Increased Shorebird Monitoring and Training in Sonora, Mexico

Final report on winter monitoring by the Alamos Wildlands Alliance

Final Report for SJV Award F13AP00669

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112,705 acres affected

81 species

157,454 total bird detections

25 people trained/affected

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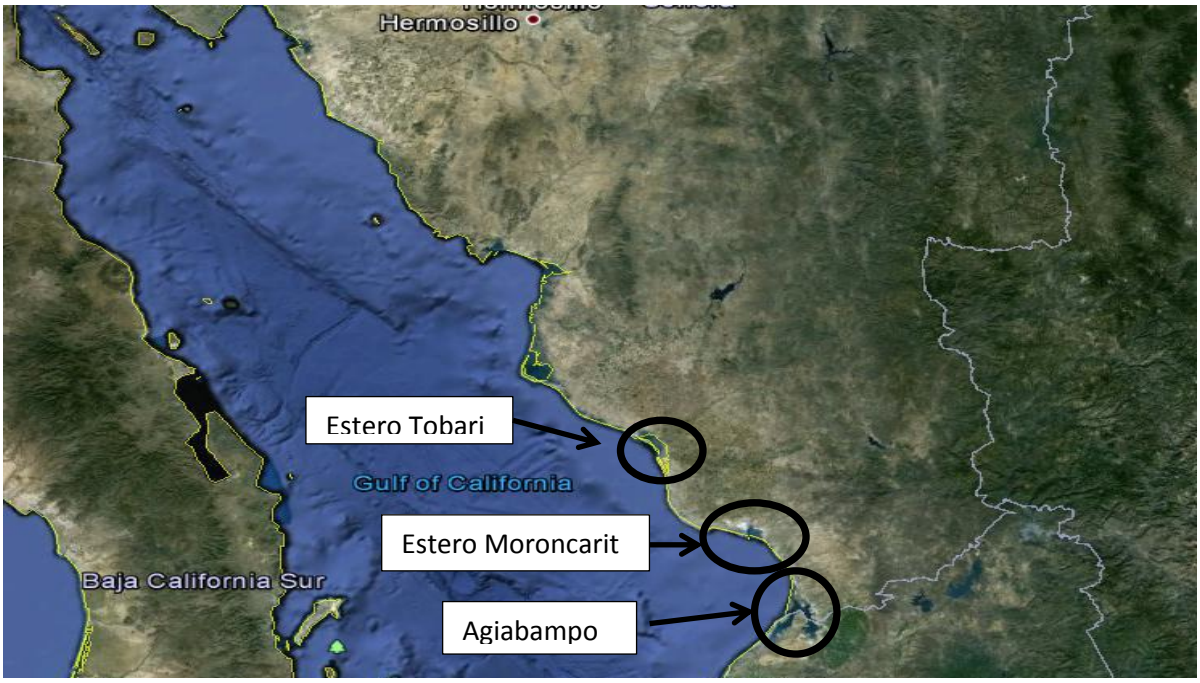
Summary:

The 3 large estuaries of southern Sonora (Figure 1) receive no formal protection despite their large size and regional significance (combined total of over 112,705 ha). Collectively they provide habitat to many thousands of wintering and migratory birds including over 38 species of waterfowl, shorebirds, and colonial waterbirds that are species of concern in the SJV Bird Conservation Plan (SJV technical committee, Beardmore, C., 2006). Despite the regional significance of the estuaries there remains a lack of standardized and rigorous bird monitoring data Harrington 1993, Mellink 2005). Increased monitoring and data sharing will facilitate comparisons to other coastal wetlands in the SJV region and the rest of the hemisphere. This program was able contribute to other monitoring projects that are already in place through the Pacific Flyway Shorebird Project, and research monitoring programs in Sinaloa, Nayarit, and Baja California. The rapid growth of industrial agriculture, and its consequent pesticide and fertilizer use in southern Sonora are certain to bring changes in coastal habitat and its use by migratory and resident birds. In addition, monitoring data will help inform regional conservation planning in the face of increased effects of climate change.

After receiving funding from the Sonoran Joint Venture awards program, a fundraiser, and the Rufford foundation small grants program ($9500 USD), the Alamos Wildlands Alliance began a waterbird monitoring program in southern Sonora, Mexico; gathering baseline data on shorebird, waterfowl, and colonial waterbirds. On a monthly basis from November 2013 through March of 2014, we counted all species and numbers of birds in different sampling units within

the Agiabampo, Moroncarit, and Tobari bays of southern Sonora (Figure 1). This was the first organized effort to survey aquatic bird use over the winter and migratory periods in this part of the world.

FIGURE 1 Study area.



Accomplished Project Objectives and Outcomes:

1. Increase monitoring in 3 southern Sonoran estuaries for the wintering and migratory periods of all aquatic bird species.
a. We surveyed the same sites that are existing sampling areas for the Pacific Flyway Shorebird Survey (PFSS) for all bird species in Esteros: Agiabampo, Moroncarit, and Tobari.
b. To maintain regional consistency in methods, the same methods were those used for PFSS throughout Northwest Mexico (Palacios, et al 2011) and include; point counts, area surveys, and transect surveys on foot, in autos, and by panga.
c. A minimum of 5 visits were made to each of the three study areas in southwest Sonora. More than 48 days were spent in the field.
d. Waterbird monitoring in the Agiabampo estuary continued with localized weekly surveys.
2. Gather and synthesize a database for all waterbirds in southern Sonora.
a. Data was summarized and will be shared with the Avian Knowledge Network to facilitate use by other researchers and land managers.
b. Generation of baseline data is a priority of the SJV conservation plan (SJV technical

committee, Beardmore, C., 2006).
3. Describe aquatic bird use of 3 estuaries and phenology of wintering and migration.
a. Other areas not previously surveyed in all three estuaries were scouted and appropriate sites were surveyed or noted for future surveys.
b. Surveys covering the entire wintering period and migration will provide valuable data on the use of the region during winter and migrations, allowing researchers to better plan future monitoring and conservation efforts.
c. Data on abundance shows that all three sites merit inclusion of new sites in the World Hemispheric Shorebird Reserve Network (WHSRN). Bahia Tobari was recently granted recognition as the 90th site in the network.
4. Provide capacity building opportunities for regional biologists at the Navopatia Field Station.
a. Through contacts with our partners, CISA Tierras para la Conservación A.C., and Grupo de Aves del Noroeste (GANO), PRBO Conservation Science, and government agencies, interested students and biologists were invited to the Navopatia Field Station for small group workshops on bird identification and monitoring techniques.
b. 15 visiting biologists, students, and/or local community members contributed to shorebird surveys in Agiabampo and other estuaries. This will also help assist in networking and new partnership development throughout Northwest Mexico.
c. Partner Xicoténcatl Vega Picos, of the Grupo de Aves del Noroeste (GANO), assisted with recruiting workshop participants and training materials.
5. Due to unforeseen circumstances our partner, CISA Tierras para la Conservación, was not able to pay crew leaders. We gave stipends directly to crew members.
a. We engaged two experienced Mexican nationals at a living wage to oversee field work and assist with data entry and analysis.
6. We summarized data and prepared this report for all interested stakeholders.
a. Previously collected waterbird data will be incorporated into a master dataset and a report summarizing findings and suggestions for future monitoring and research will be prepared.
7. Archive data within the Avian Knowledge Network.
a. Data will be stored and shared in the California Avian Data Center (CADC) and the Migratory Shorebird Project with the support of PRBO Conservation Science.
b. PRBO Conservation Science will assist AWA with distribution of relevant data and results.

Methods used were identical to those that have been used for the last 3 years in northwest Mexico as part of the Pacific Flyway Shorebird Survey (PFSS) (Palacios, et al 2011). The same sampling units were used, however, all species were counted at each site. Historically only Western Sandpipers (*Calidris mauri*) and Dunlin (*Calidris alpina*) were counted during PFSS surveys. Surveys were consistently conducted within three hours of low tide, with a couple of exceptions necessary to discover optimum survey times at different sites.

Training and Outreach

Capacity building was a major component of the project. We were able to give stipends and provide airfare for two Mexican nationals, Eric Antonio and Jilly Rodriguez, to help lead the field crews and teach visiting students and biologists. In addition, we were able to give instruction to 15 regional students, biologists, and local people. Workshop participants were compensated for travel costs and housed at the Navopatia Field Station. Participants came from Universities and NGOs from Hermosillo, Culiacan, and local villages. Workshops were held in small groups of one to four people at a time for 2 to 4 day periods. Each participant was given a Kaufman Field Guide to Birds of North America in Spanish and a training booklet that outlined the basics of bird watching and ornithology. In-depth discussions of the value and methods of aquatic bird monitoring took place throughout the workshops. Participants contributed to surveys during the workshops, often surprised by the initial difficulty of accurately counting hundreds of birds of dozens of species. We were not able to provide stipends to Mexican volunteer crew leaders through CISA, A.C.. The stipends were paid directly to the biologists.

The biggest challenge we faced during the project was scheduling and coordinating workshop participants. The remote nature of the estuaries in southern Sonora can make coordination of vehicles and buses a trial. In the future, advertising will begin earlier.

Over the course of the project we re-sighted 8 Caspian Terns (*Hydroprogyne caspia*) that were banded in Northern California and Eastern Washington at their nesting colonies. The birds were all sighted from November through January. We also re-sighted one American White Pelican (*Pelicanus erythrorhynchos*) that was banded in Southern Idaho by the Idaho Department of Fish and Game. The increased effort led to important new wintering records for each of those projects.

Site Descriptions

All three sites are Important Bird Areas (#129-131) and within the federal zone. They are also within the arid borderlands region of the SJV Bird Conservation Plan, though habitats affected by this project are all within coastal wetlands. They are a mix of mud bays, tidal flats, sand beaches, and mangroves. Upland habitats consist mainly of industrial agriculture, degraded xeric habitats, and primeval cactus forest.

Bahia Tobari is the smallest of the estuaries at 8274 hectares and is surrounded by industrial agriculture and three different municipios. It is an important bird area (#129). It contains the private island Isla Huivulai which is now only accessible by boat. The estuary is comprised of immense mudflats, with occasional borders of short mangroves and sandy beaches. There are 2 sampling units at Bahia Tobari.

Estero Moroncarit covers 13,627 hectares and is within the Municipio of Huatabampo. It is an important bird area (#130) and a registered RAMSAR wetland of international importance (#1984) (RAMSAR, 2012). It also has immense mud flats and some areas of dense mangroves. There are 3 sampling units at Moroncarit.

Estero Agiabampo at 90,804 hectares is the largest estuary in the region. It straddles the southern Sonora/northern Sinaloa border and is also an important bird area (#131) as well as a RAMSAR wetland of international importance (#1797) (RAMSAR 2012). It is surrounded by agriculture, primeval cactus forest, and degraded thornscrub habitats. Mangrove stands can be extensive in parts of the estuary. It contains two protected islands; Isla Masocarit, an island of mangrove and near pristine upland habitat, and Isla de Pajaros, a small islet that is a breeding colony for Blue-footed Boobies (*Sula nebouxii*) and Cormorants (*Phalacrocorax spp.*), also a roosting area for shorebirds and some seabirds. There are 11 different sampling units at Agiabampo. These include one site that was surveyed at least weekly to help gain an understanding of migration phenology in general and for several species.

Several species that represent species of conservation concern/priority species in the SJV regional conservation plan, were chosen to explore migration phenology and compare among sites. Those species are: waterfowl: Northern Pintail (*Anas acuta*), shorebirds: Western Sandpiper (*Calidris mauri*), colonial waterbirds: Caspian Tern (*Hydroprogne caspia*). Graphs for each estuary hosting the three species throughout the winter were included.

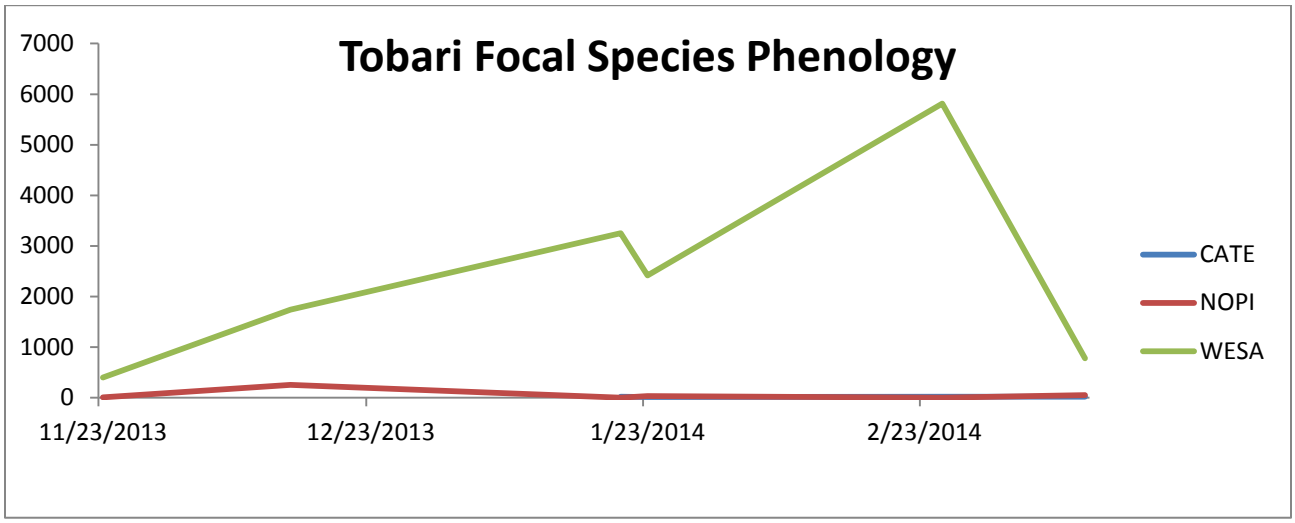
Results

Bahia Tobari

Tobari was the one estuary that could be surveyed at high tide. Most surveys were done within three hours of low-tide. The sites surveyed include a portion of shoreline in the village of Paredoncito and a two part section along the entrance to the removed causeway. Other

sampling units could be created to expand the survey area. This was not done this season as travel and access issues precluded more intensive surveys. Tobari had 6 different visits and 42,550 individuals of 56 species. Late February was when detections were highest (Figure 2). Northern Pintails were more abundant in December in Tobari. Brant (*Branta bernicula*) were absent on many survey dates, in the sampling areas, but present in larger numbers throughout the bay.

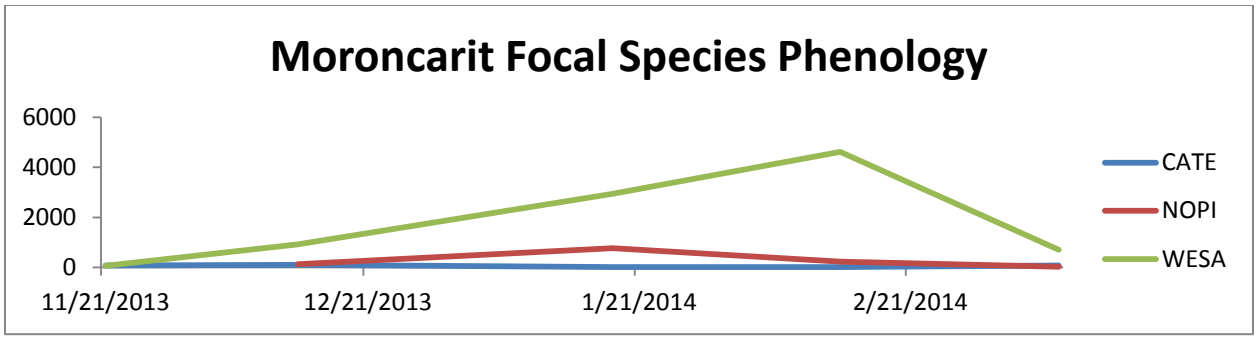
Figure 2.



Moroncarit

Moroncarit has 3 sampling units that cover a large area in this bay. We counted 47,528 birds of 57 species. February had the most detections (especially concerning Western Sandpipers, with numbers dropping off by March 10. (Figure 3) Moroncarit was also the source of 6 of the 8 color-banded Caspian Terns we re-sighted over the course of the project. It is well situated for aquatic bird sampling efforts. The sites are easily accessed and active with many species.

Figure 3.



Agiabampo

The Agiabampo is the largest bay/estuary in the study area, and in most of Sonora. There are 11 sampling units. More were chosen in this estuary to include sites that had a mix of usage levels. We observed 67,376 birds of 77 species in the Agiabampo estuary. Phenology was more variable due to the greater effort (Figure 4) We re-sighted two color-banded Caspian Terns and a banded American White Pelican in Agiabampo. There was greater effort in Agiabampo due to its proximity to the Navopatia Field Station. One site (Arroyo Bamocha), was surveyed at least weekly to observe the migration phenology (Figure 5). Agiabampo showed another peak in detections in late December and a lesser peak in February.

Figure 4.

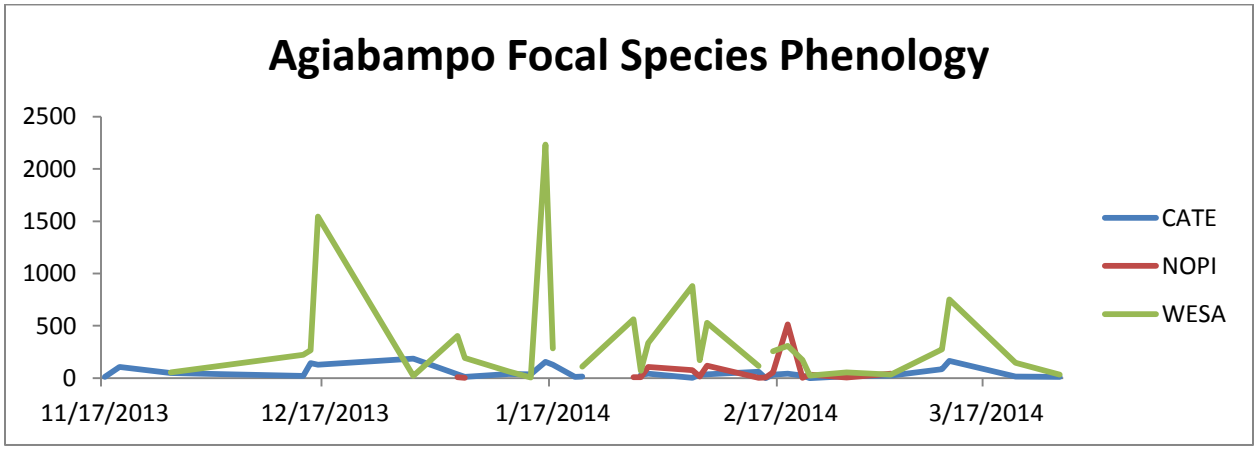
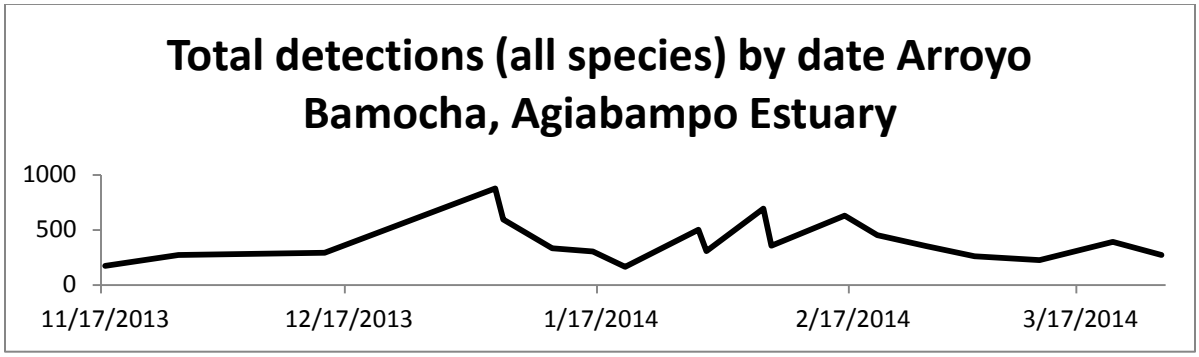


Figure 5.



Conclusions

Only three species were graphed to simplify the presentation. Western Sandpipers in many cases, represented a larger suite of species than the other selected focal species.

The need for long-term aquatic bird monitoring in Northern Mexico, indeed the entire hemisphere, is genuine. While continuing and expanding this project and protocol would be valuable, without adequate funding and personnel such an expansion would be ambitious.

By expanding the temporal and species scope of the well-established Pacific Flyway Shorebird Survey (PFSS) the capacity of the project could be expanded without significantly more resources. Choosing a subset of species of concern and expanding surveys to include another visit throughout the winter (mid to late February, if this project can be scaled to the rest of the region) we can gather monitoring data on other at risk species and expand available data for the area.

In Southern Sonora scaled back monitoring will continue in 2014-15. Many sites in the Agiabampo estuary will continue to be monitored weekly throughout the 2014-15 winter season. Moroncarit and Tobari will be surveyed opportunistically and for the PFSS. The outreach aspect of the project will continue in a less formal way until more funding is secured. Many of the workshop participants plan to return and volunteer to improve their field skills during the 2014-15 season.

Only one of the bays (Tobari) is currently included in the Western Hemisphere Shorebird Reserve Network (WHSRN). Based on this past season's data and scouting trips it appears that with coordinated counts the other two bays have at a minimum, the requisite 20,000 shorebirds to be included in the WHSRN.

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Appendix 1. Species detected and totals in 3 estuaries on Southern Sonora

	Species	AGIABAMPO	MORONCARIT	TOBARI	Grand Total
AMAV	American Avocet	4011	528	3624	8163
AMCO	American Coot	863		13	876
AMOY	American Oystercatcher	123	55	35	213
AMWI	American Wigeon	2218		283	2501
AWPE	American White Pelican	1538	57	77	1672
BBPL	Black-bellied Plover	98	1211	465	1774
BCNH	Black-crowned Night-Heron	10	2	1	13
BFBO	Blue-footed Booby	5273			5273
BLSK	Black Skimmer	272	632	1	905
BLVU	Black Vulture	4			4
BNST	Black-necked Stilt	268	28	209	505
BOGU	Bonaparte's Gull	3	2		5
BRAC	Brandt's Cormorant	2			2
BRAN	Brant	62	8133	9	8204
BRBO	Brown Booby	104			104
BRPE	Brown Pelican	3228	301	141	3670
BUFF	Bufflehead	513	1		514
BWTE	Blue-winged Teal		2		2
CAEG	Cattle Egret			1	1
CAGU	California Gull	34	25	29	88
CANV	Canvasback	15			15
CATE	Caspian Tern	1700	284	87	2071
CITE	Cinnamon Teal	28			28
CLRA	Clapper Rail	1			1
COLO	Common Loon	24			24
DCCO	Double-crested Cormorant	7476		43	7519
DUNL	Dunlin	709	185	1706	2600
EAGR	Eared Grebe	271	1		272
ELTE	Elegant Tern	437	32		469
EUWI	Eurasian Wigeon	5			5
FOTE	Forster's Tern	681	40	30	751
GADW	Gadwall	75		53	128
GBHE	Great Blue Heron	313	39	71	423
GBTE	Gull-billed Tern	40	11	30	81
GREG	Great Egret	242	265	18	525
GRHE	Green Heron	8		2	10
GRYE	Greater Yellowlegs	65	11	10	86
GWTE	Green-winged Teal	1922	2	236	2160
HEEG	Heermann's Gull	255	112	76	443
HERG	Herring Gull	13	30	3	46

HOGR	Horned Grebe	3			3
KILL	Killdeer		1	5	6
LAGU	Laughing Gull	3588	1084	335	5007
LBCU	Long-billed Curlew	36	24	22	82
LBHE	Little Blue Heron	22	30	11	63
LESA	Least Sandpiper	1503	421	2607	4531
LESC	Lesser Scaup	1340	390	9	1739
LETE	Least Tern	2			2
LEYE	Lesser Yellowlegs	1	5		6
MAFR	Magnificent Frigatebird	173			173
MAGO	Marbled Godwit	730	7148	1721	9599
MALL	Mallard	2			2
NECO	Neotropic Cormorant	1714		1	1715
NOPI	Northern Pintail	2098	1137	358	3593
NSHO	Northern Shoveler	4416	519	7517	12452
OSPR	Osprey	4	1		5
RBGU	Ring-billed Gull	3233	2677	657	6567
RBME	Red-breasted Merganser	308			308
REDH	Redhead	344			344
REEG	Reddish Egret	31	18	2	51
REKN	Red Knot		30		30
ROSP	Roseate Spoonbill	46	15	6	67
ROYT	Royal Tern	277	13		290
RUDU	Ruddy Duck	65			65
RUTU	Ruddy Turnstone	55	49	7	111
SAND	Sanderling	301	15		316
SEPL	Semipalmated Plover	197	61	928	1186
SNEG	Snowy Egret	208	393	37	638
SNPL	Snowy Plover	9		31	40
SPSA	Spotted Sandpiper	4	6	2	12
TRHE	Tricolored Heron	20	16	4	40
TUVU	Turkey Vulture	21			21
UNDO	Unidentified Dowitcher	2424	8969	5545	16938
WEGU	Western Gull		9		9
WESA	Western Sandpiper	10130	9242	14407	33779
WHIB	White Ibis	163	231	169	563
WHIM	Whimbrel	41	81	41	163
WILL	Willet	859	2814	685	4358
WIPH	Wilson's Phalarope			6	6
WIPL	Wilson's Plover	36	13	25	74
YCNH	Yellow-crowned Night-Heron	11	13	32	56
YFGU	Yellow-footed Gull	57	114	127	298
Grand Total		**67376**	**47528**	**42550**	**157454**

Appendix 2. GPS coordinates of monitoring sites.

SITIO	UNIDAD DE MUESTREO	(INICIO) X (longitud)	Y (latitud)	(FINAL) X (longitud)	Y (latitud)	
MORONCARIT	YAVAROS 1	648002	2954545	647651	2954323	
	YAVAROS 2	644880	2955003			
	YAVAROS 3	644828	2955055	643796	2955603	
AGIABAMPO	ARROYO BAMOCHA	675848	2926796	675848	2926796	
	BACO 4	689668	2907474	689668	2907474	
	BACO1	689329	2099529	689329	2099529	
	BACO2	689128	2900351	689128	2900351	
	BACO3	690176	2908602	690176	2908602	
	EL CALLEJON	674524	2914177	6750340	2921419	
	ISLA PAJAROS	676056	2908888	676056	2908888	
	PUNTA NORTE 1	673572	2912893	673850	2912337	
	NAVOPATIA	676009	2921108			
	LA UVA	678853	2921934	679259	2921125	
	PUNTA NORTE2	674355	2913024	674355	2913024	
TOBARI	PAREDONCITO	607458	2993739	607458	2993739	
	TOBARI	615945	2997703	601983	2998185	
All sites have DATUM as NAD83						
All UTM region = 12R						

Appendix 3. Waterbird monitoring data form.

FORMATO PARA MONITOREO DE AVES ACUATICAS. Pagina ____de _____

Fecha (A/M/D)_____ Sitio_____ Unidad de Muestreo_____
Hora inicio/final_____/_____ Nubosidad (0-100%) _____ Área visible (0-100%) _____
Observadores _____
Marea.-

☐ 1.Alta ☐ 2.Casi alta y subiendo ☐ 3. Casi alta y bajando ☐ 4.Media y subiendo ☐ 5.Media y bajando.
☐ 6.Casi baja y subiendo ☐ 7.Casi baja y bajando ☐ 8.Baja ☐ 9. No se observa.

Viento.-

☐ 0. Calmo ☐ 1.ligero ☐ 2.Brisa ligera ☐ 3.Brisa suave
☐ 4. Brisa moderada ☐ 5.Brisa fresca ☐ 6.Brisa Fuerte

Precipitacion.-

☐ 0.Ninguna ☐ 1.lluvia Intermitente
☐ 2. Lluvia permanente (suspenda el censo)

Especie	Individuos	Especie	Individuos
WESA	5 A 10 D		

D=Descansando, A=Alimentandose.

Depredadores: SI / NO_____Disturbio: SI/NO_____
Comentarios_____
_____

Para aves anilladas los colores se anotan (IA/IB; DA/DB).