
AIDA
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para la Defensa del Ambiente


CENTRO MEXICANO DE DERECHO AMBIENTAL
CEMDA

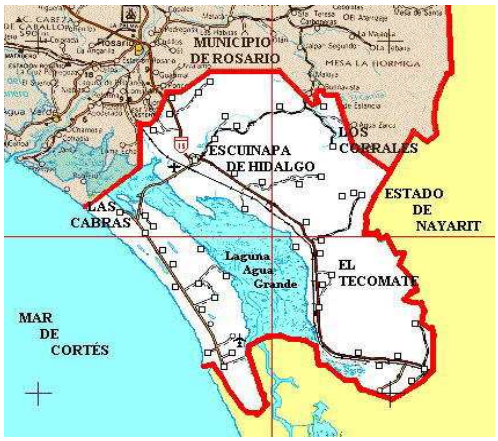
REPORT

An Outline of Proposed Development Projects and the Potential Impacts on the Ramsar Sites *Marismas Nacionales* and *Laguna Huizache-Caimanero* in Sinaloa and Nayarit, Mexico: CIP *Costa del Pacifico,* Irrigation District 111, Las Cruces and Santa Maria Hydroelectric Dams

I. THE *CENTRO INTEGRALMENTE PLANEADO (CIP) COSTA DEL PACIFICO* DEVELOPMENT IN SINALOA, MEXICO.

On September 29, 2008, Mexican President Felipe Calderon announced the Mexican government's decision to develop the *Centro Integralmente Planeado* (CIP) *Costa del Pacifico*, a tourism development expected to be twice the size of Cancun. The CIP *Costa del Pacifico* is planned for construction on the coast of the district of Escuinapa, in the state of Sinaloa, Mexico. Escuinapa has a population of 49,655 people. The CIP will be developed in the region known as Las Cabras (population: 1342), immediately adjacent to the community of Isla del Bosque (population: 4588).[1] According to estimates by FONATUR, the CIP will receive 3 million tourists in the year 2025. To accommodate this tourism traffic, the plan is to develop 2,381 hectares, building more than 1,500 hectares of real estate to provide 44,200 bedrooms. The plans include 16,850 hotel bedrooms, 16,350 bedrooms in 8,175 condominiums, timeshares and villas, and 11,000 rooms in 5,500 homes for permanent residents. Additionally there will be four golf courses, a marina with man-made waterways, and commercial and entertainment centers. The development aims to generate 150,000 direct and indirect jobs, indicating an additional increase in the permanent population of the area.[2]

The location of the proposed development at Las Cabras, showing the adjacent wetlands and community of Isla del Bosque (pop. 4588)



The district of Esquinapa, showing the location of Las Cabras and the extent of the *Laguna Agua Grande*, a significant branch of *Marismas Nacionales*.

[1] Instituto Nacional de Estadistica, Geografia e Informatica, Census 2005, http://www.inegi.org.mx/inegi/default.aspx

[2] FONATUR Presentation: "COSTA DEL PACIFICO PRESIDENCIA 110908 Modo de compatibilidad .pdf"

I.1 POTENTIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED CIP *COSTA DEL PACIFICO* DEVELOPMENT AND THE LAS CRUCES DAM.

Developments such as the CIP routinely displace massive amounts of earth, water, and living organisms, and generate both wastes and ecosystem interference from human activities. It is therefore almost certain that this proposed development will cause significant adverse impacts and pose a great risk to the viability of the *Marismas Nacionales*. The below describe some of the threats, impacts of which on the wetlands must be addressed.

The Las Cruces Dam in Nayarit

The CIP plan estimates that by the year 2025 there will be 2.89 million tourists per year visiting the development. As a result, there will be great demand for additional power and water. The solution currently put forth by the Mexican government is the construction of the *Las Cruces* dam in the bordering state of Nayarit. The Federal Electricity Commission (CFE, Comisión Federal de Electricidad) intends to build this dam with funding from a public works scheme. As of yet, CFE has not made public tender.

Per the current plans for the Las Cruces dam, the dam would be located in central Nayarit, approximately 65 km northwest of the city of Tepic in the municipalities of Ruiz and Rosamorada. The site is on the San Pedro River, just below the juncture with the Arroyo Rancho Viejo, 6 km upstream from the juncture with Arroyo El Naranjo and 38 km from the point where the San Pedro River crosses the railroad.

According to available information, Las Cruces will have a total capacity of 480 MW in two turbine-generation units of 240 MW each. Bearing in mind its potential multi-use (hydropower, reducing the peak flood peak, consolidation and expansion of the probable existing irrigation district), Las Cruces is projected to have a wall that it is 176 m high and 445 m long[3], which, according to the World Commission on Dams, would mean this project would be classified as a mega-dam[4].

Being a planned mega-dam, the *Las Cruces* dam presents significant potential environmental impacts. The CFE has already paid two consultants to elaborate the Environmental Impact Statement (EIS) for the dam. Among likely impacts from such a dam would be: drastically reduced water flow in the river flowing to the wetlands; reduced water quality below the dam that would impact the wetlands, changes in the natural flooding pattern of the river, changes in sedimentation levels, and impacts on all species that depend on the river, including those in the wetland, among others. Although the EIA has yet to be developed, there is no doubt that a

[3] Information request 1816400060209 www.infomex.org.mx

[4] According to the criteria of the International Commission on Large Dams (ICOLD) World Register, mega-dams are ones higher than 15 m (or higher than 10 m but with more than 500 m crest length), or more than 1 million m^3 storage capacity, or more than 2 000 m^3 /s spilling capacity. ICOLD Position Paper on Dams and Environment, p. 4. This definition was adopted by the World Commission on Dams Report, 2000.

project and dam of this size will demand changes to infrastructure, and will result in drastic impacts on the surrounding ecosystems, including the *Marismas Nacionales*.

It is of note that the contract for developing the aforementioned EIS permits only three months for the consultants to conduct all relevant baseline assessments for the site. (Climate, geology, geomorphology, etc.) Clearly this is not sufficient time to thoroughly and appropriately conduct such studies.[5]

The proposed dam would cut off a great deal of the water that currently enters the Ramsar site and redirect it to the tourism center, causing what will undoubtedly be profound and highly damaging effects on the wetland. Given that the mean annual evaporation of 1,800-2,000 mm outstrips the mean annual precipitation 800-1,200 mm by up to a meter, the loss of the water flowing from further inland will certainly have a significant impact on water levels and its availability in the wetlands.[6]

Electricity

With a new power source and high demand for electricity must come transmission lines, and with transmission lines come a slew of potential environmental impacts. The construction of the transmission lines can seriously alter wildlife habitats along the transmission corridor, and the electro-magnetic field (EMF) generated by the lines may pose potential health and safety risks to both humans and wildlife.

[5] Comision Federal de Electricidad http://www.cfe.gob.mx/es/LaEmpresa/queescfe/Listadodecentralesgeneradoras/
[6] Ibid

Sewage Pollution
The tourist traffic required to fill 44,200 bedrooms, in comparison with the current population of less than 5,000 people in the immediate vicinity, will be enormous (an estimated 3 million people in 2025). As stated above, the population of Las Cabras in the 2005 Census was 1342, and the population of neighboring Isla del Bosque was 4588.[7] This influx of people implies a great risk to the wetlands due to the tremendous quantity of raw sewage that will be generated. As of yet there has been no proposal for how to deal with this potentially hazardous material that, if released into the natural environment, would have serious consequences for water quality and both the endangered and non-endangered plant and animal species native to the *Marismas Nacionales* Ramsar site.

Runoff Pollution
The four proposed golf courses and surrounding landscaped areas will require the use of substantial quantities of fertilizer, herbicides and pesticides. Typical fertilizers are high in nitrogen compounds that are quickly carried off by water and have proven to be toxic to many animal species when present in sufficient quantities. Such organic compounds can also cause eutrophication of waters with limited circulation, posing a substantial threat to the wetlands. In extreme cases the increase in algal growth leads to hypoxia, and the inability of the waters to sustain life due to lack of oxygen.

Furthermore, the development of roads and increased automobile traffic will present the possibility of toxic petroleum-based oils and residues entering the ecosystem via storm drains. Given the mean annual precipitation levels of 300-1000mm, or 800-1200mm when adjusted for the relative humidity of 75%, the potential for runoff pollution to affect the wetlands is great and must be addressed.[8]

Boat Traffic
The proposal for a tourist marina brings the possibility of increased boat traffic in the area, which presents not only a direct hazard to wildlife via disturbances and collisions, but also the possibility of wetland and coastal water pollution due to increased fuel and exhaust entering the water systems of the wetland.

I.2 THE FAILURE TO COMPLY WITH THE RAMSAR CONVENTION ON PART OF THE MEXICAN GOVERNMENT

According to the recommendations enacted by the Ramsar Convention on Wetlands in 1996, participating governments should demand integration of environmental considerations in relation to the planning decisions in a form that is clear and transparent to the public, such as an environmental impact assessment (Recommendation 6.2, 1996). As of yet and in spite of the extensive nature of the project proposed, there has been no such assessment in relation to the CIP *Costa del Pacifico*.

[7] Instituto Nacional de Estadistica, Geografia e Informatica, Census 2005, http://www.inegi.org.mx/inegi/default.aspx
[8] FICHA INFORMATIVA DE LOS HUMEDALES DE RAMSAR (FIR) – VERSIÓN 2006-2008

I.3 LEGAL ACTION AT THE NATIONAL LEVEL AND NEED FOR INTERVENTION BY THE SECRETARIAT

It is imperative that the Ramsar Secretariat take action in this case, because national legal and administrative procedures will not be resolved in time to prevent significant impacts to the wetlands.

On February, 18th, 2009, GREENPEACE filed a popular complaint in regards to the CIP against FONATUR with the office of the Attorney General of Mexico (PROFEPA) for violation of the General Law of Ecological Equilibrium and Environmental Protection (*Ley General de Equilibrio Ecológico y Protección al Ambiente* (LGEEPA)). On April, 24th, 2009, CEMDA filed another popular complaint regarding the CIP against the same authorities, this time for violation of the General Law for Sustainable Forest Development. As of yet there has been no decision on either of these complaints and cases such as these can take up to two years to reach a final resolution, as described below.

Popular Complaint

Chapter VII of the General Law of Ecological Equilibrium and Environmental Protection (LGEEPA) provides for popular complaints to be addressed by the Attorney General for Environmental Protection (PROFEPA) via the following procedure:

- Submission of the complaint and its registration.
- Investigation of the submission and transmission of the complaint to the competent local authority, who then takes charge of the case.
- Notification to the complainant within 10 working days, regarding the official start of the complaint procedure.
- When a finding has been made, the results of the investigation are made known to the complainant.

Generally, PROFEPA requires six months to one year to simply draft a resolution to a popular complaint. Furthermore, the environmental authority does not have the staff to conduct site inspections. The process generally requires about two years for a definitive resolution. This time delay stresses the importance of actions from the Ramsar Secretariat as *Marismas Nacionales* would be affected by the CIP and the *Las Cruces* dam projects in less than one year. The complaint filed via the national process is extremely unlikely to be resolved in time to stem impacts to the wetlands.

Additionally, on May 15, 2009, several Non Governmental Organizations submitted a letter to inform the Ministry of the Environment that the construction of the CIP at Sinaloa and Las Cruces at Nayarit is likely to damage *Marismas Nacionales*. Further, several local NGOs are attempting to meet with FONATUR or environmental authorities to discuss issues about the possible impacts to *Marismas Nacionales*. However, to date there has been no response from the authorities on this matter.

II. IRRIGATION DISTRICT 111, RIO PRESIDIO, SINALOA

The Irrigation District 111 project is a plan to build irrigation infrastructure and divert water from the Presidio river for use as drinking water for the city of Mazatlán and for agricultural uses. The plan is to build canals, pipes, seven pumping stations and 2,414 hydrants to irrigate 22,500 hectares of land. The pumping capacity of the project will total 17.7 m^3/s, of which three m^3/s will be for drinking water, leaving the remaining 14.7 for agricultural purposes. Two-hundred hectares of land will be deforested for the purposes of the infrastructure, with another 22,500 hectares to be deforested for agricultural use.[9]

II.1 POTENTIAL ENVIRONMENTAL IMPACTS OF IRRIGATION DISTRICT 111

Although the irrigation district itself is not located in close proximity to the *Laguna Huizache-Caimanero* site nor *Marismas Nacionales,* an irrigation project of this magnitude can have serious downstream impacts. The Presidio river flows into the Pacific ocean only a few kilometers from the *Laguna Huizache-Caimanero* site, and they are at one point only separated by a strech of low agricultural land. This means that upstream diversions of water can affect the ecology of the *Laguna* and the surrounding coastal areas. Lower levels of water flowing down the river mean that water from the nearby *Laguna Huizache-Caimanero* may infiltrate the soil to replenish the groundwater, thus depleting the level of water in the wetland. Furthermore, the increased agricultural activity allowed by the irrigation can lead to increased agrochemical run-off into the coastal water system, again threatening eutrophication of relatively calm wetland waters.

III. THE SANTA MARIA DAM ON THE BALUARTE RIVER

The Santa Maria Dam on the Baluarte River will establish a 840,000 cubic meter-capacity reservoir. This water will be used to irrigate 120,000 hectares of land and generate an estimated 236 gigawatt hours of electricity per year.[10]

III.1 POTENTIAL ENVIRONMENTAL IMPACTS OF THE SANTA MARIA DAM

As the Baluarte River flows to the Pacific Ocean, it feeds the *Laguna Huizache-Caimanero*. A significant reduction in the influx of water can produce dire consequences for the flora and fauna of the Ramsar sites, particularly to the endangered wildlife species.

The most significant consequence of this myriad of complex and interconnected environmental disruptions is that they tend to fragment the riverine ecosystem, isolating populations of species

[9] Resolution: "Distrito de Riego 111,Rio Presidio, Sinaloa" Fondo de Infraestructura Hidráulica de Sinaloa, April 20, 2009

[10] http://www.semarnat.gob.mx/Pages/Consultatutramite.aspx?bita_numero=25SI2009H0003 Resumen Sintético: Información Disponible Presa Santa Maria Dam, Municipality of Rosario, Sinaloa Sobre el Río Baluarte, 2009

living up and downstream of the dam and cutting off migrations and other species movements. Because almost all dams reduce normal flooding, they also fragment ecosystems by isolating the river from its floodplain, turning a 'floodplain river' into a 'reservoir river'. The elimination of the benefits provided by natural flooding may be the single most ecologically damaging impact of a dam. This fragmentation of river ecosystems has undoubtedly resulted in a massive reduction in the number of species in the world's watersheds and the declining water quality.

Map showing the Baluarte and Presidio Rivers, its mouth near the *Lagunas Huizache-Caimanero* and *Marismas Nacionales*, the proposed location for the Santa Maria Dam, and the resulting irrigated area outlined in yellow.[11]

IV. INFORMATION ABOUT THE AFFECTED WETLANDS

IV.1 *MARISMAS NACIONALES*

The *Marismas Nacionales* wetlands were designated as a Ramsar site on the 22nd of June, 1995. Centered at coordinates 22º08'N 105º32'W, the elevation varies from 0 to 200m above sea level. They cover an area of 200,000 hectares between the Mexican states of Sinaloa and Nayarit.

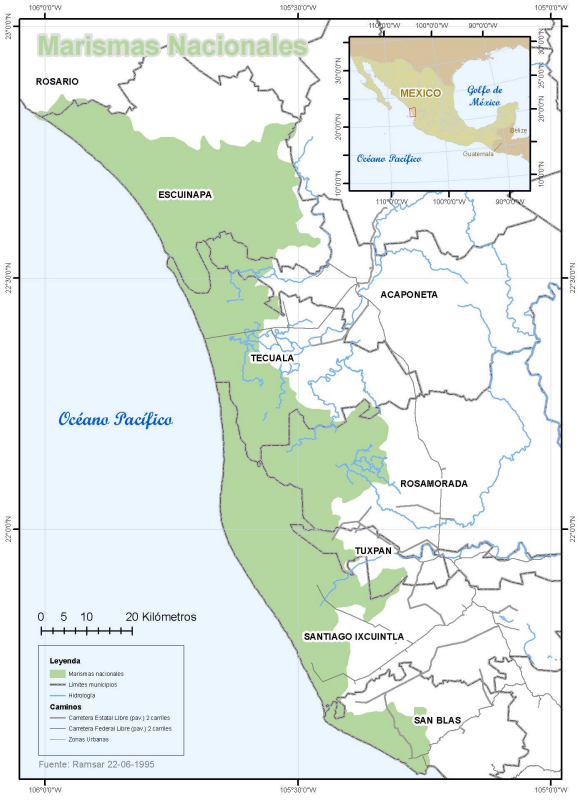
[11] Resumen Sintético: Infomación Disponible Presa Santa Maria Sobre el Río Baluarte, 2009

According to the Ramsar datasheet reported in November of 2007, the *Marismas Nacionales* is an internationally important wetland, as it meets Ramsar criteria for internationally important wetlands numbers 1, 2, 4, and 5.[12] These state that a wetland should be considered internationally important if it:

> a) contains a representative, rare, or unique example of a natural or near natural wetland type found within the appropriate biogeographic region (Criterion 1).
> b) supports vulnerable, endangered, or critically endangered, species or threatened ecological communities (Criterion 2).
> c) supports plant and/or animal species at a critical stage in their lifecycles or during adverse conditions (Criterion 4).
> d) regularly supports 20,000 or more waterbirds (Criterion 5). [13]

The *Marismas Nacionales* are especially of value for the maintenance of the ecological and genetic diversity of the region (Criterion 1). In the coastal regions of Sinaloa and Nayarit, where the *Marismas Nacionales* lie, 98 species of mammal have been registered, including 9 species that are in danger of extinction and the *Orbygnia* palm forests on sand bars constitute a threatened community (Criterion 2). Among the threatened mammals are the river otter (*Lontra canadienses),* the collared peccary (*Tayassu tajacu*), the puma (*Puma concolor*), the jaguar (*Panthera onca*), the ocelot (*Leopardus pardalis*) the margay (*Leopardus wiedii*), and the white tailed deer (*Odocoileus virginianus*). Furthermore, 252 species of bird have been found in the region, 60% of which are permanent residents and the remaining 40% of which are migratory (Criterion 4). Finally, the region regularly sustains a population of 26,000 water birds, and furthermore is a winter refuge for more than 110,000 shorebirds (Criterion 5).[14]

[12] FICHA INFORMATIVA DE LOS HUMEDALES DE RAMSAR (FIR) – VERSIÓN 2006-2008
[13] Ramsar Information Paper no. 5, Criteria for Identifying Wetlands of International Importance
[14] FICHA INFORMATIVA DE LOS HUMEDALES DE RAMSAR (FIR) – VERSIÓN 2006-2008



The extent of the *Marismas Nacionales* wetlands, showing the entire coastline of the district of Escuinapa, where the CIP *Costa del Pacifico* is under development.

IV.2 *LAGUNA HUIZACHE-CAIMANERO*

The *Laguna Huizache-Caimanero* was designated as a Ramsar site on February 2nd, 2007. It is centered at 22°50'N 105°55'W, in the state of Sinaloa, Mexico. The site measures 48,283 hectares, and is a site if high importance for migratory birds, and is a habitat for many species that are considered either threatened with extinction or vulnerable. The *Laguna Huizache-Caimanero* meets the Ramsar Criteria for wetlands of international importance numbers 2, 4, 5, 7, and 8.[15] These state that a wetland should be considered internationally important if it:

a) supports vulnerable, endangered, or critically endangered, species or threatened ecological communities (Criterion 2).
b) supports plant and/or animal species at a critical stage in their lifecycles or during adverse conditions (Criterion 4).
c) regularly supports 20,000 or more waterbirds (Criterion 5).
d) supports a significant number of indigenous fish sub-species, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity (Criterion 7).

[15] Ficha Informativa de los Humedales de Ramsar, (FIR) 2006-2008

e) is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend (Criterion 8).[16]

The *Laguna Huizache-Caimanero* is home to a wide variety of vulnerable and endangered species, such as the American Crocodile (*Crocodylus acutus*), the Mexican Beaded Lizard (*Heloderma horridum*), the Boa (*Boa constrictor*), the Mallard (*Anas platyrhynchos*) and the Olive Ridley Sea Turtle (*Lepidochelys olivacea*) (Criterion 2). The site is located within the migratory corridor and is one of the most important locations for wintering, resting, and foraging for the birds of Mexico's North Pacific region (Criterion 4). Mexico's National Commission for the Conservation of Biodiversity (CONABIO) reported that 75,000 individual White Pelicans (*Pelecanus erythororchinus*), 200,000 American Avocets (*Recurvirostra Americana)* and at least 7 species of ducks (Criterion 5) frequent the site. Additionally, the wetland supports a vast fish community whose population is distributed approximately as 8% freshwater fish, 8% fish typical of estuary environments, 31% marine fish that visit the estuary as adults to feed, 33% marine fish that use the estuary for reproductive and the bearing of young, while the remaining 20% are marine fish that occasionally visit the site. The site serves as a temporal or permanent habitat for 83 species of fish, belonging to 29 families (Criterion 7 and 8).[17] This wetland therefore also has high value as a breeding ground that helps maintain fish populations in the Sea of Cortez and outside.

V. CONCLUSIONS

This outline is intended to give a basic understanding of the situation regarding the threats to *Marismas Nacionales* and *Laguna Huizache-Caimanero* in relation to the proposed CIP *Costa del Pacifico* development, the Santa Maria Dam, and the 111th Irrigation District. The two Ramsar designated sites are wetlands of international importance, home to many thousands of water birds and several endangered plant and animal species. The sheer scale of the CIP *Costa del Pacifico* development means that it will undoubtedly have many impacts upon this pivotal sites, and the effects from the 111th Irrigation District and the Santa Maria Dam on the water flowing into these areas are sure to be substantial. In conclusion, we can only reiterate the importance of the *Marismas Nacionales* and *Laguna Huizache-Caimanero* wetlands, and urge the Secretariat of the Ramsar Convention to in turn exert its influence and remind the Mexican Government of their obligations under the Ramsar Convention and under Mexican Law.

The regulating agency in Mexico is:
Secretaría de Medio Ambiente y Recursos Naturales, (SEMARNAT), Blvd. Adolfo Ruiz Cortinez # 4209, Col. Jardines de la Montaña, Del. Tlalpan, CP 14210 México DF (Tel +52 55 5628 0600 or +52 55 5449 7001, Fax +52 55 5628 0643 or +52 55 5628 0644, Email c.secretario@semarnat.gob.mx) Daily contact: Ernesto Enkerlin Hoeflich, enkerlin@conanp.gob.mx or comisionado@conanp.gob.mx

[16] Ramsar Information Paper no. 5, Criteria for Identifying Wetlands of International Importance
[17] Ficha Informativa de los Humedales de Ramsar, (FIR) 2006-2008