North American Bird Conservation Initiative



Advancing Integrated Bird Conservation in North America

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Translation assistance by Norma Ferriz.



The All-Bird Bulletin

The North American Wetlands Conservation Act (NAWCA) in Mexico: 1991-2013

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Mexico's wetlands represent a wide range of coastal and continental habitats, from mangroves to *ciénegas* to lagoons. The importance of these habitats to migratory birds is without question. Priority wetland sites in Mexico support impressive congregations of wetland-dependent birds and serve as critical wintering and migratory stopover sites for many species that breed in the United States and Canada.

For example, on the Gulf of California in the State of Sinaloa lies Ensenada de Pabellones, where a series of lagoon complexes, estuarine waters, swamps, marshes, and meadows support 292 species of migratory and resident birds. The area holds globally important wintering concentrations of Northern Pintail, Northern Shoveler, and Greenwinged Teal, and is a Western Hemisphere Shorebird Reserve Network (WHSRN) site of international importance, hosting more than 300,000 wintering shorebirds, including Western Sandpiper, Marbled Godwit, and American Avocet. In addition, Laguna Madre, located along the Gulf of Mexico in the State of Tamaulipas, supports internationally important concentrations



Northern Pintail. / Gary Kramer, U.S. Fish and Wildlife Service

of Redhead, Northern Pintail, and Ruddy Duck. It is a WHSRN site of international importance and supports critical wintering populations of such listed species as Reddish Egret and Piping Plover.

History and Process. Given the importance of wetlands to the continent's migratory bird populations, Congress passed the North American Wetlands Conservation Act (NAWCA) in1989. For the past 22 years, the Act has provided funds to protect and restore more than 27 million acres in the United States, Mexico, and Canada. The Act was passed to support activities under the North American Water-

fowl Management Plan, a tri-national agreement that provides a strategy for the long-term protection of wetland and associated upland habitats needed by waterfowl. Over the last ten years, the Act has expanded its scope to include the conservation of wetland-associated migratory birds listed in the U.S. Shorebird Conservation Plan, the North American Waterbird Conservation Plan, and Partners In Flight Conservation Plans.



Reddish Egret. / Tom Grey

Approximately five percent of NAWCA's annual appropriation is allocated to projects in Mexico each year. In the last five years, NAWCA's Mexico Grant Program has received, on average, \$2.7 million annually.

Once a year, applicants to NAWCA's Mexico Grant Program submit project proposals to both the U.S. Fish and Wildlife Service's Division of Bird Habitat Conservation and Mexico's Secretariat of the Environment and Natural Resources Division of Wildlife (SEMARNAT-DGVS), the Service's counterpart in Mexico. Based on their longstanding partnership, the offices collaborate on the preliminary review of each proposal. Eligible proposals are presented to the North American Wetlands Conservation Council, which recommends projects to the Migratory Bird Conservation Commission for final funding approval. The Division of Bird Habitat Conservation awards and administers the approved grants.

As a result, since 1991, more than 1,170 partners have been involved in 268 Act-supported projects in 31 Mexican states, representing \$45,700,000 in Act funds matched by \$103,114,000 in partner funds. Grant and matching funds support a wide range of conservation activities in Mexico, including habitat protection, restoration, and enhancement; environmental education and outreach; training and capacity building; and sustainable use and infra-structure development. For more information see:

www.fws.gov/birdhabitat/Grants/NAWCA/Standard/Mexico/grantsENG.shtm

Program Evolution. From 1991, when NAWCA supported its first partner in Mexico, until the early 2000s, NAWCA's Mexico Grant Program was simply growing in every possible direction—new partners, new areas, new priorities, and an increasing budget. But by 2005, it was apparent that the program had evolved and matured enough to begin the detailed business of direct habitat protection. This shift in priorities was long overdue, but until land was actually available for sale or for inclusion under federal protection, and methodologies and legal procedures were in place and understood, this shift could not be made. Even today, Mexican laws and regulations are still evolving to support land protection for conservation purposes, including the development of various legal mechanisms to protect habitat for conservation purposes. Ten years ago, few if any projects supported by NAWCA in Mexico conducted habitat protection activities.

Today the majority of projects selected for funding routinely protect habitat acres or restore protected habitat or both. The program's priority activities, however, are still evolving due to stiff competition from developers, who want to purchase attractive coastal habitat and have the funds to do so. It remains to be seen what direction the NAWCA Mexico Program will take given these challenges and new ones on the horizon such as global climate change (see article on Page 22), while still maintaining bird habitat conservation and protection as its priority.

Strategic Life Cycle Conservation. Regardless of the conservation mechanism, the need to conserve habitat in Mexico for migratory birds remains a priority for the U.S. NABCI Committee, whose mission is to safeguard North America's birds and their habitats for future generations. The Committee is dedicated to working tri-nationally to support every stage of a species' life cycle—throughout the geographic range of nesting, migration, and wintering habitats—the full spectrum of bird conservation. Conservation of bird habitats in Mexico is critical for the many species that overwinter in, migrate through, and live year-round in the country.

NAWCA projects in Mexico most often occur at sites with various priority designations, including: (1) Mexican Priority Wetlands; (2) Areas of greatest significance to North American ducks, geese, and swans, designated by the NAWMP; (3) 28 key wetlands for waterfowl in Mexico; (4) 28 key wetlands for shorebirds in Mexico; as well as a preliminary list of 51 priority sites for Colonial Waterbirds in Mexico—the product of a NAWCA-supported project undertaken by Pronatura Sur described on Page 25. Strategic location at such priority sites is one of a number of important criteria used in NAWCA's Mexico Grant Program proposal review and ranking process to promote

the conservation of these migratory species. (Visit <u>www.fws.gov/</u> <u>birdhabitat/Grants/NAWCA/Standard/Mexico/files/List and</u> <u>maps.pdf</u> to see priority site maps.)

In 2006, building on priority bird regions in Mexico, NABCI partners identified five critical areas for priority bird species migrating to and from the United States and Canada: Laguna Madre in Tamaulipas, Marismas Nacionales in Nayarit, El Triunfo in Chiapas, the Yucatán Peninsula, and the Grasslands of Chihuahua. Information from long-term migration monitoring studies has been used to link these Mexican sites with sites and partnerships in the United States and Canada that support the priority species. Over the years, NAWCA-Mexico projects have been conducted at these priority sites, precisely because of the importance of bird habitat conservation in those areas (see articles that begin on Pages 3, 5, 7, 9, 12, and 14). NAWCA has also supported the development of



Piping Plover. / Mike Morel, U.S. Fish and Wildlife Service

grassroots regional alliances in some of these and other areas of Mexico—such as the Colorado River Delta as described in the article on Page 16—to build capacity for long-term bird conservation.

This issue of *The All-Bird Bulletin* is dedicated to showcasing recent projects funded by NAWCA in Mexico. With the movement toward full life cycle conservation, it's imperative that conservationists renew and augment their efforts to work internationally—through programs like NAWCA—to conserve habitat throughout the ranges of migratory birds.

Two Decades of Work to Benefit Birds, Wetlands, and Forests in the Yucatán Peninsula

Gonzalo Meredíz Alonso, Executive Director, Amigos de Sian Ka'an, A.C.

Environmental conservation is a complex endeavor that involves both maintaining the natural richness of an area and promoting community development at local, national, international, and global levels. The strategic location of the Yucatán Peninsula, and the increased growth and urban and coastal development it has experienced in the last 30 years, make it an ideal location to showcase these complexities. The Peninsula's vital role for migratory birds, high biodiversity, and vast areas of wetlands facilitated an alliance among several local conservation organizations and NAWCA. Collaboration between NAWCA and partners like Pronatura, Ducks Unlimited de Mexico, and Amigos de Sian Ka'an (ASK) has been particularly important to conservation in this region.



Wetlands of Northern Cozumel Island. / Roy Toft

Conservation work in the peninsula has evolved in recent years

through the joint efforts of different organizations. For example, collaboration among ASK, Niños y Crías, El Edén Ecological Reserve, Pronatura Península de Yucatán, The Nature Conservancy, and Mexico's National Commission on Protected Areas (CONANP) led to the formation of the Yucatán Peninsula Avian Alliance (AAPY), which was later renamed the Yucatán Peninsula Environmental Alliance. This Alliance was a vision of the North American Bird Conservation Initiative.



Amigos de Sian Ka'an became NAWCA's first partner in Mexico in the early 1990s, with the publication of Wetlands, A Forgotten World, a series of text- and workbooks for local schools. The series received national and local recognition, and launched a conservation partnership that has spanned more than 20 years. Since publication of this series, ASK and NAWCA have collaborated on many other conservation projects in the Yucatán's 842,629 acres of wetlands, rain and dry forests, and marine ecosystems. NAWCA has supported ASK in monitoring reefs, birds, and crocodiles at the Banco Chinchorro Biosphere Reserve, and in starting an ambitious project to eradicate invasive mammals on the keys of the region. This initiative now includes CONANP, Island Ecology and Conservation Group, and local fishermen, with additional support from the World Wildlife Fund-Carlos Slim Foundation alliance.

NAWCA has been a fundamental partner in securing federal and state decrees of new protected areas in the state of Quintana Roo, including Bala'an K'aax (316,295 acres), the Chichankanab lagoon (27,180 acres), and two protected areas in Cozumel (totaling 140,850 acres). These collaborative efforts have resulted in the protection of 55 percent of the islands and 75 percent of the shoreline in Quintana Roo, along with their endemic, native, and migratory species.



Pez Maya. / Gonzalo Meredíz Alonso

Conservation of public natural protected areas has been complemented by the purchase of strategic private properties to maintain the health of different species and ecosystems, such as Pez Maya, an idyllic property within the Sian Ka'an Biosphere Reserve, a UNESCO World Heritage Site. Pez Maya, which is owned by ASK, covers 64 acres and 1.86 miles of shoreline and protects the vast Sian Ka'an wetland complex outlet to the ocean and the Mesoamerican Reef.

NAWCA again demonstrated trust in long-term partners by supporting the initial efforts of AAPY for the purchase of 1,621 acres of forest and wetlands in northern Quintana Roo (San Mateo Aké). This purchase increased the conservation areas of El Edén Ecological Reserve and Yum Balám

Federal Reserve. NAWCA is also supporting the process to protect thousands of additional acres through both public and private mechanisms, and environmental education efforts led by Niños y Crías. In addition, NAWCA supports and has facilitated the involvement of other organizations such as the American Bird Conservancy.

Planning Legal Conservation Mechanisms and Restoring Migratory Bird Populations at Marismas Nacionales, Nayarit

Miguel Angel Cruz Nieto, Director of Bird Conservation & Miguel Angel Vargas, Director of Land Conservation, Pronatura Noroeste, A.C., and Victor Vázquez Morán, Director, Biosphere Reserve Marismas Nacionales Nayarit. Mexico's National Commission on Protected Areas (CONANP)

Marismas Nacionales is a large complex of lagoons, bays, ponds, bogs, and mangroves covering more than 1.2 million acres. Mangroves alone occupy 279,200 acres of that territory, and more than 100,000 people live in the area,

distributed over 230 different communities. The local economy is based on shrimp farming, aquaculture, agriculture, and, to a lesser extent, cattle ranching. In some communities, such as San Blas, ecotourism is also an important activity. Seven mighty rivers—Presidio, Baluarte, Cañas, Acaponeta, Rosamorada, Bejuco, and San Pedro—flowing down from the mountains feed the Marismas Nacionales system, resulting in a complex land- and water-scape that includes sand dunes, mangroves, coastal lagoons, brackish water ponds, aquatic vegetation, tidal flats, and mud flats, among other features.

Despite its ecological importance, Marismas Nacionales is one of the most threatened and deteriorated wetlands in Mexico. Large areas of wetlands have been eliminated and continue to be destroyed due to the cumulative effects of several threats, including the loss of 27 percent of the region's mangroves, which are still being destroyed at a rate of nearly 0.8 percent annually. The primary threats include conversion of natural areas into agricultural land, overexploitation of marine resources, aquaculture; mangrove exploitation, and the opening of channels for aquaculture and fishing. With NAWCA support, Pronatura Noroeste (PNO) and its partners have been battling these challenges, resulting in a number of key conservation achievements:



Canal in Marismas filled with flocks of Great Egret, Wood Stork, and White Ibis. / Miguel Vargas

- Negotiations between PNO and leaders representing local fishermen were a decisive factor in obtaining the decree of the Biosphere Reserve Marismas Nacionales in Nayarit (330,760 acres) in May 2010. PNO also supported the workshops to reach consensus for the Reserve's conservation and management plan, which provides zoning and land use information and recommendations for use within the reserve.
- In collaboration with Mexico's National Forestry Commission (CONAFOR) and the Autonomous University of Nayarit, PNO published the *Functional Assessment of Marismas Nacionales*, which provides an information framework for the systematic and integrated analysis of the current state of the wetland system. The Assessment was prepared using aerial photography interpretation techniques, field sampling, statistical and cartographical analysis, and modeling of water dynamics, among other environmental assessment tools. The analysis resulted in the classification of fourteen tidal watersheds subdivided into 47 sub-basins that form 57 tidal sub-systems.
- Notable alterations exist in the water circulation patterns in Marismas Nacionales, particularly in the Ejido Francisco Villa, where there are more than 19,700 acres of dead mangroves. Using information from the Assessment, and with the participation of restoration experts, PNO has developed more than eight hydrological rehabilitation community projects to benefit 740 acres of wetlands. PNO has planned, designed, and implemented these projects, including delivery of community organization, training, and strategic communications components. Projects have also included draining and connecting natural water channels to recover the historical hydrological patterns, evaluating and monitoring the restoration efforts, and, more recently, implementing the Sustainable Watersheds Program. These hydrological rehabilitation projects are being replicated throughout the region, and some are even using sophisticated techniques such as wave energy and ocean power technologies.
- PNO has designed a Site Conservation Strategy that incorporates private conservation mechanisms such as conservation easements. Natural protected areas and private conservation easements complement each

other and result in higher protection levels for the most critical areas. Owners can receive incentives from federal programs for the environmental services their properties provide. PNO is ready to start implementing this strategy at Marismas Nacionales, and will also promote the creation of Sustainable Management Units (UMAs) in the Ejido Francisco Villa (23,287 acres) and the zoning of the Ejido Palma Grande (24,730 acres).



American Avocet flock. / Mauricio Cortes

• PNO has monitored shorebirds and colonial waterbirds, the spatial and seasonal distribution of resident and migratory birds, the threats they face, and the identification of critical habitat. PNO has also evaluated pollutants, and has identified conservation opportunities for these populations. More than 60,000 American Avocet, 46,000 Snowy Plover, 31,000 Long-billed Dowitcher, and 50,000 Northern Shoveler have been recorded at Marismas Nacionales. Specific studies about populations of American Avocet and Snowy Plover are being conducted in collaboration with Weber University in Salt Lake City, Utah, and the National Autonomous University of Navarit.

• In 2012 Mexican regulations established standards and procedures to determine the volume or the ecological flow necessary for a watershed, wetland or river to support healthy and

sustainable aquatic ecosystems. This estimation can be used for watershed management and for the creation of water reserves as has been proposed for the first time in Mexico by the National Water Commission. PNO staff has been trained to implement this innovative tool as part of their freshwater conservation strategy and will complete a proposal for a water reserve for the Acaponeta River watershed in Marismas Nacionales by late 2013.

- Another key PNO program, the Environmental Outreach and Education Program for Strategic Audiences, has resulted in:
 - Publication of educational materials including an educational manual and bird field guide;
 - Training of more than 200 teachers and participation of 4,000 children;

- Participation of 3,000 children in the drawing contest to create the Marismas Nacionales Migratory Bird Calendar in 2013 (2,000 copies);

- Participation of 20,000 people in five different public conservation events;

- Organization of two bird festivals;
- Founding of ten student eco-clubs;
- Painting of ten conservation murals; and
- Establishment of 40 school-based conservation projects.

The vision of PNO's efforts is based on recognition of the importance of integrating local residents and conservation organizations working in the area to protect Marismas Nacionales. And that recognition has paid off, with the support of many other partners. PNO's financial partners in these conservation efforts include the NAWCA (bird habitat protection and restoration, environmental education, and bird monitoring), the Packard Foundation (marine conservation), the Resource Legacy Fund (land protection), Birdlife International (bird monitoring and establishment of bird-watching route), Forest Trends (environmental services), World Wildlife Fund and the Carlos Slim Foundation (water reserves program), CONANP, and CONAFOR (hydrological rehabilitation and environmental services payments).

For more information, contact Miguel Angel Cruz Nieto at <u>mcruz@pronatura-noroeste.org</u> or Miguel Angel Vargas at <u>mvargas@pronatura-noroeste.org</u> or visit <u>www.pronatura-noroeste.org</u>.

Protecting and Conserving Migratory Bird Habitat in Laguna Madre, Tamaulipas

José Alfredo Alvarez Cerda, Tamaulipan Ecoregion & Wetlands Coordinator, Pronatura Noroeste, A.C.

Pronatura Noroeste (PNE), one of the leading organizations for conserving priority ecosystems in northeast Mexico, has been involved in conservation projects in the Laguna Madre region for more than thirteen years. In addition to the environmental concerns, PNE projects always consider the community level components integral to successful outcomes. PNE's conservation work in the region has followed four main strategies: (1) land protection; (2) habitat restoration; (3) monitoring of migratory aquatic birds; and (4) community development.

The Laguna Madre wetland complex is one of the most important sites along the Gulf of Mexico for wintering aquatic migratory birds. It includes a hyper-saline lagoon—with salinity levels up to 13 parts per million—as well as some scattered freshwater lagoons. This habitat combination is excellent for species such as Redhead and Northern Pintail, which depend on freshwater sources to dilute the salt they consume while feeding on marine grasses in the saline lagoon.

During the last decade, the amount of freshwater, from seasonal wetlands, dams, and riparian corridors close to Laguna Madre, has diminished dramatically due to changes in the regional hydrological regimes. These changes, caused mainly by irrigation of farmlands, have forced the aquatic migratory birds to travel longer distances to find suitable drinking water, increasing both their energy use and their exposure to predators.

White Pelican flock at Laguna Madre, Matamoros Tamaulipas./ Alfredo Alvarez, La Capilla Community

With the support of NAWCA, PNE has completed two two-phase projects since 2008, to restore priority freshwater wetlands near Laguna Madre, and mitigate the reduction of freshwater available to aquatic migratory birds. The emphasis of these projects was on the recovery of the ecological volume of Arroyo del Tigre, part of the Rio Grande Delta. Arroyo del Tigre is a riparian corridor with a river bed more than 62 miles long. Historically, it was a natural channel for the excess water of the Rio Grande during the rainy season, and it feeds an important system of seasonal wetlands vital to the wintering migration of many birds.

Unfortunately, due to human activities during the mid-twentieth century, Arroyo del Tigre lost its functionality, and by the 1970s, it no longer provided any environmental services to the region. The growth of the city of Matamoros, urban development, and extensive agricultural development in the region, as well as extreme events in the last few years such as hurricanes and droughts caused by climate change, have all contributed to the decline of the river.

By 2012, however, 70 percent of Arroyo del Tigre's ecological volume had been recovered through various infrastructure projects as a result of collaboration among municipal governments, Mexico's National Protected Areas Commission (CONANP), the public, and PNE. One element of this endeavor was a series of projects connecting rain runoff drains and redirecting treated waters from the Matamoros water treatment plant. The connecting infrastructure feeds 925 gallons of water into the system, allowing water levels to reach the coastal wetlands, which serve as wintering habitat for aquatic migratory birds. One of the most important achievements of the Arroyo del Tigre recovery efforts is the increased awareness and organization of local river users, who were given a chance to see how maintaining the health of natural ecosystems can also enhance farming, cattle ranching, and fishing. In 2012, a group of 28 ejido and private property owners from around Arroyo del Tigre created a non-profit, Producción y Conservación del Tigre, A.C.



Barra Soto La Marina, one of several barrier islands that separate Laguna Madre from the Gulf of Mexico on the east. / Héctor Garza

(Production and Conservation of El Tigre), to organize and regulate water usage activities, and influence stakeholders on decisions involving projects and infrastructure that could have an impact on the river.

To guarantee the care and maintenance of the restoration and rehabilitation projects at Arroyo del Tigre, PNE has signed eight private and ejido land conservation easements covering 62,888 acres that encompass wintering habitats for aquatic migratory birds. In addition, PNE has recorded the different bird species that use Laguna Madre and its associated habitats, and shared this information with partners to strengthen the Management Plan for Laguna Madre, the Rio Grande Delta Flora and Fauna Protected Area, and other national and international conservation plans.

PNE has also identified freshwater wetlands throughout Laguna Madre that have largely lost their freshwater capture and storage capacity, due to sedimentation or poorly main-

tained retention walls. Through PNE conservation projects, 3,700 acres of those wetlands have been restored, increasing available water for shorebirds and aquatic migratory birds.



Dowitcher spp. in Laguna Madre, a WHSRN site of international importance. / Héctor Garza

PNE's projects at Laguna Madre supported by NAWCA have been very successful. Each has resulted in the recovery of important habitat for migratory aquatic birds. However, there is still much to do in our endeavor to build a future where human development can thrive without affecting the feeding, resting, and reproduction areas of aquatic birds.

Ongoing projects focused on the recovery of freshwater coastal wetlands are a high priority, including addressing the need for mapping the Rio Grande Delta and Arroyo del Tigre region. By characterizing each of the wetlands used by migratory birds, such a map would allow us to identify which wetlands require conservation, protection, or restoration. The map would also be an important decision-making tool for government and private agencies working in the area.

For the future, it is important for PNE to maintain a strong relationship with the Producción y Conservación del Tigre organiza-

tion, and support them in negotiating and implementing projects that enhance the system—for they are the stewards of this land and will ensure the proper use of these natural resources in the long-term.

For more information, contact Alfredo Alvarez at <u>aalvarez@pronaturane.org</u> or visit <u>www.pronaturane.org</u>.

Restoring and Establishing Freshwater Wetlands Adjacent to Laguna Madre, Tamaulipas as Habitat for Migratory Waterfowl

David Colón Quesada, Project Supervisor, Ducks Unlimited de México, A.C.

Laguna Madre in Tamaulipas is one of Mexico's richest biological aquatic ecosystems. Due to its geographic location and the environmental heterogeneity embodied in its different types of wetlands, Laguna Madre hosts a wide variety of resident and migratory birds. Laguna Madre and the freshwater lagoons nearby form an important wintering habitat for ducks and geese, which is why it is considered to be one of 28 priority sites for waterfowl conservation in Mexico. These wetlands are critical habitat for 6 percent of Mexico's endangered Piping Plover population, 50 percent of the Reddish Egret population that migrates to Mexico, and 36 percent of the continental population of Redhead. Thus, conservation of Laguna Madre and the surrounding wetlands is fundamental to ensuring a future for these species.

A significant portion of the Laguna Madre watershed has been converted to agricultural land and cattle ranches. One result of the diversion of streams and rivers, and the drainage systems built as part of the conversion of these lands, is that many of the area's freshwater wetlands have been reduced or lost entirely. As part of a 2012 initiative to recover the region's wetlands, Ducks Unlimited de México (DUMAC), with support from NAWCA and Ducks Unlimited, Inc., conducted a project to restore, create, and manage freshwater wetlands as wintering habitat for migratory waterfowl at Rancho Los Ébanos, a private property located southeast of Laguna Madre in the municipality of San Fernando, Tamaulipas. The main objective of the project was to build hydraulic infrastructure to channel and conduct water from the drainage of agricultural lands for the purpose of successively flooding a series of flood lands connected through spillways and channels.

As part of the project, 2.3 miles of channels were constructed to conduct water to the flood zones on the southern part of the property, including a feeder channel of 1.2 miles that conducts excess water to the first flood zone. To divert the water toward the rest of the flood zones, a reinforced concrete retention dike was constructed in the drainage area, which increases the flow level and redirects it into the channel that conducts the water into the rest of the flood zones.

Four channels with reinforced concrete culverts were established to distribute water from the feeder channel into the flood zones, which increased the water capture capacity by collecting rainwater coming from the northern areas of the ranch. In order to regulate water levels in the flood zones, two reinforced concrete spillways were built, each 32.7 yards long, that ensure that once each flood zone reaches its maximum water level, the excess water flows into the adjacent flood zones. Almost two miles of retention dikes, made of com-





Culvert for water distribution in the flooding areas. / Gerardo Torres Balderas



Spillway. / Gerardo Torres Balderas



Retention walls. / Gerardo Torres Balderas



Freshwater wetlands for migratory birds. / Gerardo Torres Balderas

pacted earth (some reinforced with stone to withstand tidal influences of Laguna Madre) were constructed to keep the water within the flood zones.

This hydraulic infrastructure has created 721 acres of freshwater wetlands and resulted in efficient management of water flows and increased water capture. These developments will benefit waterfowl and increase water availability for the ranch's cattle. Long-term care, management, and protection of the infrastructure—and the restored wetlands—was secured through collaborative agreements with the owners, who actively participated in the project's development.

For more information, contact David Colón Quesada at <u>dcolon@dumac.org</u> or visit <u>www.dumac.org</u>.

Restauración y Creación de Humedales de Agua Dulce Adyacentes a la Laguna Madre como Hábitat para Anátidos Migratorios (Proyecto MX-N158B)



Regional Strategy for Conserving Waterfowl and Other Wildlife in Central Mexico

David Colón Quesada, Project Supervisor, Ducks Unlimited de México, A.C.

The Mexican Bajío is one of the most agriculturally developed biogeographic regions in Mexico. Located in central Mexico, this region includes the states of Querétaro, Guanajuato, Aguascalientes, and the northern part of Jalisco and Michoacán. Its fertile soils and climatic stability favor a high seasonal and irrigated agricultural yield, making it one of the most productive areas in Mexico.

In the Pénjamo municipality, in Guanajuato, the agricultural boom has resulted in the deforestation of large areas of oak forests, scrublands, and natural grasslands, as well as reduced wildlife populations. In the valleys, there are several small wetlands that serve as important refuge and resting sites for hundreds of migratory and resident aquatic birds. In the last few years, the wetlands have diminished as a result of intentional drying for conversion to agricultural fields. Farming in drained wetlands is a technique used to exploit the accumulated water in the soil. At the same time, the remaining wetlands are being polluted with household



Northern Pintail and Cinnamon Teal at La Estación Dam. / David Colón Quesada

sewage, agricultural chemicals, and organic residues from local pig farms. The unhealthy conditions created by these pollutants have resulted in massive aquatic bird die-offs in some of the wetlands.

In 2009, Ducks Unlimited de México, with the support of NAWCA, Ducks Unlimited, Inc., Profauna, the Pénjamo Municipal Government and the local community, developed a conservation strategy for the wildlife and aquatic and terrestrial ecosystems of Pénjamo. The strategy included establishing a wildlife conservation area and organizing environmental education workshops and presentations for local agricultural producers to emphasize the importance of low-impact agricultural techniques and encourage development of wetland restoration and conservation plans.

In order to conserve most of the municipality's ecosystems, the conservation strategy proposed the creation of a regional Sustainable Management Unit (UMA) for wildlife, a legal conservation and sustainable use tool endorsed by Mexico's Environmental Ministry (SEMARNAT) that would include ejido lands (communal lands) and private properties with important wetlands. The objectives of the UMA included natural habitat and wildlife conservation actions to ensure their long-term existence, habitat restoration strategies, research projects, and managed hunting.

Ejidos and private proprietors were very responsive and eager to participate in the UMA initiative. In collaboration with citizens interested in conservation, we were able to start a nonprofit to administer the UMA. After a lengthy and complicated process, the regional UMA was finally authorized by SEMARNAT in 2012. Of the 25,575 acres that form the UMA, 85.8 percent is ejido land and 14.2 percent is private property.

Concurrently we offered twelve environmental education workshops for elementary school children in collaboration with the University of Guadalajara. These education workshops increased awareness about the local wetlands, their biodiversity, and the challenges to their survival. The workshops were offered at eight elementary schools, reaching 1,151 students and 28 teachers. We also published an environmental education manual for teachers that focused on the local wetlands and included specific activities and background readings.

Management and Sustainable Use of Wetlands within the El Fortín Ecological Easement, Pijijiapan, Chiapas, Mexico

Xavier Rojas García, Project Officer, Pronatura Sur, A.C.

In order to protect, restore, and manage priority habitats for resident and migratory birds in southern Mexico (Chiapas and Oaxaca), Pronatura Sur has developed a critical sites intervention strategy. This strategy has four components: (a) strategic information gathering for conservation (biological, economic and community assessment); (b) promotion of legal and alternative mechanisms to protect priority wetlands; (c) strengthening local capacity for planning, negotiation and sustainable management of natural resources, and (d) designing and consolidating community conservation models that can be regionally replicated.



Coastal wetlands in the Ejido El Fortín. / Xavier Rojas Garcia

Within this context, Pronatura Sur and members of the Ejido El Fortín have collaborated to produce important conservation work. The Ejido El Fortín is located on the coastal plain and has designated a community ecological conservation area covering 1,235 acres of wetlands that are critical to the conservation of migratory and resident aquatic birds and shorebirds of national and international importance. The area is a continuation of the wetland coastal corridor that includes the Mexican Priority Wetland, La Encrucijada, and the Priority Wetland for Shorebirds, Laguna La Joya. The conservation priority of this area was well defined in three previous NAWCA supported projects.

The Ejido El Fortin owns 2,620 acres. About 2,100 of these acres are covered by a combination of seasonal wetlands, permanently flooded wetlands with grasslands in coastal dunes, mud flats, brine coastal lagoons (tule and

ground cover plants), mangroves and thorn forest, and shrublands with characteristic species from lowland flooding forests. The confluence of these different ecosystems make these ejido lands ideal places for breeding, resting and feeding for a wide variety of wildlife that are nationally and internationally important.

Since 2003, there have been a number of efforts to protect, rehabilitate, and sustainably manage the natural resources of Ejido El Fortín. Among the most important actions are those geared toward consolidating a community-based legal protection strategy. With NAWCA support, between 2007 and 2011, Pronatura Sur implemented negotiation and planning activities to establish a conservation easement that protected 1,235 acres of coastal wetlands within the communal use area of the ejido. Ejido members voted to continue their efforts to conserve and restore these acres.

Because it was impossible to establish an alternative legal protection mechanism, Pronatura Sur, in collaboration with ejido members, began a zoning effort to develop a management plan for the conservation and use of their land based on a Sustainable Management Unit (UMA), and to strengthen local capacities to develop productive alternatives. As a result, the ejido is poised to join forces with another group to form the first regional birdwatching UMA in coastal Chiapas. Based on evaluations of the environmental and stakeholder potential of the area, the ejido has also defined and consolidated a management plan as well as a training program to help them manage the area's natural resources.

In the future, the biggest challenges will be generating enough funding to continue these efforts, developing interinstitutional relations, and obtaining technical advice to implement the management plan and its training components. The Ejido El Fortín and Pronatura Sur are implementing a funding strategy to seek support from government agencies and private companies as well as from different international funding sources. NAWCA's support has been crucial to consolidating the development of the conservation model based on the community's potential. This model established the technical and conceptual basis to build a conservation strategy for the priority wetlands in southern Mexico.

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Great and Snowy Egret in el Madresalito. / Francisco Ruz



Ejido El Fortín Zoning Map. / Patrocinio Alba López



Strengthening local capacities to operate the birdwatching UMA at Ejido El Fortín. / Alberto Martínez

Another Step in the Ecological Restoration of Isla Arena Mangroves, Campeche

David Alonzo Parra, Coordinator Southeast Regional Office, Ducks Unlimited de México, A.C.

With assistance from NAWCA, Ducks Unlimited de México (DUMAC) constructed seven culverts along the Tankuche-Isla Arena highway, restoring the hydrology of a 5,282-acre area of mangroves in one of the most important wetlands for migratory waterfowl on the Gulf of Mexico. The rehabilitated area of Isla Arena is lo-



Area of Isla Arena affected by the highway. / Eduardo Carrera González

cated on the northwest corner of the Yucatán Peninsula, within a region known as the "Petenes" of Campeche. This region is a coastal plain about nine miles wide and 62 miles long and harbors a great portion of the biodiversity in this eco-region. It is essentially a flooded saltwater marsh nine months of the year. The marsh contains diverse plant communities, including mangroves, bulrushes, brackish water grasslands, petenes and forests.

The combination of freshwater, resulting from rain and natural springs, and marine water sources, brought by the tides, (along with tidal changes, the gentle slope of the continent, and the winds of the North) promote flooding of Isla Arena systems during autumn and winter. Flooding with brackish waters allows the growth of grasslands and algae that are important food sources for migratory waterfowl.

Unfortunately, as in many regions, the coastal wet-

lands of Yucatán are being affected by the construction and maintenance of highways, culverts, and connection channels from the marsh to the sea. With the passage of time, these conditions have caused an increased sediment salinity and led to the death of the mangroves. Other activities that have had an impact on the wetlands are

Rehabilitation Program

Phase I: Construction of 3 culverts (northern area).

Phase II: Building of 4 culverts (central-southern area).

Phase III: Opening of connection and secondary channels, soil enhancement work, and construction of spillways. land use changes, the filling of marshes to build unregulated human settlements and trash dumps, wild fires, use of timber for housing construction, and fisheries. In addition, natural events such as hurricanes further affect these ecosystems.

In spite of its importance, the Petenes region does not escape the problems of poorly planned highway construction. The El Remate-Isla Arena road was built more than 30 years ago, impacting 15,300 acres of wetlands and killing 1,150 acres of mangroves. Later, in 1993, the Public Works and Communications Ministry of the State of Campeche paved 9.7 miles of this road, installing 19 culverts to reestablish the water flow that had previously been blocked. However, these culverts do not coincide with the natural drainage areas, which have been modified or filled with sediments as a result of the barrier effect of the highway.

This highway modifies and reduces water flow from the Petenes to the disturbed area, affecting its level, frequency, and flooded period

(hydroperiod). These changes have in turn increased evaporation and salinization rates, leading to the death of the mangroves west of the highway.

In 2001, DUMAC, with NAWCA's support, began restoring the area by constructing three culverts on the topographically lowest areas of the highway. This construction enhanced water flow and reestablished parameters that allow structural and distributional growth of the affected mangroves. DUMAC and the Center for Research and Advanced Studies-Merida Campus conducted research to quantify the impact of the restored hydrology by monitoring changes in the physical and chemical characteristics of the water and sediments.

The studies show that the area, impacted by the construction of the culverts in 2001, demonstrated an increase in seedlings density (from 187 to 340 plants per hectare and from 64 to 140 plants per hectare). The studies also indicated a survival rate of the seedlings of over 90 percent. The seedlings in the monitoring area closest to the culverts had the largest growth rate (0.0013 inches/day).

Even though the water salinity in the area impacted by the three culverts has diminished, the average salinity of the sediments in the affected area (15,300 acres) was 97.3 ppt in 2009, reaching values of 118 ppt at times. Based on these numbers DUMAC decided to conduct a second phase of the project in 2010, constructing four culverts in the areas of maximum efficiency for the flow of natural channels and in areas with the highest salt levels in the sediment. Thanks to these culverts the salt content in sediments has diminished to 51.26 ppt on average. These lower salinity levels allow mangrove development (Fig. 1).

Valore: Promedios de Salinidad Intersticial (ppt)



Figure 1. Average interstitial salinity values (parts per trillion) of sediment in restoration areas.



Building of culverts at El Remate-Isla Arena highway, Campeche as part of the wetlands rehabilitation work in the area. / Gerardo Torres Balderas

We are currently concluding studies on the changing mangrove coverage in the restored area through satellite imagery and aerial photography. Our studies compare data from 1948, 2000, 2004 and 2009. These studies indicate that there has been mangrove growth (2000 to 2009) as a result of the seven culverts in an area that used to be dead. The enhancement of the hydroperiod in the 15,281-acre area has also resulted in increased use of the area by shorebirds and Blue-winged Teal.

In the third phase of this project, we are conditioning sediments and constructing more than 10 miles of connection channels between the culverts and spillways previously constructed. DUMAC has done similar projects in other mangrove regions of the Yucatán Peninsula, with excellent success in diminishing sediment salinity and accelerating the regeneration of the mangroves.

With these actions, we are securing conservation of more than 14,800 acres of priority wetlands for migratory waterfowl. Hydrological rehabilitation and recovery of mangroves in the Petenes area is contributing to the conservation community's understanding of the ecological engineering processes needed to establish mangrove conservation projects in different karst regions.

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Joint Initiative for Restoration of the Colorado River Delta

Osvel Hinojosa Huerta, Director, Water and Wetlands Program, Pronatura Noroeste, A.C.



Map of priority areas for water requirements in the Colorado River Delta, Mexico. / Osvel Hinojosa Huerta

The Colorado River Delta, located in the Mexican states of Baja California and Sonora, is one of the highest priority wetlands for conservation in North America. Despite severe environmental alterations caused by water diversions in the basin, in both the United States and Mexico, the Colorado Delta still provides critical habitat for 350,000 wintering aquatic birds, including listed species such as Yuma Clapper Rail and Snowy Plover.

Led by Pronatura Noroeste, the Joint Initiative for the Restoration of the Colorado River Delta was launched by a binational partnership of nonprofit organizations, government agencies, academic institutions, and local communities to protect and restore these wetlands. Our partners include the Sonoran Institute, the Environmental Defense Fund, the Commission on Ecology and Sustainable Development of Sonora, the Environmental Protection Agency of Baja California, and the Upper Gulf of California and Colorado River Delta Biosphere Reserve. Together we have been able to engage other partners, such as Mexico's National Water Commission, the International Boundary and Water Commission, and the U.S. Bureau of Reclamation.

Our long-term goal is to restore and protect at least 100,000 acres of priority wetland sites in the Delta, including the Colorado River floodplain, the Hardy River, the Ciénega de Santa Clara, and El Doctor wetlands. Conservation activities include land protection, dedication of water flows to the wetlands, and implementation of active restoration at key sites.

With the support of the NAWCA, we have already been able to achieve significant restoration outcomes, including:

- Acquisition of water rights in the Mexicali Valley for a permanent yearly allocation of 3,400 acre-feet the first time in Mexican history that water rights were acquired and dedicated for environmental purposes, after the National Water Law was updated in 2004 to include environmental considerations;
- Protection of 1,480 acres of wetlands in the Delta through concessions on federal lands within the Colorado River floodplain;
- Protection of 1,500 acres in the Ciénega de Santa Clara and El Doctor wetlands through the establishment of conservation easements with the local communities;
- Dedication of 12,800 acre-feet per year of effluent from the Las Arenitas Wastewater Treatment Plant to improve flows in the Hardy River, and restoration of a 250-acre wetland adjacent to the treatment plant, through a partnership with the Government of Baja California and the National Water Commission. In the first three years since its restoration, 152 species of birds have been recorded at the site, with a maximum of 15,000 waterbird individuals on a single day; and
- Restoration and enhancement of 7,400 acres of wetland habitat throughout the Delta in twelve different restoration projects.

These efforts have yielded increased momentum for conservation of the Delta, with a positive effect on U.S.-Mexico relations. Since 2009, a bi-national process, coordinated by the International Boundary and Water Commission, has been in place for establishing the framework for the signing of Minute 316 of the International Water Treaty, which provides water to protect the Ciénega de Santa Clara. This process recently has focused on negotiating a new agreement to improve management of the Colorado River, that includes an environmental component.

On November 20, 2012, these negotiations proved successful and resulted in the signing of Minute 319, which guarantees the allocation of 150,000 acre-feet of water for restoration in the Delta within the next five years. Next steps include ongoing efforts to acquire water rights for restoration, together with actions to protect critical sites and the restoration of over 2,200 acres of new wetland habitat.

Organizations of the Joint Initiative have been involved in restoration of the Delta for more than fifteen years, and plan to continue their efforts in this important region. Through this collaborative process, the Joint Initiative has learned that water allocation for environmental purposes is feasible, as is the protection of large tracts of wetlands. The Colorado River Delta is a very resilient ecosystem. Successful, costefficient restoration can be achieved when we understand the hydrological, ecological, and human dimensions of each site and work in concert with these elements. Collaboration is essential, especially in bi-national ecosystems like the Delta.

The Joint Initiative has seen that restoration generates incredible benefits for wildlife—migratory species continue to arrive in massive numbers, and sensitive species, such as Yuma Clapper Rail and Least Bittern, have undergone population increases. But restoration also brings significant benefits to local communities, which now have greater opportunities for income generation through ecotourism and fishing, due to improved wetland resources. Through the implementation of these efforts and Minute 319, we expect to see water flows running throughout the Colorado River Delta, restoring new habitat and reconnecting the river with the Gulf of California once again.

For more information, contact Osvel Hinojosa Huerta at <u>ohinojosa@pronatura-noroeste.org</u> or visit <u>www.pronatura-noroeste.org/</u>.



Map of the Joint Initiative's restoration sites in the Colorado River Delta. / Osvel Hinojosa Huerta



Western Grebe. / Osvel Hinojosa Huerta



Las Arenitas wetland. / Osvel Hinojosa Huerta

Brant Conservation in Northwest Mexico

Gustavo D. Danemann, Executive Director, Pronatura Noroeste, A.C.

The Pacific Black Brant is considered a conservation priority in the North American Waterfowl Management Plan. With support from NAWCA, Pronatura Noroeste, A.C. (PNO), along with other partners, has addressed Brant conservation in northwest Mexico using a four-step protocol, implemented in the region since 2008. This protocol includes (1) analysis of the area's Brant habitat condition, through monitoring of the Brant wintering



Pacific Black Brant. / Victor Ayala



Aerial photograph of Brant migrating over northwest Mexico. / Victor Ayala

population; (2) education on Brant conservation issues offered to communities adjacent to Brant wintering wetlands; (3) protection of critical habitat in those sites; and (4) design of administrative instruments to conserve Brant habitat and food sources. So far, these activities have involved the San Quintín Bay, the Ojo de Liebre wetland complex, San Ignacio Lagoon, and Magdalena Bay, along the Baja California Peninsula. Initial population surveys have been conducted at all continental wintering sites. What we have learned will further conservation of this important species.

Brant Population and Habitat in Northwest Mexico. Over the last fifteen years, northwest Mexico has been home to an average of 97,000 Brant each winter, representing between 60 and 80 percent of the total species population. On average, about 31,000 Brant (31.8 percent of the population wintering in Mexico) winter at Ojo de Liebre Lagoon; 25,200 (25.8 percent) at San Quintín Bay; 19,700 (20.2 percent) at San Ignacio Lagoon; and 6,400 (6.5 percent) at Magdalena Bay. All of these wetlands are located along the Pacific coast of the Baja California Peninsula. Another 14,200 Brant winter in wetlands along the Sonoran and Sinaloan coasts, on mainland Mexico, including the Yavaros-Moroncarit-Tovari system (6,300 Brant, 6.5 percent), the Infiernillo Channel (5,800, 5.9 percent), and Santa María Bay (2,100, 2.2 percent). While the peninsular populations have decreased since the 1960s, the continental wetlands have shown a slight increase in Brant numbers for the same period of time.

Brant distribution coincides with that of the eelgrass, its main food source during the winter. At one time, the Brant population wintering south of 26°N latitude was significantly larger, but a decrease in the abundance of eelgrass in those latitudes caused the Brant to begin congregating in their current number and location, mostly north of 26° 30'N. As suggested by our recent research, changes in

Brant distribution within northwest Mexico could also be related to the decrease in density and biomass of eelgrass in the Ojo de Liebre, San Quintín, and San Ignacio wetlands during the last decade. Even when present in many of the Brant wintering wetlands, other disturbances of and changes in habitat quality do not seem to have a significant effect on regional Brant distribution.

Habitat Protection. To date, only the Ojo de Liebre and San Ignacio Lagoons are included in a federally protected area—the Vizcaino Biosphere Reserve (VBR). Due to its proximity to the headquarters of the VBR in Guerrero Negro, the Ojo de Liebre Lagoon receives more attention from federal authorities. The land and federal

zone along critical portions of coastline are also being considered for further conservation agreements by landowners and concessions by the federal government. Adjacent to the Lagoon, the artificial wetland created by the Guerrero Negro Saltworks is under concession to the Exportadora de Sal, S.A.C.V., a company that has committed to permanent protection of this area.

Surrounding San Ignacio Lagoon, approximately 320,000 acres have been secured through conservation easements on communal properties and through a Sustainable Management Unit (UMA) for wildlife established on public land and administered by PNO. After years of effort, 95 percent of all coastal wetlands of the lagoon have been protected by one or another of the land protection instru-

ments we have implemented, and there are plans to protect the remaining 5 percent.

Although the protection status of the other three important sites varies, it is important to note that all the sites have been proposed for federal protection and work to that end is in progress. PNO and its partners continue to promote the implementation of diverse public and private land protection instruments to conserve more habitat at all the sites. We have acquired some properties, and have been successful at having federal coastline tracts leased by the federal government— "concessioned"—for conservation purposes.

Brant Conservation Plan for Northwest Mexico. Building on experience gained through the study of Brant populations, their wintering habitat, and their conservation needs in northwest Mexico, a group of specialists have prepared a first draft Brant Conservation Plan for the region.

The Brant Conservation Plan has two main objectives—to protect Brant wintering habitat and eelgrass beds, and to maintain or increase the Brant winter population levels and distribution. To achieve these objectives, the Plan proposes six strategies: (1) reduce and prevent human disturbance at critical sites; (2) strengthen natural protected areas that host wintering Brant, promote new protected areas, and prevent coastal development in sensitive sites; (3) establish buffer zones around wintering wetlands, through private and public land protection; (4) evaluate



and prevent pollution, particularly from agrochemical compounds; (5) eliminate poaching; and (6) promote scientific research and monitoring. Although at first glance the plan may appear to be very ambitious, many of the proposed strategies have already been implemented successfully in the region, providing critical experience for addressing further conservation challenges. The *Brant Conservation Plan for Northwest Mexico* was presented at the Pacific Flyway Study Committee Meeting held in Newport, Oregon, in March 2013, adding to a long history of joint efforts to benefit the conservation of migratory birds throughout Canada, the United States, and Mexico.

Community Education. Conservation of Brant and their wintering habitat in Northwest Mexico requires community support, that is, support from the local population. With this in mind, we produced and distributed education

Developing Multi-dimensional Strategies for Conserving Veracruz's Alvarado Wetland Complex

Elisa Peresbarbosa Rojas, Executive Director, and Aníbal Ramírez, Ecoforestry Program Director, Pronatura Veracruz

The Alvarado wetlands are rich in biodiversity and contain the largest mangrove area in the state of Veracruz more than 47,000 acres. Mangroves are key to the local economy since they provide refuge and reproduction sites for a great variety of commercially important fish. These wetlands also host millions of migratory birds that use them as wintering sites or as stopover sites on their annual journey south.



Alvarado Wetland Complex canals./ Elisa Peresbarbosa Rojas

Every year, mangrove trees are lost as a result of intentional burning and the modification of water flows. Even though mangroves are a protected species, people use them regularly to make charcoal and fences for cattle ranching. One of the biggest challenges that we face is reconciling the protection of this ecosystem with the economic and development needs of the local inhabitants. The challenge continues to intensify, particularly in the face of declining fishing activities that once were one of the main economic resources of the area.

Fifteen years ago, Pronatura Veracruz sought support from NAWCA for the conservation and sustainable development of this national and international priority site. We began our work in Alvarado with a strong environmental education

effort, developing a wetland manual for elementary school children and an associated teachers guide. We introduced the education program in 20 schools and taught the children about the importance and biological richness of the wetlands where they live. Through years of conservation education work, we planted seeds of interest to protect and conserve the natural resources of the area.

Unfortunately, economic needs supersede the locals' love for the wetlands and conscience to protect them. These needs are some of the main motivations that guide the different stakeholders' actions that—day-by-day—determine the fate of these wetlands.

To that end, we have worked continuously to assist the Alvarado communities in the conservation of their wetlands. But because economic need guide's the daily actions of these stakeholders, the delicate balance between income generation and sustainability is a necessary consideration in everything we do. However, we have made important strides in raising the consciousness of community members so that they understand that there are benefits to conservation that can provide sustainable, income generating activities.

Here are some of the highlights of our work over the last few years:

- In 2004, with support from NAWCA, we purchased our first, small property in the Alvarado Complex, in the town of La Playa, Ejido Costa de la Palma.
- In 2005, we conducted a mangrove reforestation effort—with mixed results.
- In 2007, we began work on the legal protection of areas important to migratory birds and a process to certify private properties for that purpose.
- In 2011, we started a certificate training program in mangrove restoration that was the foundation of the Ecological Mangrove Restoration School (ERES)

- In 2012, we purchased a second property in the Alvarado wetland complex.
- By 2013, we certified 1,957 private acres for conservation, where we have planted mangrove and implemented restoration and other management activities.

It is important to note that the owners or custodians of the private reserves are primarily small landowners, many of them livestock producers. Cattle ranching has been the predominant economic activity in the area for more than 250 years. We are working with some ranchers on cattle management best practices that allow us to generate examples that balance cattle production with mangrove protection. One of the key best practices is the

fencing and isolation of cattle from certain areas to allow for natural mangrove regeneration. Another preferred practice is the construction of rainwater capture systems so cattle can access better quality freshwater, eliminating the need for cattle to seek and trample the small pools otherwise used by birds, thus reducing erosion and sedimentation.

Through the years we have gathered information about the avifauna that use these wetlands, identifying their relative abundance. We have recently installed a monitoring program of photo-traps, tied to the ecological restoration, which will help us identify bioindicators of the ecological health of the mangrove wetlands, and will provide information on the bird populations using the wetland system.



Painted Bunting. / Robert Burton, U.S. Fish and Wildlife Service

In addition to protection of key sites and restoration efforts, we are generating the necessary information to promote and maintain sustainable forestry and mangrove use practices. This is and has been the greatest challenge that we have faced in the areas where we work: how to generate and strengthen an economic activity that involves a rational use of natural resources, while incorporating environmental criteria, and that will generate enough economic incentive for the local inhabitants.

These projects have built a conservation infrastructure, established private protected areas, and most importantly developed a highly committed and enthusiastic human community ready to face the growing environmental and economic challenges of the Alvarado wetland area. We hope to continue our partnership with NAWCA in this tireless effort to design and apply multi-dimensional strategies for the protection and conservation of mangroves

in Veracruz—one of Mexico's most important ecosystems and home to thousands of species of migratory birds and other wildlife.

For more information, contact Elisa Peresbarbosa Rojas at <u>eperesbarbosa@pronaturaveracruz.org</u> or visit <u>pronaturaveracruz.org</u>.



Common Gallinule between Blue-winged Teal pair. / Steve Hillebrand, U.S. Fish and Wildlife Service

Reducing the Impacts of Climate Change on the Gulf Coast of Mexico

Ellen C. Murphy, NAWCA's Mexico Program Coordinator, Division of Bird Habitat Conservation, U.S. Fish and Wildlife Service, and Gabriela de la Fuente, Assistant Director, Ducks Unlimited de México, A.C.

Approximately 60 percent of Mexico's runoff waters discharge into the Gulf of Mexico, creating vast wetlands and lacustrine systems from Laguna Madre in Tamaulipas all the way to the Yucatán Peninsula. In 2009, results from the Earth Simulator confirmed Global Carbon Cycling Model projections of drastic alterations to the water cycle in Mexico due to climate change, affecting ecosystem integrity and services, with major economic implications. These impacts have been caused by an increase in evaporation, changes in water circulation, and sea level rise, and prompted the Mexican government to designate the Gulf's coastal wetlands as the ecosystems most critically threatened by climate change.

The coastal lagoons located along the Gulf of Mexico provide critical habitats for migratory waterfowl, waterbird, and shorebird species. Seven of the 28 priority wetlands of Mexico are located in this coastal region. Forty-five percent of the bird species are visitors that spend the Northern Hemisphere's winter months here. Another ten percent of the species are transitory visitors and only spend a short time on their way to their wintering sites in latitudes further south. Another ten percent of the species are accidental visitors, whose presence in the area is not very well documented. This region is also considered to be one of the most important migratory corridors in the world for birds of prey with over four million individuals recorded every autumn.

In response to the results of the above models, and with concern for maintaining these vital ecosystems, the Mexican Government and a group of partners developed criteria for evaluating and prioritizing coastal wetlands. They found several sites to be highly susceptible to the impacts of climate change, including sea-level rise and coastal subsidence; altered freshwater and sediment influx; saltwater intrusion; agricultural, industrial, and urban runoff; and storms associated with frontal passage and tropical lows, to name only a few. So to reduce the vulnerability of Mexico's water resources to these anticipated climate impacts, and with a focus on impacts to the integrity and stability of the Gulf's wetlands, they joined with the World Bank and other Mexican partners to develop an adaptive measures strategy that includes:

- Planning and implementing wetland restoration strategies and preparing action plans that integrate climate change adaptation measures and resource management programs for the protection of threatened habitats;
- Establishing adequate management programs to restore mangrove ecosystems;
- Implementing pilot adaptation measures to maintain water supplies for productive sectors such as agriculture and cattle ranching; and
- Developing mechanisms to promote sustainable land use patterns that maintain the functional integrity of wetland ecosystems in the region.

NAWCA began its support for this major climate change project by partnering with the World Bank and the Mexican National Institute of Ecology and Climate Change, through a grant to Ducks Unlimited of Mexico (DUMAC). This multi-million dollar project—*Restoration of Critical Migratory Bird Habitat Utilizing Adaptive Measures to Reduce the Impact of Variable Climate Change on Wetlands of the Gulf Coast of Mexico*—is large in scope and aims to be far-reaching in its impact. This project will address the climate change issues at four threatened sites, identified by the Mexican Government (see map on Page 23).

NAWCA funded objectives include:

- (1) Protecting more than 106,000 wetland acres;
- (2) Enhancing and restoring 86,487 wetland acres, including acres affected by saline intrusion;
- (3) Restoring biological corridors;

(4) Applying rainwater capture and retention technologies;

(5) Promoting participatory development in communities for implementing adaptive measures;

(6) Evaluating the feasibility of fishing operations and their effects on fish populations and biodiversity in some coastal lagoons; and

(7) Applying communication techniques in accordance with each site's stakeholders to support the application of restoration measures.

The adaptation measures, to be supported by NAWCA funds and managed by DUMAC, will focus on conserving wetlands, consistent with the purposes of NAWCA. Other measures related to socio-demographic and economic factors are important to carry out in the short, medium, and long-term. To adapt to and reduce the effects of variable climate change, institutional capacities must be developed for the long-term, which requires continuous learning and adjustment cycles. This also implies, among other things, developing normative changes, operation rules, and programs (federal, state and local) that include variability and climate change components. It is

imperative that capacitybuilding in institutions, organizations, and society become a tool for promoting changes in behavior that address adaptation to changing climatic conditions. All actions are focused on diminishing the impacts of climate variability and change, as well as maintaining environmental conditions of the Gulf of Mexico's coastal wetlands, resulting in long-term benefits for the whole ecosystem and quality of life for the local human population.

For more information, contact Gabriela de la Fuente at gdelafuente@dumac.org or visit www.dumac.org.



Four sites, identified by the Mexican government as being highly susceptible to climate change in the Gulf of Mexico, which will be the focus of the NAWCA-funded project. / DUMAC

From Sian Ka'an, Page 4

The strong, ongoing collaboration among NAWCA and its partners in the Yucatán Peninsula is unique on the continent as an example of concrete construction and implementation of a long-term vision among different stakeholders. The joint efforts and financial investments made over a span of more than two decades provide a solid foundation that will allow us to face the great environmental challenges of this region. The area hosts millions of migratory birds but at the same time, billions of dollars of investments in tourism and urban infrastructure are being made that will compete with the wildlife for its habitat, along with 10 million tourists and thousands of immigrants. As agriculture grows, wildfires increase, and urban sprawl displaces forests, wetlands become smaller. In fact, 55 percent of the mangroves, which existed in the 1970s, on the northern coast of Quintana Roo, have been lost.

The challenges are formidable, but so are the achievements to date of NAWCA, AAPY, and its other partners. Now we have the opportunity to build a new and strategic conservation vision that includes the development of monetary funds structured for environmental services payments; models of tourism that include conservation objectives; and public policies that facilitate community and private participation in the use, management, and conservation of natural resources. We have the opportunity to build and strengthen a new paradigm that marries conservation and development in a single model to benefit people, wildlife, and the environment in equal measure and for the long-term.

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Important Sites for Colonial Waterbirds in Mexico: Developing a Preliminary Map

Efrain Castillejos Castellanos, Project Officer, Pronatura Sur, A.C.

Prior to 2009, priority sites for waterfowl and shorebirds had been identified in Mexico, however no unified, formal effort had been made to identify the important sites for colonial waterbirds. With support from NAWCA, Pronatura Sur, in collaboration with other Pronatura offices and other partners, developed a preliminary map of important colonial waterbird areas in Mexico.

The process had several phases: (1) inventory and analysis of the existing information about colonial waterbirds in Mexico; (2) a national workshop to identify priority sites for the conservation of aquatic birds; (3) surveys at potentially important sites for colonial waterbirds; and, (4) creation of maps and databases for important colonial waterbird areas in Mexico.



American White Pelican. / Robert Burton, U.S. Fish and Wildlife Service

Inventory and Analysis of the Existing Information about Colonial Waterbirds in Mexico. At the beginning of this process, we reviewed the existing knowledge of colonial waterbirds in Mexico. This gave us a regional perspective regarding the current gaps of knowledge and helped us identify waterbird experts in Mexico. We discovered that the Pacific coast had more published research on waterbirds than the Gulf of Mexico. Northwestern Mexico, including the Sea of Cortez and Baja Peninsula and its associated islands, was the area with the most published papers on waterbirds. We found a total of 273 scientific papers and thesis dissertations about waterbirds. The states with the most publications were Baja California Sur (83), Baja California (65), Sonora (33), Sinaloa (19), Colima (17), Navarit (16), and Jalisco (16). The other states each have fewer than 10 publications about waterbirds.

National Workshop to Identify Priority Sites for the Conservation of Colonial Waterbirds. Based on the analysis of the existing information from the first phase, we convened experts and organizations working on colonial waterbird conservation. The workshop was held in Guadalajara, Jalisco in September 2009. There were 21 participants from 14 government agencies, research centers and conservation organizations. They had expertise in different regions, such as the Pacific, Gulf of Mexico, Yucatán Peninsula, and inland wetlands throughout Mexico.

During the workshop, experts identified priority sites that met "congregation criteria" (A4) proposed by Birdlife International (<u>www.birdlife.org/datazone/info/ibacritglob</u>). One of these criteria indicates that in order for a site to be considered priority it must host a congregation of individuals of at least one percent of the biogeographic or worldwide population of a priority waterbird species.

Surveys at Potentially Important Sites for Colonial Waterbirds. This activity was designed to evaluate the important sites that, based on the criteria established by the expert workshop, could potentially host significant congregations of waterbirds. We surveyed sites that experts were not able to confirm as priority areas during the workshop, given the scarcity of available information and the regional information gaps. Twenty sites in the Pacific region, 20 in the Gulf of Mexico-Yucatán Peninsula region, and six inland wetlands were visited and surveyed.

Creation of Maps and Databases on the Important Colonial Waterbird Areas in Mexico. Based on the information from the previous phases of this process, we created a database titled, Important Areas for Colonial Waterbirds with Migratory Populations in Mexico, which identified 51 important areas, 25 on the Pacific and Baja California Peninsula

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coasts, 13 on the Gulf of Mexico and Yucatán Peninsula, and 13 inland wetlands. Each of these sites hosts at least one percent of the worldwide or biogeographic population of one or more priority migratory waterbirds. Once the important areas were identified, we prioritized the sites based on three criteria: (1) Sites with three or more priority species; (2) Sites with two or fewer priority species; and (3) Sites on islands or dams. By applying these criteria, we developed the *Preliminary Map of Important Areas for Colonial Waterbirds with Migratory Populations in Mexico* (see below).

Although this map is in preliminary form, it is now being used by the NAWCA Council Staff Mexico Proposal Review Subcommittee as one of the tools to evaluate proposals. Pronatura Sur will request funding to conduct another phase of this effort to ground truth those sites identified as potentially important to waterbirds in Mexico, and to further develop the body of information available in Mexico regarding waterbirds in general. In the future, we hope that the map will no longer be considered "preliminary" and will be used throughout the conservation community.

For more information, contact the Efrain Castillejos Castellanos at <u>efrain@pronatura-sur.org</u> or visit <u>www.pronatura-sur.org</u>.



The North American Bird Conservation Initiative (NABCI) is a coalition of organizations and partnerships dedicated to advancing integrated bird conservation in North America.
The vision of NABCI is to see populations and habitats of North America's birds protected, restored, and enhanced through coordinated efforts at international, national, regional, state, and local levels, guided by sound science and effective management.
The goal of NABCI is to deliver the full spectrum of bird conservation through regionally based, biologically driven, landscape-oriented partnerships.

The All-Bird Bulletin is the news and information-sharing publication

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The All-Bird Bulletin publishes information on infrastructure, planinclude author's name, organization, title, and contact information.



From Brant, Page 19

materials-including a teacher's handbook, student workbook, and laminated posters-on Brant and wetlands. Our focus was on the elementary schools located in areas adjacent to all four Brant wintering wetlands along the Baja California Peninsula. This initiative complements the biennial Guerrero Negro Bird Festival held in the town adjacent to the Ojo de Liebre Lagoon. We conducted a number of workshops in local communities, reaching hundreds of children and their families. We have found that the local population, if educated on the importance of conserving Brant habitat, will work to support our efforts and become stewards in the long-term.

For more information, contact Gustavo D. Danemann at gdanemann@pronatura-noroeste.org or visit www.pronatura-noroeste.org/

Ojo de Liebre Lagoon. / Victor Ayala

From Regional Strategy, Page 11

We also provided twelve presentations to farmers on low-impact agricultural techniques, training 93 people on drip irrigation systems, use of organic fertilizers, and crops with low water requirements. After these presentations, some of the farmers started producing compost aerated by earthworms to use in their corn and garbanzo plots, which resulted in high yields and reduced chemicals in the soil that will contribute to cleaner runoff.



Northern Pintail at Los Trojes Dam. / David Colón Quesada

As part of the restoration and protection activities, we implemented the mini-habitat exclusion program, through which we were able to fence ponds and establish defined gates to prevent cattle from roaming along the water's edge. Restricting the movement of the cattle has allowed growth of aquatic and shoreline vegetation in most of the pond areas. Applying the program to 40 ponds restored a total of 938 acres, and allowed us to build the infrastructure to create two 20-acre lagoons.

Ducks Unlimited de México continues to coordinate with the UMA on wildlife monitoring projects and defining habitat conservation needs. The nonprofit in charge of the UMA has negotiated with local and state authorities to obtain the necessary funds to invest in additional conservation strategies and irrigation technology for more efficient water usage.

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