"
Morning Dove	MDOO-4						U	"
White Winged Dove	WWDO-3						M-SI	"
White Winged Dove	WWDO-4						M-SI	"

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR4 Lin Chase **Surveyor(s):** L. Priest, R. Wayne, C. Choate

		Date 1: 4/1/11	Date 2: 4/18/11	Date 3: 5/2/11	Date 4: 5/22/11	Date 5: 6/1/11	Date 6: 6/13/11	In/Out
Time	Start:	0610	0545	0527	0822	0627	0506	
	End:	0717	0619	0619	0914	0721	0554	
Temp	Start:	67.0	70.1	60.2	78.3	60	71	
	End:	70.6	68.6	56.5	82.5	70	64.5	
% Cloud Cover:		0	5 - 5	0 - 0	2 - 2	45 - 85	0 - 0	
Wind (mph):		0	1.6 - 2.0	1.0 - 0.0	0 - 2.0	0 - 0	0 - 0	
Species Full Name	**Terr./Ind. Code**							
Verdin	VERD - 1	U	P	U, NY				IN
Morning Dove	MODO - 1		2 MODO's, possible pair					IN
Hummingbird (Unknown)	HUMM - 1		U					Out
Mourning Dove	MODO - 2			U				IN
Mourning Dove	MODO - 3			P				"
Mourning Dove	MODO - 4			U				"
Gambels Quail	GAQU - 1			P				"
Ash Throated Flycatcher	ATFL - 1				U			"
Abert's Towhee	ABTO - 1					U		"
Verdin	VERD - 2						U-SI	

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#)juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 5 **Surveyor(s):** B. Wayne, L. Rost, C. Choate

		Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
Time	Start :	0740	0605	0530	0525	0640	0600	
	End:	1005	0829	0746	0749	0827	0721	
Temp	Start:	78.6	69	64	64	67	76.0	
	End:	89.4	75	72	73.5	80	81.0	
% Cloud Cover:		35 - 25	0 - 0	5 - 3	0 - 0	0 - 0	0 - 0	
Wind (mph):		4.0 - 3.0	2.2 - 7.0	1 - 0	0 - 3.0	1 - 5	2.3 - 2.0	
Species Full Name	**Terr./Ind. Code**							
Bullocks Oriole	BUOR - 1	m						IN
Verdin	VERD - 1	P	P	NY	P(1)			"
Verdin	VERD - 2	P			U			"
Black chinned Hummingbird	BCHU - 1	U						"
Annas Hummingbird	ANHU - 1	2 - U P?			.			"
Song Sparrow	SOSP - 1	U						"
Common Ground Dove	COGD - 1	m						"
Northern Mockingbird	NOMO - 1	P	P	2 U's	U	P	P	"
Gambel's Quail	GAQU - 1	3 - U						"
White Winged Dove	WWDO - 1	M - SI						"

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#) juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR 5 **Surveyor(s):** L. Piest, B. Wayne

Species Name	Terr./Ind. Code	Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
								IN
Ladder Backed Woodpecker	LBWO-1	2-u						"
Gila Woodpecker	GIWO-1	1-u						"
Anna's Hummingbird	ANHU-2	NE, F	NY, F	NY, F	U(1)	Juv.	2-Juv.	"
Mourning Dove	MODO-1	P						"
Verdin	VERD-3	P		1 Dep. Young				"
Anna's Hummingbird	ANHU-3	m-SI						"
Ladder Backed Woodpecker	LBWO-2	u						"
Crissal Thrasher	CRTH-1	u	u	u				"
Common Grand Dove	COGD-2	m						"
House Finch	HOFI-1	m-SI		P				"
Mourning Dove	MODO-2	u						"
Mourning Dove	MODO-3	u	u					"
Northern Mockingbird	NOMO-2	m-SI	m-SI	m-SI	m-SI	m-SI	m-SI	"
Gila Woodpecker	GIWO-2	U						"
Warbling Vireo	WAVI-1	2-u						"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet

(Continuation Page)

Plot Name: RR5 **Surveyor(s):** L. Piest, R. Wayne

Species Name	Terr./Ind. Code	Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
House Finch	HOFI-2	P		NY				IN
Abert's Towhee	ABTO-1	U	U					Out
Anna's Hummingbird	ANHU-4	F						Out
Hooded Oriole	HOOR-1	P						IN
House Finch	HOFI-3		m-5I					
Western Kingbird	WEKI-1		4 Indiv's	4 Indiv's (2 P?)				Out
Abert's Towhee	ABTO-2		P			NY		IN
Black Headed Grosbeak	BHGB-1		m					"
Abert's Towhee	ABTO-3		P		P			
Verdin	VERD-4		P, ON	NY				IN
Anna's Hummingbird	ANHU-5		U	U				"
Ash Throated Flycatcher	ATFL-1		U					Out
Brown Headed Cowbird	BHCO-1		3M, 1F					Out
Verdin	VERD-5		U					IN
House Finch	HOFI-4		m					Out
Bullock's Oriole	BUOR-2		m					Out

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR 5 Surveyor(s): L. Piest, C. Choate, R. Wayne

Species Name	Terr./Ind. Code	Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
White Winged Dove	WWDO-2		U					In
Brown Headed Cowbird	BHCO-2		M-SI					Out
Western Kingbird	WEKI-2		U					Out
Lucy's Warbler	LUWA-1		ZF*					Out
Verdin	VERD-6		U	NY	P			In
Mourning Dove	MODO-4		U					"
Ladder Backed Woodpecker	LBWO-3		U-SI					"
Black Headed Grosbeak	BHGB-2		3 M*					"
Common Yellowthroat	COYE-1		U-SI					"
Abert's Towhee	ABTO-4		P		P		P	"
Hummingbird	Humm.		U					"
Verdin	VERD-7		U					"
Gila Woodpecker	GIWO-3		U-SI					"
Northern Mockingbird	NOMO-3		U-SI					"
Gila Woodpecker	GIWO-4		U-SI					"
Brown Headed Cowbird	BHCO-3		M					"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR 5 **Surveyor(s):** L. Piest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
Gila Woodpecker	GIWO-5			M				"
Ladder Backed Woodpecker	LBWO-4			F				Out
White Winged Dove	WWDO-3			P				Out
Bell's Vireo	BEVI-1			M-SI				Out
Black Tailed Gnatcatcher	BTGN-1			U				IN
Ladder Backed Woodpecker	LBWO-5			U	P	P		"
White Winged Dove	WWDO-4			P				"
Gila Woodpecker	GIWO-3			P, ON same as GIWO3				Out
Verdin	VERD-8			NY				IN
Verdin	VERD-9			F, M, NY			P(I)	"
Anna's Hummingbird	ANHU-6			2 Juv's				"
Abert's Towhee	ABTO-5			P				"
Mourning Dove	MODO-5			U				"
Morning Dove	MODO-6			P		ON		"
Morning Dove	MODO-7			U				"
Morning Dove	MODO-8			U				"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR 5 **Surveyor(s):** L. Priest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
Morning Dove	MODO-9			NE				IN
Morning Dove	MODO-10			U				Out
Morning Dove	MODO-11			U				
Brown Headed Cowbird	BHCO-4				M-SI			IN
Gambel's Quail	GAQU-2				U			"
Northern Mockingbird	NOMO-4				2M's. 1U			"
Great Tailed Grackle	GTGR-1				2M-1F			"
House Finch	HOFI-5				P(1)			"
Gambel's Quail	GAQU-3				P(7)			"
House Finch	HOFI-6				P(5)			Out
Brown Headed Cowbird	BHCO-5				F-C			IN
Black Chinned Hummingbird	BCHU-2				M			"
White Winged Dove	WWDO-5				U			"
Gila Woodpecker	GIWO-6				U-C			Out
White Winged Dove	WWDO-6				U			IN
White Winged Dove	WWDO-7				U			"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR5 Surveyor(s): L. Piest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
White Winged Dove	WWDO-8				P			IN
Brown Headed Cowbird	BHCO-6				F-C			"
Black Chinned Hummingbird	BCHU-3				M			"
White Winged Dove	WWDO-9				C-U			"
Morning Dove	MODO-12				U(1)			"
Morning Dove	MODO-13				NE			"
Morning Dove	MODO-14				U			"
Morning Dove	MODO-15				NV			"
Abert's Towhee	ABTO-6				P			Out
Abert's Towhee	ABTO-7				U			Out
Abert's Towhee	ABTO-8				P.			Out
Abert's Towhee	ABTO-9				M			IN
Verdin	VERD-10				U			Out
Blue Grosbeak	BLGR-1				.	M-SI		IN
Crissal Thrasher	CRTH-2					U		Out
White Winged Dove	WWDO-10					U		IN

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR5 **Surveyor(s):** L.Dist, R.Wayne, C.Choate

Species Name	Terr./Ind. Code	Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
Gila Woodpecker	GIWO-7					P		IN
White Winged Dove	WWDO-11					U		"
Black Chinned Hummingbird	BCHU-4					M		Out
Black Chinned Hummingbird	BCHU-5					U		IN
Anna's Hummingbird	ANHU-7					F		
Abert's Towhee	ABTO-10					U		Out
Morning Dove	MODO-16					U		IN
Ladder Backed Woodpecker	LBWO-6						U	IN
Great Tailed Grackle	GTGR-2						U	"
White Winged Dove	WWDO-12						U	"
Great Tailed Grackle	GTGR-3						U	"
House Finch	HOFI-7						F	"
White Winged Dove	WWDO-13						U	"
Brown Headed Cowbird	BHCO-7						M-SE	
Northern Mockingbird	NOMO-5						U	
Brown Headed Cowbird	BHCO-8						P	

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: RR 5 **Surveyor(s):** L. Diest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
Great Tailed Grackle	GTGR-4						F	IN
White Winged Dove	WWDO-14						U	"
White Winged Dove	WWDO-15						ON	"
Morning Dove	MODO-17						U	"
Morning Dove	MODO-18						U	"
Morning Dove	MODO-19						U	"
Morning Dove	MODO-20						U	"
Morning Dove	MODO-21						P	"
Morning Dove	MODO-22						U	"
Morning Dove	MODO-23						P	"
Abert's Towhee	ABTO-11						U	"

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 1 Lin Chase **Surveyor(s):** L. Priest, B. Wayne, C. Choate

		Date 1: 4/7/11	Date 2: 4/21/11	Date 3: 5/3/2011	Date 4: 5/24/11	Date 5: 6/2/11	Date 6: 6/15/11	In/Out
Time	Start :	0738	0846	0822	0754	0512	0651	
	End:	0905	0928	0920	0843	0624	0738	
Temp	Start:	67.2	76.0	77.0	75.0	60	75.0	
	End:	73.3	78.0	85.0	72.0	61	82.2	
% Cloud Cover:		0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	
Wind (mph):		1 - 2	7.0 - 6.8	2.0 - 1	1.0 - 1.0	1 - 0	0 - 0	
Species Full Name	**Terr./Ind. Code**							
Common Yellowthroat	COYE - 1	U-SI, I note chirp						In
Song Sparrow	SOSP - 1	U-SI						In
Mourning Dove	MODO - 1	ON - P						out
Common Yellowthroat	COYE - 2	M - visual						IN
Brownheaded Cowbird	BHCO - 1	F - SI						"
Mourning Dove	MODO - 2	U - visual						"
Black chinned Hummingbird	BCHU - 1	M - visual						"
Common Yellowthroat	COYE - 3		U - SI					Out
Song Sparrow	SOSP - 2		U - SI					Out
Yellow Headed Blackbird	YHBL - 1		U - SI					Out

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#)juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 1 **Surveyor(s):** L. Piest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/7/11	Date 2: 4/21/11	Date 3: 5/3/11	Date 4: 5/24/11	Date 5: 6/2/11	Date 6: 6/15/11	In/Out
								IN
Brown Headed Cowbird	BHCO-2			M-SI				"
Verdin	VERD-1			P				"
White Winged Dove	WWDO-1			M-SI				"
Mourning Dove	MODO-3			P				"
Ladder Backed Woodpecker	LBWO-1			U-SI				Out
Mourning Dove	MODO-4				U-(1) JUV.			Out
Song Sparrow	SOSP-3	SOSP 1, 2+3 possibly same.			U-SI		M-SI	IN
White Winged Dove	WWDO-2				U-SI			"
White winged Dove	WWDO-3				U			"
Brown Headed Cowbird	BHCO-3				M-SI			"
VERDIN	VERD-2					P(1) JUV.		"
Brown Headed Cowbird	BHCO-4					P		"
Mourning Dove	MODO-4					M-SI		"
Ash Throated Flycatcher	ATFL-1					U-SI		"
Blue Grosbeak	BLGR-1					M-SI		
White Winged Dove	WWDO-4					M-SI		"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR1 **Surveyor(s):** L. Priest R. Wayne, Chhoate

Species Name	Terr./Ind. Code	Date 1: 4/7/11	Date 2: 4/21/11	Date 3: 5/3/11	Date 4: 5/24/11	Date 5: 6/2/11	Date 6: 6/15/11	In/Out
White Winged Dove	WWDV-5					M-SI		IN
Song Sparrow	SOSP-4					M-SI		Out
White Winged Dove	WWDV-6						M-SI	IN
Brown Headed Cowbird	BHCO-5						F-C	IN
Black Chinned Hummingbird	BCHU-2						F	IN

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CRZ Lin Chase **Surveyor(s):** L Priest, R. Wayne, C. Choate

		Date 1: 4/3/2011	Date 2: 4/18/11	Date 3: 5/2/11	Date 4: 5/22/11	Date 5: 6/1/11	Date 6: 6/13/11	In/Out
Time	Start :	0601	0939	0826	0657	0508	0725	
	End:	0717	0920	0922	0745	0620	0813	
Temp	Start:	64.0	79.0	72.0	66.2	62	76	
	End:	63.4	78.4	81.0	70.6	60	82.5	
% Cloud Cover:		20 - 35	5 - 3	0 - 0	2 - 2	100 - 95	0 - 0	
Wind (mph):		4 - 4	6.4 - 5.5	2 - 1	0 - 1	0 - 0	0 - 3.0	
Species Full Name	**Terr./Ind. Code**							
Ash Throated Flycatcher	ATFL-1	P	U-SI					IN
Abert's Towhee	ABTO-1	U-SI	U-SI					"
Mourning Dove	MODO-1	M-SI						"
Common Yellowthroat	COYE-1	U-SI						? border
Gambel's Quail -	GAQU-1		U					IN
Gambel's Quail -	GAQU-2		U					Out
Abert's Towhee	ABTO-2		U-SI					Out
Hummingbird (Anna's)	HUMM-1		U					IN
Western Tanager	WETA-1		M					Out

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#) juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 2 **Surveyor(s):** L.Piest, R. Wayne, C.Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/11	Date 2: 4/18/11	Date 3: 5/2/11	Date 4: 5/22/11	Date 5: 6/1/11	Date 6: 6/13/11	In/Out
Gila Woodpecker	GIWO-1		U-SI					Out
Mourning Dove	MODO-2			U-Silent				In
Abert's Towhee	ABTO-3			P		P-SI		"
Ladder Backed Woodpecker	LBWO-1			U	U			"
White Winged Dove	WWDO-1			M-SI				"
Black Chinned Hummingbird	BCHU-1			U				Out
Verdin	VERD-1			P				IN
White Winged Dove	WWDO-2				U			"
Blue Grosbeak	BLGR-1				M SI			"
Verdin	VERD-2				U			"
Black chinned Hummingbird	BCHU-2				M			"
Hummingbird	Humm-2				U			"
White Winged Dove	WWDO-3				U			"
Great Horned Owl	GHOW-1				U		U	"
Brown Headed Cowbird	BHCO-1				F-SI			Out
White Winged Dove	WWDO-4					U-SI		IN

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 2 **Surveyor(s):** L. Priest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/2011	Date 2: 4/16/2011	Date 3: 5/2/11	Date 4: 5/22/11	Date 5: 6/1/11	Date 6: 6/13/11	In/Out
Verdin	VERD-3					P		IN
Brown Headed Cowbird	BHCO-2					P		"
Verdin	VERD-4					U-SI		"
Annas Hummingbird	ANHU-1					JUV-U		"
Brown Headed Cowbird	BHCO-3					2:M		"
Gambel's Quail	GAQU-3					M-SI		Out
Crissal Thasher	CRTH-1					U-SI		Out
Abert's Towhee	ABTO-4					P-SI		Out
Annas Hummingbird	ANHU-2					P		IN
Mourning Dove	MODO-3					P		"
Mourning Dove	MODO-4					U		"
Brown Headed Cowbird	BHCO-4						M-SI	IN
Annas Hummingbird	ANHU-3						J	IN
Abert's Towhee	ABTO-5						P	Out
Verdin	VERD-5						P(1)	Out
Song Sparrow	SOSP-1						M-SI	IN

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 3 **Surveyor(s):** L. Piest, R. Wayne, C. Choate

		Date 1: 4/3/2011	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/1	Date 6: 6/15/11	In/Out
Time	Start :	0849	0923	0534	0626	0740	0600	
	End:	0953	0931	0654	0746	0845	0646	
Temp	Start:	71.4	82.0	57.0	57.0	70	66.0	
	End:	75.5	79.0	63.0	75.0	77	74.8	
% Cloud Cover:		15 - 5	25 - 25	25 - 35	0 - 0	0 - 0	0 - 0	
Wind (mph):		3.0 - 3.0	1.8 - 3.0	0 - 4	0 - 1.0	0 - 1	0 - 0	
Species Full Name	**Terr./Ind. Code**							
Verdin	VERD - 1	U - SI						Out
Morning Dove	MODO - 1	U						Out
Morning Dove	MODO - 2	U						IN
Morning Dove	MODO - 3	U						"
Verdin	VERD - 2	NE	ON - likely NY	P - 1 Juvenile				"
Morning Dove	MODO - 4	P						"
Ash Throated Flycatcher	ATFL - 1	U - SI						"
Morning Dove	MODO - 5	U						"
Ladder Backed Woodpecker	LBWO - 1	U - SI						IN
Common Yellowthroat	COYE - 1	U - SI (male chip)						Out

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#)juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 3 **Surveyor(s):** L. Piest, B. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/11	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
								IN
Black Tailed Gnatcatcher	BTGN-1	U-SI	U-silent	M-SI				"/out
Mourning Dove	MODO-6	U						"
Mourning Dove	MODO-7	U						"
House Finch	HOFI-1	M-SI						"
Western Kingbird	WEKI-1	M-SI	U close to obs on previous visit	P-ON	NB	P	P, ON/	"
Brown Headed Cowbird	BHCO-1		F					"
Mourning Dove	MODO-8		U	U				"
Mourning Dove	MODO-9		P					"
Western Kingbird	WEKI-2		U					"
Brown Headed Cowbird	BHCO-2		F-SI					Out
Mourning Dove	MODO-10		U					IN
Mourning Dove	MODO-11		U					"
Gambel's Quail	GAQU-1		M					"
Gila Woodpecker	GIWO-1		M					"
Black Tailed Gnatcatcher	BTGN-2		U-SI					Out
Morning Dove	MODO-12		U					IN

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 3 **Surveyor(s):** L. Priest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/11	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
Blue Grosbeak	BLGB-1			M-SI				Out
Abert's Towhee	ABTO-1			P				In
Ladder Backed Woodpecker	LBWO-2			P				"
Lesser Night Hawk	LENI-1			2, possible pair				"
Brown Headed Cowbird	BHCO-3			P				"
Ash Throated Flycatcher	ATFL-2			P				"
Ash Throated Flycatcher	ATFL-3			U-SI				"
White Winged Dove	WWDO-1			U				"
White Winged Dove	WWDO-2			3 WWDO's				"
Mourning Dove	MODO-13			P				"
Mourning Dove	MODO-14			P				Out
Lesser Nighthawk	LENI-1				U			Out
Blue Grosbeak	BLGR-2				M-SI			Out
House Finch	HOFI-2				5-HOFI			IN
								"
Black Tailed Gnatcatcher	BTGN-3				P(1) JUV.			"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 3 **Surveyor(s):** L. Piest, R Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/11	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
Brown Headed Cowbird	BHCO-4				M			IN
Black Tailed Gnatcatcher	BTGN-4				M			"
Verdin	VERD-3				P(1) juv.			"
Lesser Nighthawk	LENI-2				NE	NE	(E, 1Y) NE, 4Y	"
Brown Headed Cowbird	BHCO-5				M			"
Brown Headed Cowbird	BHCO-6				M			"
Western Kingbird	WEKI-1	* Same as WEKI-1, 6/6/11 *			NB			"
Lesser Nighthawk	LENI-3				P			"
White Winged Dove	WWDO-3				U			Out
Mourning Dove	MODO-15				U			IN
White Winged Dove	WWDO-4				U			Out
Mourning Dove	MODO-16				U			IN
Mourning Dove	MODO-17				U			"
Mourning Dove	MODO-18				2 MODO - U			Out
Ash Throated Flycatcher	ATFL-4					V-SI		IN
Ladder Backed Woodpecker	LBWO-3					F		

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 3 **Surveyor(s):** L. Priest R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/11	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
House Finch	HOFI - 3					P		
Blue Grosbeak	BLGR - 3					U - C		
Morning Dove	MODO - 19					2 MODO		
White Winged Dove	WWDO - 5					U		
White Winged Dove	WWDO - 6					M - SI		
Mourning Dove	MODO - 20					3P		
Morning Dove	MODO - 21					U		
Eurasian Colored Dove	ECDO - 1					U		
Lesser Nighthawk	LENI - 4						U	IN
Red Winged Blackbird	RWBL - 1						M	"
Blue Grosbeak	BLGR - 3						M	"
White Winged Dove	WWDO - 7						U	"
Morning Dove	MODO - 22						U	"
"	MODO - 23						3 - U	"
"	MODO - 24						6 - U	"
"	MODO - 25						4 - U	"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 3 **Surveyor(s):** Lin Priest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/11	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
Morning Dove	MDOO-26						U	
"	MDOO-27						M-U	
"	MDOO-28						F-U	
"	MDOO-29						P	
"	MDOO-30						F-U	

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 4 **Surveyor(s):** L Pest, R. Wayne, C. Choate

		Date 1: 4/3/2011	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
Time	Start:	0735	0710	0704	0519	0634	0500	
	End:	0839	0818	0811	0622	0734	0556	
Temp	Start:	65.1	65	63.0	57.0	60	67.7	
	End:	71.4	78	72.0	55.3	70	66.0	
% Cloud Cover:		30 - 15	75 - 25	35 - 25	0 - 0	0 - 0	0 - 0	
Wind (mph):		1.2 - 3.0	1 - 0.8	4 - 1	0 - 0	0 - 0	0 - 0	
Species Full Name	**Terr./Ind. Code**							
Ladder Backed Woodpecker	LBWO-1	U		U				
Bullock's Oriole	BUOR-1	M						Out
Ash Throated Flycatcher	ATFL-1	U						In
Black Tailed Gnatcatcher	BTGN-1	U-SI						"
Verdin	VERD-1	P						"
Verdin	VERD-2	U-SI						"
Mourning Dove	MODO-1	P						Out
Ash Throated Fly Catcher	ATFL-2	U		U		NY	U-C	Out
Black Chinned Hummingbird	BCHU-1	M-DD						Out
Verdin	VERD-3		U-SI					In
Verdin	VERD-4		U-SI					"

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#)juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 4 **Surveyor(s):** L. Piest R. Wayne, C Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/11	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
Mourning Dove	MODO-2		P					Out
Mourning Dove	MODO-3		U	U				IN
Mourning Dove	MODO-4		2 - likely Pair					Out
Abert's Towhee	ABTO-1		P					Out
Ash Throated Flycatcher	ATFL-3		U					Out
Verdin	VERD-5		U-SI					Out
Mourning Dove	MODO-5		P					In
House Finch	HOFI-1		U-SI					Out
Mourning Dove	MODO-6		U					Out
Black Tailed Gnatcatcher	BTGN-2		U-SI					Out
Mourning Dove	MODO-7		P					Out
Brown Headed Cowbird	BHCO-1		4-M, 2-F → On same tree	5 M, 2 F close to prev. obs.?				In
Black Tailed Gnatcatcher	BTGN-3		U					In
White Winged Dove	WWDO-1			U				"
Black Chinned Hummingbird	BCHU-2			U				"
Gambel's Quail	GAQU-1			M				"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CB 4 **Surveyor(s):** L. Piest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/2011	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
Verdin	VERD-6			U				IN
White Winged Dove	WWDO-2			U				"
Abert's Towhee	ABTO-2			U				"
White Winged Dove	WWDO-3			U				"
White Winged Dove	WWDO-4			U				"
Mourning Dove	MODO-8			U				"
Mourning Dove	MODO-9			U				Out
Brown Headed Cowbird	BHCO-2				M-SI			Out
Mourning Dove	MODO-10				U			Out
Brown Headed Cowbird	BHCO-3				M			IN
Mourning Dove	MODO-11				U			"
Lesser Nighthawk	LENI-1				U			Out
White Winged Dove	WWDO-5				U			Out
Mourning Dove	MODO-12				2 MODO-U			Out
White winged Dove	WWDO-6				U			IN
Anna's Hummingbird	ANHU-1				F			"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 4 Surveyor(s): L.Pest, R.Wayne, C.Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/11	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
Brown Headed Cowbird	BHCO-4				F-SI			IN
White Winged Dove	WWDO-7				U			"
Brown Headed Cowbird	BHCO-5				M-SI			"
Morning Dove	MODO-13				P			"
Morning Dove	MODO-14					ON		"
Black Tailed Gnatcatcher	BTGN-3					U-SI		"
Morning Dove	MODO-15					NE		"
Morning Dove	MODO-16					U		Out
Verdin	VERD-7					U-SI		Out
Morning Dove	MODO-17					F		IN
White Winged Dove	WWDO-8					1M,1F		"
Morning Dove	MODO-18					P		"
Western Kingbird	WEKI-1					U		Out
Annas Hummingbird	ANHU-2					P		Out
Abets Towhee	ABTO-3					U		Out
Morning Dove	MODO-19						U	IN

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 4 **Surveyor(s):** L. Piest, B. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/3/11	Date 2: 4/20/11	Date 3: 5/4/11	Date 4: 5/24/11	Date 5: 6/3/11	Date 6: 6/15/11	In/Out
Abert's Towhee	ABTO-4						V-C	Out
Morning Dove	MODO-20						P	Out
Western Kingbird	WEKI-2						V	IN
Morning Dove	MODO-21						2-5	"
Morning Dove	MODO-22						4-V	"
White Winged Dove	WWDO-9						V	IN
White Winged Dove	WWDO-10						V	Out
Morning Dove	MODO-23						V	Out

2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR5 **Surveyor(s):** L Rich, R Wayne, C Choate

		Date 1: 4/7/11	Date 2: 4/20/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
Time	Start:	0605	0546	0802	0810	0511	0505	
	End:	0727	0648	0902	0907	0621	0547	
Temp	Start:	63.5	60	76	78.5	54	68.0	
	End:	64.8	61.0	84	85.0	60	70.5	
% Cloud Cover:		0-0	10-25	5-2	0-0	0-0	0-0	
Wind (mph):		2-2	0-0	0-0	1-0	0.0	0-0	
Species Full Name	**Terr./Ind. Code**							
Verdin	VERD-1	M-SI						
House Finch	HOFI-1	P	M-SI					Out
Ladder Backed Woodpecker	LBWO-1	F-visual						In
House Finch	HOFI-2	F-SI						"
Crissal Thrasher	CRTH-1	M-SI						"
Ash Throated Flycatcher	ATFL-1	U-SI	U-SI					Out
Abert's Towhee	ABTO-1	P						In
Ash Throated Flycatcher	ATFL-2	P						In
Sharp Shinned Hawk	SSHA-1	U-visual						In
Brown Headed Cowbird	BHCO-1		F-SI					Out
Abert's Towhee	ABTO-2		P					Out

Pair (P): mated pair observed

Nest building (NB): (evidence: nest material carried or construction observed)

Eggs (NE): Nest being incubated or nest with eggs found

Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls, young seen)

Singing (SI)/Silent: individual bird songing or observed silent

Fledging (FY): dependent young present outside the nest

Distracting display (DD): territorial displays

Nest guarding (NG): repeated calling and bird does not leave

Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure

Male (M) or Female (F): observed calling, other sex not detected

Unknown sex (U): sexual dimorphism is not apparent

Group #: Record # of individuals in group for migrants

Dependent young (#DY) or Juvenile (#)juv: number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)

In/Out: Is nest or center of territory inside or outside area search plot

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CB5 Surveyor(s): L. Piest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/7/11	Date 2: 4/20/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
Mourning Dove	MODO-1		U					Out
Mourning Dove	MODO-2		U					In
Brown Headed Cowbird	BHCO-2		P					"
Brown Headed Cowbird	BHCO-3		U					"
Mourning Dove	MODO-3		U					"
Mourning Dove	MODO-4		P					Out
Western Kingbird	WEKI-1		P	P				Out
Western Kingbird	WEKI-2		P					Out
Ladder Backed Woodpecker	LBWO-2		U					In
Ash Throated Flycatcher	ATFL-3		U					Out
Lesser Nighthawk	LENI-1			U	P			Out
Common Ground Dove	COGD-1			U				Out
Brown Headed Cowbird	BHCO-4			P				In
Mourning Dove	MODO-5			P				"
White Winged Dove	WHDO-1			P	P			"
White Winged Dove	WHDO-2			U				"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 5 **Surveyor(s):** L. Piest R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/7/11	Date 2: 4/20/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
White Winged Dove	WWDO-3			M-SI				"
White Winged Dove	WWDO-4			M-SI				"
Lesser Nighthawk	LENI-2			U	U			"
Verdin	VERD-2			U				Out
Verdin	VERD-3			P, NY				IN
Mourning Dove	MODO-6		U					Out
Mourning Dove	MODO-7				U			In
White Winged Dove	WWDO-5				U			"
Mourning Dove	MODO-8				U			"
Mourning Dove	MODO-9				U			"
Mourning Dove	MODO-10				U			"
White Winged Dove	WWDO-6				U			"
Verdin	VERD-4				U-SI			"
White Winged Dove	WWDO-6				U			"
White Winged Dove	WWDO-7				U			"
Brown Headed Cowbird	BHCO-5				F-SI			"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR5 **Surveyor(s):** L.Piest, R.Wayne, C.Choate

Species Name	Terr./Ind. Code	Date 1: 4/7/11	Date 2: 4/20/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
								Out
Morning Dove	MODO-11				V			out
Morning Dove	MODO-17				V			out
Morning Dove	MODO-13				V			IN
Morning Dove	MODO-14				4-V			V
"	MODO-15				V			"
"	MODO-16				V			Out
"	MODO-17				V			Out
Verdin	VERD-5				V			IN
Brown Headed Cowbird	BHCO-6				M			IN
White Winged Dove	WWDO-8				V			"
House Finch	HOFI-3				.	7-HOFI-V		Out
White Winged Dove	WWDO-8					NY		Out
Morning Dove	MODO-18					V		IN
Morning Dove	MODO-19					P		"
White Winged Dove	WWDO-9					V		"
White Winged Dove	WWDO-10					V		"

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 5 **Surveyor(s):** L. Piest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/7/11	Date 2: 4/20/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
Brown Headed Cowbird	BHCO-7					M-SI		IN
Morning Dove	MODO-20					V		"
Morning Dove	MODO-21					NE	NE	"
Anna's Hummingbird	ANHU-1					M-C		"
White Winged Dove	WWDO-11					V		"
Morning Dove	MODO-22					V		"
Abert's Towhee	ABTO-3					V		Out
Brown Headed Cowbird	BHCO-8					F-C		IN
White Winged Dove	WWDO-12					ON		"
Abert's Towhee	ABTO-4					P		out
Verdin	VERD-6						M-SI	IN
White Winged Dove	WWDO-13						V-C	"
Morning Dove	MODO-23						V	
Morning Dove	MODO-24						V	
Morning Dove	MODO-25						V	
Morning Dove	MODO-26						V	

2011 Yuma East Wetlands Riparaian Bird Area Search/Spot-Mapping Datasheet
(Continuation Page)

Plot Name: CR 5 **Surveyor(s):** L. Priest, R. Wayne, C. Choate

Species Name	Terr./Ind. Code	Date 1: 4/7/11	Date 2: 4/20/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/4/11	Date 6: 6/16/11	In/Out
Verdin	VEEO-7						U-C	In
Ash Throated Flycatcher	ATFL-4						U-C	Out
House Finch	HOFI-4						M-SI	Out

Appendix D. Non-breeding Bird Datasheets

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR1 **Date:** 4/1/11

Surveyor(s): L. Piest, R. Wayne **TIME: Start:** 0730 **End:** 0856

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Yellow rumped warbler	1	1	5	7
Lesser Goldfinch	3			3
Orange crowned warbler			3	3
Wilsons Warbler	2			2
Ruby crowned Kinglet			1	1
Black Throated Gray Warbler			2	2

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR1 **Date:** 4/18/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0627 **End:** 0829

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Orange Crowned Warbler			1	1
Wilsons Warbler			1	1
Nashville Warbler			2	2
Yellow-Rumped Warbler			3	3

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR1 **Date:** 5/2/11

Surveyor(s): L. Priest, Z. Wayne **TIME: Start:** 0626 **End:** 0814

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilson's Warbler	2			2
Warbling Vireo			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR1 **Date:** 5/22/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0511 **End:** 0646

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Cliff Swallow			12	12
Wilson's Warbler	1	1		2
Townsend's Warbler			1	1
Willow Flycatcher			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 1 **Date:** 6/1/11

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0727 **End:** 0838

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Townsend's Warbler	1	1		2
Hermit Thrush			1	1
Western Wood. Pewee			2	2
MacGillivray's Warblers			1	1
Willow Flycatcher			1	1
Warbling Vireo			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR1 **Date:** 6/13/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0605 **End:** 0706

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Willow Flycatcher			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR2 **Date:** 4/11

Surveyor(s): L. Dist, B. Wayne **TIME: Start:** 0912 **End:** 1007

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR2 **Date:** 4/19/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0707 **End:** 0838

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilsons Warbler	1		11	3
Nashville Warbler			1	1
Orange Crowned Warbler			2	2

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RB 2 **Date:** 5/13/11

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0538 **End:** 0704

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 2 **Date:** 5/23/11

Surveyor(s): L. Choate, R. Wayne **TIME: Start:** 0524 **End:** 0632

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Townsend's Warbler			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR2 **Date:** 6/3/11

Surveyor(s): L Priest, B Wayne **TIME: Start:** 0512 **End:** 0623

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Cliff Swallow			2	2

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 2 **Date:** 6/14/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0601 **End:** 0652

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilson's Warbler	1			1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: BR 3 **Date:** 4/2/11

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0616 **End:** 0719

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Black Throated Gray Warbler			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR3 **Date:** 4/19/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0545 **End:** 0702

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR3 **Date:** 5/3/4

Surveyor(s): L. Piest, R. Wayne **TIME: Start:** 0707 **End:** 0816

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 3 **Date:** 5/23/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0636 **End:** 0738

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilsons Warbler	1			1
Yellow Warbler		1		1
Hermit Thrush			11	2
Willow Flycatcher			11	2

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR3 **Date:** 6/2/11

Surveyor(s): L. Priest, B. Wayne **TIME: Start:** 0634 **End:** 0745

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Warbling Vireo			2	2
Willow Flycatcher			3	3
Cordilleran Flycatcher			2	2
Wilson's Warbler	3			3
Cliff Swallow			12	12

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 3 **Date:** 6/14/11

Surveyor(s): L. Choate, R. Wayne **TIME: Start:** 0503 **End:** 0557

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Lesser Nighthawk			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR4 **Date:** 4/1/11

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0610 **End:** 0717

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Western Kingbird			1	1 - Brief stop

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR4 **Date:** 4/18/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0545 **End:** 0619

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 4 **Date:** 5/2/11

Surveyor(s): L. Piest, R. Wayne **TIME: Start:** 0527 **End:** 0619

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 4 **Date:** 5/22/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0822 **End:** 0914

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Willow Flycatcher			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: BR4 **Date:** 6/1/11

Surveyor(s): L. Priest, B. Wayne **TIME: Start:** 0627 **End:** 0721

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Cliff Swallow			10	10

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 4 **Date:** 6/13/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0506 **End:** 0554

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 5 **Date:** 4/2/11

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0740 **End:** 1005

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Nashville Warbler			III	3
Black Throated Gray Warbler	1	1	1	3
Orange Crowned Warbler			IIII	5
Yellow Rumped Warbler			1	1
Hermit Thrush			1	1
White Crowned Sparrow			2	2

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 5 **Date:** 4/21/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0605 **End:** 0829

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilson's Warbler			3	3
Nashville Warbler			2	2
White Crowned Sparrow			2	2
American Goldfinch	1			1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR5 **Date:** 5/5/11

Surveyor(s): L. Piest, R. Wayne **TIME: Start:** 0530 **End:** 0746

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Western Tanager	2			2
Wilson's Warbler	7			7
Warbling Vireo			1	1
White Crowned Sparrow			1	1
Western Wood Pewee			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 5 **Date:** 5/25/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0520 **End:** 0749

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Willow Flycatchers			4	4
Western Tanager	4			4

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 5 **Date:** 6/4/11

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0640 **End:** 0827

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Willow Flycatcher			2	2
Cordilleran Flycatcher			2	2
Rough Winged Swallow			2	2

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: RR 5 **Date:** 6/16/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0600 **End:** 0721

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR1 **Date:** 4/7/11

Surveyor(s): Z. Piest, R. Wayne **TIME: Start:** 0738 **End:** 0905

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Black Throated Gray Warbler			1	1
Orange crowned Warbler			1	1
Yellow Rumped Warbler			3	3

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 1 **Date:** 4/21/11

Surveyor(s): C. Choate, Z. Wayne **TIME: Start:** 0846 **End:** 0928

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR1 **Date:** 5/3/11

Surveyor(s): L. Diest, R. Wayne **TIME: Start:** 0822 **End:** 0920

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Warbling Vireo			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 1 **Date:** 5/24/11

Surveyor(s): C. Choate, B. Wayne **TIME: Start:** 0754 **End:** 0843

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Willow Flycatcher			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 1 **Date:** 6/2/11

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0512 **End:** 0624

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Cordilleran Flycatcher			1	1
Wilsons Warble	1			1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR1 **Date:** 6/15/11

Surveyor(s): C. Choate, B. Wayne **TIME: Start:** 0651 **End:** 0738

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR2 **Date:** 4/3/2011

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0609 **End:** 0717

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Orange Cowned Warbler			1	1
Northern Harrier			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR2 **Date:** 4/18/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0839 **End:** 0920

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CRZ **Date:** 5/2/11

Surveyor(s): L. Piest, R. Wayne **TIME: Start:** 0926 **End:** 0922

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Warbling Vireo			1	1
Black Throated Gray Warbler			1	1
Wilson's Warbler	1			1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR2 **Date:** 5/22/11

Surveyor(s): L. Choate, B. Wayne **TIME: Start:** 0657 **End:** 0745

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 2 **Date:** 6/1/11

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0509 **End:** 0620

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 2 **Date:** 6/13/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0725 **End:** 0813

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Cliff Swallow			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR3 **Date:** 4/3/2011

Surveyor(s): L. Piest, R. Wayne **TIME: Start:** 0849 **End:** 0953

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
House Wren			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 3 **Date:** 4/20/11

Surveyor(s): C Choate, R. Wayne **TIME: Start:** 0823 **End:** 0931

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Orange Crowned Warblers			2	2

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 3 **Date:** 5/4/11

Surveyor(s): L. Diest, R. Wayne **TIME: Start:** 0534 **End:** 0654

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilson's Warbler	1			1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 3 **Date:** 5/24/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0626 **End:** 0746

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilson's Warbler	1			1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 3 **Date:** 6/3/11

Surveyor(s): L. Piest, B. Wayne **TIME: Start:** 0740 **End:** 0845

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Rough Winged Swallow			1	1
Wilson's Warbler	1			1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 3 **Date:** 6/15/11

Surveyor(s): C. Choate **TIME: Start:** 0600 **End:** 0646

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 4 **Date:** 4/3/2011

Surveyor(s): L. Piest, R. Wayne **TIME: Start:** 0735 **End:** 0839

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilson's Warbler			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 4 **Date:** 4/20/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0710 **End:** 0818

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilson's Warbler			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 4 **Date:** 5/4/11

Surveyor(s): L. Piest, R. Wayne **TIME: Start:** 0704 **End:** 0811

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR4 **Date:** 5/24/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0626 **End:** 0746

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilson's Warbler		1		1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 4 **Date:** 6/3/11

Surveyor(s): L. Piest, R Wayne **TIME: Start:** 0634 **End:** 0734

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 4 **Date:** 6/15/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0500 **End:** 0506

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 5 **Date:** 4/7/11

Surveyor(s): L. Priest, R. Wayne **TIME: Start:** 0605 **End:** 0727

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Yellow Rumped Warbler			5	5

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 5 **Date:** 4/20/11

Surveyor(s): C. Choate, R. Wayne **TIME: Start:** 0546 **End:** 0648

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Wilson's Warbler			1	1
Black Throated Gray Warbler			1	1

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 5 **Date:** 5/5/11

Surveyor(s): L. Piest, R. Wayne **TIME: Start:** 0802 **End:** 0902

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Hermit Warbler	1			1
Wilsonis Warbler	1	1		2

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 5 **Date:** 5/25/11

Surveyor(s): R. Wayne **TIME: Start:** 0810 **End:** 0907

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Willow Flycatcher			2	2

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 5 **Date:** 6/4/11

Surveyor(s): L Pratt, B Wayne **TIME: Start:** 0511 **End:** 0621

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
NONE				

** Record one row/line for EACH bird species

2011 Yuma East Wetlands Riparian Bird Survey
Intensive Survey Non-Breeder Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: CR 5 **Date:** 6/16/11

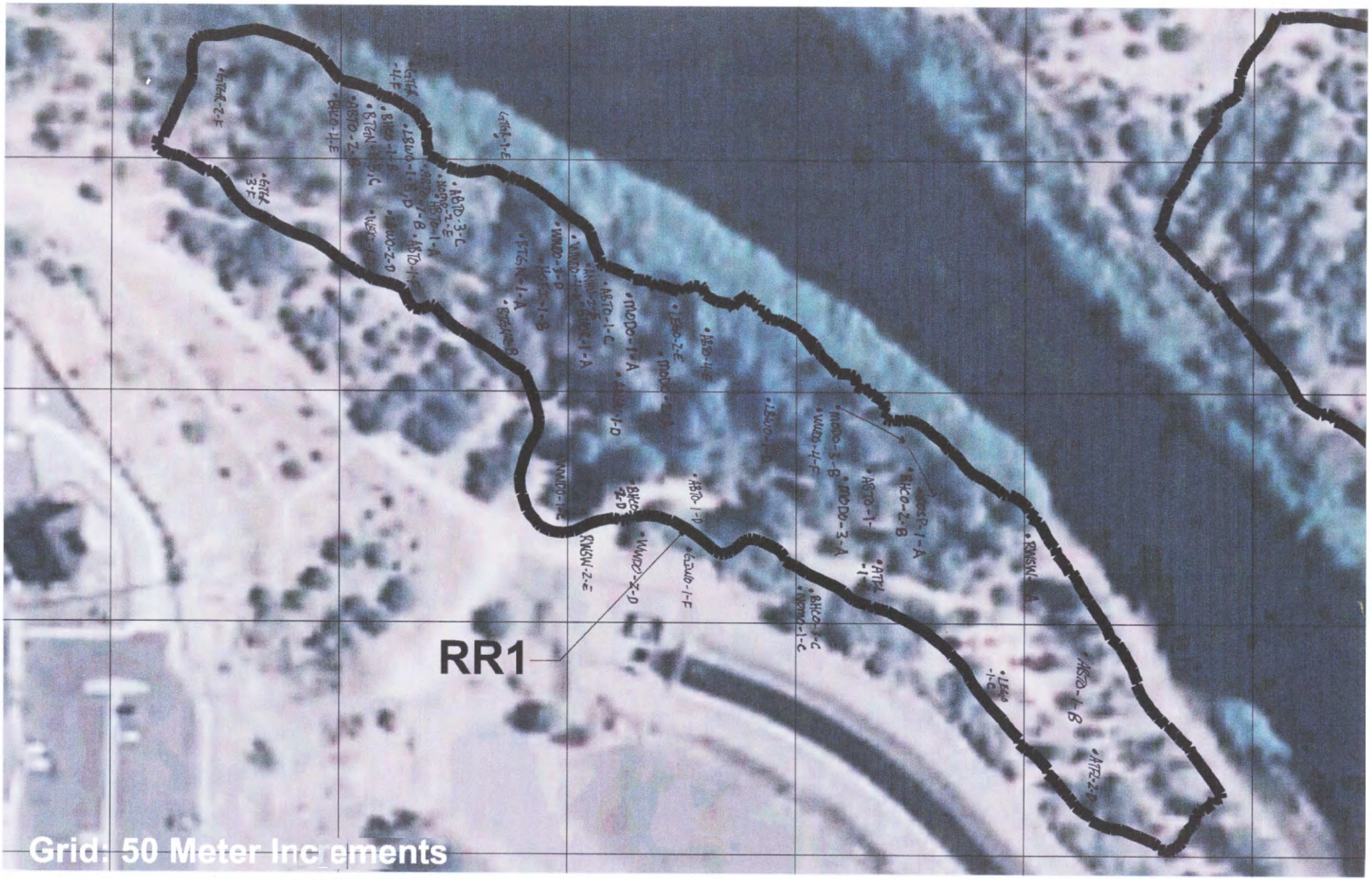
Surveyor(s): L. Choate, B. Wayne **TIME: Start:** 0505 **End:** 0547

Species** (full name)	Males	Females	Unknowns	Total # of Individuals
Lesser Nighthawk			1	1

** Record one row/line for EACH bird species

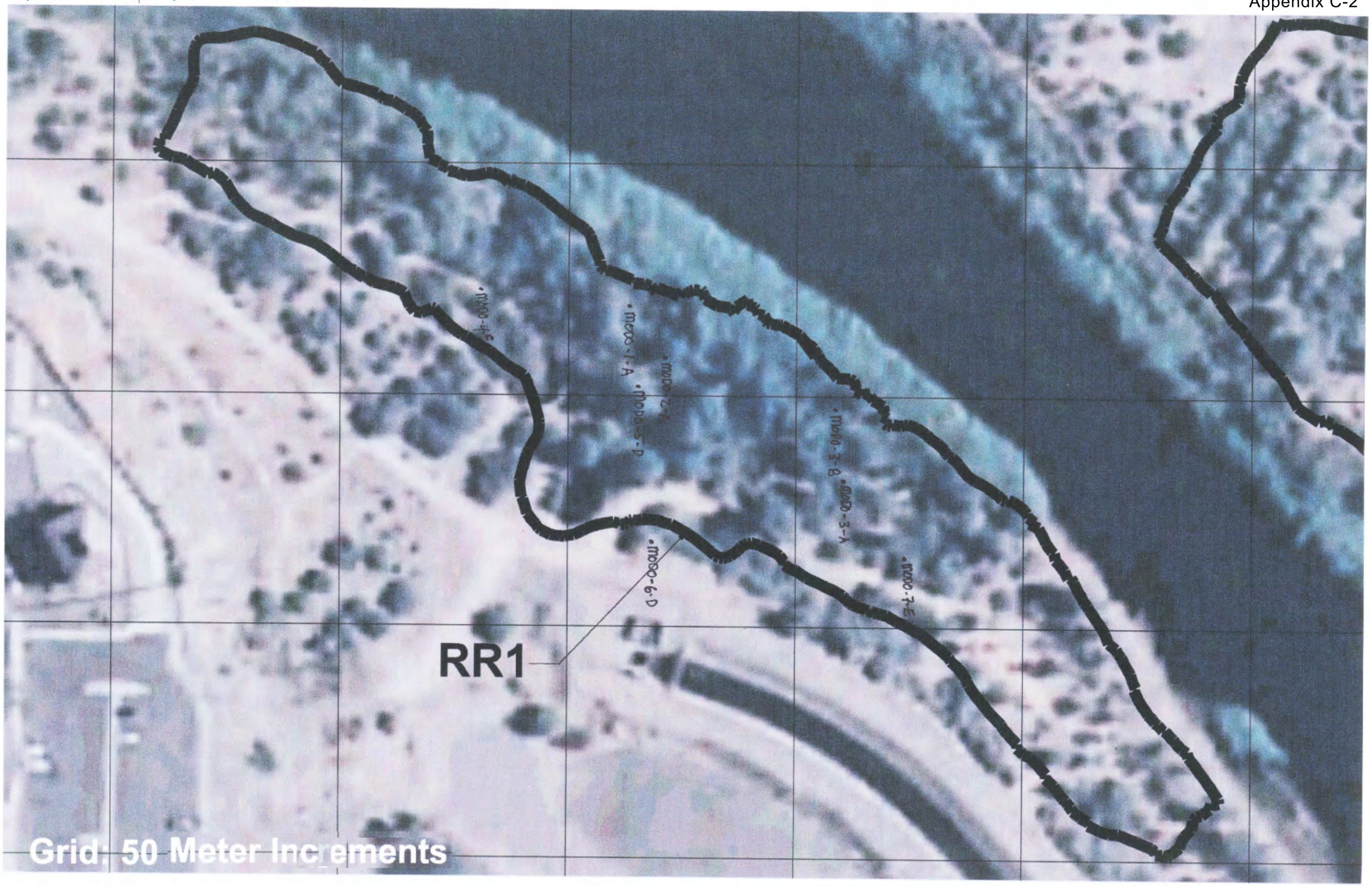
Appendix E. Resident Bird Territory Maps

TERRITORY MAP

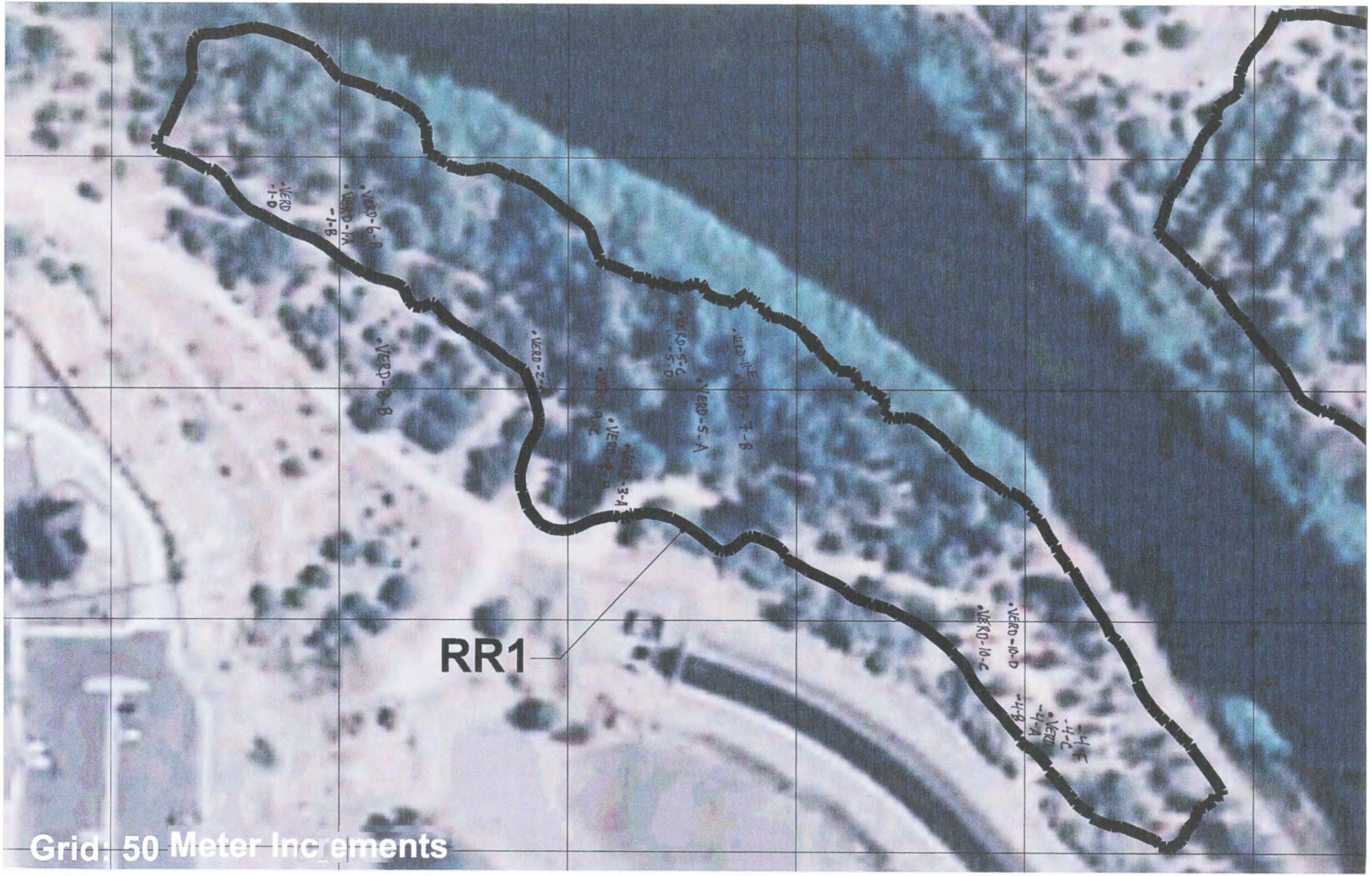


TERRITORY MAP - MODO'

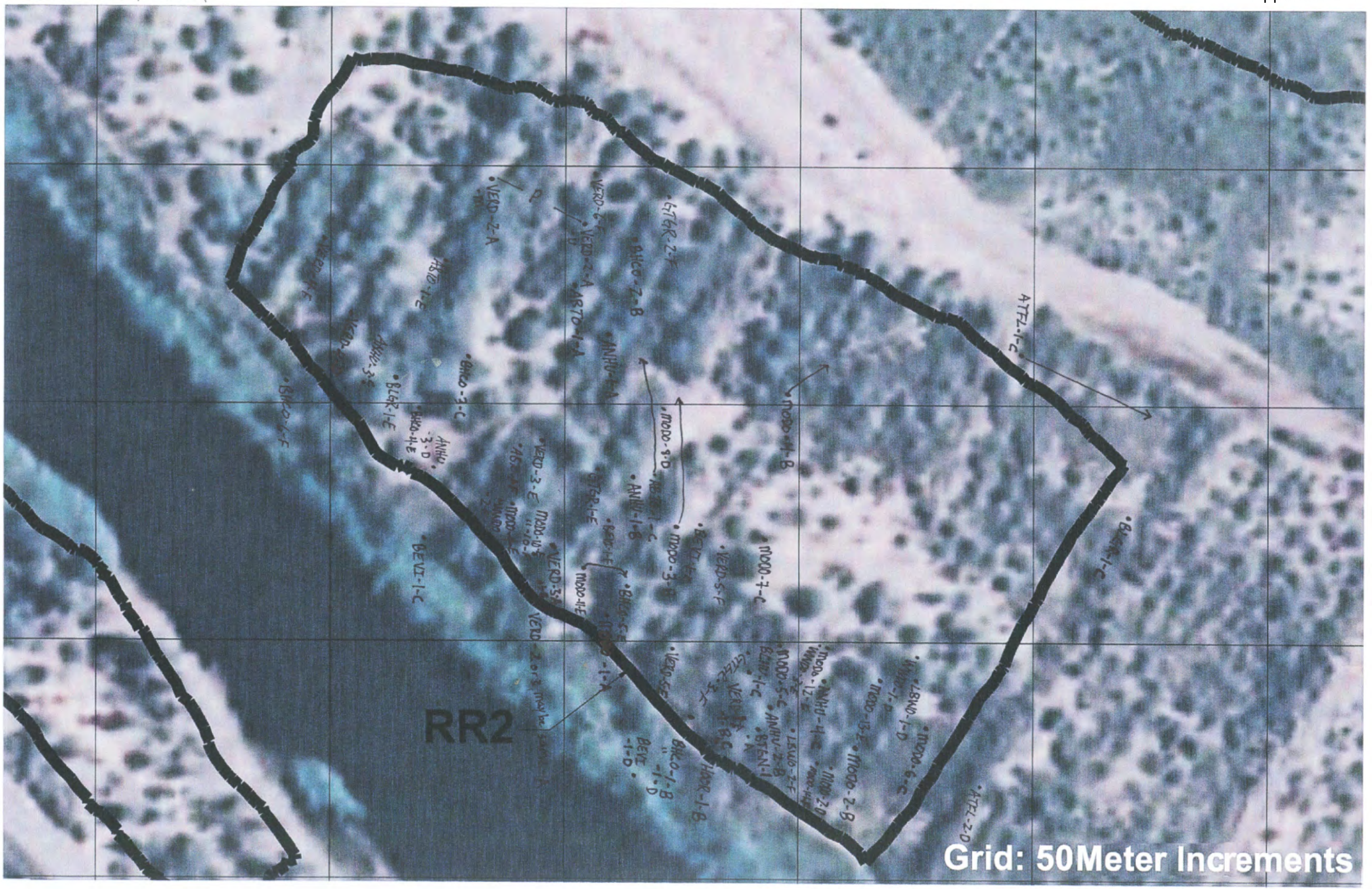
Appendix C-2



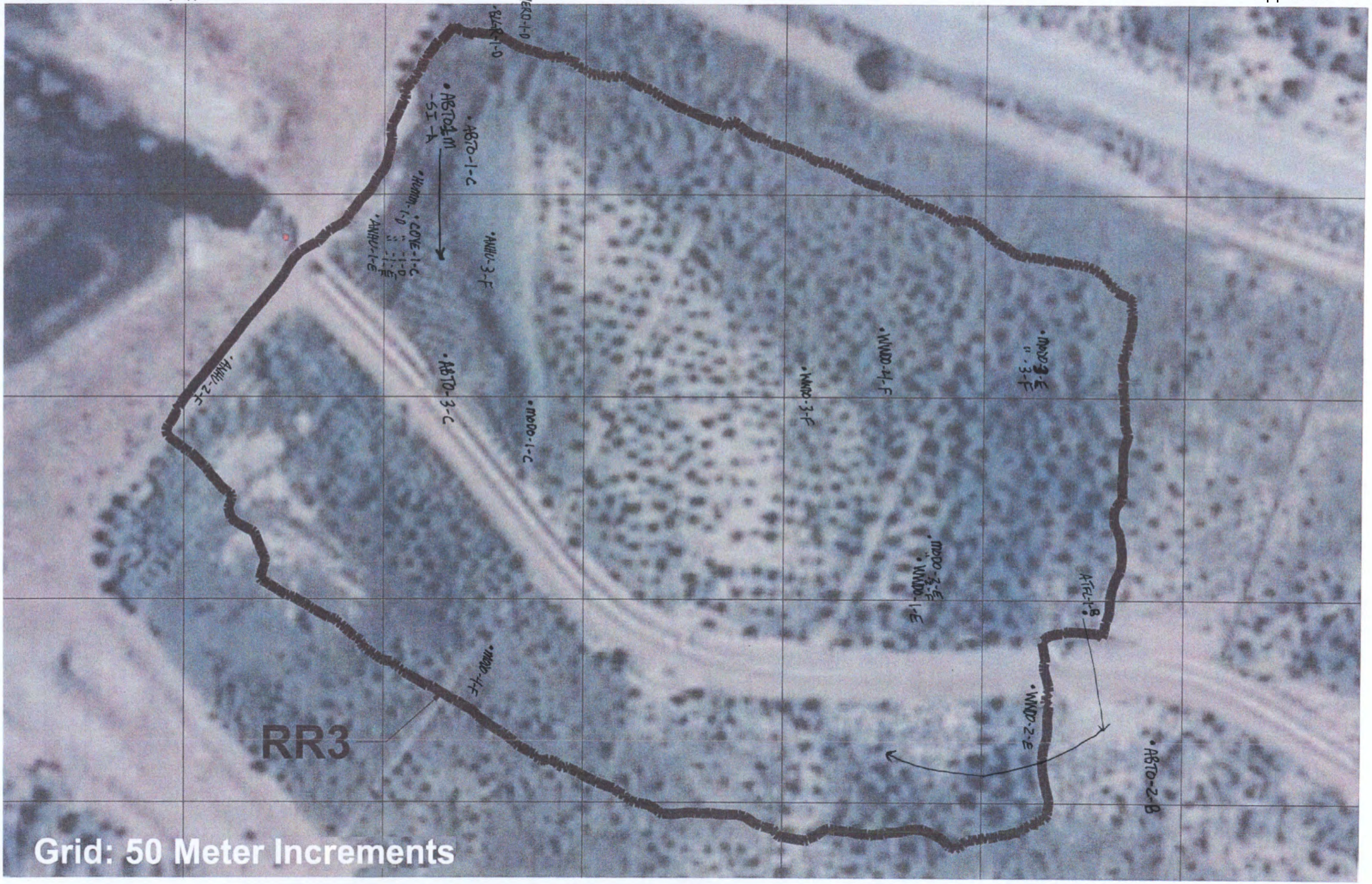
TERRITORY MAP - VERDIN'S



TERRITORY MAP



TERRITORY MAP



TERRITORY MAP

TERRITORY MAP

TERRITORY MAP - ABTO'S

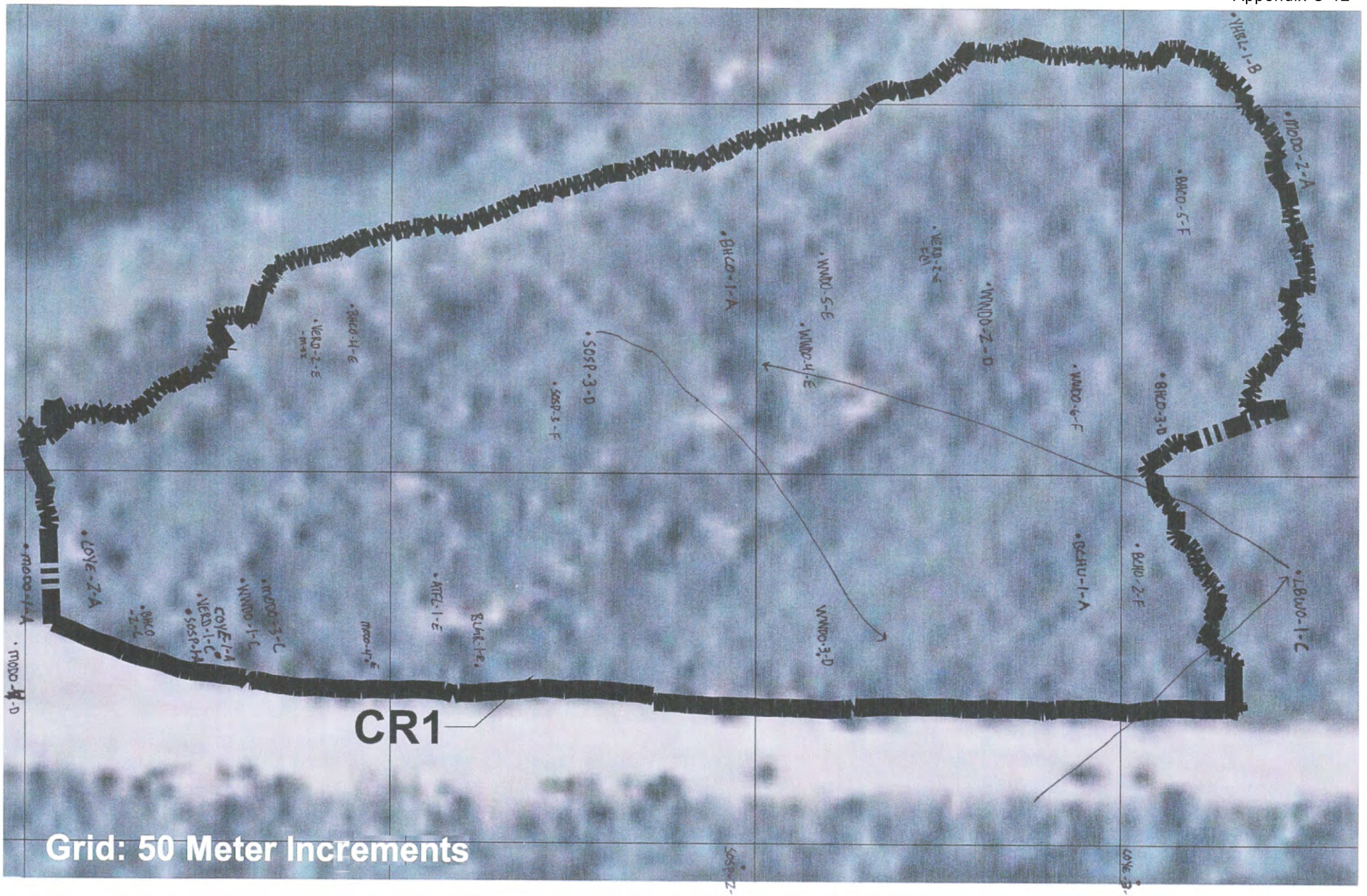
TERRITORY MAP - ANHU

TERRITORY MAP - VERDIN'S

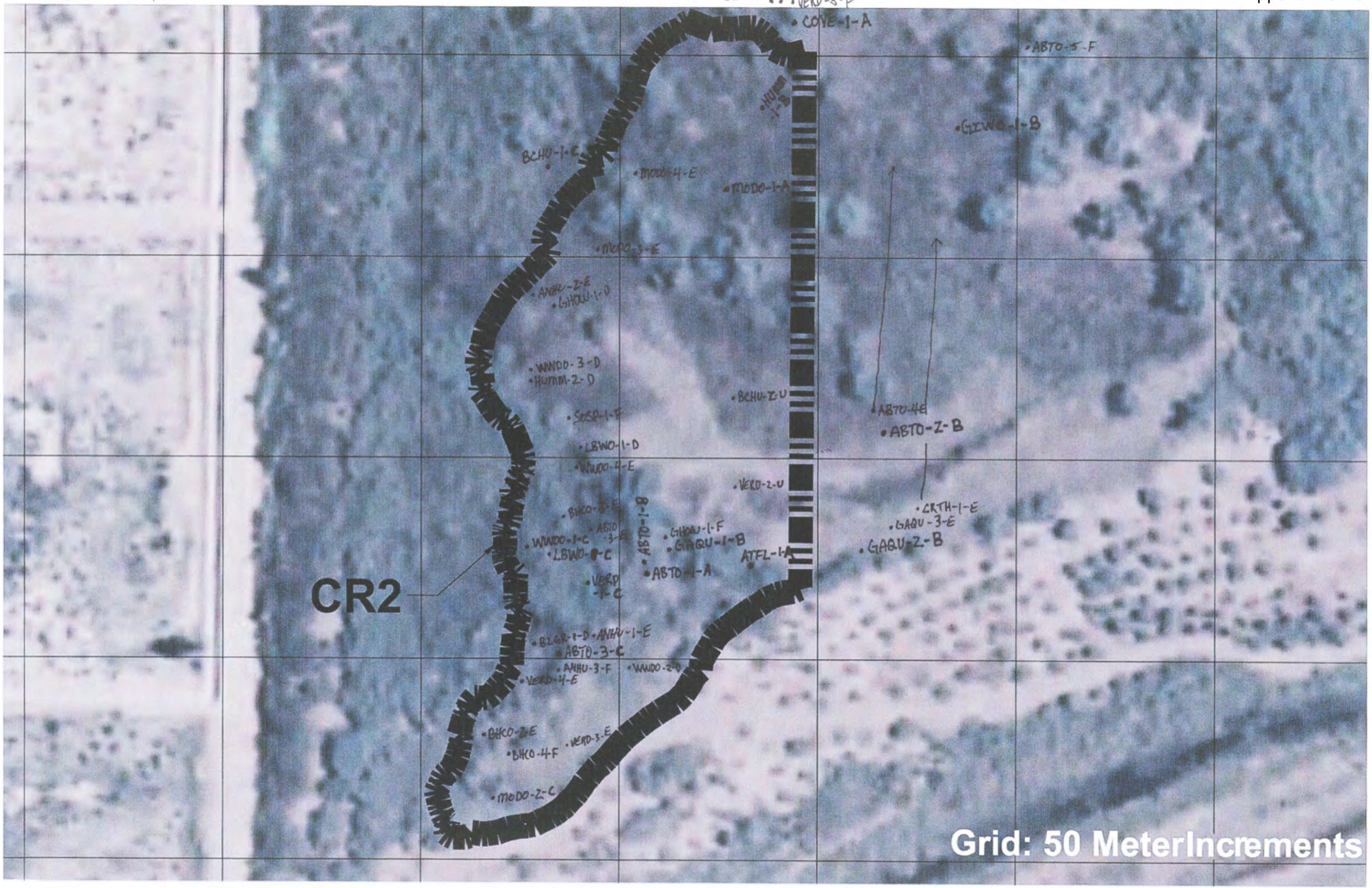
TERRITORY MAP - MODO'S

TERRITORY MAP

Appendix C-12



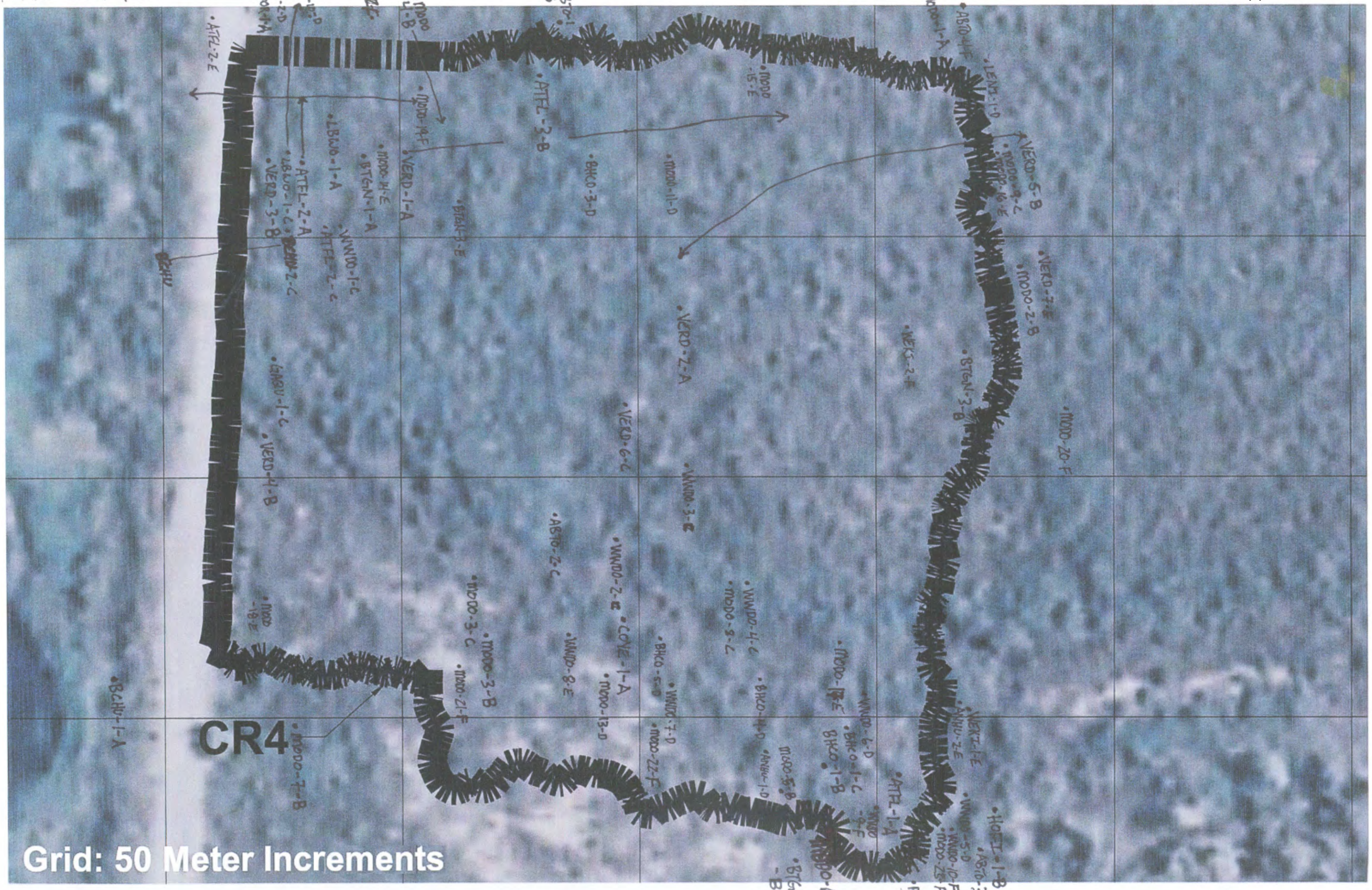
TERRITORY MAP



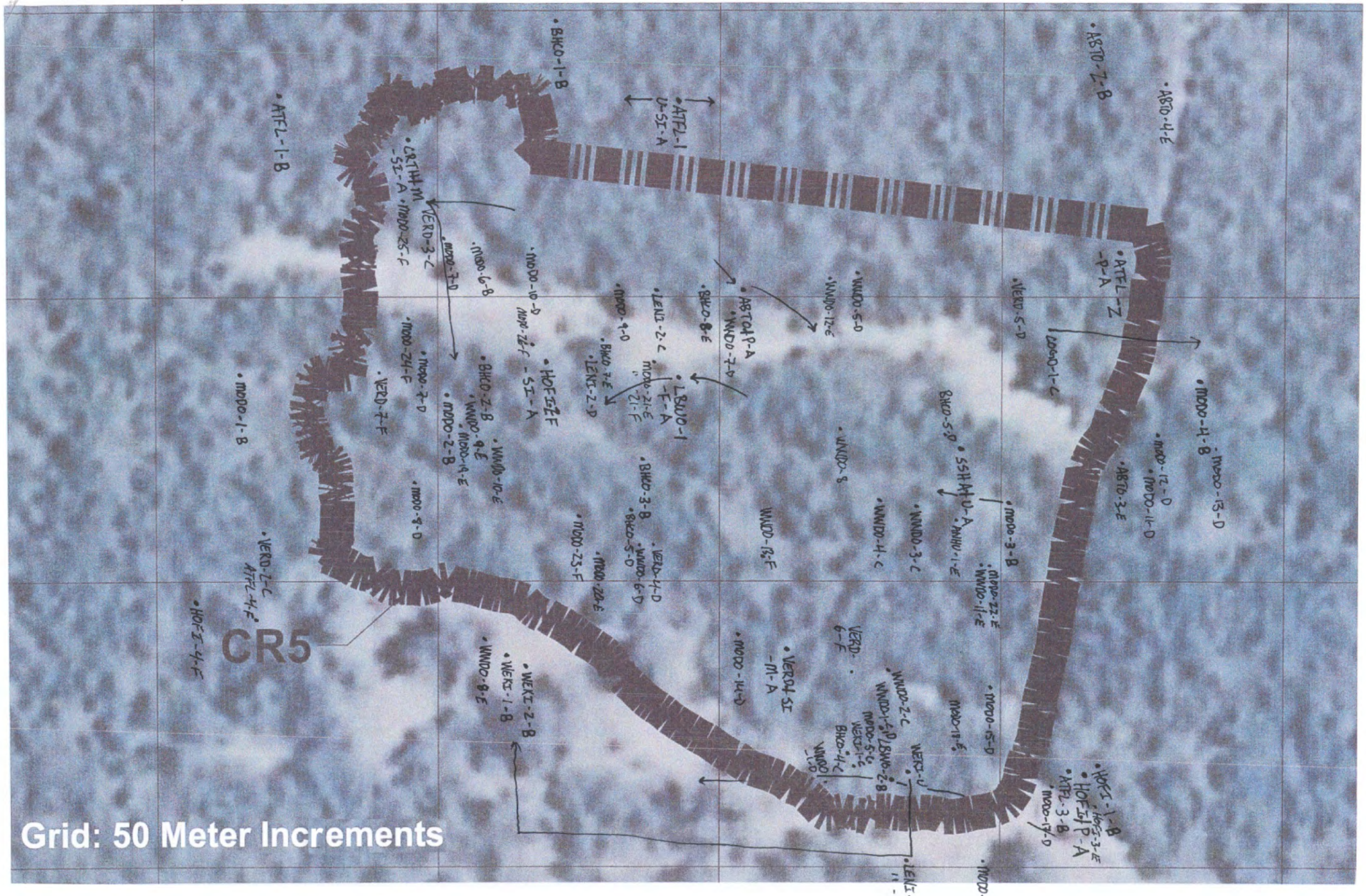
TERRITORY MAP - MODO's + WWDO's

TERRITORY MAP · AFTER First Survey MODO's on seperate Map

TERRITORY MAP



TERRITORY MAP



Appendix F. Marsh Bird Survey Datasheets

National Marsh Bird Monitoring Program Survey Data Sheet

Pg___of___

Date ~~RIVER ROUTE~~ 3/15/2011

Name of marsh or route : River Route

Observer(s) *(list all)**: H. Trathnigg ; R. Wayne

Survey replicate # : 1

	Before	After
Temperature *(°F)* :	52.9	76.1
Wind speed *(mph)* :	0.9	1.5
Cloud cover *(%)* :	5	10
Precipitation *(see below)* :	none	none

**list all observers in order of their contribution to the data collected*

put an "S" in the appropriate column if the bird was seen, a "1" if the bird was heard, and "1S" if both heard and seen

Station#	Start Time (military)	Background noise	Species	Responded During: Before	Pass 0-1	Pass 1-2	Pass 2-3	Pass 3-4	Pass 4-5	BLRA 5-6	LEBI 6-7	VIRA 7-8	CLRA 8-9	After	Call Type(s)	Direction	Distance (meters)	Detected at a Previous Point	Comments
Riv 6	0646	1	none													○			
Riv 7	07 02	1	none													○			
Riv 8	0719	1	none													○			
Riv 11	0731	1	none													○			
Riv 9	0749	1	none													○			
Riv 10	0810	1	none													○			
Riv 1	0825	1	none													○			
Riv 2	0838	1	none													○			
Riv 4	0851	1	none													○			
Riv 3	0906	1	none													○			
																○			
																○			
																○			
																○			
																○			
																○			
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																○			
																○			
																○			

Call Types: BLRA: *kicky-doo, grr, churt* CLRA: cltr, kburr, kek, khurrah LEBI: *coo, kak, ert* VIRA: *grunt, ticket, kicker*

If the call type is not one of the above listed types, describe the call in the comments column

Station: light rain, rain, heavy rain light snow, snow, heavy snow, fog, none

Noise: 0 *no noise* 1 *faint noise* 2 *moderate noise (probably can't hear some birds beyond 100m)*

se (probably can't hear some birds beyond 50m) 4 *intense noise (probably can't hear some birds beyond 25m)*

National Marsh Bird Monitoring Program Survey Data Sheet

Pg___of___

Date 3/16/11

Name of marsh or route : Land route

Observer(s) (list all)*: H. Trathnigg, K. Wayne

Survey replicate # : 1

	Before	After
Temperature (°F) :	66.8	78
Wind speed (mph) :	0.0	1.1
Cloud cover (%) :	15	15
Precipitation (see below) :	none	none

*list all observers in order of their contribution to the data collected

put an "S" in the appropriate column if the bird was seen, a "1" if the bird was heard, and "1S" if both heard and seen

Station#	Start Time (military)	Background noise	Species	Responded During: Before	Pass 0-1	Pass 1-2	Pass 2-3	Pass 3-4	Pass 4-5	BLRA 5-6	LEBI 6-7	VIRA 7-8	CLRA 8-9	After	Call Type(s)	Direction	Distance (meters)	Detected at a Previous Point	Comments
RW8	0623	2	none													○			
																○			
RW7	0639	2	none													○			
																○			
RW6	0701	2	none													○			
																○			
RW5	0714	2	none													○			
																○			
RW3	0737	2	none													○			
																○			
RW4	0756	2	none													○			
																○			
RW1	0825	1	none													○			
																○			
RW2	0835	1	none													○			
																○			
CW2	0853	1	none													○			
																○			
CW3	0901	1	none													○			
																○			
CW4	0915	1	none													○			
																○			
CW6	0929	1	SORA									1			peep	✓	150	No	
																○			
CW7	0943	1	none													○			
CW8	0954	1	none													○			

Call Types: BLRA: *kicky-doo, grr, churr* CLRA: *cltr, kburr, kek, khurrah* LEBI: *coo, kak, ert* VIRA: *grunt, ticket, kicker*

If the call type is not one of the above listed types describe the call in the comments column

Precipitation: light rain, rain, heavy rain light snow, snow, heavy snow, fog, none

Background noise: 0 *no noise* 1 *faint noise* 2 *moderate noise (probably can't hear some birds beyond 100m)*

3 *loud noise (probably can't hear some birds beyond 50m)* 4 *intense noise (probably can't hear some birds beyond 25m)*

SRA
COMO

National Marsh Bird Monitoring Program Survey Data Sheet

Date 4/5/11

Name of marsh or route :

Observer(s) *(list all)**: C. Choate, R. Wayne

Survey replicate # : 2

	Before	After
Temperature *(°F)* :	56.5	78.0
Wind speed *(mph)* :	0	2.1
Cloud cover *(%)* :	0	0
Precipitation *(see below)* :		

**list all observers in order of their contribution to the data collected*

put an "S" in the appropriate column if the bird was seen, a "1" if the bird was heard, and "1S" if both heard and seen

Station#	Start Time (military)	Background noise	Species	Responded During: Before	Pass 0-1	Pass 1-2	Pass 2-3	Pass 3-4	Pass 4-5	BLRA 5-6	LEBI 6-7	VIRA 7-8	CLRA 8-9	After	Call Type(s)	Direction	Distance (meters)	Detected at a Previous Point	Comments
RIV6	0614	2																	
RIV7	0628	1																	
RIV8	0644	1																	
RRANDI/	0657	1	SORA	S	S	S	S	S	S	S	S	S	S	S	-	E	2	NO	visual obs
CW5																			
RIV9	0711	1																	
RIV10	0732	1																	
RIV1	0747	1																	
RIV2	0759	1																	
RIV4/	0812	1	COMO					1S								E	43	NO	SI
CW1																			
RIV5/	0830	1																	
CW2																			
RIV3	0848	1																	

Call Types: BLRA: *kicky-doo, grr, churt* CLRA: cltr, kburr, kek, khurrah LEBI: *coo, kak, ert* VIRA: *grunt, ticket, kicker*

If the call type is not one of the above listed types, describe the call in the comments column

Precipitation: light rain, rain, heavy rain, light snow, snow, heavy snow, fog, none

Background noise: 0 *no noise* 1 *faint noise* 2 *moderate noise (probably can't hear some birds beyond 100m)*

3 *loud noise (probably can't hear some birds beyond 50m)* 4 *intense noise (probably can't hear some birds beyond 25m)*

National Marsh Bird Monitoring Program Survey Data Sheet

Date 4/6/11

Name of marsh or route :

Observer(s) *(list all)**: C. Choate

Survey replicate # : 2

	Before	After
Temperature (°F):	65.0	87.3
Wind speed (mph):	0.0	0.0
Cloud cover (%):	20	70-80
Precipitation *(see below)*:	–	–

**list all observers in order of their contribution to the data collected*

put an "S" in the appropriate column if the bird was seen, a "1" if the bird was heard, and "1S" if both heard and seen

Station#	Start Time (military)	Background noise	Species	Responded During: Before	Pass 0-1	Pass 1-2	Pass 2-3	Pass 3-4	Pass 4-5	BLRA 5-6	LEBI 6-7	VIRA 7-8	CLRA 8-9	After	Call Type(s)	Direction	Distance (meters)	Detected at a Previous Point	Comments
RW8	0601	3	SORA								5				–		25	NO	visual/obs.
RW7	0619	3																	
RW6	0634	2																	
RW5	0647	1											1						
RW4	0706	1																	
RW3	0744	2																	
CW6	0810	1																	
CW7	0926	1	SORA					5									45		visual
			COMO										5				40		visual
CW8	0859	2	COMO									1					~80		S1
			LEBI		-								1	1	COO		~178		COO
CW4	0859	1																	
CW3	0910	1																	

Call Types: BLRA: *kicky-doo, grr, churt* CLRA: cltr, kburr, kek, khurrah LEBI: *coo, kak, ert* VIRA: *grunt, ticket, kicker*

If the call type is not one of the above listed types, describe the call in the comments column

Precipitation: light rain, rain, heavy rain, light snow, snow, heavy snow, fog, none

Background noise: 0 *no noise* 1 *faint noise* 2 *moderate noise (probably can't hear some birds beyond 100m)*

3 *loud noise (probably can't hear some birds beyond 50m)* 4 *intense noise (probably can't hear some birds beyond 25m)*

National Marsh Bird Monitoring Program Survey Data Sheet

Date 4/6/2011

Name of marsh or route :

Observer(s) *(list all)**: C. Choate, R. Wayne

Survey replicate # : 2

	Before	After
Temperature *(°F)*:		87.3
Wind speed *(mph)*:		0
Cloud cover *(%)*:		75%
Precipitation *(see below)*:		—

**list all observers in order of their contribution to the data collected*

put an "S" in the appropriate column if the bird was seen, a "1" if the bird was heard, and "1S" if both heard and seen

Station#	Start Time (military)	Background noise	Species	Responded During: Before	Pass 0-1	Pass 1-2	Pass 2-3	Pass 3-4	Pass 4-5	BLRA 5-6	LEBI 6-7	VIRA 7-8	CLRA 8-9	After	Call Type(s)	Direction	Distance (meters)	Detected at a Previous Point	Comments
RW12	0435	2														○			
																○			
RW11	0950	1	LEBI										1	1S	coo	○	100	N	
																○			
																○			
																○			
																○			
																○			
																○			
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Call Types: BLRA: *kicky-doo, grr, churt* CLRA: cltr, kburr, kek, khurrah LEBI: *coo, kak, ert* VIRA: *grunt, ticket, kicker*

If the call type is not one of the above listed types, describe the call in the comments column

Precipitation: light rain, rain, heavy rain, light snow, snow, heavy snow, fog, none

Background noise: 0 *no noise* 1 *faint noise* 2 *moderate noise (probably can't hear some birds beyond 100m)*

3 *loud noise (probably can't hear some birds beyond 50m)* 4 *intense noise (probably can't hear some birds beyond 25m)*

National Marsh Bird Monitoring Program Survey Data Sheet

Date 5/11/11

Name of marsh or route :

Observer(s) *(list all)**: C Choate, R. Wayne

Survey replicate # : 3

	Before	After
Temperature *(°F)* :	64	
Wind speed *(mph)* :	0	
Cloud cover *(%)* :	0	
Precipitation *(see below)* :	–	–

**list all observers in order of their contribution to the data collected*

put an "S" in the appropriate column if the bird was seen, a "1" if the bird was heard, and "1S" if both heard and seen

Station#	Start Time (military)	Background noise	Species	Responded During: Before	Pass 0-1	Pass 1-2	Pass 2-3	Pass 3-4	Pass 4-5	BLRA 5-6	LEBI 6-7	VIRA 7-8	CLRA 8-9	After	Call Type(s)	Direction	Distance (meters)	Detected at a Previous Point	Comments
RW8	0532	2																	
RW7	0546	2																	
RW6	0558	1	CLRA				1		1	1	1				Kek		120	N	
			CLRA							1	1	1	1S	1	Kek		80	N	
RW5	0612	1	CLRA	1	1	1	1	1	1	1	1	1	1	1	Kek		110	N	
			CLRA		1	1	1	1	1	1	1	1	1	1	Kek		130	N	
RW3	0633	1	CLRA	1	1	1	1	1	1	1	1	1	1	1	Kek		80	Y	detected at RW5
			CLRA							1			1	1	Kek		140	N	
RW4	0652	1	CLRA	1											Kek		115	N	
			CLRA				1	1	1	1					Kek		183	Y	detected at RW5
CW6	0718	1																	
CW7	0738	1																	
CW8	0745	1																	
CW4	0803	1																	

Call Types: BLRA: *kicky-doo, grr, churt* CLRA: cltr, kburr, kek, khurrah LEBI: *coo, kak, ert* VIRA: *grunt, ticket, kicker*

If the call type is not one of the above listed types, describe the call in the comments column

Precipitation: light rain, rain, heavy rain, light snow, snow, heavy snow, fog, none

Background noise: 0 *no noise* 1 *faint noise* 2 *moderate noise (probably can't hear some birds beyond 100m)*

3 *loud noise (probably can't hear some birds beyond 50m)* 4 *intense noise (probably can't hear some birds beyond 25m)*

National Marsh Bird Monitoring Program Survey Data Sheet

Date 5/11/11

Name of marsh or route :

Observer(s) *(list all)**: C. Choate, R. Wayne

Survey replicate # : 3

	Before	After
Temperature *(°F)* :		77.8
Wind speed *(mph)* :		1.7
Cloud cover *(%)* :		0
Precipitation *(see below)* :		—

**list all observers in order of their contribution to the data collected*

put an "S" in the appropriate column if the bird was seen, a "1" if the bird was heard, and "1S" if both heard and seen

Station#	Start Time (military)	Background noise	Species	Responded During: Before	Pass 0-1	Pass 1-2	Pass 2-3	Pass 3-4	Pass 4-5	BLRA 5-6	LEBI 6-7	VIRA 7-8	CLRA 8-9	After	Call Type(s)	Direction	Distance (meters)	Detected at a Previous Point	Comments
CW3	0817	1																	
RW2	0833	1																	
RW1	0847	1																	

Call Types: BLRA: *kicky-doo, grr, churt* CLRA: cltr, kburr, kek, khurrah LEBI: *coo, kak, ert* VIRA: *grunt, ticket, kicker*

If the call type is not one of the above listed types, describe the call in the comments column

Precipitation: light rain, rain, heavy rain, light snow, snow, heavy snow, fog, none

Background noise: 0 *no noise* 1 *faint noise* 2 *moderate noise (probably can't hear some birds beyond 100m)*

3 *loud noise (probably can't hear some birds beyond 50m)* 4 *intense noise (probably can't hear some birds beyond 25m)*

National Marsh Bird Monitoring Program Survey Data Sheet

Date 5/12/11

Name of marsh or route :

Observer(s) *(list all)**: C. Choate, R. Wayne

Survey replicate # : 3

	Before	After
Temperature *(°F)* :	66.6	73.6
Wind speed *(mph)* :	0	1.4
Cloud cover *(%)* :	0	0
Precipitation *(see below)* :	—	—

**list all observers in order of their contribution to the data collected*

put an "S" in the appropriate column if the bird was seen, a "1" if the bird was heard, and "1S" if both heard and seen

Station#	Start Time (military)	Background noise	Species	Responded During: Before	Pass 0-1	Pass 1-2	Pass 2-3	Pass 3-4	Pass 4-5	BLRA 5-6	LEBI 6-7	VIRA 7-8	CLRA 8-9	After	Call Type(s)	Direction	Distance (meters)	Detected at a Previous	Comments
RIV 6	0541	1																	
RIV 7	0556	1																	
RIV 8	0609	1																	
CW 5/	0625	1	COMO	S															
REI																			
RIV 9	0637	1	CLRA				1								KEK		unk. 450		
													1						
RIV 10	0658	1																	
RIV 1	0712	4																	Abq pump running too loud to hear any birds
																			Point skipped
RIV 2	0717	1																	
CW 1/	0729	4																	NC Pump running
RIV 4																			
CW 2/	0746	1	COMO	S	S	1S	S	1S	S	S	S	S	S						
RIV 5																			
RIV 3	0809	2																	Drip pump running

Call Types: BLRA: *kicky-doo, grr, churt* CLRA: cltr, kburr, kek, khurrah LEBI:*coo, kak, ert* VIRA: *grunt, ticket, kicker*

If the call type is not one of the above listed types, describe the call in the comments column

Precipitation: light rain, rain, heavy rain, light snow, snow, heavy snow, fog, none

Background noise: 0 *no noise* 1 *faint noise* 2 *moderate noise (probably can't hear some birds beyond 100m)*

3 *loud noise (probably can't hear some birds beyond 50m)* 4 *intense noise (probably can't hear some birds beyond 25m)*

Appendix G. Bird Variable Circular Plot Datasheets

Yuma East Wetlands Variable Circular Plot Data Collection

Site: YEW Observer (s): H. Trathen 99; R. Wayne Sheet ____ of ____

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
RW5 (cont)	7/16	0714			CITE										☒	
					SNEG											
RW3	7/16	0737			MAWR											
					SOSP											
					KILL											
RW4	7/16	0756			MAWR											
					SOSP											
					BLPH											
RW1	7/16	0828			KILL											
					MAWR											
					BLST											
					SOSP											

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: YEW

Observer (s): H. Trathnigg, R. Wayne

Sheet _____ of _____

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
RW8	3/16	0623	66.8F	0.0	COYE		1									
					YHBB	1				1		2				
					MAWR			2				1				
					AMCO			1	2							
RW7	3/16	0639			YHBB		2	1	2		3					
					KILL										1	
					RHBB			1								
					COYE	1	1									
					MAWR	1				1						
					~~KILL~~											
RW6	3/16	0701			SOSP						1					
					MAWR					1	1	2				
					KILL				1				1			
					COYE					1						
RW5	3/16	0714			BLPH										1	
					MAWR		1	1	1	1						
					SOSP			2								
					COYE		1		1							

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

LEYE

Yuma East Wetlands Variable Circular Plot Data Collection

Site: YEW

Observer (s): H. Trathnigg; K. Wayne

Sheet ____ of ____

Point Name & Number	Date	Time	Air Temp. (°F)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
CW5	3/15/11	734	65.5	5%; 0 wind	VERD		•									
					MAWR			•		•						
					ABTO									•		
					COYE					•						
					AMCO						••					
					HOFI								•			
CW1	"	851	73	5%, 0 mph	~~TEAL~~ CANV		•									
					PBGR								•			
					COYE		••									
					ABTO										•	
					LBWO									•		
					MAWR					•						
					AMCO					•						
					BCNH					•						
					COMO								•			

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: _____ Observer (s):_____ Sheet _____of _____

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: YEW

Observer (s): H. Trathen, B. Wayne

Sheet _____ of _____

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
RW2	3/16	0835			SNEG											
					BLPH											
					~~GRHE~~											
CW2	3/16	0853			BHCO											
					COYE											
					AMCO											
					ABTO											
					YRWA											
CW3	3/16	0904			ABTO											
					ATFL											
					AMCO											
CW4	3/16	0915			VERD											
CW6	3/16	0929			AMCO											

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: YEW Observer (s): H. Trathnigg, R. Wayne Sheet ____ of ____

Point Name & Number	Date	Time	Air Temp. (°C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
CW7	3/16	0943			AMCO				' '							
					ATFL								'			
					BHCO								'			
					VELD				'							
					PBGR								'			
					COYT				'							
CW8	3/16	0954	78°F	1.1	COYT								' '			
					~~PBGR~~											
					AMCO			'				'				
					MAWR				'							
					ATFL							'				

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: _____ Observer (s): C. Choate, R. Wayne Sheet 1 of 3

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
CW5	4/5/11	0658	63.4	0.0	COYE			•								SI
					VERD						•					SI
CW1	4/5/11	0812			BRCO			•								SI
					COYE				•						•	SI
					COMO					•		•				SI
CW2	"	0830	73.0	1.0	AMCO				•	•						
					VERD			•								
					COYE						•					
					warbler				•							

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: _____ Observer (s): C. Choate, R. Wayne Sheet 2 of 3

Point Name & Number	Date	Time	Air Temp. (°C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
RW8	4/6	0601	65.0	20% CC; 0.0mph	YHBL		2		1		3		2			Calling
					AMCO		2					1	1			
RW7	"	0619			YHBL			2	3	2					2	Calling
					BNST								1			
RW6	"	0634														
RW5	"	0647		50% CC	MAWR					1						SI
RW3	"	0706			YHBL			1	1	1	2	1				calling
RW4	"	0744		"	SOSP							1				
CW6	"	0810			YHBL								1		2	calling
					AMCO										1	
					COYE									1		SI

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: _____ Observer (s): C. Choate, R. Wayne Sheet 3 of 3

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
CW7	4/6	0826		45% cc	AMCO			•		• •				•		
					VERD						•					SI
					SORA					•						
CW8	"	0839			GBHE									•		
					YHBL								• •	⊠ •		calling
					GTGR									•		
								—								
CW4	"	0854			VERD								•			SI
CW3	"	0910			AMCO				•						•	
RW2	"	0935		70% cc	AMCO						• •					
					COYE				•				•			chatter
RW1	"	0956	87.3	70% cc	SPARROW?			• •								
				0 mph												

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: YEW

Observer (s): C. Choate, R. Wayne

Sheet 1 of 4

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
RW8	5/11	0532	64.0	0% 0	YHBL		2	3		2		1		1		Calling, del T/A Fledglings
RW7	"	0546			COYE			1								singing
					YHBL		2		1		1			1		calling, DT fledglings
RW6	"	0558			YHBL						2			2		calling
					CLSW			2	3							
					RWSW			2	2	2						
					TRSW				2	1						
RW5		0612			COYE				1	1						singing
RW3		0633			COYE						2					singing
					swallow			2	2							
RW4		0652			WETA											flyover
					CLSW											"
					COYE					1						singing
					BHCO							1				
					ATFL								1			

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: _____ Observer (s): _____ Sheet 2 of 4

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
CW6	5/11	0718		0;0	AMCO								•	••		
					YHBL							••	••			
CW7	5/11	0738			COYE											Singing
					WIWA											
					AMCO		•									
					BHGB							•				Singing
					YHBL					•						
CW8		0745			YHBL								•			
					AMCO		•									
CW4		0803			LBWO								•			Singing
					WIWA			•								
					BHCO			•								
CW3		0816			WIWA		•									
RW2		0833			WIWA	•										
					SPSA			•								

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: _____ Observer (s): _____ Sheet 3 of 4

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
RW1	5/11	0847	77.8	0%; 1.7	COYE											

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Yuma East Wetlands Variable Circular Plot Data Collection

Site: _____ Observer (s): C. Choate; R. Wayne Sheet 4 of 4

Point Name & Number	Date	Time	Air Temp. ('C)	Weather (% CC; Wind Speed)	SPECIES	0-10m	10-20m	20-30m	30-40m	40-50m	50-60m	60-70m	70-80m	80-90m	90-100m	Breeding Behavior
CW5	5/12	0625	66.6	0; 0	BHCO											
CW1	"	0730			AGTO											
					WIWA											
CW2		0746	73.6	0; 1.4	BHCO											
					COMO											

Breeding Behavior: Singing, calling, migrant, fledgling, nest observed, nest guarding, eggs present, defending territory/nest

Appendix H. Butterfly Datasheets

Yuma East Wetlands Butterfly Search Datasheet

Site: RB1 Observer (s): R Wayne, Kelly M Date: 5-3-11 Sheet 1 of 2

Air Temp. (°C): Start 28.1 End 34.5 Weather (% CC; Wind Speed): Start 0 ; 1.5 End 0 , 1

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Brephidium exile	nectaring	W. sea purslane	✓		6	30	12	-detected outside of time limit
Brephidium exile	nectaring	W. sea purslane			3	3	13	-outside of time limit

Behavoir: Nectaring, basking, flying, drinking water

Ellen

Yuma East Wetlands Butterfly Search Datasheet

Site: RR1 Observer (s): R. Wayne, K Ivy Date: 6/13/11 Sheet ___ of ___

Air Temp. ('C): Start 93 End 93.2 Weather (% CC; Wind Speed): Start 0.0 End 0,0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
W. pygmy blue	nectar	W. sea purslane		X	12	6	17.5	RR1-1
"	"	"		X	4	4	7	-2
"	"	"		X	2	7	9	-3
"	"	"		X	1	19	16	-4
"	"	"		X	6	25	17	-5
"	"	"		X	5	84	47	-6 outside of boundary
"	"	"		X	3	160	15	-7

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR1 Observer (s): KJ, DM Date: 7/14/11 Sheet ___ of ___

Air Temp. (°C): Start 98 End 98 Weather (% CC; Wind Speed): Start D. 2 End 1°10, 1.5

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
W. Pirdw	Nector	purslane		X	8	3	17	RR1-1
" "	nector	" "		X	4	40	9	RR1-2
" "	" "	" "		X	5	150	10	RR1-3
" "	" "	" "		X	1	207	14	RR1-4
ceraunus blue	Flying			X	1	211	11	RR1-5
W.P. Blue	flying			X	2	211	11	RR1-5

Behavoir: Nectaring, basking, flying, drinking water

RR1 TW pts: 104-106

Yuma East Wetlands Butterfly Search Datasheet

Site: RRZ Observer (s): R. Wayne; K. Ivy Date: 5/4/11 Sheet 1 of 2

Air Temp. ('C): Start 86 End 102 Weather (% CC; Wind Speed): Start 40%, 0 End 35, 1

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR2 Observer (s): R Wayne, K NN Date: 4/7/11 Sheet __ of __

Air Temp. ('C): Start 88 End 89 Weather (% CC; Wind Speed): Start 0, 3 End 0, 3

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Marina Blue	Flying			X	1	83	9	detected outside time limit

Behavoir: Nectaring, basking, flying, drinking water

TWW pics - 117 - 119

Yuma East Wetlands Butterfly Search Datasheet

Site: RR2 Observer (s): PM, KT Date: 7/15/11 Sheet ___ of ___

Air Temp. ('C): Start 88 End 94 Weather (% CC; Wind Speed): Start 0,0 End 0,0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Cerauus Blue	basking			X	1	10	39	RR2-1 found dead
W.P.B	basking			X	1	79	42	RR2-2
Cerauus Blue	flying			X	1	82	48	RR2-3
" "	flying			X	1	108	22	flying outside of RR2-4 boundary
" "	flying			X	1	160	1	RR2-5
" "	basking			X	1	151	3	RR2-6 found dead

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR3 Observer (s): R. Wayne, K. Ivy Date: 5/5/11 Sheet ___ of ___

Air Temp. ('C): Start 94 End 96.4 Weather (% CC; Wind Speed): Start 2%, 0 End 5%, 1.2

			Collected					
→ (common checkered skipper) Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Pyrgus communis	Flying		X		1	5	12	
or Pyrgus albescens								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR3 Observer (s): R Wayne, K Ly Date: 6/13/11 Sheet __ of __

Air Temp. ('C): Start 86.5 End 90 Weather (% CC; Wind Speed): Start 0, 2.5 End 0,0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Cabbage White	Flying			X	1	56.5	6	RR3-1
Western Pygmy Blue	Flying			X	1	196.5	10.5	RR3-2

Behavoir: Nectaring, basking, flying, drinking water

TW PES 107-108
/113

Yuma East Wetlands Butterfly Search Datasheet

Site: RR 3 Observer (s): Date: 7/15/11 Sheet ___ of ___

Air Temp. ('C): Start 30 End 38 Weather (% CC; Wind Speed): Start 0,0 End 00

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Ceraunus Blue	Flying		X		1	225.8	27	PC: 110 RR3-1
" "	Flying			X	1	207.5	43.5	RR 3-2 PC: 111
" "	Flying			X	1	182	35	RR3-3

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR 4 Observer (s): R. Wayne, K. Jay Date: 5/2/11 Sheet 1 of ___

Air Temp. (°C): Start 31.1 End ___ Weather (% CC; Wind Speed): Start 0; 7.5 End ___

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Nathalis iole	Nectar	Heliotrope	✓		4	70	17.5	
" "	Flying		✓		1	92	14	

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR4　　Observer (s): R. Wagne, [illegible]　　Date: 6/10/11　　Sheet ___ of ___

Air Temp. (°C): Start 99　End 100　　Weather (% CC; Wind Speed): Start 10%, 2　End 3%, 1.5

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
pygmy blues	nectar	purslane		X	2	14	53	[illegible] RR 4-
" "	nectar	heliotrope		X	1	4.5	45	RR4-2
" "	nectar	purslane	X		6	1	30	RR4-3
"	flying	–		X	2	128	33	RR4-4 outside bounda[ry]
"	flying	–		X	4	138	35	RR4-5 - outside bounda[ry]
"	nectar	heliotrope		X	1	140	24	RR4-6
"	nectar	purslane		X	10	180	50.5	RR4-7
"	nectar	purslane/helio.		X	7	7	46	RR4-8
"	nectar	purslane		X	3	57	40	RR4-9
"	"	"		X	7	47.5	50	RR4-10
"	"	"		X	2	38	44	RR4-11
"	"	"		X	2	30	26	" -12

·oir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR4 Observer (s): KI, DM Date: 7/13/11 Sheet ___ of ___

Air Temp. ('C): Start 96 End 100 Weather (% CC; Wind Speed): Start 2 0CC End 3 wind, 0 C.C.

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
W. pygmy blue	flying			X	3	8	43	RR4-1
" "	nectar	purslane/heliotrope		X	8	0	31	RR4-2
" "	nectar	purslane		X	2	1	24	RR4-3
" "	flying			X	1	52	27	RR4-4
~~Spring Azure~~ CB.	nectar	screwbean		X	2	68	29	RR4-5
" "	" "	"		X	1	64	16	RR4-6
" "	" "	"		X	1	96.5	32	RR4-7
W. pygmy blue	flying			X	1	104.5	9	RR4-8
~~Spring Azure~~ C.B.	flying			X	1	104.5	9	RR4-8
" "	flying			X	1	139	22	RR4-9
Unknown 1	nectar	heliotrope	X		1	174	11	RR4-10
~~Spring Azure~~ CB	nectar	screwbean		X	1	198	28	RR4-11
W. pygmy blue	nectar	U-Wing		X	1	183	35	RR4-12
" "	" "	purslane/heliotrope		X	20	183	50	RR4-13
unknown 1	nectar	purslane/heliotrope		X	1	168	55	RR4-14
W. pygmy blue	nectar	" "		X	12	168	55	RR4-14
" "	"	purslane		X	7	140	38	RR4-15
" "	"	purslane/heliotrope		X	25	139	48	RR4-16
~~Spring Azure~~ BB.	nectar	screwbean		X	1	130	40	RR4-17
W. pygmy blue	nectar	purslane/heliotrope		X	260	50	47.5	RR4-18
~~Spring Azure~~ C.B.	" "	screwbean		X	1	50	47.5	RR4-18
W. pygmy blue	nectar	purslane		X	5	32	41	RR4-19
W. pygmy blue	" "	"		X	2	9	40.5	RR4-20
ceranus blue	" "	screwbean		X	3	9	40.5	RR4-20

found outside of transect

Behavoir: Nectaring, basking, flying, drinking water

~~Ceranus Blue~~

CB = Ceranus Blue

Yuma East Wetlands Butterfly Search Datasheet

Site: BR5 Observer (s): K. Wayne, K. Ivy Date: 5/5/2011 Sheet ___ of ___

Air Temp. ('C): Start 96.2 End 99 Weather (% CC; Wind Speed): Start 3%, 1 End 20%, 3

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR5 Observer (s): R. Wayne; K. Lily Date: 6/10/11 Sheet ___ of ___

Air Temp. ('C): Start 81 End 84 Weather (% CC; Wind Speed): Start 0, 1 End 0, 0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

pir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR5 Observer (s): KL, DM Date: 7/15/1 Sheet ___of ___

Air Temp. ('C): Start 92 End 99 Weather (% CC; Wind Speed): Start 0%, 1-8 End 10%, 2

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
orange/yellow	basking on tamarisk			X	1	203	9	RR5-1
" "	basking			X	1	275	13	RR5-2
" "	nectar	Sunflower/ tamarisk		X	1	311	1.5 trying to	RR5-3 nectar on any inflorescence I can find back and forth b/w sunflower / tamarisk

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR 1 Observer (s): R. Wayne, K. Ivy Date: 5/6/11 Sheet ___ of ___

Air Temp. ('C): Start 82.9 End 86.4 Weather (% CC; Wind Speed): Start 0, 0 End 0, 1

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR 1 Observer (s): R. Wayne, R. NJ Date: 6/13/11 Sheet ___ of ___

Air Temp. ('C): Start 102 End 102 Weather (% CC; Wind Speed): Start 0, 0 End 0, 0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

TUB - 23 & 24

Yuma East Wetlands Butterfly Search Datasheet

Site: CR1 Observer (s): KT, DM Date: 7/15/11 Sheet ___ of ___

Air Temp. ('C): Start 94 End 94 Weather (% CC; Wind Speed): Start 0, 0 End 0, 0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR 2 E Observer (s): R. Wayne Date: 5/11/11 Sheet ___ of ___

Air Temp. (°F): Start 85.0 End 87.0 Weather (% CC; Wind Speed): Start 0%; 1.0 End 0%; 3.5

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0	-	-						

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR2 | Observer (s): R Wayne, K Ivy | Date: 6/10/11 | Sheet ___ of ___

Air Temp. ('C): Start 95 End 99 | Weather (% CC; Wind Speed): Start 5%, 3.3 End 6% ; 2

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								
CR2	7/14/11		KI, DM					
start.	98 98	end			weather : 3, 0% ;			
0								
pictures	for TW:	~~2015~~ 0096 -		0100				
RR4-TW pics :		0101-0102						

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR3 Observer (s): K Hayre, K. Ivy Date: 5/6/11 Sheet ___of ___

Air Temp. ('C): Start 91 End 86.5 Weather (% CC; Wind Speed): Start 0, 2 End 0, 4

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Pieris rapae	flying			X	1			

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR3 Observer (s): R. Wayne, K. Ly Date: 4/14/11 Sheet ___ of ___

Air Temp. ('C): Start 28 End 29 Weather (% CC; Wind Speed): Start 30%, 0 End 20%, 0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

TVNPLS: 120 122

Yuma East Wetlands Butterfly Search Datasheet

Site: CR3 Observer (s): KJ DM Date: 7/15/11 Sheet ___of___

Air Temp. ('C): Start 94 End 94 Weather (% CC; Wind Speed): Start 0%, 1 End 0, 0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR 4 Observer (s): R. Wayne Date: 5/11/11 Sheet ___of ___

Air Temp. (°F): Start 88.0 End 85.0 Weather (% CC; Wind Speed): Start 0%; 1.1 End 0%; 2.6

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
—	—	—						

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR4 Observer (s): R Wayo · K. Fry Date: 6/13/11 Sheet ___ of ___

Air Temp. ('C): Start 91 End 91 Weather (% CC; Wind Speed): Start 0, 2 3 End 0, 2. 5

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

TUV pics 125-126

Yuma East Wetlands Butterfly Search Datasheet

Site: CR4 Observer (s): KI, DM Date: 7/5/11 Sheet ___ of ___

Air Temp. ('C): Start 99 End 99 Weather (% CC; Wind Speed): Start 0%/2 End 0%/2

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR5 Observer (s): K. Wayne, K. W Date: 5/6/2011 Sheet ___ of ___

Air Temp. ('C): Start 91 End 95.5 Weather (% CC; Wind Speed): Start 0, 1.7 End 0, 2.1

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR5 Observer (s): R. Wayne, K.W Date: 6/13/11 Sheet ___of ___

Air Temp. ('C): Start 98 End_____ Weather (% CC; Wind Speed): Start 0, 1 End_____

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

TVV-27,28

Yuma East Wetlands Butterfly Search Datasheet

Site: CR5 Observer (s): KL, DM Date: 7/15/11 Sheet ___ of ___

Air Temp. (°C): Start 97 End 98 Weather (% CC; Wind Speed): Start 0%, 2 End 0, 2

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR1 Observer (s): L. Zepr[illegible] [illegible] Date: 9/12/11 Sheet __ of __

Air Temp. (°C): Start 81 End 87 Weather (% CC; Wind Speed): Start 0; 75% [illegible] End 0; 60%

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
W. Pygmy Blue	basking			X	3	18.2	21	RR1-1
unknown blue	basking			X	1	131	19.8	RR1-2
W. Pygmy	basking			X	2	78	32	RR1-3
" "	" "			X	5	22.4	18	RR1-4

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR2 Observer (s): L. Cipolla, KM Date: 9/13/11 Sheet ___ of ___

Air Temp. ('C): Start 90 End 93 Weather (% CC; Wind Speed): Start 40%, 2 End 10-0, 3

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
○								None found during survey
Orange sulphur	Flying			X	2	167	18	found during veg. survey.

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR3 Observer (s): C. Morgan; K. W Date: 9/13/11 Sheet ___ of ___

Air Temp. (°C): Start 93 End 96 Weather (% CC; Wind Speed): Start 60%, 3 End 60%/3

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
common Hackberry	flying			X	1	4.3	19.2	RR3-1
Ceranus blue	flying			X	1	0	49.6	RR3-3
unknown	"			X	1	206	14.3	RR3-2
pygmy blue	nectar	sunflower		X	1	179.6	15.9	RR3-4

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RK4 Observer (s): KW [illegible] Date: 9/8/11 Sheet ___ of ___

Air Temp. ('C): Start 101 End 104 Weather (% CC; Wind Speed): Start 0.0 End 1.0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
W. Pygmy Blue	nectar	purslane		X	4	23.5	48.8	RR4-1
Orange sulphur	flying			X	1	155	51	outside of plot
W Pygmy Blue	nectar	purslane		X	2	130	30	RR4-2
" "	nectar	" "		X	1	71	37.5	RR4-3
" "	" "	" "		X	3	40	51.2	RR4-4

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: RR1 Observer (s): C. Morgan, KLM Date: 9/12/11 Sheet ___ of ___

Air Temp. (°C): Start 104 End 107 Weather (% CC; Wind Speed): Start 0, 40% End 1, 35%

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Orange sulphur	flying			X	1	70	5	All Found during vegetation surveys
" "					1	180	3	
" "					1	230	2.5	
W. Pygmy Blue	Nectaring	heliotrope		X	1	393	4	RR1-1

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR1　　Observer (s): C. Morgan; K. Ivy　　Date: 9/9/11　　Sheet ___ of ___

Air Temp. ('C): Start 865 End 87　　Weather (% CC; Wind Speed): Start 85%, 7　　End 35%, 7.5

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
yellow	flying			X	1	101.5	2	[illegible] ate yellow
yellow	nectar	tamarisk		X	1	140	3	during veg surveys

CR1-1

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR2 Observer (s): C. Morgan, K. Ivy Date: 9/8/11 Sheet ___ of ___

Air Temp. ('C): Start 104 End 106 Weather (% CC; Wind Speed): Start 0, 1 End 0, 2

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR3 Observer (s): C Morgan Date: 9/9/11 Sheet ___of ___

Air Temp. ('C): Start 36 End 36.5 Weather (% CC; Wind Speed): Start 30%; 7.5 End 35%; 7

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
Yellow (sp)	flying			✓	1	115	4	CR3-1
Yellow Orange Sulphur	flying			X	1	35	12	orange sulphurs - found during vegetation
Orange sulphur	flying			X	1	95	22	during veg. survey

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CR4 Observer (s): C. Morgan, K. Ivy Date: 9/9/11 Sheet ___ of ___

Air Temp. ('C): Start 87 End 89 Weather (% CC; Wind Speed): Start 10%, 6.5 End 10%, 6

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes
0								

Behavoir: Nectaring, basking, flying, drinking water

Yuma East Wetlands Butterfly Search Datasheet

Site: CRS Observer (s): [illegible] Date: [illegible] Sheet ___of ___

Air Temp. ('C): Start 86 End 95 Weather (% CC; Wind Speed): Start 15% 5 End 15% 0

			Collected					
Butterfly Species	Behavior	Plant Species	Yes	No	# of Individuals Detected	Location on Transect (m)	Lateral Distance from Transect (m)	Notes

Behavoir: Nectaring, basking, flying, drinking water

C. Morgan KLM

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) RR1 9/6/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals	
Column1	Column2	Column3	Column4	Column5	Column6	
1			0			
2			0			
3			0			
4			0			
5			0			
6			0			
7			Marsh Fleabane		5	120
8			0			
9			Purple Flower [illegible]		7	14.
10			0			
11			0			
12			0			
13			0			
14			0			
15			0			
16			0			
17			0			
18			0			
19			0			
20			0			
21			0			

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) RF 2 4/7/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals
Column1	Column2	Column3	Column4	Column5	Column6
1			0		
2			0		
3			0		
4			0		
5			0		
6			0		
7			0		
8			0		
9			0		
10			0		
11			0		
12			Baccharis spp		1, 1
13			0		
14			0		

RAWPF Nectar Resource Data Sheet

Site Name: RR3 Habitat and Number: _____ Date: 9/6/11 Collector(s): C Morgan K

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			1 yellow basking
2	baccharis spp.	1, 2	40, 12+7	
3	" "	1	164, 12	
3	heliotrope	1	2	
4	0			
5	Sandbar willow	3	22	
6	Sandbar willow	24	67	one tree had at least 21 flowers
7	baccharis sp	1	75	
8	0			
9	0			
10	horsweed	1	6	
11	Desert marigold	1	7	
12	Horseweed	1, 1	2, 7	
13	Screwbean Mesq.	1	3	
13	horse weed	1	11	
14	Horseweed	1	14	
15	Horse weed	1, 1, 1, 1, 1	5, 15, 3, 4, 7	
16	0			
17	0			
18	Primrose	1	2	
19	horseweed	2	4	
	(2) Yellow Spotted [illegible]		[illegible]	[illegible]
	yellow flying			
19	baccharis	1	30	

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) RR4 9/6/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals
Column1	Column2	Column3	Column4	Column5	Column6
1			0		
2			0		
3			0		
4			0		
5			0		
6			0		
7			0		
8			0		
9			0		
10			0		
11			0		
12			0		
13			0		
14			0		
15			0		

C. Morgan, Kelly

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) RR5 9/6/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals	Blooms
Column1	Column2	Column3	Column4	Column5	Column6	
1			Brickellia spp		1	100
2			Screwbean Mesq.		1	1
3			Desert Marigold		1	2
4			0			
5			0			
6			heliotrope		3, 2	45, 15
7			0			
8			0			
9			0			
10			0			
11			Honey Mesquite		1	3
11			baccharis	spp	1	6
12			Tamarisk		1	7 + 20
13			baccharis spp		1	35
14			0			
15			Tamarisk		1	15 + 18
16			0			
17			0			
18			0			
19			0			
20			Tamarisk		1	60
21			0			
22			0			
23			0			
24			tamarisk		1	30
25			0			
26			baccharis	spp	1	4

290 27 28 28 0 baccharis spp heliotrope 1 1, 1 55 15, 2

C Morrison

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) CR1 9/7/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals	Blooms
Column1	Column2	Column3	Column4	Column5	Column6	
1			Tamarisk		1	15 of 55
2			'' ''		1, 1	60, 1544
3			'' ''		1	45
4			'' ''		1, 1	125 220
5			'' ''		1, 1,	95, 450
6			'' ''		1, 1	455, 50
7			'' ''		1, 1	83 95
8			'' ''		1,	35
9			'' ''		1, 1	30, 465
10			'' ''		1	40
11			'' ''		1,	450+300
12			'' ''		1,	45+12
13 *			'' ''		1	70
14			'' ''		1	65
→ Yellows Nectaring on		tamarisk				

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) CR2 9/6/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals
Column1	Column2	Column3	Column4	Column5	Column6
1			Tamarisk		1
2			0		
3			0		
4			0		
5			0		
6			0		
7			0		
8			0		
9			0		
10			0		
11			0		
12			0		
13			0		
14			0		
15			0		

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date)

9/8/11 C. Morgan K. M CR3

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals	
Column1	Column2	Column3	Column4	Column5	Column6	
1			0			
2			screwbean		1	12
3			0			
4			0			
5			0			
6			0			
7			0			
8			Tamarisk		1	11
9			0			
10			0			
11			Tamarisk		1, 1	25, 2
12			0			

RAWPF Nectar Resource Data Sheet 9/7/11

Site Name: CR4 Habitat and Number: _____ Date: _____ Collector(s): C. Morgan, Kly

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Tamarisk	1	15	
2	0			
3	Tamarisk	1	8	
4	" "	1	325	
5	0			
6	Tamarisk	1	30	
7	" "	1	13	
8	" "	1	40	
9	" "	1	6	
10	" "	1, 1	30, 27	
11	Tamarisk	1,	75 + 145	
12	" "	1	200	
13	" "	1	25	

RAWPF Nectar Resource Data Sheet

Site Name: LR5 Habitat and Number: _____ Date: 9/9/11 Collector(s): C Morgan

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	Tamarisk		3	
3	0			
4	Tamarisk	1	4	
5	0			
6	Tamarisk	1	2	
7	Tamarisk	1	21	
8	" "	1	15	
9	0			
10	0			
11	0			
12	0			
13	Tamarisk	1	17	

Appendix I. Riparian Habitat and Host Plant Datasheets

Site Name: RP1 Habitat and Number: _____ Date: 7/6/11 Collector(s): R. Wayne, K. Ly

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Heliotrope	H	1																	
	bermudagrass	H	4	4	3	4	4	3	3	4										2
	phrag	H	1	1		1	1	1										1		
	white clover	H	1	1				1												
	purslane	H	1		2															
	bacc. spp.	H		1		2	3													
	honeymesq.	MC		3				3		3		5	4	4	4	3				4
	CW	MC		3				2	1	2	4					2				3
	bacc spp.	S			3			2	3	4	3				3	3	2	2	1	
	Screwbean	MC			3	2	3	5	4					3	3	1	3	2	2	
	Saltwisle				1		1													1
	Gooding	MC													4				3	
	3Square																	1		
	Palo Verde																		4	
		ft																		
	Distance to Water (ft):		104	50	95	49	56	73	101	54	96	119	65	124	76	136	141	86	170	105
	Temperature ('C):																			

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Site Name: RR1 Habitat and Number: _____ Date: 7/6/11 Collector: RWAYNE, KIVY

RAWPF Vegetation Cover Class Data Sheet

			Circular Plot Number												Unknown Species	
Plot #	Plant Species	Strata Class	19	20	21	22	23	24	25	26	27	28	29	30	Description	Collected
	CW	mc	4	5		4					3	3	3			
	Bacc. spp.	S	3		2	2	2									
	Alkali Sacaton	S	2													
	Sandbar W.	S	2													
	Bermuda	H	2													
	Honey Mis.	S	1	3	1	3		4						3		
	Purslane			1					2							
	Sorrubean	S				1	3	·	3	1		2				
		ft														
	Distance to Water (m):		155	166	119	145	101	143	47	86	86	87	39	77		
	Temperature (°C):															

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RP1 Habitat and Number: _____ Date: 7/6/11 Sheet ____ of ____ Observer (s): KWAYNE, KIVY

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1		0		8	27	Honey Mes.	S	13	42	SBM	MC
2		0		9	57	CW	MC	13	53	Goodding Willow	MC
3		0		9	64	CW	MC	13	59	" "	MC
4		0		9	70	CW	MC	13	60	" "	MC
5	20	Screwbean	S	10	31	Ho. Mes.	S	13	62	" "	MC
5	25	" "	S	11	46	Hon. Mes	MC	13	73-79	" "	MC
5	34	" "	S	11	51	" "	MC	14		0	
6	18	SBM	S	11	53	" "	MC	15		0	
6	20	SBM	S	12	30	SBM	S	16		0	
6	22	" "	S	12	35	SBM	S	17	32	Paloverde	S
6	25	" "	S	12	37	SBM	S	17	47	" "	MC
6	26	" "	S	12	39	SBM	S	18	13	Hon Mes	S
6	27	" "	S	12	40	" "	MC	19	11	Bacc. spp	S
6	28-30	" "	S	12	46	" "	MC	19	54	CW	MC
6	42	" "	MC	13	24	SBM	S	20	4	Hon. Mes	S
7	6	Bacc spp.	S	13	29	SBM	S	20	22	CW	S
7	11	" "	S	13	36	SBM	S	20	31	" "	S
8	25	Honey Mes.	S	13	38	" "	S	20	39	" "	S

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

OVER →

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RR2 Habitat and Number: _____ Date: 7/7/11 Sheet ____ of ____

Observer (s): KI, ~~SA~~ RW

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	19	Arrowweed	S	8		0		21	6	bacc. sp.	
2		0		9	7	Arrowweed	S	22	11	Arrowweed	
3		0		10	4	Arrowweed	S	23	14	screwbean	S
4		0		11		0		23	21-22	" "	S
5	1-12	Arrowweed	S	12	16	Arrowweed	S	24		0	
6	25	CW	S	13	8	" "	S	25		0	
6	32	CW	S	14	11	Arrowweed	S	26		0	
6	53	CW	MC	15	6	screwbean	S	27		0	
6	56	CW	MC	15	44	CW	MC	28		0	
6	68	CW	MC	15	55	CW	MC	29	23	Honey	S
6	77	CW	MC	15	60	CW	MC	29	29	Honey	S
7	19	CW	S	16	17	Arrowweed	S	30	16	Arrow	S
7	28	CW	S	17		0					
7	31	CW	S	18	16	screwbean	S				
7	35	CW	S	18	21	Screwbean	S				
7	40-50	CW	MC	19	8	Arrowweed	S				
7	54-59	CW	MC	19	11-16	" "	S				
7	63	CW	MC	20		0					

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: RR2 Habitat and Number: _____ Date: 7/7/11 Collector(s): KL, RW

RAWPF Vegetation Cover Class Data Sheet

			Circular Plot Number																	
Plot #	Plant Species	Strata Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Arrowwood		5	4	2	1	4	3	3	3	3	2	1	3	3	3	2	4	2	
	Honey Locust				1									3				2		
	Chokecherry						2	3	3						2	2	3		2	
	Bur oak spp.								2		1	2					2			
	Serviceberry									2							3	2	2	2
	Gooseberry										3									3
	Hawthorn												2							
	Tamarack												1							
	Quaking Aspen																			1
		ft																		
Distance to Water (m):			167	384	218	181	330	170	89	259	107	196	306	246	150	196	81	238	82	147
Temperature (°C):																				

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class		Height
Tree Tall Canopy		>10 m
Tree Middle Canopy		4- 10 m
Shrub		0- 4 m
Herbaceous & Surface Cover		<0.5 m

RAWPF Vegetation Cover Class Data Sheet

Site Name: RR2 Habitat and Number: _____ Date: 7/7/11 Collector: K1, SM

			Circular Plot Number												Unknown Species	
Plot #	Plant Species	Strata Class	19	20	21	22	23	24	25	26	27	28	29	30	Description	Collected
	Arrow		5	4	2	3	2		2			2	3	7		
	bull spp.		2		3		3	1		2	3	4	2			
	4 wing		1													
	Sesbania				1		3					2				
	honey					1					12		3	1		
	cup									2						
	Goodings												1			
		ft														
	Distance to Water (m):		179	216	141	240	190	113	199	83	115	192	204	226		
	Temperature (°C):															

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet Sheet _____ of _____

Site: RR3 **Habitat and Number:** _____ **Date:** 7/6/11 **Observer (s):** KL, SM

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	9	Sacaton	S	9	23	CW	S	16	4	~~bermuda~~	S
2	15	Gooding	S	9	18	CW	S	16	4	Sacaton	S
3	10 23	Sandbar	S	10	6	Sacaton	S	16	45	CW	S
3	10	Sacaton	S	11	10	Sacaton	S	16	21	CW	S
4	9	Sandbar	S	12	5	Sacaton	S	16	31	CW	S
4	6	Sacaton	S	12	13	CW	S	16	38	CW	S
4	17	Sandbar	S	12	15	CW	S	16	41	CW	MC
5	9	Sandbar	S	12	20	CW	S	17	3	Saltgrass	S
5	7	Sacaton	S	12	23	CW	S	17	48	bacc.	S
6	10	Sandbar	S	13	4	primrose	S	17	10	bacc.	S
6	17	CW	S	13	4	tammy	S	17	14	baccsm	S
6	21	CW	S	13	3	saltgrass	S	18	2	Saltgrass	S
6	32	CW	S	14	4	Saltgrass	S	19	2-5	primrose	S
7	8	Sacaton	S	14	3	primrose	S	19	22	CW	S
8	4	CW	S	14	3	Saltgrass	S	19	30	CW	S
8	15	CW	S	15	6	Sacaton	S	19	33	CW	S
8	26	CW	S	15	1	primrose	S	19	36	CW	S
9	7	Sacaton	S	15	23	CW	S	20	5	Sacaton	S

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

OVER →

RAWPF Vegetation Cover Class Data Sheet

Site Name: RR3 **Habitat and Number:** **Date:** 7/8/11 **Collector(s):** KL, SM

Plot #	Plant Species	Strata Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Sacaton		6	7	7	7	7	7	6	6	7	7	5	6	2	2	4	3	2	2
	bacc spp.		2		3										4	1			4	
	Gooding		2																	
	Arrowweed		1				1								1					
	heliotrope		2		3															
	sandbar			6	6	6	6	4	3	2										
	tammy			2	1										1					
	purslane		1																	
	primrose				F	1		1							2	2		1		
	CW							2	4	5	5	4	1	5	3	4	4	5		2
	white sweet clove				1	1			1								2			
	horsetail								2			1	2	3	1				1	
	honey										2	3								
	D. Marigold												1							
	Saltgrass														6	5			6	5
phragmites grass	Screwbean																2	2		
~~bermuda~~		Distance to Water (ft):	106	134	135	175	213	274	303	322	446	492	530	505	703	707	623	~~[illegible]~~ 676	788	786
sow thistle		Temperature (°C):																	2	

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The Daubenmire Cover Scale			
Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
	5 -25%	15	Uncommon
	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale			
Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class		Height
Tree Tall Canopy		>10 m
Tree Middle Canopy		4- 10 m
Shrub		0- 4 m
Herbaceous & Surface Cover		

54-0996 = Bear Spanish needle

Site Name: RR3 Habitat and Number: RAWPF Vegetation Cover Class Data Sheet Date: 7/8/11 Collector: KI, SM

			Circular Plot Number												Unknown Species	
Plot #	Plant Species	Strata Class	19	20	21	22	23	24	25	26	27	28	29	30	Description	Collected
	CW	4	4	5		4	2	4	5	5	3	3		2		
	primrose	3	3	4	4							2	3			
	sacaton	3	3	3	~~4~~ 3	4	5	7	3	7	7	4	7	7		
mexican	Sprangletop	1	1													
fan	Palm	1	1													
	bacc			1	2							4		2		
	hollyhock			1	1							1				
	Screwbean			3	2		~~5~~ 3						2			
	Cx Hyrass			4	1	3										
	honey					1					3	2				
white	sweetclover					2										
	Fleabane					1										
	horsetail					1	2	1		2						
	Arrowleaf								3			2				
	Gooding											2	4			
	Sandbar	ft												1		
	Distance to Water (ft):		702	738	678	632	615	587	443	408	472	388	362	271		
	Temperature (°C):															

Photo # Description:
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Photo # Description:

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RR4 Habitat and Number: _____ Date: 7/6/4 Sheet ____ of ____ Observer (s): R. Wayne, K. Ly

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1		0		6	45	CW	MC	20		0	
2	15	Cottonwood	S	7		0		21		0	
2	17	"	S	8		0		22		0	
2	19	CW	S	9		0		23		0	
2	25	CW	S	10		0		24		0	
2	31	CW	S	11	37	CW	MC	25		0	
2	36	CW	S	12		0		26		0	
2	42	CW	MC	13		0		27		0	
2	45	CW	MC	14		0		28		0	
3		0		15		0		29		0	
4		0		16	23	CW	S	30		0	
5	2	Purslane	H	16	27	CW	S				
6	21	CW	S	16	33	CW	S				
6	29	CW	S	17		0					
6	30	CW	S	18	16	Screwbean	S				
6	34	CW	S	18	20	SBM	S				
6	36	CW	S	19	21	SBM	S				
6	42	CW	MC	19		0					

Dm (decimeter) sections go up to >8 m. **Cover Classes**: herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: RR4 Habitat and Number: _____ Date: 7/6/11 Collector(s): R. Wayne K. Wy

RAWPF Vegetation Cover Class Data Sheet

			Circular Plot Number																	
Plot #	Plant Species	Strata Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Cottonwood	MC	4	5	3	3		4	0			0	4		0	0		5	-	4
	Arrowweed	S	1		2	1							1							
	Heliotrope	S			2		2										2	1		
	Purslane	S					5													
	Screwbean	S					3	3					2	3						3
	Bacc. spp.	S					1	1												
	Phrag.	S					1													
	Sowthistle	~~AH~~					1													
	Bacc. spp	~~H~~ S						1												
	Cottonwood	S								4	3						4		5	
		~~Ft~~																		
Distance to Water (m):			211	156	155	269	315	67	198	331	318	307	159	90	318	224	160	254	275	284
Temperature (°C):																				

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Site Name: RR4 Habitat and Number: RAWPF Vegetation Cover Class Data Sheet Date: 7/6/11 Collector: R WAYNE, K IVY

			Circular Plot Number												Unknown Species	
Plot #	Plant Species	Strata Class	19	20	21	22	23	24	25	26	27	28	29	30	Description	Collected
	Screwbean	S	3	0									0	3		
	CW	MC		0	3	4	3	4		3		4		4		
	Bacc. spp.	S						1			1	1				
	Heliotrop	S						2			4					
	purslane	S						1								
	4-Wing	S							2			2				
	Amaranth	S								1		1				
	Quailbush	S									1					
		Ft														
	Distance to Water (m):		290	286	203	333	99	160	359	261	110	163	141	124		
	Temperature (°C):															

Photo # Description:
Photo # Description:
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Photo # Description:
Photo # Description:

The Daubenmire Cover Scale			
Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
	5 -25%	15	Uncommon
	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale			
Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RR5 Habitat and Number: _____ Date: 7/7/11 Sheet ___ of ___

Observer (s): K1, ~~SOR~~ RW

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	44	Gooding	MC	11	25	Honey	S	22	4	Bacc sp	S
1	73	" "	MC	11	33-40	CW	S	22	25-27	" "	S
2	18	bacc. sp	S	11	49	CW	MC	23		0	
3		0		11	62-69	CW	MC	24	17	honey	S
4		0		11	73-79	CW	MC	24	31	" "	
5	34	CW	S	12		0		24	33-36	" "	S
5	38	CW	S	13		0		25		0	
5	50-59	CW	MC	14	38-40	CW	S	26	57	CW	MC
5	64	CW	MC	15		0		26	61-68	CW	MC
5	70	CW	MC	16		0		27		0	
6	28	Strawbea	S	17	14	bacc sp.	S	28		0	
6	34	" "	S	18	12	Arrowwood	S	29		0	
7		0		19		0		30		0	
8		0		20	36	Gooding	S				
9	4	Arrow	S	20	52	Gooding	MC				
10	60	CW	MC	20	62	" "	MC				
10	69	CW	MC	21	25	CW	S				
10	79	CW	MC	21	28	CW	S				

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: RR5 Habitat and Number: _____ Date: 7/7/11 Collector(s): KI, SOREW

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Gooding		3		1				2											
	bacc. ssp		1	4		2	1	2	2		1						1		3	
	phrag.		1	1			1			1	1									
	Honey				2				3	1		3	3							
	Arrowweed					2				1	2			2		4				3
	CW						4	3				4	5		3	2	2	3	2	
	Paloverde						2													
	tamarisk							1				1	1	3	2		1	4		2
	Quailbush																	2		
	Screwbean																		3	
	Distance to Water (m):																			
	Temperature (°C):																			

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class		Height
Tree Tall Canopy		>10 m
Tree Middle Canopy		4- 10 m
Shrub		0- 4 m
Herbaceous & Surface Cover		<0.5 m

Site Name: RR5 Habitat and Number: _____ Date: 7/7/11 Collector: KI, SM

RAWPF Vegetation Cover Class Data Sheet

			Circular Plot Number												Unknown Species	
Plot #	Plant Species	Strata Class	19	20	21	22	23	24	25	26	27	28	29	30	Description	Collected
	ball. spp.		2			3		2	1		2		1			
	tansy		3	3			3				1	1		1		
	Bedding			3						4						
	CW				4					3		2				
	Sandbar					2										
	honey						3	4								
	heliotrope										1					
Distance to Water (m):																
Temperature ('C):																

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Site Name: CR1 Habitat and Number: RAWPF Vegetation Cover Class Data Sheet Date: 7/19/11 Collector(s): K.T.DM

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	tamarisk		6	7	5	5	6	6	7	4	6	5	4	7	5	6	7	6	7	3
	Arrowweed					1				1		1	2							5
	Sorenbea									2			1							
		Ft																		
	Distance to Water (m):		144	152	134	160	115	96	101	103	160	133	170	92	78	85	71	73	68	68
	Temperature (°C):		8/21																	

Photo # Description:

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Photo # Description:

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50-75%	62.5	Common
6	75-95%	85	Abundant
7	95-100%	97.5	Dominant

Strata Class		Height
Tree Tall Canopy		>10 m
Tree Middle Canopy		4- 10 m
Shrub		0- 4 m
Herbaceous & Surface Cover		<0.5 m

Site Name: CR1 Habitat and Number: _____ Date: 7/11/11 Collector: K1, DM

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 19	20	21	22	23	24	25	26	27	28	29	30	Unknown Species: Description	Collected
	Tamarisk		6	4	6	5	5	3	7	6	7	7	6	5		
	Arrowweed		4	3		1	4	7	4							
	Honey			5												
		F+														
	Distance to Water (m):		73	143	168	187	191	113	78	62	92	106	118	135		
	Temperature ('C):															

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: CR1 Habitat and Number: _____ Date: 7/11/21 Observer (s): EL, DM Sheet ____ of ____

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	6	Tamarisk	S	6	17	Tamarisk	S	13	20	" "	S
1	11	" "	S	6	20	" "	S	14	11	" "	S
1	14	" "	S	6	25-31	" "	S	14	17-18	" "	S
1	20	" "	S	6	49-54	" "	MC	14	29-40	" "	S
1	22	" "	S	7	11	" "	S	14	45-49	" "	MC
2	16	Tamarisk	S	7	27-	" "	S	15	17	" "	S
2	6	" "	S	7	42	" "	MC	15	22	" "	S
2	17-20	" "	S	8	20	Sorrelbean	S	16	8	" "	S
2	28	" "	S	9	11	Tamarisk	S	16	14	" "	S
2	34	" "	S	9	17	" "	S	17	6	" "	S
2	40	" "	MC	9	30	" "	S	17	13	" "	S
3	20	Tamarisk	S	9	34	" "	S	17	20-26	" "	S
3	23	" "	S	9	40-44	" "	MC	18	7-21	Arrowweed	S
~~4~~		~~0~~		~~10~~	~~18-19~~	" "	S	18	28-30	Tamarisk	S
5	22	Tamarisk	S	11	21	" "	S	18	38	Tamarisk	S
5	27-29	" "	S	12	23	" "	S	18	41	" "	MC
5	38-44	" "	MC	12	43	" "	MC	18	44	" "	MC
6	10	" "	S	13	7-13	" "	S				

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

CR2 - 7/7/11 RWAYNE, KIVY

Pt.#	DM	Species	Cover	Pt.#	DM	Species	Cover	Pt.#	DM	Species	Cover
1		0		11	11-19	phrag	5				
2	10	phrag	5	12		0		25		0	
2	16-18	phrag	5	13		0		26		0	
~~3~~	20	screwbean	5	14		0		27		0	
3	27	" "	5	15		0		28		0	
3	31-39	" "	5	16	8-35	Arrowweed	5	29		0	
				17		0					
4		0		18		0		30		0	
5		0		19		0					
6		0		20		0					
7		0		21		0					
8		0		22		0					
9		0		23		0					
10	15	phrag	5	24		0					

Site Name: CR2 **Habitat and Number:** ______

RAWPF Vegetation Cover Class Data Sheet

Date: 7/7/11 **Collector(s):** R. Waynes, K. Ley

			Circular Plot Number																	
Plot #	**Plant Species**	**Strata Class**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
	tamarisk	MC	4	2	3	3	2	3	2	1								2		0
	phrag	S	2	3	4	2	1	1		2	3	3	3	3	2	1				
	Arrowweed	S	2	2	1		2									2	4	4		
	Screwbean			2	3															
	Bacc. spp.																		2	
		Distance to Water (~~m~~ ft):	258	268	290	298	332	368	352	359	389	394	404	428	427	420	459	444	486	490
		Temperature ('C):																		

Photo # ______ **Description:** ______
Photo # ______ **Description:** ______
Photo # ______ **Description:** ______
Photo # ______ **Description:** ______
Photo # ______ **Description:** ______

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class		Height
Tree Tall Canopy		>10 m
Tree Middle Canopy		4- 10 m
Shrub		0- 4 m
Herbaceous & Surface Cover		<0.5 m

RAWPF Vegetation Cover Class Data Sheet

Site Name: CR2 Habitat and Number: _____ Date: 7/7/11 Collector: RWAYNE, KIVY

			Circular Plot Number												Unknown Species	
Plot #	Plant Species	Strata Class	19	20	21	22	23	24	25	26	27	28	29	30	Description	Collected
	Arrowhead		0	3	4			0	0	0			0	0		
	Gooding					1										
	Prag						1									
	tamarisk									1	1					
	bacc. spp											2				
		ft														
	Distance to Water (m):		516	532	563	552	544	560	595	592	605	629	651	637		
	Temperature (°C):															

Photo # _____ Description:
Photo # _____ Description:
Photo # _____ Description:
Photo # _____ Description:
Photo # _____ Description:

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Sheet ____ of ____

Site: CR3 **Habitat and Number:** _____ **Date:** 7/7/11 **Observer (s):** E.W, K.J

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	14	Arrowweed	S	14	10	Arrowweed	S	29		0	
2	4	Arrowweed	S	14	16-17	" "	S	30		0	
3		0		15	6-10	" "	S				
4	0-11	Arrowweed	S	16	12	Arrow	S				
4	12-15	tammy	S	16	18	Tammy	S				
4	22	tammy	S	16	21-23	tammy	S				
5	11-13	Arrowweed	S	17	7	Arrowwe	S				
6	15	Arrowweed	S	18	7	" "					
7	8	" "	S	19	8	Arrowweed	S				
8	9	Arrowwe	S	20	11-14	" "	S				
8	12	" "	S	21	6	" "	S				
9	20	Arrowed	S	22		0					
10	41	CW	ML	23		0					
~~10~~	~~51~~	~~CW~~	~~ML~~	24		0					
10	51-58	CW	ML	25	13	Arrowweed	S				
11		0		26	8	" "	S				
12	6-19	Arrowweed	S	27		0					
13	4	Arrowweed	S	28		0					

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

RAWPF Vegetation Cover Class Data Sheet

Site Name: CR3 Habitat and Number: _____ Date: 7/7/11 Collector(s): ~~[illegible]~~ R.W.K.

			Circular Plot Number																	
Plot #	Plant Species	Strata Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Arrowwood		5	3	2	2	2	5	5	4	3	3	2	5	3	3	3	4	2	4
	tamarack			1		3			2	2	2					2		3		
	Swamp boom					3				3										
	Gooding						1					2			1					
	CW											3								
		F4																		
	Distance to Water (m):		331	570	499	454	585	493	534	556	541	515	556	513	579	546	496	469	564	520
	Temperature (°C):																			

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

RAWPF Vegetation Cover Class Data Sheet

Site Name: CR3 Habitat and Number: _____ Date: 7/7/11 Collector: RW, KI

			Circular Plot Number												Unknown Species	
Plot #	Plant Species	Strata Class	19	20	21	22	23	24	25	26	27	28	29	30	Description	Collected
	Arrowweed		3	1	4	3	2	2	4	2	2	2	3	2		
	tamarisk		1			1		3			2	2	1	3		
		A														
Distance to Water (m):			484	440	516	483	499	481	428	477	492	435	405	466		
Temperature (°C):																

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: CR4 Habitat and Number: _____ Date: 7/11/11 Sheet ____ of ____ Observer (s): K.I, DM

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	14	Arrowweed	S	14	18	Tammy	S	24	10	Screwbean	S
1	17	" "	S	14	31-34	" "	S	24	30	" "	S
2	13-16	Arrowweed	S	15	7	Arrowweed	S	25	10	Arroweed	S
3	10-16	Arrowweed	S	16	17	Tammy	S	26		0	
3	19	Tamarisk	S	17	7	Arroweed		27	10	Tammy	S
4	11-21	Tammy	S	18	7	Tammy	S	28	14	Arrowd.	S
5		0		18	27-40	" "	S	29	17	Screwbean	S
6	24-30	Tammy	S	18	41	" "	MC	29	25	" "	S
7	9	" "	S	19	6	" "	S	29	32	" "	S
7	17	" "	S	19	20	" "	S	30	5-20	Tammy	S
7	22	" "	S	19	26	" "	S				
8		0		19	7	Arrowweed	S				
9	3	Arrowweed	S	19	17	" "	S				
~~10~~	~~2-11~~	" "	S	~~20~~		0					
11	18	Tammy	S	21	11	Arrowweed	S				
12	10	" "	S	22		0					
12	16	" "	S	23		0					
13	15-19	" "	S	24	3	Arrowweed	S				

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

RAWPF Vegetation Cover Class Data Sheet

Site Name: CR4 Habitat and Number: _____ Date: 7/11/11 Collector(s): KL, DM

			Circular Plot Number																	
Plot #	Plant Species	Strata Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Arrowweed		5	6	4	5	3	1	2	3	2	3	4	2	2	3	1	4	2	7
	Tamarisk		3	3	3	3	4	6	5	3	1	1	3	3	3	4	1	3	3	
	Screwbean		3																	
		ft									547									
	Distance to Water (ft):		297	297	306	335	397	423	461	504	~~467~~	612	655	666	660	643	682	635	565	584
	Temperature (°C):		32.5	C°																

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale			
Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale			
Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

P15-1024-1027

Site Name: CR4 Habitat and Number: _____ Date: 7/11/11 Collector: K1, DM

RAWPF Vegetation Cover Class Data Sheet

			Circular Plot Number												Unknown Species	
Plot #	Plant Species	Strata Class	19	20	21	22	23	24	25	26	27	28	29	30	Description	Collected
	Arrowreed		3	2	3	3	3	3	3	4	3	3	3	4		
	Tamarisk		5	4	1	1	1	1	3		2	2	1	5		
	Sweetbean						3	4					4			
	Goodding CW											2				
														2		
		Ft														
	Distance to Water (m):		588	540	564	562	522	472	396	295	224	158	130	129		
	Temperature (°C):															

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

CR5 - 7/11/11 - K1, DM

1	29	Tammy	S	8	38	Tammy	S	15		O		24	18-31	Tammy	S
1	38-40	" "	S	8	43	" "	MC	16	53	Tammy	MC	25	9	" "	S
1	40-46	" "	MC	9	17	" "	S	16	65	" "	MC	25	31-37	" "	S
2	10	" "	S	9	22	" "	S	17		O		26	3	" "	S
2	37	" "	S	10	32	" "	S	18	15	Arrow W.	S	26	14	Arrow W.	S
2	46	" "	MC	10	43	" "	MC	18	24	Tammy	S	26	18-22	Tammy	S
3	4	" "	S	10	55	" "	MC	18	28	" "	S	27	21	" "	S
3	22	" "	S	10	64	" "	MC	19	12	" "	S	27	28-34	" "	S
3	26-32	" "	S	11	24-30	" "	S	19	19-22	" "	S	27	52	" "	MC
3	38	" "	S	11	38	" "	S	20	20	" "	S	27	63	" "	MC
4		O		12	16	Arrow W.	S	20	26	" "	S	28	28	" "	S
5	16	Tammy	S	12	27	Tammy	S	20	42	" "	MC	29	13	" "	S
6		O		13	11	Arrow W.	S	20	47-52	" "	MC	29	19-26	" "	S
7	18-23	Tammy	S	13	43	Tammy	MC	21		O		29	29	" "	S
7	33	" "	S	14	10	" "	S	22	14	Arrow W.	S	30	18-21	Arrow W.	S
8	19	" "	S	14	26	" "	S	23	19	Tammy	S				
8	27	" "	S	14	39	" "	S	23	28	" "	S				

RAWPF Vegetation Cover Class Data Sheet

Site Name: CR5 Habitat and Number: _____ Date: 7/11/11 Collector(s): KL, DM

			Circular Plot Number																	
Plot #	Plant Species	Strata Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Tammy		6	7	6	3	6	3	5	6	5	7	5	4	6	7	3	6	5	4
	Arrowweed		1		1	4	1				2		4	3	2					6
	honey					1														
		ft																		
Distance to Water (m):			486	498	513	566	543	610	626	649	611	598	638	632	692	724	694	744	808	837
Temperature (°C):			34																	

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class		Height
Tree Tall Canopy		>10 m
Tree Middle Canopy		4- 10 m
Shrub		0- 4 m
Herbaceous & Surface Cover		<0.5 m

Pic 1031

Site Name: CR5 Habitat and Number: _____ Date: 7/12/11 Collector: KL-BM

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 19	20	21	22	23	24	25	26	27	28	29	30	Unknown Species: Description	Collected
	Tammy		5	6	3	3	5	5	5	4	5	4	6	4		
	Arrowweed					3	3			4		4		3		
		F7														
Distance to Water (m):			788	828	788	827	865	861	920	915	876	892	755	671		
Temperature ('C):																

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Appendix J. Wetlands Habitat Datasheets

Research AWPF Total Vegetation Volume Data Collection Sheet

Sheet 1 of 2

Site: _____ Habitat and Number: _____ Date: 09/21/11 Observer (s): C. Morgan and L. Zepeda

Between RW2 and CW2

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	6	Tammy		8	12	Arrowweed		15	46	Phrag	
2	63	Cattail		9	—	— Open water			109		
"	70	"		10	46	Cattail			189		
3	55	Cattail		"	59	"		16	44	Phrag	
4	81	Arrowweed		"	64	"		"	78	"	
"	84	"		"	131	"		"	139	"	
"	66	"		"	177	"		"	146	"	
"	139	Cattail		11	84	Cattail		17	35	Phrag	
5	64	Cattail		"	93	"		"	42	"	
"	75	"		"	127	"		"	41	"	
"	144	"		12	14	Tammy		"	64	"	
"	187	"		"	15	"		"	107	"	
6	—	— open water		13	82	Tammy		"	158	"	
7	127	Cattail		"	194	"		18	46	Phrag	
"	183	"		13	351	Goodding willow		"	78	"	
"	186	"		"	422	"		"	142	"	
"	221	"		14	—	bare ground		19	33	Phrag	
8	4	Hyssop		15	31	Phrag			71	11	

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Research AWPF Total Vegetation Volume Data Collection Sheet

Sheet 2 of 2

Site: CW1 Habitat and Number: _____ Date: 09/21/11 Observer (s): C. Morgan and L. Zepeda

Between RW2 and CW2

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
19	109	Phrag									
	207	"									
	297	"									
20	17	Phrag									
	49	"									
	74	"									
	180	"									
	240	"									
	310	"									

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: CW1 Between RW2 and CW2

RAWPF Vegetation Cover Class Data Sheet

Habitat and Number: _____ Date: 09/21/11 Collector(s): C. Morgan and L. Zupeda

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Tansy	shrub	3	2	1	2			3	4		3	1	4	3							
	Cattail	shrub	5	6		5	7		6			5	6		3							
	~~Mpl~~ Arrowweed	shrub		1	4	4				2		3	1									
	Openwtr	S.C.						7			7											
	Marsh Fleabane	shrub							1	2				2								
	Kyssop	herb								6												
	Spearleaf	herb											8	2								
	Purslane	herb												1								
	G. W.	TMC												~~8~~	5							
	Bareground	S.C.														7						
	Phrag	TMC															7	6	6	7		
																					6	7
Distance to Water (m):																						
Temperature ('C):			98	98	98	98	98	98	99	99	99	99	99	99	99	99	99	99	99	98	98	98

Photo # _____ Description: _____

Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet Sheet ____ of ____

Site: CW2 **Habitat and Number:** _____ **Date:** 09/19/11 & 09/21/11 **Observer (s):** C. Morgan, L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	202	Salt cedar		7	119	Arrowweed		16	103	Phrag	
	288	"		9	142	Salt cedar			159	"	
	105	"			208	"			331	"	
	70	"		8	0	bare ground		17	23	Phrag	
2	382	Salt cedar		10	84	Quail bush			52	"	
	271	"			115	"			125	"	
3	75	Salt cedar			158	"			359	"	
	152	gopping Willow		11	105	Arrow-weed		18	43	Phrag	
	206	"		12	13	Fanleaf crinkle mat			75	"	
	304	"		13	40	Salt cedar			120	"	
	567	"			65	"			280	"	
4	17	Arrowweed			70	"		19	97	Cat tail	
	110	"			88	"			176	"	
5	0	Open water		14	165	Quail bush			211	"	
6	0	Bare ground		15	60	Salt cedar		20	14	Cat tail	
7	62	Arrow weed			123	Arrow weed			85	Phrag	
	70	"		16	15	Phrag			150	"	
	91	"			30	"					

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

RAWPF Vegetation Cover Class Data Sheet

Site Name: CW2 Habitat and Number: _____ Date: 09/19/11 & 09/21/11 Collector(s): C. Morgan, L. Zepeda

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Salt cedar	Shrub	6	6	5	5		4			5				6		4					
	Gooding willow	Mtc			6																	
	Arrow Weed	Shrub				3			5		2		4			2	4					
	Fan palm	Ttc				3																
	Open water	S.cover					7															
	Fanleaf crinkleroot	herb							1				2	2								
	Bare ground	S.cover								7												
	Quail bush	shrub										6				5						
	Phrag	shrub																5	7	7	4	4
	Giant Salvania	herb																4			4	3
	Cat tail	shrub																			4	3
	Marsh flea	shrub																			2	
	Distance to Water (m):																					
	Temperature ('C):		81	81	81	81	81	82	82	82	82	82	83	83	83	83	83	83	83	84	84	84

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: CW3 Habitat and Number: _____ Date: 09/21/11 Sheet 1 of 2

Observer (s): C. Morgan and L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	155	Arrow weed		6	114	Cattail		10	167	Phrag	
	45	"		"	160	Phrag		11	23	Phrag	
2	45	Salt cedar		"	259	Cat tail			51		
3	0	Open water		7	24	Phrag			149		
4	38	Arrow weed			57	"			161		
	59	"		8	30	Phrag		12	35	Phrag	
	120	Salt cedar			45	"			94	"	
	153	"			87	"			126	"	
5	20	Phrag			165	"			160	"	
	55	"			214	"			204	"	
	62	"		9	20	Rat tail			403	Gooding will	
	77	"			50	"		13	0	Open H2O	
	92	"			87	"		14	35	Cat tail	
	105	"			123	Phrag			85	Phrag	
	140	"			162	"			146	"	
	174	"		10	20	Phrag			190	"	
	247	"			75	"		15	120	Cat tail	
	277	"			143	"			155	"	

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: CW3 Habitat and Number: _____ Date: 09/21/11 Observer (s): C. Morgan and L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
15	291	Cat-tail									
16	94	Phrag									
17	45	Cat tail									
	134	"									
	155	"									
	209	"									
18	241	Salt cedar									
	29	Phrag									
	97	"									
	133	"									
19	54	Arrow-Weed									
	143	"									
	222	Salt cedar									
20	116	Arrow-weed									
	59	"									
	197	Salt cedar									
	310	Salt cedar									

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

RAWPF Vegetation Cover Class Data Sheet

Site Name: CW3 Habitat and Number: _____ Date: 09/21/11 Collector(s): C. Morgan and L Zepeda

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Arrow weed	shrub	4			3															4	4
	Salt cedar	shrub	3	3		3														5	5	4
	Bacharis	shrub	2																			
	Open water	S.C.			7										7							
	Phrag	shrub					7	5	6	7	4	3	7	5		4		3		4		
	Cat tail	shrub						4			5	4				5	5	2	5			
	Giant salvinia	herb						4	3			4					2					
	Willow	shrub												4						-		4
	Marsh flea	shrub																	3			
	Distance to Water (m):																					
	Temperature (°C):		84	84	85	85	85	85	85	86	86	86	86	86	86	86	87	87	87	87	87	87

Photo # _____ Description: * Phragmites were more than 4 meters at some points.

Photo # _____ Description:

Photo # _____ Description:

Photo # _____ Description:

Photo # _____ Description:

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: CW 4 Habitat and Number: _____ Date: 09/19/11 Sheet 1 of 1 Observer (s): C. Morgan and L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	300	Salt cedar		7	295	Baccharis		14	19	Hyssop	
	143	"			282	"			22	"	
2	220	Phrag			253	"		15	30	Phrag	
	147	"		8	226	Gooding will			120	"	
	98	"			249	"			223	Salt cedar	
	37	"		9	138	Arrow-weed			404	"	
3	310	Baccharis			195	Salt cedar		16	20	Baccharis	
	198	"		10	30	Phrag			96	"	
4	410	Phrag			55	"		17	30	Phrag	
	286	"			145	"			210	"	
	85	"			454	"		18	21	Hyssop	
	342	Baccharis		11	0	Open water			151	Cattail	
5	737	Fan palm		12	146	Phrag		19	220	Cattail	
	643	"			203	"			236	"	
	303	"		13	15	Hyssop		20	57	Phrag	
6	185	Sand bar			22	"			91	"	
	32	Salt cedar			27	"			330	"	
7	327	Baccharis		14	10	Hyssop			475	"	

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: CW4 Habitat and Number: Date: 09/19/11 Collector(s): C. Morgan and L. Zepeda

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Salt cedar	shrub	4		3			3	3	3	5						4			1		
	Arrow-weed	shrub	4	3						4	5											
	Phrag	Tmc	3	6		6		1				7		3			5	3	5			7
	Baccharis	shrub			5	4	3		6								3	4				
	Fan palm	Tmc					6															
	Sandbar	shrub						4														
	Goo Ding's	Tmc								5												
	Open water	sc											7									
	Hyssop	herb												3	7	7				6	3	
	Marsh flea	Shrub													2	1				1	2	
	Cat tail	shrub																3		3	5	1
	Giant salvia	herb																	2			
	Distance to Water (m):																					
	Temperature ('C):		85	85	85	85	85	86	86	86	86	87	87	87	87	87	87	87	87	87	88	88

Photo # Description:

Photo # Description:

Photo # Description:

Photo # Description:

Photo # Description:

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: CW 5 Habitat and Number: _____ Date: 09/21/11 Sheet 1 of 2

Observer (s): C. Morgan and L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	42	Phrag		6	96	Phrag	11	11	66	Salt cedar	
	57	"			143	"			98		
	79	"			237	"			233		
	92	"			323	"		12	79	Salt cedar	
	111	"		7	60	Phrag			90	"	
	176	"			98	"			156	"	
2	47	Phrag			114	"			247	"	
	111	"			148	"		13	31	Salt cedar	
	201	"			207	"			62	"	
	221	"		8	95	Phrag			145	"	
3	64	Phrag			25	"			241	"	
	128	"		9	41	Phrag			302	"	
	216	"			85	"		14	75	Salt cedar	
4	90	Phrag			126	"			106	"	
	232	"			219	"			155	"	
	287	"			312	"			248	"	
	319	"		10	99	Phrag			314	"	
5	0	Open water			239	"		15	40	Arrow weed	

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Research AWPF Total Vegetation Volume Data Collection Sheet

Sheet 2 of 2

Site: CW5 Habitat and Number: _____ Date: 09/22/11 Observer (s): L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
15	152	Salt cedar		20	221	Salt cedar					
	165	Arrow weed			295	"					
16	140	Salt cedar									
	269	"									
	471	"									
17	373	Salt cedar									
18	136	Salt cedar									
	170	"									
	226	"									
	281	"									
19.	55	Salt cedar									
	119	"									
	140	"									
	181	"									
	305	"									
	350	"									
20	140										
	195										

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

RAWPF Vegetation Cover Class Data Sheet

Site Name: CW5

Habitat and Number: ______

Date: 09/21/11 & 09/22/11

Collector(s): C. Morgan and L. Zepeda

Plot #	Plant Species	Strata Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Phrag	Mtc, shrub	7	7	7	7		7	7	7	7	7										
	Open water	SC					7															
	Salt cedar	shrub											7	7	7	6	7	7	7	7	7	7
	Arrow weed	shrub											3	2		3	2					1
	Distance to Water (m):																					
	Temperature ('C):		96	96	96	96	96	97	97	97	97	97										

Photo # ______ Description:

Photo # ______ Description:

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Site Name: CW6 **Habitat and Number:** ________

RAWPF Vegetation Cover Class Data Sheet

Date: 09/21/11 + 09/22/11 **Collector(s):** C. Mayer & L. Zepeda

			Circular Plot Number																			
Plot #	**Plant Species**	**Strata Class**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CW6	Cattail	herb	6	3	6			5		6												
CW6	Phragmites	shrub		6	3		7	4	7	3	7				5	6	7		7			
	Open water	S.C.				7						7										
	Bare ground	S.C.											7					7		7		7
	Salt bush	Shrub												6							7	
	Arrow weed	shrub													4	3	2					
		Distance to Water (m):																				
		Temperature ('C):																				

Photo # ________ **Description:** ________

Photo # ________ **Description:** ________

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class		Height
Tree Tall Canopy		>10 m
Tree Middle Canopy		4- 10 m
Shrub		0- 4 m
Herbaceous & Surface Cover		<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Sheet 1 of 1

Site: CW6 Habitat and Number: _____ Date: 09/21/11 & 09/22/11 Observer (s): C. Morgan and L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	40	CaVail		7	25	Phrag		14	88	Arrow weed	
	70				33			15	324	Phrag	
	85			8	67	CaVail			161	"	
	130				80				133	"	
2	70	Phrag			231				78	"	
	145			9	57	Phrag			32	"	
	280				98			16	0	Bare ground	
3	90	Phrag			130			17	244	Phrag	
	240				333				257	"	
	403			10	—	— ground			128	"	
4	—	— ground		11	0	Bare ground			91	"	
5	155	Phrag		12	34	Salt bush			54	"	
	252				66	Salt bush			28	"	
	279				78	Salt bush		18	0	Bare grond	
6	205	Phrag		13	60	Arrow-weed		19	30	Salt bush	
	212	CaVail			76	"			71	"	
	252				118	"			89	"	
7	65	Phrag		14	39	Arrow-weed			188	"	

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

20 0 Bare ground

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: CW7 Habitat and Number: _____ Date: 09/21/11 Sheet 1 of 1 Observer (s): C. Morgan, and L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	45	Salt cedar		9	311	Salt cedar		18	137	Arrow weed	
	142	"		10	70	Arrow weed			205	Sandar willow	
2	54	Arrow weed			73	"		19	115	CA bulrush	
	67	"			84	"			158	Salt cedar	
3	99	Arrow weed		11	60	Baccharis		20	50	Phrag	
	138	"			158	"			101	Salt cedar	
4	49	Gooding's Willow			179	"			230	Phrag	
	93	"		12	162	Cat tail					
5	178	Screw bean mesquite			350	Gooding willow					
6	51	Baccharis		13	69	Marsh flea					
	177	"			79	"					
7	40	Arrow weed		14	0	Open water					
	84	"		15	69	CA Bulrush					
8	45	Salt cedar			158	"					
9	100	Baccharis		16	95	CA Bulrush					
	172	"			220	"					
	190	"		17	87	CA Bulrus					
	211	"			165	Tammy					

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: CW7 Habitat and Number: _____ Date: 09/21/11 Collector(s): C. Morgan and L. Zepeda

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Salt cedar	shrub	4		3			2	3	2	3	3	2						2	2	4	3
	Arrow weed	shrub	3	3	3		2	2	3			3			1					3	2	1
	Creosote bush	shrub	1																			
	Cotton wood	Tmc			2	4	3	3														
	Good willow	Tmc				4	2				3		4	5								
	Screwbean	Tmc				3	4			1	3		1	3								
	Baccharis	Shrub				2	2	4		4	3		4						2	3		3
	Honey mesquit	shrub										1										
	Cat tail	Shrub												3					2	2		2
	Marsh	Shrub													3							
	Phrag	Shrub													2							5
	Sandbar willow	Shrub													3					3		
	Open water	SC														7						
	CA bulrush	shrub															3	4	3		3	
	Distance to Water (m):																					
	Temperature (°C):		93	93	94	94	94	94	94	95	95	95	95	95	95	95	95	96	96	96	96	96

Photo # _____ Description:

Photo # _____ Description:

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)		Class Midpoints (%)	Class Name
1	0 -1%	1	0.5	Rare
2	1 -5%	2	2.5	Occasional
3	5 -25%	3	15	Uncommon
4	25 -50%	4	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: CWS Habitat and Number: _____ Date: 09/21/11 Sheet _____ of _____ Observer (s): C. Morgan and L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	90	Phrag		8	166	Phrag		15	0	Open water	
	100	"			402	"		16	74	Phrag	
	232	"		9	230	Phrag			230	Gooding Willow	
2	17	Phrag		10	27	Cat tail			434	"	
	121	"			60	"		17	0	Open water	
	83	Cat tail			92	"		18	21	Phrag	
3	0	Open water			130	"			183	"	
4	10	Cat tail		11	0	Open water		19	190	Phrag	
	88	Phrag		12	26	Salt cedar			352	"	
	199	"			128	"		20	0	Open water	
5	54	Phrag			187	"					
	110	"		13	30	Arrow. weed					
	230	"			62	"					
6	145	Cat tail			78	"					
	248	Phrag		14	207	Phrag					
	369	"			283	"					
7	0	Open water			332	"					
8	46	Phrag			400	"					

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: CW8 Habitat and Number: _____ Date: 09/21/11 Collector(s): C. Morgan and L. Zepeda

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Salt-cedar	shrub	1										3	3						2		
	Phrag	shrub	6	7		6	7	6		7	7	5		3		7		5		7	7	
	Cat tail	shrub		1		3		3				3										
	Open water	S.C.			7				7				7				7		7			7
	Sandar will	shrub									1			1								
	Arrow weed	shrub													4							
	Good. willow	Tmc																5				
Distance to Water (m):																						
Temperature (°C):			88	88	89	89	89	89	89	90	90	90	90	90	91	91	91	91	91	91	91	92

Photo # _____ Description: _____

Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RW1 Habitat and Number: _____ Date: 09/19/11 Sheet _____ of _____ Observer (s): C. Morgan, L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	26	Sacaton		8	78	screw bean					
2	0	N/A		9	27	honey mes					
3	15	Brittle bush		10	17	pursakane					
	40	"		11	34	sacaton					
	60	"			93	"					
4	33	Sacaton			117	Baccharis					
	63	"		12	120	Ca bulrush					
5	35	three-square		13	165	Baccharis					
	77	"		14	0	Bare ground					
6	145	screw beans		15	44	sprangle top					
	203	Screw bean		16	175	Ca bulrush					
	220	"		17	123	Cottonwood					
7	65	three square		"	34	Sacaton					
	53	"		18	148	honey mes					
	105	cattail		19	20	Saltgrass					
8	60	sandbar willo		20	33	Sacaton					
	45	Ca/Kali sacaton									
	55	"									

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

RAWPF Vegetation Cover Class Data Sheet

Site Name: RW1 Habitat and Number: _____ Date: 09/19/11 Collector(s): C. Morgan, and L. Zapeda

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Sacaton	herb	3			5		2	3	3			3		3				5	2	1	5
	Baccharis	shrub	1	3								4	3		5							
	Salt cedar	shrub	1																			
	Brittlebush	shrub			2										3							
	Three-square	herb				1	4		4	3												3
	Salt grass	herb					3	3	3			1	1	2						3	4	
	Screwbean	tmc						+		4										4	2	
	honey mes	tmc						4			2	2								3		
	heliotrope	herb						1														
	Phragmites	shrub						+														
	cattai	shrub							2									3				
	Verba mansa	herb							4													4
	Sandbar willow	shrub								3								3	3			
	persalane	herb										3	2							1		
	Ca bulrush	herb												3				3				
	Marsh fleabane	shrub												2				3				
	Unk weed 1													3								
	Bare ground															7						

Distance to Water (m):

Temperature (°C):

Photo # Description:

Unk weed 1	alternate leaves, light rose color (flower), yellow center	3
Spearmint top	herb	1
Cottonwood	tmc	1
Gooding will	tmc	5

The Daubenmire Cover Scale			
Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale			
Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RW2 Habitat and Number: _____ Date: 09/15/11 Sheet 1 of 1 Observer (s): K Ivy, C Morgan,

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	23	Sacaton		7	8	Saltgrass		14	138	Cattail	20
1	29	Sacaton		8	65	Cattail		15	76	Cattail	
2	16	Sacaton		8	35	Saltgrass			85		
2	25	Sacaton		8	37	Unk weed			15		
2	50	"		9	0	—		16	37	Alkali Bulrush	
2	60	"		10	0	—			40		
2	15	Pursaline		11	50	March Fleabane			50		
3	90	SBW		11	73	"		17	40	~~Spearmint~~ ~~BTE~~	
3	140	SBW		11	40	Sandbar willow			42		
3	167	"		11	65	Ca bulrush			45		
3	220	"		12	19	Sacaton			35	Alkali Bulrush	
4	0	—		12	22				67		
5	0	—		12	31				107	Cattail BTE	
6	34	three-square		12	54			18	9	Sacaton	
6	59	"		13	24	Ca Bulrush		18	18		
7	15	Sacaton		13	37			19	65	Honey	
7	20	"		13	42				~~134~~	Honey	
7	65	"		14	68	Alkali rush			68	Sacaton	
									57		
									32	10	

9 ISG

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: RW2 Habitat and Number: _____ Date: 09/15/11 Collector: K. Ivy, C. Morgan, L. Zepeda

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 1 (19)	2 (20)	3 (21)	4 (22)	5 (23)	6 (24)	7 (25)	8 (26)	9 (27)	10 (28)	11 (29)	12 (30)	Unknown Species (13) Description	Unknown Species Collected
	Sacaton	Herb	5	3	1		2	3	4		2					
	baccharis sp	H	2								2					
	H.M.	Shrub	1						1		1					
	Sprangletop	Herb	2							1			2			
	Persaline	Herb	1	3	1		1		1							
	Salt grass	Herb						4	3	5						
	Tammy	Shrub	1								1					
	Sb W	MC			4											
	Marsh flea bane	Herb			2			3		3			4			
	Dandelion	Herb			1											
	Open water	—				7										
	heliotrop	Herb					2				3	21				
	Sandbar willow	Shrub					1	3		3			3			
	three-square	herb													Pic 285-8584	
	cat-tail	shrub								3			2			
	Unk weed 1	shrub								2					Pic 285-8584	
	Ca bulrush	herb									3		3			
	Distance to Water (m):															
	Temperature (°C):															

Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____
Photo # _____ Description: _____

Research AWPF Total Vegetation Volume Data Collection Sheet

Sheet 1 of 2

Site: RW 3 Habitat and Number: _____ Date: 9/30/11 Observer (s): L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	68	Cat tail		6	80	CA bulrush		11	98	CA bulrush	
	122	"			159	"		"	114	"	
	131	"		7	40	CA bulrush			127	"	
2	110	Cat tail			79	"			173	"	
	126	"			153	Cat tail		12	72	CA bulrush	
	142	"		8	64	CA bulrush			94	"	
	202	"			92	"			135	"	
3	60	Cat tail			149	"			176	"	
	96	"		9	44	CA bulrush		13	64	CA bulrush	
	105	"			51	"			88	"	
4	80	Cat tail			139	"			109	"	
	128	"		10	54	CA bulrush			150	"	
	134	"			59	"			170	"	
5	46	CA bulrush			79	"		14	44	CA bulrush	
	60	"			114	"			60	"	
	65	"			120	"			142	"	
	82	"			127	"			191	Cat tail	
6	45			11	81			15	30	Salt grass	

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RW 3 Habitat and Number: _____ Date: 09/30/11 Observer (s): L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
15	41	Salt grass		20	194						
16	45	Mex sprangle									
	49	"									
	58	"									
	86	"									
17	39	CA bulrush									
	65	"									
	112	Cat tail									
	189	"									
18	35	CA bulrush									
	71	"									
	99	"									
19	215	Cat tail									
	149	"									
	111	CA bulrush									
	86	"									
	60	Phrag									
20	100	Cat tail									

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: RW3 Habitat and Number: Date: 9/30/11 Collector(s): L. Zepeda

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Cat tail		5	6	5	5		1	3							4			4	1	3	6
	Salt grass		4	1	2								1				7	2				
	Mex Sprangle					3											2	7				
	CA bulrush						6	6	5	7	7	7	6	7	7	5			5	5	5	3
	Phrag																1				1	
	Purslane																	2				
	Distance to Water (m):																					
	Temperature ('C):																					

Photo # Description:

Photo # Description:

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RW4 Habitat and Number: _____ Date: 9/30/11 Sheet ____ of ____ Observer (s): L Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	75	Baccharis		5	150	CA bulrush		11	105	CA bulrush	
	163	"		6	119	Phrag			180	Cat tail	
2	22	Baccharis			156	CA bulrush		12	56	CA bulrush	
	72	"		7	70	CA bulrush			100	"	
	86	Bacchans			108	"		13	188	Sandbar	
3	44	CA bulrush			170	"			140	CA bulrush	
	67	"		8	85	CA bulrush			49	CA bulrush	
	93	"			116	"		15	54	CA bulrush	
	165	Cat tail			149	"			64	"	
4	174	CA bulrush			156	"			79	"	
	158	"		9	53	CA bulrush			104	"	
	131	"			79	"			147	"	
	100	"			98	"		16	36	CA bulrush	
	65	"			169	"			98	"	
	46	"			175	"			160	"	
5	82	CA bulrush		10	45	CA bulrush		17	79	CA bulrush	
	97	"			132	"			185	Screw bean	
	125	"			149	"		18	45	CA bulrush	

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RW4 Habitat and Number: _____ Date: 9/30/11 Sheet _____ of _____ Observer (s): L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
19	92	Salt cedar									
	139	"									
19	66	CA bulrush									
	170	Cat tail									
20	140	CA bulrush									

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: RW4 Habitat and Number: _____ Date: 9/30/11 Collector(s): L. Zepeda

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Baccharis	shrub	5								1					2						
	Screw bean	Tmc	1																3			
	Phragmites	shrub	2	2	1		1	4	1						2	1		1	1			2
	March flea bane	herb	1								1					1	1					
	Purslane	herb	2																			
	Salt grass	herb	2	2												1		1				
	CA bulrush	~~shrub~~ herb			5	7	7	4	6	6	7	6	7	5	5	4	6	7	5	5	6	5
	Cat tail	~~shrub~~ herb			2	1		3		1			2	4			2				2	
	Willow (tree)	Tmc		5	2										4							1
	Three square	herb										1								2		
	Mex sprangle	herb														1						
	Salt cedar	shrub																		3		
	Nightshade	herb	1																			
	Distance to Water (m):																					
	Temperature ('C):																					

Photo # _____ Description: _____

Photo # . Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RW5 Habitat and Number: _____ Date: 09/29/11 Observer (s): L. Zepeda

Sheet 1 of 2

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	64	Cat tail		7	213	Cat tail		14	89	CA bulrush	
	112	"			132	"			222	"	
	129	"			91	"			74	"	
	169	"		8	89	Cat tail		15	93	Cat tail	
2	54	Cat tail			109	"			156	"	
	79	"			189	"			170	"	
	104	"			207	"		16	28	Salt grass	
	154	"		9	19	Salt grass			48	Cat tail	
3	72	Cat tail			32	"			96	"	
	79	"			39	"			143	"	
	103	"		10	27	Mex sprangle			202	"	
	183	"			165	Gooding's will		17	33	Mex sprangl	
4	136	Cat tail			67	CA bulrush			41	"	
5	109	Cat tail		12	94	CA bulrush		18	49	Three squa	
	179	"			115	"			61	"	
6	71	Cat tail			149	"			35	Mex sprangle	
	163	"		13	104	CA bulrush		19	45	Three squa	
	172	"			187	Cat tail			51	"	

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Research AWPF Total Vegetation Volume Data Collection Sheet

Sheet 2 of 2

Site: RW5 Habitat and Number: _____ Date: 09/29/11 Observer (s): L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
19	55	Thee squre									
20	39	Thee squre									
	48	"									
	65	Ca bulrush									

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

RAWPF Vegetation Cover Class Data Sheet

Site Name: RW5 Habitat and Number: _____ Date: 09/29/11 Collector(s): L. Zepeda

			Circular Plot Number																			
Plot #	Plant Species	Strata Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Cat tail	herb	6	6	5	5	5	5	6	6	3	1			5	4	5	5	3			1
	CA bulrush		2					1		2			5	6	3	5	1					
	Marsh flea				2	1	1	1	1				2							1		
	Mex sprangle				1		1		1		2	3						2	5	3	2	
	Salt grass										7	3						4				
	Purslane											4										
	Willow (sand)											2										
	Salt cedar											1										
	Gooding's will												4									
	Three square																			6	6	5
Distance to Water (m):																						
Temperature (°F):			99																			

Photo # _____ Description: _____

Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RW6 Habitat and Number: _____ Date: 09/29/11 Observer (s): L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	26	Three-square	herb	7	84	Mex sprangle		12	153	Cat tail	
	42	"	herb		96	"		13	94	Cat tail	
	56	"	herb	8	81	CA bulrush			155	"	
2	31	Three square	herb		90			14	53	Cat tail	herb
	52	"	herb		93				184	"	
3	22	Three square		9	60	Hardstem		15	74	CA bulrush	
	53	"			69	"			108	Cat tail	
	88	Cat tail			116	Cat tail			120	"	
4	57	Three square			163	"		16	50	Three Squre	
	81	"		10	84	Hardstem			84	"	
	89	Mex sprangle			91	"		17	98	Sandbar	
	43	Marsh fleabane			113	Three square		18	35	Salt grass	
5	149	Ca bulrush		11	60	Three square			43	"	
	90	Three square			120	CA bulrush		19	21	Saltgrass	
	59	"		12	43	Cat tail			35	Three square	
6	141	Cat tail			87	Mex sprangle		20	9	Salt grass	
	61	Marsh flea			104	Cat tail			26	Mex sprangle	
	67	Mex sprangle			124	"					

cimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Site Name: RW6 Habitat and Number: Date: 09/29/11 Collector(s): L. Zepeda

RAWPF Vegetation Cover Class Data Sheet

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Three square	herb	6	5	5	5	5	4	1	2			2					5	5			
	Marsh flea bane	herb		2		1	3	3	3		3	3	4	2		1	2		1		1	
	Mex sprangle	herb		2		2	2		4	2	2		3	1	2	1	2				3	3
	Cat tail	shrub			2			4	3	4	5	5	5	4	6	5	4			1		
	CA bulrush	shrub					2	2	2	2		3	3	4	2	2	4	1		4		
	Salt grass	herb										2							5	5	5	4
	Sandbar will	Shrub																	3	2		2
	Pursilane	herb																			4	3
	Honey mesquite	Tmc																				4
	Distance to Water (m):																					
	Temperature (°F):		96°																			

Photo # Description:
Photo # Description:
Photo # Description:
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Photo # Description:

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

90°F

Research AWPF Total Vegetation Volume Data Collection Sheet

Sheet 1 of 2

Site: YEW **Habitat and Number:** RW 7 **Date:** 9/29/11 **Observer (s):** C. Morgan + L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	156	CA bulrush	herb	6	68	CA bulrush	herb	10	189	CA bulrush	herb
2	59	CA bulrush	herb		92			11	46	Sacaton	herb
	147				95				59		
	177				109				72		
	181				114				79		
3	137	Cattail	herb		153			12	11	ISG	herb
	153			7	97	CA bulrush	herb		88	Cattail	herb
	222				106			13	N/A	Open water	—
4	cm 96	CA bulrush	herb		117			14	18	ISG	herb
	112				179				31	CA bulrush	herb
	134			8	59	CA bulrush	herb	15	139	Cattail	herb
	187				107				145		
	212				56	ISG			149		
	245			9	60	Cattail	herb	16	23	ISG	herb
	268	Cattail			77	baccaris	shrub		12	Purslane	
5	98	CA bulrush	herb	10	112	CA bulrush	herb		134	Cattail	
	146				139			17	19	D. Sacaton	herb
	190	Cattail			149				28		

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: _____ Habitat and Number: RW7 Date: 09/29/11 Sheet 2 of 2 Observer (s): C. Morgan, L. Zepeda

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
18	35	Saccharum	Lerb								
↓	184	H. Mesquite	shrub								
↓	259	↓	↓								
19	—	Background	—								
20	29	Lehmannia	Lerb								

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

RAWPF Vegetation Cover Class Data Sheet

Site Name: [illegible] YEW Habitat and Number: RW 7 Date: 9/29/11 Collector(s): C. Morgan & L. Zepeda

Plot #	Plant Species	Strata Class	Circular Plot Number 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
RW 7	CA buttrush	Herb	6	7	5	6	6	5	6	5		6				3	5					
	CoWeil	herb	3	2	4	2	3		3			3		3			4					
	ISG	Herb	2					4		4	4			5		6	1	4				
	Screwbean	shrub	2					2			3			2				1				
	A. Saccaton	Herb	1																			
	Baccharis	shrub						1		2	4		2									
	Mr. Fleabane	Herb								3								2				
	Pursilane	Herb									4			3		3		3				
	A. Saccaton	Herb											6						5	5	Cw	1
	Open water														7							
	Heliotrope	Herb																2			B	3
	Tamarisk	Shrub																1				
	N. Mesquite	Shrub																	2	5	4	
	G. Wolfberry	shrub																				2
	Distance to Water (m):																					
	Temperature ('C):																					

Photo # _____ Description: _____

Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Research AWPF Total Vegetation Volume Data Collection Sheet

Site: RW8 Habitat and Number: _____ Date: 09/29/11 Observer (s): C. Mayo & L. Zepeda

Sheet _____ of _____

Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class	Point #	Dm Sections	Species	Cover Class
1	13	ISG	Herb	12	113	CatTail	Herb	20	11	3 Square	Herb
2	16	ISG	Herb	"	165	"	"				
"	19	"	"	13	-	open water					
"	21	"	"	14	83	CA Bulrush	Herb				
3	15	ISG	Herb	"	89	"	"				
	19	"	"	"	116	"	"				
	28	"	"	"	143	"	"				
4	36	3 square	Herb	"	149	"	"				
"	46	"	"	15	63	CA Bulrush	Herb				
5	157	CA Bulrush	Herb	16	19	ISG	Herb				
6	~~-~~	open water	-	"	49	"	"				
7	148	CatTail	Herb	17	68	CA. Bulrush	Herb				
8	28	ISG	Herb	"	79	"	"				
9	-	open water	-	"	81	"	"				
10	14	3 square	Herb	"	147	"	"				
11	66	CatTail	Herb	18	-	open water	-				
"	173	"	"	19	16	3 Square	Herb				
12	108	CatTail	Herb	20	17	Phragmites	Herb				

Dm (decimeter) sections go up to >8 m. **Cover Classes:** herb (<0.5 m), shrub (woody stems, 0- 4 m), medium canopy (4- 6 m) and tall canopy (>6 m)

RAWPF Vegetation Cover Class Data Sheet

Site Name: RW8 Habitat and Number: _____ Date: 09/29/11 Collector(s): C. Myers & L Zepeda

			Circular Plot Number																			
Plot #	Plant Species	Strata Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
RW8	ISG	Herb	5	6	6					4		3						5	4		4	4
	Baccharis	shrub		2	1																	
	Phragmites	herb			2																	
	3 square	herb				5				3		5			3						4	4
	Spearmint	herb				1																
	CA bulrush	shrub				2	3		3			2			4	6	6	3	3			1
	Pusilum	herb				1				3		2							2		1	2
	Cattail	shrub					4	4	5				5	3		3					1	
	Heliotype	herb								1												1
	Tamarisk	shrub								1		1		2							1	1
	Marsh Fleabane	herb										2	1		1						3	1
	Open water	SC									7									7		
	Arrowweed	shrub																				1
	Distance to Water (m):																					
	Temperature (°C):																					

Photo # _____ Description: _____

Photo # _____ Description: _____

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
1	0 -1%	0.5	Rare
2	1 -5%	2.5	Occasional
3	5 -25%	15	Uncommon
4	25 -50%	37.5	Somewhat common

The Daubenmire Cover Scale

Cover Class	Range of Cover (%)	Class Midpoints (%)	Class Name
5	50 -75%	62.5	Common
6	75- 95%	85	Abundant
7	95- 100%	97.5	Dominant

Strata Class	Height
Tree Tall Canopy	>10 m
Tree Middle Canopy	4- 10 m
Shrub	0- 4 m
Herbaceous & Surface Cover	<0.5 m

Appendix K. Riparian Area Search Site Photos

RR1 Looking northwest

RR1 Looking west, Typical vegetation density at eastern end of plot

RR1 Looking north, typical vegetation density at western end of plot

RR2 Looking south vegetation with varied conditions of living and dead cottonwoods

RR2 Looking west Typical vegetation: arrowweed, four-wing saltbush, screwbean/ honey mesquite, and cottonwood

RR2 Looking northwest areas mixed with dense and sparse vegetation

RR3 Looking west, Typical stand of high planting density of cottonwoods

RR3 Looking north, Typical density of vegetation at east end of plot

RR3 Looking north Typical Sandbar/ Gooding Willow stands

RR4 Looking west, typical cottonwood/mesquite planting

RR4 Looking east, typical cottonwood/mesquite planting

CR1 Looking northwest typical monoculture of tamarisk stands throughout entire plot

CR1 Looking northeast typical monoculture of tamarisk stands taken from transect

CR2 Looking west
few stands of tamarisk

CR2 looking south,
typical vegetation: few
arrowweed, tamarisk,
and Gooding Willow
amongst dead
phragmites

CR2 Looking west
at center of transect

CR3 Looking east, typical vegetation density with few cottonwood

CR3 Looking northeast,open areas with mostly arrowweed and tamarisk

CR4 Looking east, thick stands
of tamarisk and dead phragmites

CR4 View taken from transect looking north,
typical vegetation density of tamarisk

CR5 Looking north, large open area
surrounded by thick stands of tamarisk

CR5 View taken from transect looking east,
typical vegetation density of tamarisk stands
along with few arrowweed

Appendix L. Wetland Area Search Site Photos

CW1. Looking west. September 2011.

CW1. Looking northeast. Septebmer 2011.

CW2. Looking south. September 2011.

CW2. Looking north. September 2011.

CW3. Looking northeast. September 2011.

CW3. Looking northwest. September 2011.

CW 4. Looking northwest over the site. September 2011.

CW 4. Looking southeast. September 2011.

CW5. Looking southeast over the site. September 2011.

CW5. Looking northwest. September 2011.

CW6. Looking southeast over the site. September 2011.

CW6. Looking northeast. September 2011.

CW 7. Looking sourtheast. September 2011.

CW7. Looking southeast. September 2011.

CW8. Looking northeast. September 2011.

CW8. Looking southeast. September 2011.

RW1. Looking north. August 2011.

RW1. Looking northeast. August 2011.

RW2. Looking southwest. September 2011.

RW2. Looking west. September 2011.

RW3. Looking east. September 2011.

RW3. Looking southeast. September 2011.

RW4. Looking northwest. September 2011.

RW4. Looking southwest. September 2011.

RW5. Looking northwest. September 2011.

RW5. Looking southwest. September 2011.

RW6. Looking northwest. September 2011.

RW6. Looking southwest. September 2011.

RW7. Looking southest. September 2011.

RW7. Looking southwest. September 2011.

RW8. Looking north. September 2011.

RW8. Looking northeast. September 2011.

Appendix M. Nectar Resource Datasheets

RAWPF Nectar Resource Data Sheet

Site Name: RR1 Habitat and Number: _____ Date: 5/3/11 Collector(s): R. Wayne, C.W.

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	White sweet clover	17	2,3,2, 2 =61	
2	W. Sea Purslane	2,1,1,1 =5	28, 14, 225, 20 =297	
2	Heliotrope	1,2,1,1 =5	5,25,1,20 =51	
2	Sow Thistle	1	1	
2	Chenopode	6	2	- lambs quarters
3	Yellow sweet clover	1,1,3,1,3,3,1,2,4 =19	14,8,20,5,18,20 21,23,5 =144	
3	White sweet clover	3,1,1,1,1,1,1,2,3,3,1,2,1 =22	33,9,32,16,33,18,11 50,41,46,25,40,2,15 =370	
3	SOW Thistle	1,1 =2	6,4 =10	
4	W sea purslane	8	262	
5	0			
6	0			
7	0			
8	0			
9	SOW THISTLE	1	2	
10	0			
11	SOW THISTLE	1,1 =2	2,1 =3	
12	0			
13	0			
14	0			
15	0			
16	0			
17	0			
18	0			
19	0			
20	0			
21	0			

RAWPF Nectar Resource Data Sheet

Site Name: RR1 Habitat and Number: _____ Date: 6/6/11 Collector(s): R. Wayne, K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	White Sweet clover	1	1	
2	White sweet clover	1, 1, 1, 1	1, 1, 3, 1	
3	White clover	1, 1	1, 4	
4	0			
5	Honey Mesquite	1	50	
6	0			
7	Honey Mesquite	1	2	
8	Honey Mesquite	1	1	
9	0			
10	0			
11	0			
12	0			
13	0			
14	0			
15	Honey Mesquite	1	22	
16	0			
17	0			
18	0			
19	0			
20	0			
21	Screwbean	1	2	

RAWPF Nectar Resource Data Sheet

Site Name: PRI Habitat and Number: _____ Date: 7/14/11 Collector(s): KL, DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	heliotrope	1,1	4,1	
1	white sweet clover	4,1,1	12,2,1	
2	white sweet clover	1,1,1	1,2,1	
2	Screwbean	1,	4	
3	" "	1,	5,	
3	purslane	1,	2	* cerqurus bur found during veg. survey
4	screwbean	1,	3	
5	honey	1,	12	
6	Goldring	1,	10	
6	screwbean	1,	2	
7	honey	1,	37	
8	0			
9	0			
10	0			
11	honey	1,1	2,19	
12	Screwbean	1	12	
13	0			
14	screwbean	1,	5	
14	heliotrope	1	7	
15	0			
16	honey	1,	11	
17	0			
18	screwbean	1,	3	
19	" "	1	1	
20	0			
21	0			

RAWPF Nectar Resource Data Sheet

Site Name: RR2 Habitat and Number: _____ Date: 5/4/11 Collector(s): R Wayne, K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Arrowweed	1	42	
2	Arrowweed	1	8	
2	Honey Mesquite	2	19	
3	0			
4	Arrowweed	1,1,1,1,1,1,1,1,1,2, 1,1,1,1,1,1,1,1 =20	1,3,8,5,2,13,1,1,19,1,9 1,13,3,30,3,8,6,20,12 =158	
5	Arrowweed	1	4	
5	Honey Mesquite	1	6	
6	Honey Mesquite	1	28	
6	Arrowweed	1,1,1 =3	3,8,4 =15	
7	Arrowweed	1,1,1,2,1, =6	1,1,4,4,8 =18	
7	Honey Mesquite	1	21	
8	Arrowweed	1,1,1 =3	19,18,5 =42	
9	Honey Mesquite	1,1 =2	15,10 =25	Not all flowers are living
10	Arrowweed	1	1	
11	Arrowweed	1,1,1 =3	1,1,5 =7	
12	Arrowweed	1,1,1,1,1,1,1,1,1,1 =10	1,1,1,1,2,2,2,5 3,27 =45	
12	Honey Mesquite	1	13	
13	Heliotrope	1	1	
14	Honey Mesquite	1,1 =2	11,16 =27	
14	Arrowweed	1,1,1,1,1,1 =6	13,2,1,6,2, 31,1 =56	
1				

RAWPF Nectar Resource Data Sheet

Site Name: RR2 Habitat and Number: _____ Date: 6/7/11 Collector(s): R. Wayne, K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Arrowweed	3	14, 3, 11	
1	Screwbean Mes.	1	3	
2	Screwbean	1	1	
3	Arrowweed	1, 1	6, 3	
3	Heliotrope	1	5	
4	Arrowweed	1, 1, 1, 2	3, 4, 3, 3, 6	
5	Arrowweed	1, 1	26, 2	
* 5	screwbean	1,	1	
6	Arrowweed	1, 1, 1, 1	5, 8, 11, 7	
7	Screwbean	1,	3	
7	Honey Mes.	1	7	
8	0			
9	Arrowweed	1, 1, 1	5, 15, 4	
10	Honey Mesquite	1	1	
11	Arrowweed	1, 1, 1, 1	1, 2, 4, 2	
12	0			
13	Honey Mesq.	1	10	
14	0			

RAWPF Nectar Resource Data Sheet

Site Name: RR2 Habitat and Number: _____ Date: 7/13/11 Collector(s): KI, DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	0			
3	Screwbean	1, 1,	10, 24	* Ceanothus found during veg-survey
4	" "	1	5	
5	0			
6	0			
7	screwbean	1	2	
8	0			
9	Honey Mes.	1	3	
10	screwbean	1	1	
11	0			
12	0			
13	0			* W.P.b. found during veg. survey
14	Honey	1, 1	3, 2	

RAWPF Nectar Resource Data Sheet

Site Name: KR3 Habitat and Number: _____ Date: 5/4/11 Collector(s): R. Wayne King

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Primrose	1	3	
2	Primrose	5, 1, 5, 1, 1, 1, 1	7, 1, 1, 1, 1, 1, 5	
3	" "	5, 4 = 9	8, 4, = 12	
4	Desert marigold	1	2	
5	Primrose	6	6	
6	0			
7	Primrose	3	3	
8	Primrose	9, 32, 1, 1, 1, 4, 1, 3, 2, 1, 3, 4 = 75	2, 1, 1, 1, 1, 1, 5, 1, 1, 2, 4, 4, 12, 1, 1, 4, 1, 4, 3, 3, 3, 4, 6, 1, 1, 2 = 108	
9	0			
10	0			
11	0			
12	0			
13	0			
14	Primrose	125	172	¼ of plot was taken then estimated after
14	Heliotropium	19, 1, 1 = 21	38, 2, 2 = 42	
15	Primrose	1, 1, 12 = 14	1, 2, 35 = 38	
15	Arrowweed	1	1	
16	Primrose	200, 150	400, 520, 120	
17	Primrose	72	19	
18	0			
19	Primrose	15	45	

RAWPF Nectar Resource Data Sheet

Site Name: PR3 Habitat and Number: _____ Date: 6/7/11 Collector(s): R. Wayne; K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	0			
3	primrose	1	1	
4	0			
5	0			
6	0			
7	0			
8	primrose	1	1	
8	heliotrope	1, 1, 2, 1	1, 3, 2, 3	
9	0			
10	0			
11	0			
12	0			
13	0			
14	primrose	1	1	
15	0			
16	purslane	1, 1,	38, 33	
16	primrose	1	1	
17	primrose	1	1	
18	0			
19	Honey Mes.	1	6	

RAWPF Nectar Resource Data Sheet

Site Name: RR3 Habitat and Number: _____ Date: 7/13/11 Collector(s): KI, DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	0			
3	Sandbar	1,1,1	2,1,1	
4	" "	60	900+	each willow had at least 15 inflorescences
5	" "	5	75	" "
6	" "	1,1,1,1,1,1,	20,5,2,9,12,7	
7	0			
8	0			
9	0			
10	0			
11	0			
R	0			
13	Screwbean	1	15	
14	heliotrope	1	10	
14	purple nightshade	1	2	
14	screw bean	1	6	
15	0			
16	0			
17	Screwbean	1	16	
18	Screwbean	1	2	
19	White sweet clover	1	2	

RAWPF Nectar Resource Data Sheet

Site Name: RR4 Habitat and Number: _____ Date: 5/2/11 Collector(s): R. Kleyne, K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Screwbean Mesquite	1	21	Half of a Mesquite
2	" "	1	8	
3	Heliotrope	5	38	desert/salt heliotrope
3	Sow Thistle	6	89	
3	Western Sea Purslane	15	2500+(-)	each individual 100-200+ inflorescences (1/6) of individuals are blooming
4	N/A			
5	N/A			
6	N/A			
7	Heliotrope	8	82	
7	Screwbean Mesquite	1	17	
8	N/A			
9	N/A			
10	N/A			
11	N/A			
12	N/A			
13	Heliotrope	13	27	
14	Heliotrope	1	9	
15	0			

RAWPF Nectar Resource Data Sheet

Site Name: RR4 Habitat and Number: _____ Date: 6/6/11 Collector(s): P. Wayne, K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Screwbean	1	1	
2	0			
3	Screwbean	1	3	
4	0			
5	0			
6	0			
7	0			
8	Heliotrope	1,1,1,2,2,4,1,4,1,1,2,1	5,3,3,14,18,24,12 30,8,25,60,13	=215
8	Screwbean	1	2	
9	0			
10	Screwbean	1,1,	3,3,	
10	heliotrope	1,1,1,1,6,3,2,1,1,1	4,62,21,18,14,7,5,5	=92
11	0			
12	0			
13	0			
14	0			
15	screwbean	1	9	

RAWPF Nectar Resource Data Sheet

Site Name: RR4 Habitat and Number: _____ Date: 7/11/11 Collector(s): KI, DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	purslane	1, 1, 1	15, 185, 8	took 1/8 of plant and counted, estimated the rest
2	screwbean	1,	1	
3	0			
4	0			
5	Screwbean	1, 1	12, 25	
6	0			
7	screwbean	1,	4,	
8	0			
9	honeymes.	1,	7	
9	screwbean	1,	8	
10	Screwbean	1,	2	
10	heliotrope	3,	45	
11	0			
12	heliotrope	1,	10,	
13	0			
14	0			
15	0			

RAWPF Nectar Resource Data Sheet

Site Name: RR5 Habitat and Number: _____ Date: 5/5/11 Collector(s): R. Wayne Kiry

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	Honey Mesquite	1	3	mostly dead
3	0			
4	0			
5	0			
6	0			
7	0			
8	0			
9	Baccharis	1,	10	
10	0			
11	0			
12	Honey Mesquite	2	25	
13	0			
14	0			
15	0			
16	0			
17	Tamarisk	1	130	
18	0			
19	Arrowweed	3	6	
20	0			
21	Honey Mesquite	1	2	
22	0			
23	0			
24	0			
25	0			
26	0			
27	0			
28	Tamarisk	1, 2	103, 75	
29	0			

RAWPF Nectar Resource Data Sheet

Site Name: RR5 Habitat and Number: _____ Date: 6/10/11 Collector(s): R. Wayne, K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	0			
3	0			
4	0			
5	Heliotrope	1,1,1,1,2,1,2,2,1,1,1 / 1,1,1,1,1,1,2,2,1,1	9,2,3,7,11,3,7,7, 7,6,14,17	4,7,9,8,10,15,12,14,8,15 = 192
6	0			
7	0			
8	0			
9	0			
10	0			
11	0			
12	0			
13	Honey Mesquite	1	7	
14	0			
15	0			
16	0			
17	0			
18	0			
19	0			
20	0			
21	0			
22	Screwbean	1	7	
23	0			
24	0			
* 25	0			unknown spotted butterfly
26	0			
27	0			
28	Tamarisk	1	80	
29	heliotrope	1,1,1	39, 60, 16 = 115	
24	screwbean	1	4	

RAWPF Nectar Resource Data Sheet

Site Name: RR5 **Habitat and Number:** ______ **Date:** 7/14/11 **Collector(s):** KI, DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	0			
3	0			
4	0			
5	0			
6	heliotrope	1,1,1,1,1,1,2,1,1,1 =11	1,3,3,29,3,5,2,10,6,6	
7	screwbean	1	2	
8	0			
9	0			
10	0			
11	0			
12	0			
13	0			
14	honey	1	2	
15	honey	1	10	
16	0			
2 ceraunus blue 17	tamarisk	1	3	
☆ 18	0			
19	0			
20	~~0~~ tamarisk	1	23	
21	screwbean	1	2	
22	screwbean	1	14	
23	0			
24	0			
5	0			
6	0			
7	0			

0 29 screwbean 1 | 65

9 heliotrope 1,1,1,1 112,137,42

RAWPF Nectar Resource Data Sheet

Site Name: CR1 **Habitat and Number:** _____ **Date:** 5/6/11 **Collector(s):** R. Wayne; K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	0			
3	Tamarisk	2	10	
4	Tamarisk	1	20	
5	0			
6	Tamarisk	1	5	
7	Tamarisk	1,1,1, =3	40,5,17=62	
8	Tamarisk	1,	8	
9	Tamarisk	1	7	
10	Tamarisk	1, 1	75, 8 =83	
11	0			
12	Tamarisk	1,1,	10,5 =15	
13	Arrow weed	1	3	
14	Tamarisk	1	9	

RAWPF Nectar Resource Data Sheet

Site Name: CR1 Habitat and Number: _____ Date: 6/8/11 Collector(s): R. Wayne; K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Tamarisk	1, 1, 1	65, 15, 37	=117
2	Tamarisk	1, 1	17, 300	=317
3	Arrowweed	4	54, 64, 54, 47	
3	Tamarisk	1	25	
4	Arrowweed	1	4	
4	Tamarisk	1, 1	30, 4	
5	Tamarisk	1, 1	5, 26	
6	Tamarisk	1, 1, 1, 1	40, 6, 13, 30	
7	Tamarisk	1, 1, 1, 1	37+18+5, 16, 4, 20	
8	Tamarisk	1, 1, 1	30, 10, 8	
9	Tamarisk	1, 1	600, 25	
10	0			
11	Tamarisk	1, 1	18, 6	
12	Arrowweed	1, 1, 1, 1	41, 80, 55, 40	
13	Arrowwed	1, 1, 1	1, 2, 2	
13	Tamarisk	1,	5	
14	Arrowweed	1, 2, 1, 1	122, 15, 30, 35, 10	
14	Tamarisk	1,	15	

RAWPF Nectar Resource Data Sheet

Site Name: CR1 Habitat and Number: _____ Date: 7/12/11 Collector(s): ~~B~~ KL, DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Tamarisk	1, 1, 1,	120, 50, 135	
2	" "	1, 1, 1, 1	3, 82, 49, 650	
3	" "	1, 1, 1	40, 620, 63	
4	" "	1, 1, 1,	120, 180, 160,	
5	" "	1, 1	21, 110	
6	" "	1, 1	115, 85	
7	" "	1, 1, 1, 1	70, 85, 25, 520	
8	" "	1,	8+35+45	
9	" "	1,	35	
10	Arrowweed	1, 1	2, 10	
10	Tamarisk	1,	33	
11	" "	1, 1	98+20, 35	
12	Arrowweed	1, 1	3, 3,	
13	Tamarisk	1,	95	
13	Arrowweed	1	17	
14	Tamarisk	1	45	

RAWPF Nectar Resource Data Sheet

Site Name: CR2 Habitat and Number: _____ Date: 6/6/11 Collector(s): R Wayne, K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	0			
3	0			
4	0			
5	0			
6	0			
7	0			
8	Arrowweed	9	65	
9	0			
10	0			
11	0			
12	0			
13	0			
14	0			
15	0			

RAWPF Nectar Resource Data Sheet

Site Name: CR2 Habitat and Number: _____ Date: 5/9/11 Collector(s): E. Wayne, K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	0			
3	0			
4	0			
5	0			
6	0			
7	Arrowweed	1	5	
7	Tamarisk	1	60	
8	Arrowweed	~~1, 1~~, 25	~~5, 16, 13~~, 225	
9	0			
10	0			
11	0			
12	0			
13	Tamarisk	1	65	
14	Tamarisk	1	45	
15	Tamarisk	1	10	
15	Arrowweed	1, 1	16, 14	

RAWPF Nectar Resource Data Sheet

Site Name: CR2 Habitat and Number: _____ Date: 7/12/11 Collector(s): KG, DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Tamarisk	1,	11	
2	" "	1	4+8	
2	Screwbean	1, 1	3, 13	
3	0			
4	0			
5	0			
6	0			
7	Arrowweed	1	2	
8	0			
9	0			
10	0			
11	Tamarisk	1	11	
12	Arrowweed	1, 1	4, 3	
13	0			
14	0			
15	0			

RAWPF Nectar Resource Data Sheet

Site Name: CR3 Habitat and Number: _____ Date: 5/6/11 Collector(s): R. Wayne, K. Ivey

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	0			
3	Arrowweed	1	1	
4	0			
5	Arrowweed	1	2	
6	Tamarisk	1	70	
6	Arrowweed	1	12	
7	Arrowweed	1	1	
8	Tamarisk	1	8	
8	Arrowweed	2	7	
9	Arrowweed	2,1,1	12,8,7	
10	Arrowweed	1,1,1	2,1,3,	
11	Arrowweed	1,	2	
12	Arrowweed	1,1,1,1,2,1	13,14,10,2,7,4	

CR3 6/8/11

1			
2	Arrowweed	1	20
3	Arrowweed	1	1
4	Arrowweed	2, 2, 1	2, 15, 17
5	Arrowweed	1	2
6	Arrowweed	1, 1, 2	8, 1, 27
7	Arrowweed	2, 2,	12, 18
8	Arrowweed	1	10
8	Tamarisk	1	11
9	Arrowweed	1, 1, 1, 1	1, 18, 4, 2
10	Arrowweed	1, 1, 1, 1, 1	1, 2, 4, 8, 13
11	Tamarisk	1,	16
12	Arrowweed	1, 1, 1, 1	2, 1, 12, 10

RAWPF Nectar Resource Data Sheet

Site Name: CR3 Habitat and Number: _____ Date: 7/12/11 Collector(s): KJ, DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Tamarisk	1	12	
2	Screwbean	1, 1	1, 10	
3	0			
4	Arrowweed	1,	1	
4	Tamarisk	1,	6	
5	0			
6	0			
7	0			
8	Arrowweed	1,	5,	
8	Tamarisk	1	1	
9	0			
10	Arrowweed	1, 1,	3, 2	
11	0			
12	0			

RAWPF Nectar Resource Data Sheet

Site Name: CR4 Habitat and Number: _____ Date: 5/9/11 Collector(s): R. Wayne, K. Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Arrowweed	1,1,1,1,1,1,1 =7	1,1,2,9,5,2,2 =22	
2	Tamarisk	1,1,1,1,1,1, =5	40,12,70,55,25 =202	
2	Arrowweed	1,	8	
3	Arrowweed	1,	1	
3	Tamarisk	1,1	5, 25	
4	Arrowweed	3	18	
4	Tamarisk	2	15	
5	Tamarisk	1,1	~~1500~~ 2000	
6	Arrowweed	1,	3	
6	Tamarisk	1	50	
7	Arrowweed	1,1,	15,25	
7	Tamarisk	1,1,	150,20	
8	Tamarisk	1,	8	
9	Arrowweed	1,1,1,1,1,1,2 =8	4,1,11,3,2,4,3 =28	
9	Tamarisk	1,1,1	27,16,8 =51	
10	Arrowweed	1,	3	
11	Arrowweed	~~26~~ 2,	13	
12	0			
13	0			

RAWPF Nectar Resource Data Sheet

Site Name: CR4 Habitat and Number: _____ Date: 6/8/11 Collector(s): R. Wayne, K. Ly

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Arrowweed	1, 2, 1, 1	4, 2, 1, 5	
2	Arrowweed	1, 1,	2, 12	
3	Tamarisk	1, 1	5, 15	
4	Tamarisk	1,	30,	
5	Tamarisk	1, 1	65, 20	
6	Tamarisk	1, 1	15, 2	
7	Tamarisk	1, 1	10, 15	
8	0			
9	Tamarisk	1,	80,	
9	Arrowweed	2,	2	
10	Tamarisk	1	4	
11	Tamarisk	1, 1	50, 5	
11	Arrowweed	1, 1, 1	12, 9, 3	
12	Tamarisk	1,	12	
12	Arrowweed	1,	7	
13	Tamarisk	1	30-15	

RAWPF Nectar Resource Data Sheet

Site Name: CR4 Habitat and Number: _____ Date: 7/12/11 Collector(s): KH, DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Tamarisk	1	35	
2	"	1	8	
3	"	2	6	
4	"	1, 1	45, 90	
5	"	1	5	
6	Tamarisk	1	4	
7	"	1, 1	8, 32	
8	"	1, 1	6, 11	
9	"	1,	48,	
10	"	1	6	
11	"	1	47	
12	0			
13	Tamarisk	1,	78	

RAWPF Nectar Resource Data Sheet

Site Name: CR5 Habitat and Number: _____ Date: 5/6/11 Collector(s): R. Wayne, Kim

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	Honey Mesquite	1	10	
3	Arrowweed	1	5	
4	Arrowweed	1	2	
5	0			
6	0			
7	0			
8	0			
9	0			
10	0			
11	Arrowweed	5,1,1,1,1,2,1,2,1 =15	5,2,1,5,1,3,1,2,6 =26	
12	0			
13	0			
14				

RAWPF Nectar Resource Data Sheet

Site Name: CR5 Habitat and Number: _____ Date: 6/8/11 Collector(s): R Wayne, K Ivy

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0	-		
2	0			
3	0			
4	Arrowweed	1, 1	56, 52 + 60 = 168	
5	Arrowweed	1	48	
6	Arrowweed	1, 1	54, 2	
7	Arrowweed	1	10	
8	0			
9	0			
10	0			
11	Tamarisk	1	3	
12	0			
13	Arrowweed	1, 1	8, 28	

RAWPF Nectar Resource Data Sheet

Site Name: CR5 Habitat and Number: _____ Date: 7/11/11 Collector(s): KL DM

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	Tammy	1	3	
3	0	0		
4	Tammy	1	60	
5	0			
6	0			
7	Tamarisk	1	15	
8	" "	1	2	
9	Arrowweed	1, 1, 1	16, 4, 6	
10	" "	1, 1	12, 14	
11	" "	1, 1, 1, 1, 1	12, 4, 15, 1, 11	
12	0			
13	0			

C. Morgan KLM

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) RR1 9/6/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals	
Column1	Column2	Column3	Column4	Column5	Column6	
1			0			
2			0			
3			0			
4			0			
5			0			
6			0			
7			Marsh Fleabane		5	120
8			0			
9			Purple Flower [illegible]		7	14.
10			0			
11			0			
12			0			
13			0			
14			0			
15			0			
16			0			
17			0			
18			0			
19			0			
20			0			
21			0			

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) RF 2 4/7/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals
Column1	Column2	Column3	Column4	Column5	Column6
1			0		
2			0		
3			0		
4			0		
5			0		
6			0		
7			0		
8			0		
9			0		
10			0		
11			0		
12			Baccharis spp		1, 1
13			0		
14			0		

RAWPF Nectar Resource Data Sheet

Site Name: RR3 Habitat and Number: _____ Date: 9/6/11 Collector(s): C Morgan K

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			1 yellow basking
2	baccharis spp.	1, 2	40, 12+7	
3	" "	1	164, 12	
3	heliotrope	1	2	
4	0			
5	Sandbar willow	3	22	
6	Sandbar willow	24	67	one tree had at least 21 flowers
7	baccharis sp	1	75	
8	0			
9	0			
10	horsweed	1	6	
11	Desert marigold	1	7	
12	Horseweed	1, 1	2, 7	
13	Screwbean Mesq.	1	3	
13	horse weed	1	11	
14	Horseweed	1	14	
15	Horse weed	1, 1, 1, 1, 1	5, 15, 3, 4, 7	
16	0			
17	0			
18	Primrose	1	2	
19	horseweed	2	4	
	(2) Yellow Spotted [illegible]		[illegible]	[illegible]
	yellow flying			
19	baccharis	1	30	

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) RR4 9/6/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals
Column1	Column2	Column3	Column4	Column5	Column6
1			0		
2			0		
3			0		
4			0		
5			0		
6			0		
7			0		
8			0		
9			0		
10			0		
11			0		
12			0		
13			0		
14			0		
15			0		

C. Morgan, Kelly

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) RR5 9/6/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals	Blooms
Column1	Column2	Column3	Column4	Column5	Column6	
1			Brickellia spp		1	100
2			Screwbean Mesq.		1	1
3			Desert Marigold		1	2
4			0			
5			0			
6			heliotrope		3, 2	45, 15
7			0			
8			0			
9			0			
10			0			
11			Honey Mesquite		1	3
11			baccharis	spp	1	6
12			Tamarisk		1	7 + 20
13			baccharis spp		1	35
14			0			
15			Tamarisk		1	15 + 18
16			0			
17			0			
18			0			
19			0			
20			Tamarisk		1	60
21			0			
22			0			
23			0			
24			tamarisk		1	30
25			0			
26			baccharis	spp	1	4

290 27 28 28 0 baccharis spp heliotrope 1 1, 1 55 15, 2

C. Morgan, E. H.

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) CR1 9/7/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals	Blooms
Column1	Column2	Column3	Column4	Column5	Column6	
1			Tamarisk		1	15 oT 55
2			" "		1, 1	60, 1514
3			" "		1	45
4			" "		1, 1	125 220
5			" "		1, 1,	95, 450
6			" "		1, 1	455, 50
7			" "		1, 1	83 95
8			" "		1,	35
9			" "		1, 1	30, 465
10			" "		1	40
11			" "		1,	450+ 300
12			" "		1,	45+12
* 13			" "		1	70
14			" "		1	65
→ Yellows Nectaring on tamarisk						

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date) CR2 9/6/11

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals
Column1	Column2	Column3	Column4	Column5	Column6
1			Tamarisk		1
2			0		
3			0		
4			0		
5			0		
6			0		
7			0		
8			0		
9			0		
10			0		
11			0		
12			0		
13			0		
14			0		
15			0		

RAWPF Nectar Resource Database

Restored Riparian (separate by sampling date)

9/8/11 C. Morgan K. M CR3

Habitat and Number	Date	Plot #	Plant Species		Number of Blooming Individuals	
Column1	Column2	Column3	Column4	Column5	Column6	
1			0			
2			screwbean		1	12
3			0			
4			0			
5			0			
6			0			
7			0			
8			Tamarisk		1	11
9			0			
10			0			
11			Tamarisk		1, 1	25, 2
12			0			

RAWPF Nectar Resource Data Sheet 9/7/11

Site Name: CR4 Habitat and Number: _____ Date: _____ Collector(s): C. Morgan, Kly

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	Tamarisk	1	15	
2	0			
3	Tamarisk	1	8	
4	" "	1	325	
5	0			
6	Tamarisk	1	30	
7	" "	1	13	
8	" "	1	40	
9	" "	1	6	
10	" "	1, 1	30, 27	
11	Tamarisk	1,	75 + 145	
12	" "	1	200	
13	" "	1	25	

RAWPF Nectar Resource Data Sheet

Site Name: LR5 Habitat and Number: _____ Date: 9/9/11 Collector(s): C Morgan

Plot #	Plant Species	Number of Blooming Individuals	# of Inflorescences	Notes
1	0			
2	Tamarisk		3	
3	0			
4	Tamarisk	1	4	
5	0			
6	Tamarisk	1	2	
7	Tamarisk	1	21	
8	" "	1	15	
9	0			
10	0			
11	0			
12	0			
13	Tamarisk	1	17	

Appendix N. “Bird and Butterfly Recovery at the Yuma East Wetlands” Power Point Presentation

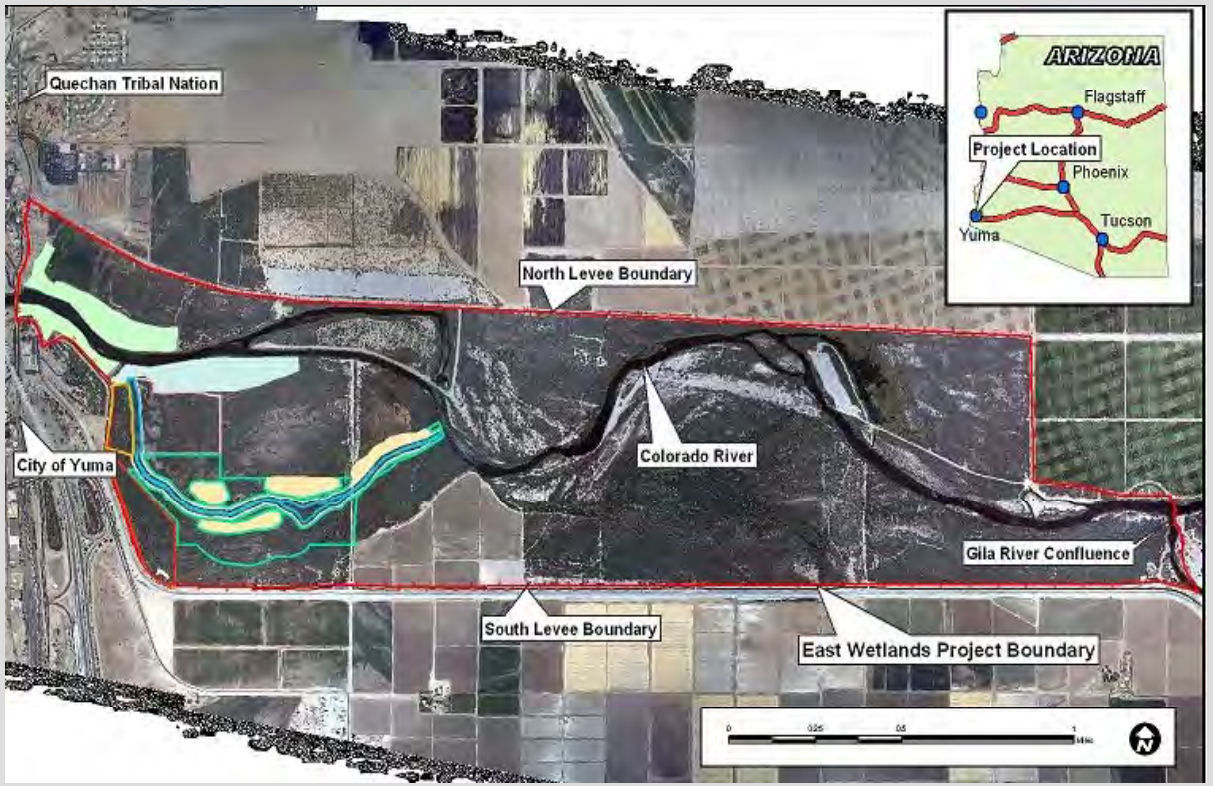
Bird and Butterfly Recovery at the Yuma East Wetlands

By:

Heidi Trathnigg
Fred Phillips Consulting, LLC

Yuma East Wetlands Restoration

- 936 acres proposed
- Goal to restore wildlife habitat
- Evaluate wildlife recovery
  - Birds
  - Invertebrates
  - Mammals
  - Amphibians & Reptiles
  - Fish



Baseline Research (2007-2008)

Birds

- Reference sites had significantly higher richness and abundance
- No difference between immature restored and control sites

Invertebrates

- Ag and reference sites had highest richness
- Some butterfly species only found in reference and mature riparian habitats
- Large scope not enough detail

Herpetofauna and Mammals

- Need more time to re-colonize site

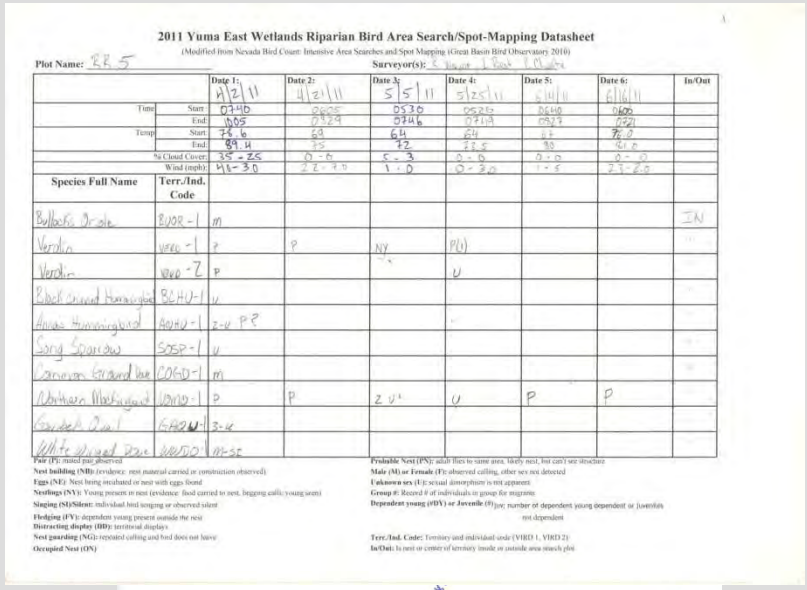
Rational and Hypothesis

- Bird Community
  - Quickly re-colonize restored areas (Passell 2000, Gardali et al. 2006)
  - Habitats have matured
- Butterfly Community
  - Quickly re-colonize restored areas
  - Good indicators of herbaceous community health (Scoble 1992)
  - Easy to identify quickly

Hypothesis: Bird and butterfly richness and abundance will be different in restored verses control sites.

Bird Surveys

- Intensive Area Searches
  (Great Basin Bird Observatory 2010 and Bart et al. 2010)
  - 10 Riparian Plots
  - 1-3 h/plot
  - 6 surveys during April- June
- Variable circular plots
  (Reynolds et al. 1980)
  - 16 Marsh Plots
  - 10 m increment bands up to 100 m
  - Marsh bird monitoring protocol



2011 Yuma East Wetlands Riparian Bird Area Search/Spot-Mapping Datasheet

(Modified from Nevada Bird Count: Intensive Area Searches and Spot Mapping (Great Basin Bird Observatory 2010)

Plot Name: ER 5 Surveyor(s):

		Date 1: 4/2/11	Date 2: 4/21/11	Date 3: 5/5/11	Date 4: 5/25/11	Date 5: 6/14/11	Date 6: 6/16/11	In/Out
Time	Start:	0740	0625	0530	0525	0540	0600	
	End:	1005	0829	0746	0719	0837	0921	
Temp	Start:	75.6	59	64	64	67	76.0	
	End:	89.4	75	72	73.5	90	91.0	
% Cloud Cover:		35 - 25	0 - 0	5 - 3	0 - 0	0 - 0	0 - 0	
Wind (mph):		4.6 - 3.0	2.2 - 9.0	1 - 0	0 - 3.0	1 - 5	2.3 - 8.0	
Species Full Name	Terr./Ind. Code							
Bullock's Oriole	BUOR-1	m						IN
Verdin	VERD-1	?	P	NY	P(J)			
Verdin	VERD-2	P			U			
Black-chinned Hummingbird	BCHU-1	u						
Anna's Hummingbird	ANHU-1	2-4 P?						
Song Sparrow	SOSP-1	u						
Cañon Towhee	CATO-1	m						
Northern Mockingbird	NOMO-1	P	P	2 U	U	P	P	
Gambel's Quail	GAQU-1	3-4						
White-winged Dove	WWDO-1	m-se						

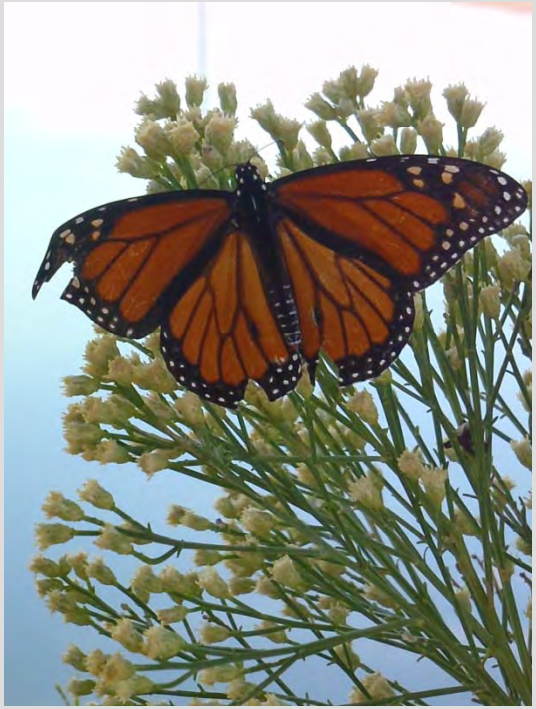
Pair (P): mated pair observed
Nest building (NB): (evidence: nest material carried or construction observed)
Eggs (NE): Nest being incubated or nest with eggs found
Nestlings (NY): Young present in nest (evidence: food carried to nest, begging calls/young seen)
Singing (SI)/Silent: individual bird singing or observed silent
Fledging (FY): dependent young present outside the nest
Distracting display (DD): territorial displays
Nest guarding (NG): repeated calling and bird does not leave
Occupied Nest (ON)

Probable Nest (PN): adult flies to same area, likely nest, but can't see structure
Male (M) or Female (F): observed calling, other sex not detected
Unknown sex (U): sexual dimorphism is not apparent
Group #: Record # of individuals in group for migrants
Dependent young (#DY) or Juvenile (J): [illegible] number of dependent young dependent or juveniles not dependent

Terr./Ind. Code: Territory and individual code (VIRD 1, VIRD 2)
In/Out: Is nest or center of territory inside or outside area search plot

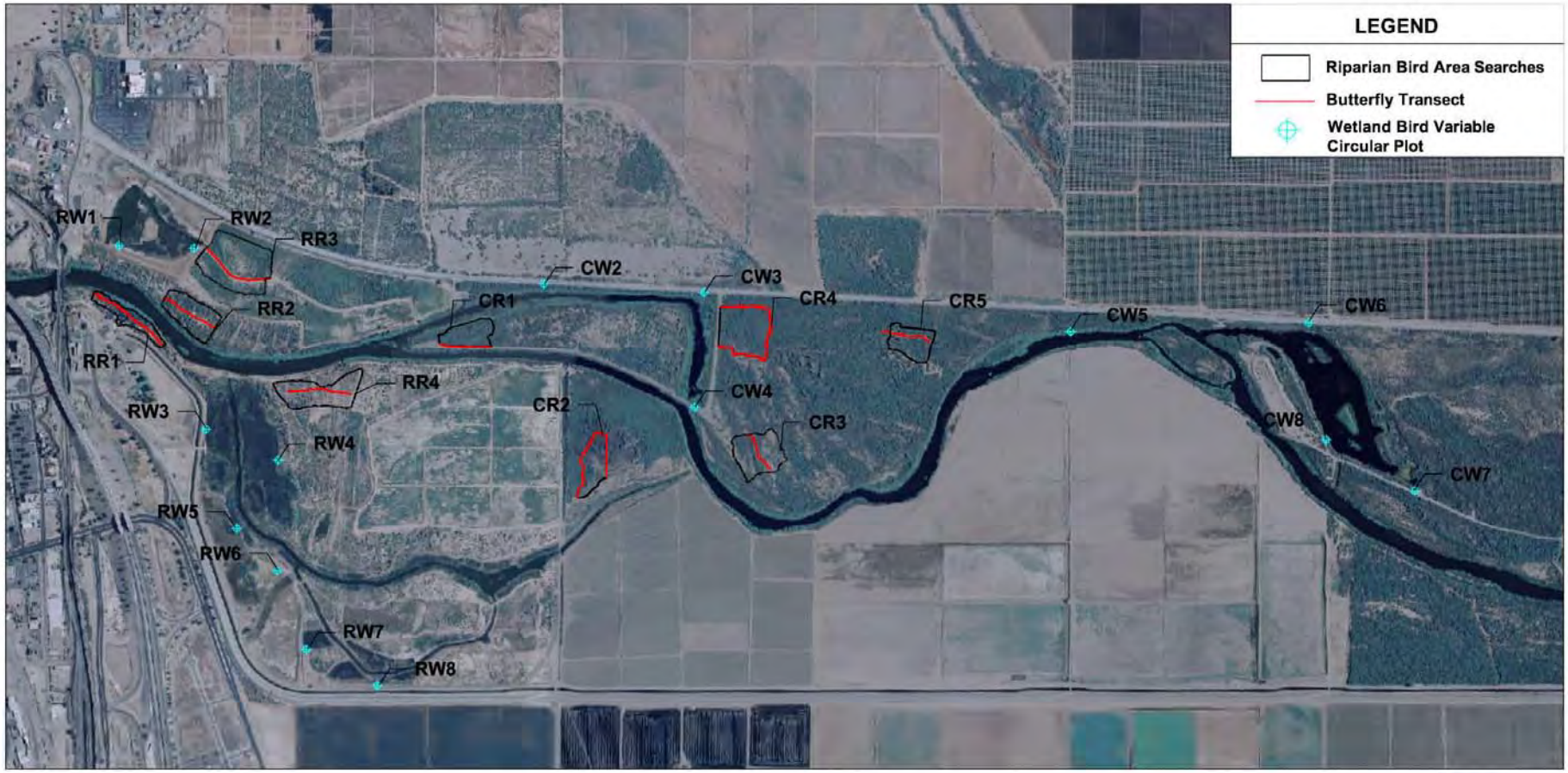
Butterfly Surveys

- 10 transects through riparian plots
- Surveyed 4 times (April, May, June, & Sept.)
- Timed searches (1 min/ 20m), not including pursuit time
- Behavior was recorded



Habitat and Nectar Resource Sampling

- Habitat Characteristics
  - 1 time per plot (July and September)
  - 30 plots in riparian and 20 plots in wetland
  - TVV and cover (3m radius circle) recorded
  - Butterfly host plant frequency and abundance; bird habitat
- Nectar Resources
  - 4 times (after butterfly sampling)
  - 3m diameter plots every 10m along transect
  - Tally blooming flowers by species
  - Number of inflorescence tallied



Fred Phillips Consulting, LLC
401 SOUTH LEROUX STREET
FLAGSTAFF, AZ
86001
TEL 928 773 1530
FAX 928 774 4166
Ecosystem Restoration Land Planning

DESIGNED FOR:
Yuma Crossing National Heritage Area
180 West First Street,
Suite E Yuma,AZ 85364

YEW Monitoring Locations

11-172 WPF Research Proposal Avifauna and Butterfly (Lepidoptera) Recovery in Restored Wetland adn Riparian Habitats

YUMA, ARIZONA

Aerial Map

Scale: 1" = 1000'

0' 250' 500' 1000' 1500' NORTH

DATE: APRIL 4, 2011
JOB NO.: 11005-2
DRAWN BY: KI
DESIGNED BY: HT
CHECKED BY:

FIGURE 1

Fred Phillips Consulting, LLC
401 SOUTH LEROUX STREET
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86001
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FAX 928 774 4166
Ecosystem Restoration Land Planning

DESIGNED FOR:
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180 West First Street,
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YWW Monitoring Locations

11-172 WPF Research Proposal Avifauna and Butterfly (Lepidoptera) Recovery in Restored Wetland adn Riparian Habitats

YUMA, ARIZONA

Aerial Map

Scale: 1" = 500'

0' 125' 250' 500' 750' NORTH

DATE: APRIL 4, 2011
JOB NO.: 11005-2
DRAWN BY: KI
DESIGNED BY: HT
CHECKED BY:

FIGURE 2

Bird Results

- 72 resident and migrating species detected in riparian and wetland sites

  Riparian

  – 15 resident species in restored

  – 9 resident species in control

  Wetland

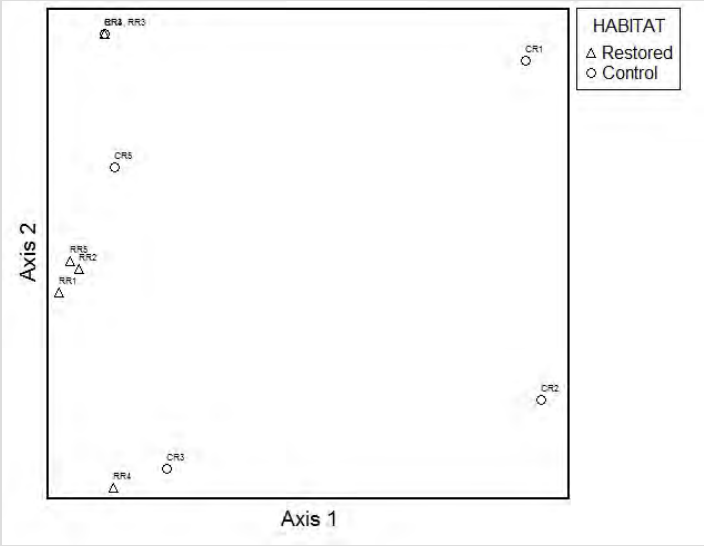
  – 14 species in restored

  – 10 species in control

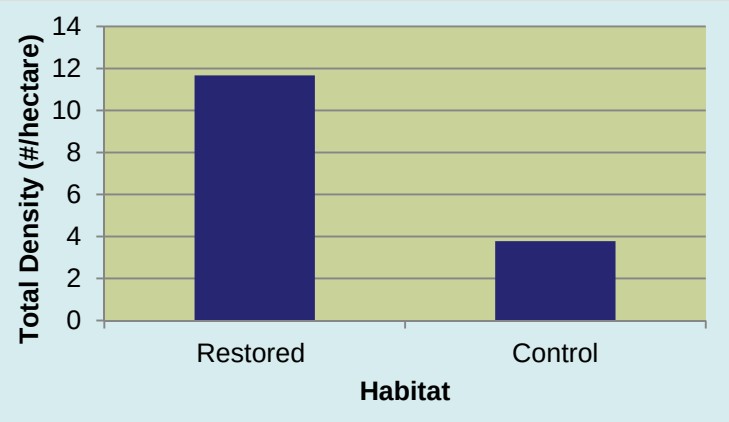
Resident Riparian Birds

		Density (#/hectare)	
Genus species	**Common Name**	**Restored Riparian**	**Control Riparian**
Pipilo aberti	Abert's Towhee	1.0331	0.0000
Calypte anna	Anna's hummingbird	0.2066	0.0000
Myiarchus cinerascens	Ash throated flycatcher	0.0000	0.2604
Vireo bellii	Bell's vireo	0.1033	0.0000
Polioptila melanura	Black-tailed gnatcatcher	0.2066	0.3906
Geothlypis trichas	Common yellowthroat	0.1033	0.0000
Toxostoma crissale	Crissal thrasher	0.1033	0.0000
Callipepla gambelii	Gambel's quail	0.9298	0.0000
Melanerpes uropygialis	Gila woodpecker	0.3099	0.0000
Quiscalus mexicanus	Great-tailed grackle	0.2066	0.0000
Carpodacus mexicanus	House finch	1.1364	0.2604
Picoides scalaris	Ladder-backed woodpecker	0.2066	0.0000
Chordeiles acutipennis	Lesser nighthawk	0.0000	0.2604
Zenaida macroura	Mourning Dove	2.6860	0.7813
Mimus polyglottos	Northern mockingbird	0.3099	0.0000
Melospiza melodia	Song sparrow	0.0000	0.1302
Auriparus flaviceps	Verdin	3.7190	0.7813
Tyrannus verticalis	Western kingbird	0.0000	0.2604
Zenaida asiatica	White winged dove	0.4132	0.6510

No difference in species richness (MWU=7, p=0.242)



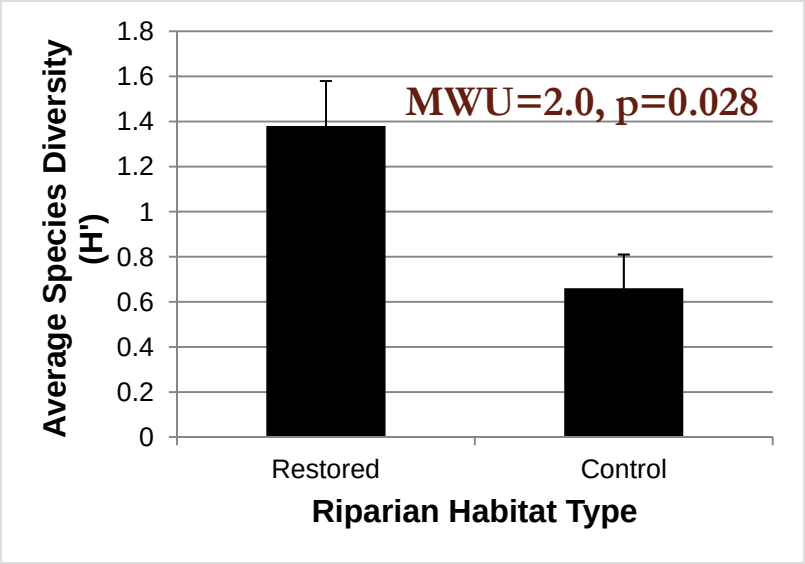
NMS Ordination; MRPP test, T=-0.1545, p= 0.389, A=0.004



MWU= 0.175, p=0.175

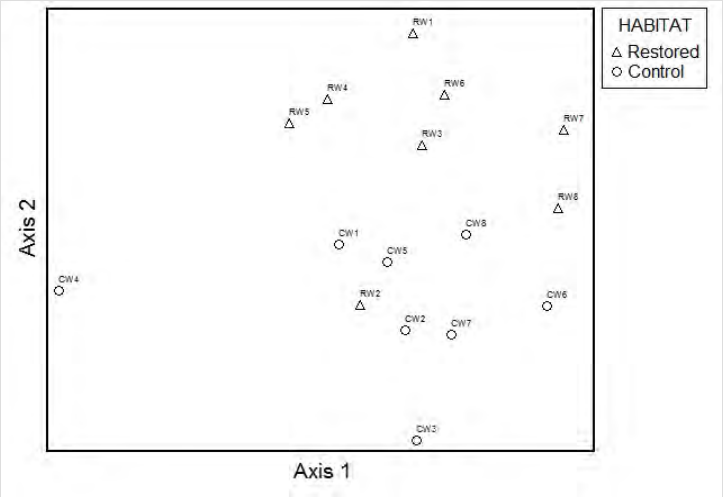
Riparian Vegetation

- Higher species diversity in restored verses control sites
- Higher % herbaceous cover in restored verses control
- No correlations with resident riparian birds and vegetation characteristics

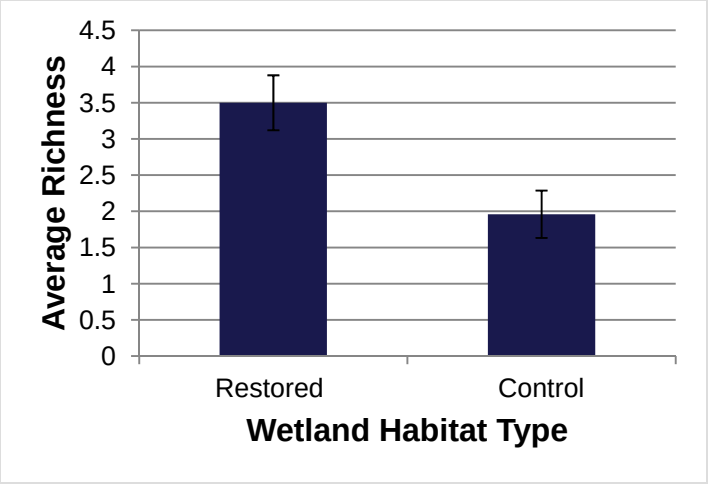


Marsh Birds

Genus species	Common Name	Total Number Detected	
		Restored Wetland	Control Wetland
Fulica americana	American coot	6	39
Himantopus mexicanus	Black-necked Stilt	4	0
Aythya valisineria	Canvasback	0	1
Anas cyanoptera	Cinnamon teal	12	0
Rallus longirostris	Clapper rail	6	0
Gallinula chloropus	Common Moorhen	0	6
Geothlypis trichas	Common yellowthroat	12	8
Ardea herodias	Great blue heron	1	1
Charadrius vociferus	Killdeer	10	0
Ixobrychus exilis	Least bittern	1	1
Cistothorus palustris	Marsh wren	22	4
Podilymbus podiceps	Pied-billed grebe	0	2
Agelaius phoeniceus	Red-winged blackbird	1	0
Egretta thula	Snowy egret	3	0
Melospiza melodia	Song Sparrow	10	0
Porzana carolina	Sora	1	3
Xanthocephalus xanthocephalus	Yellow-headed blackbird	54	19



NMS Ordination, MRPP test, T=3.486, p= 0.00048, A=0.063

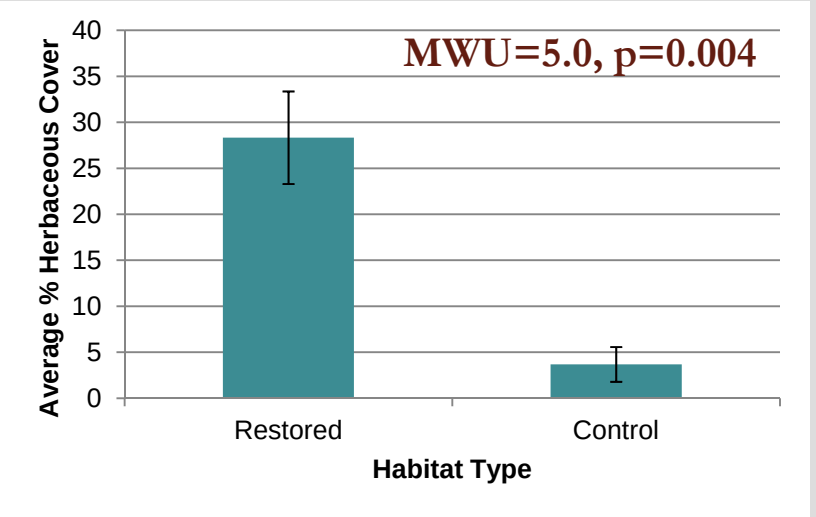


No difference in abundance (MWU=210.5, p=0.108)

MWU=156.5, p=0.006

Marsh Vegetation

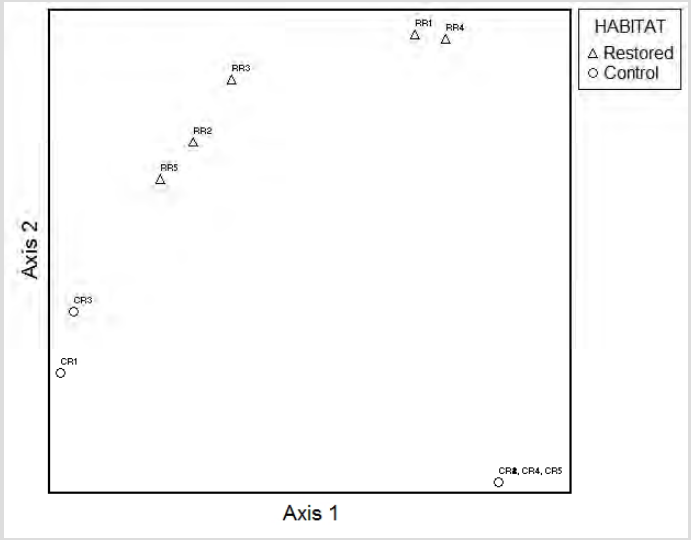
- Higher % herbaceous cover in restored verses control
- Higher % open water in control verses restored
- No correlations with marsh birds and vegetation characteristics



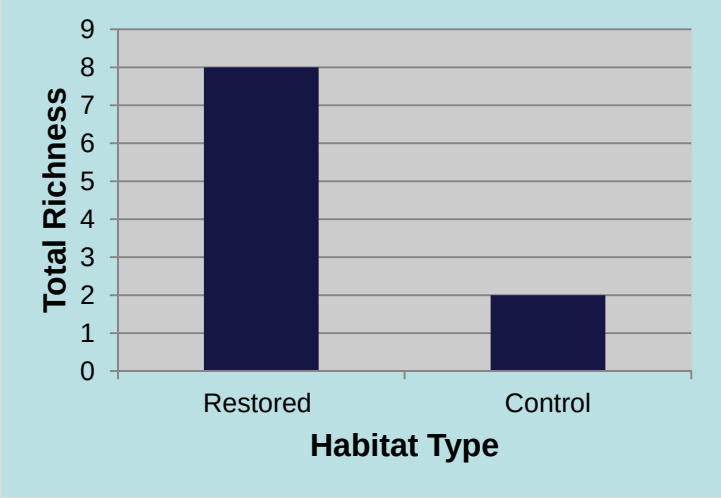
Butterflies

Family	Genius species	Host plant family	Restored observations	Control Observations
Hesperiidae	*Pyrgus communis*	Malvaceae	1	0
Lycaenidae	*Brephidium exile*	Chenopodiaceae	245	0
Lycaenidae	*Hemiargus ceraunus*	Fabaceae	26	0
Lycaenidae	*Leptotes marina*	Fabaceae	1	0
Lycaenidae	*Strymon melinus*	Fabaceae and Malvaceae	1	0
Pieridae	*Pieris rapae*	Brassicaceae	1	1
Pieridae	*Nathalis iole*	Asteraceae (Tagetes)	5	0
Pieridae	*Colias eurytheme*	Fabaceae	6	5

48 times higher abundance in restored verses control sites (MWU=44, p<0.0001)



NMS Ordination; MRPP test, =-2.527, p= 0.0234, A=0.17



MWU=48, p<0.0001

Host Plant and Nectar Resource

- No difference in host plant abundance or frequency in restored verses control
- Host plants adjacent to riparian plots: agriculture and upland
- Four times higher flowering species richness in restored verses control
- No significant difference in flowering species abundance and inflorescence abundance
- Primary nectar sources in restored habitats: western sea purslane, screwbean mesquite, wild heliotrope, and four-wing saltbush

Butterfly and Habitat Correlations

- Butterfly species richness was correlated with (α=0.10):
  - Flowering species richness
  - Flowering species abundance
  - Vegetation species diversity
  - % herbaceous vegetation
- Butterfly abundance was not correlated with environmental variables

Variable	Pearson Correlation	p-value
Flowering species richness	0.611	0.061
Flowering species abundance	0.639	0.047
Vegetation species diversity	0.581	0.078
% herbaceous vegetation	0.621	0.055

Discussion

- Birds prefer restored over control riparian and wetland habitats.

  Riparian

  – Mourning doves and verdins had highest density of resident species in restored riparian habitats.

  – MSCP species of concern:
    - Residents: Gila woodpecker and Arizona Bell's vireo
    - Migrating: Southwestern willow flycatcher and yellow warbler

  – Compare results on a regional scale

  Wetland

  – Yellow-headed black birds and marsh wrens were most abundant in restored marsh habitats.

  – American coots were most abundant in control habitats.

  – MSCP species of concern: Yuma clapper rail and least bittern

Discussion

- Butterflies prefer a diversity of flowering herbaceous species in restored habitats.
- Western pygmy blue (*Brephidium exile*) was most abundant species in restored habitats
  - Associated with alkali soils
  - Host plants in the Chenopodiaceae family
- Many species associated with agricultural crops:
  - Cabbage white (*Pieris rapae*)
  - Orange Sulfur (*Colias eurytheme*)
  - Common hairstreak (*Strymon melinus*)
  - Marine blue (*Leptotes marina*)

- Need to sample butterflies in future to distinguish patterns

Thanks to Arizona Water Protection Fund,
Yuma Crossing National Heritage Area,
Quechan Indian Tribe,
Arizona Western College, Chase Choate and
Lin Piest

Appendix O. 2012 Colorado River Terrestrial and Riparian (CRTR) Meeting Agenda

2012 Colorado River Terrestrial and Riparian (CRTR) Meeting

Laughlin, NV – Harrah's Casino

January 24th-26th, 2012

January 24th

09:00 Start of meeting and introduction – Chris Dodge

09:10 Opening Remarks, an Introduction to the MSCP – Theresa Olson - Reclamation

09:30 A Journey through Time Down the LCR: 38 Years and Counting – Bert Anderson – Re-vegetation and Wildlife Management Center

10:00 Yuma East Wetlands and Hunters Hole – Fred Phillips – Fred Phillips Consulting

10:20 Acquisition of Unprotected Habitat: Desert Tortoise & Flat-tailed Horned Lizard – Jed Blake - Reclamation

10:35 Adaptive Management of the LCR MSCP – Sonja Kokos - Reclamation

10:55 Break

11:10 Willow Flycatcher Surveys of the LCR, and Salt Cedar Beetle Monitoring – Anne Pellegrini and Mary Anne Mcleod - SWCA

11:40 Southwestern Willow Flycatcher Research - Damon Peterson - NAU

12:00 Lunch

1:20 Southwestern Willow Flycatcher Habitat Use, Reproductive Success, and Interactions with Tamarisk Beetles on the Virgin River, Utah - Rob Dobbs - UDWR

1:40 Southwestern Willow Flycatcher Survey Results from the Rio Grande – Darrell Ahlers - Reclamation

2:10 Comparison of SWFL Habitat between Areas Occupied by Tamarisk Beetle and Unoccupied Habitat – Scott O'Meara and Stacey Crowe - Reclamation

2:30 Tamarisk Feeding Invertebrates of the Las Vegas Wash– Jason Eckburg - SNWA

2:50Break

3:10 Athel Tamarisk (Tamarix aphylla) Invading the Lower Colorado River – Curt Deuser - LMNRA

3:30 Soil Hydrology Study of Yellow-billed Cuckoo and Willow Flycatcher Habitat along the LCR – George Ruffner - EcoPlan

3:50 Diets of Willow Flycatchers in Different Desert-Riparian Habitats – Bill Wiesenborn - Reclamation

4:10 Willow Flycatchers and Salt Cedar Beetle Discussion

4:30 End of the day

January 25th

09:00 Introduction for the day – Chris Dodge

09:10 Monitoring at Yuma East Wetlands – Heidi Trathnigg – Fred Phillips Consulting

09:30 System-wide Bird Surveys of the LCR for 2011 – Dawn Fletcher and Amy Leist - GBBO

09:50 Bird Monitoring along the Las Vegas Wash – Debbie Van Dooremolen - SNWA

10:10 Status of Marsh and Riparian Birds in the Colorado River Delta – Osvel Hinojosa - Pronatura

10:30 Break

10:50 Peregrine Falcons and Waterbird Interactions at LMNRA – Joe Barnes

11:10 Yellow-billed Cuckoo Survey Results from the LCR for 2011 – Shannon McNeil - SSRS

11:30 Yellow-billed Cuckoo Survey Results from the Rio Grande – Dave Moore - Reclamation

11:50 Lunch

1:20 Final Recommendations for an Elf Owl Survey Protocol – John Boone - GBBO

1:40 General Birds discussion

2:10 Edaphic and Hydrologic Influences on Floodplain Dynamics as a Method to Understand Ecosystem Functions Related to Restoration. – Doug Merkler – USDA-NRCS

2:30 Ground Water and Soil Salinity Monitoring Network – Matt Grabau - GSA

2:50 Break

3:10 Update on the Southwestern Mountain Lion Project – Ashwin Naidu – U of A

3:30 Lowland Leopard Frog and Colorado River Toad Distribution and Habitat Use in the Greater Lower Colorado River Ecosystem – Taylor Cotton – AZG&FD

3:50 Community Recovery after Fire on the Bill Williams River NWR – Kathleen Blair - BWRNWR

4:10 The New LCR MSCP Website – Michelle Reilly - Reclamation

4:30 End of day

January 26th

09:00 Daily Introduction - Allen Calvert

09:10 Habitat Monitoring Announcements – Dianne Bangle - Reclamation

09:20 Evaluating Feasibility of Seeding Native Riparian Species in the Colorado River Delta – Francisco Zamora and Karen Schlatter – Sonoran Institute

09:40 Comparing Bat Capture Surveys across Four Habitat Creation Areas – Allen Calvert - Reclamation

10:00 Post-Development Acoustic Bat Monitoring at Habitat Creation Areas - Susan Broderick - Reclamation

10:20 Break

10:40 Distribution and Roost Site Habitat Requirements of Western Yellow Bats and Western Red Bats - Joel Diamond and Ronnie Mixan

11:00 System-Wide Bat Monitoring on the LCR using Four Long Term Acoustic Stations - Joel Diamond and Ronnie Mixan

11:20 Bat Surveys of Mines within the Vicinity of Planet Ranch – Pat Brown – Brown Berry Consulting

11:40 Bat Monitoring discussion

12:00 End of Meeting