

PANAMA BAY WETLANDS: CASE STUDY OF A THREATENED ECOSYSTEM

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Abstract

The wetlands of the Upper Panama Bay in the Republic of Panama include mangroves, mudflats, estuaries, freshwater wetlands, and shallow marine waters extending about 139 km from Panama City to the east. This ecosystem has been declared a national protected area, as well as a Ramsar Wetland of International Importance. Despite these protections, the western portion of the protected area is experiencing serious threats from urban expansion of Panama City. In recent years both the Supreme Court and government environmental authorities have given a green light to wetland conversion with the subsequent loss of ecosystem functions. This manuscript examines this case study and recommends measures for increased protection of these important wetland resources.

Keywords: Panama Bay, mangroves, Ramsar Site, legislation, urban development

1 INTRODUCTION

Panama Bay wetlands include mangroves, mudflats, estuaries, freshwater wetlands, and shallow marine waters between the eastern portion of Panama City and the Gulf of San Miguel, 139 km to the east (Figure 1). These wetlands encompass 297 km² or 21% of the mangroves on the Pacific coast of Panama.

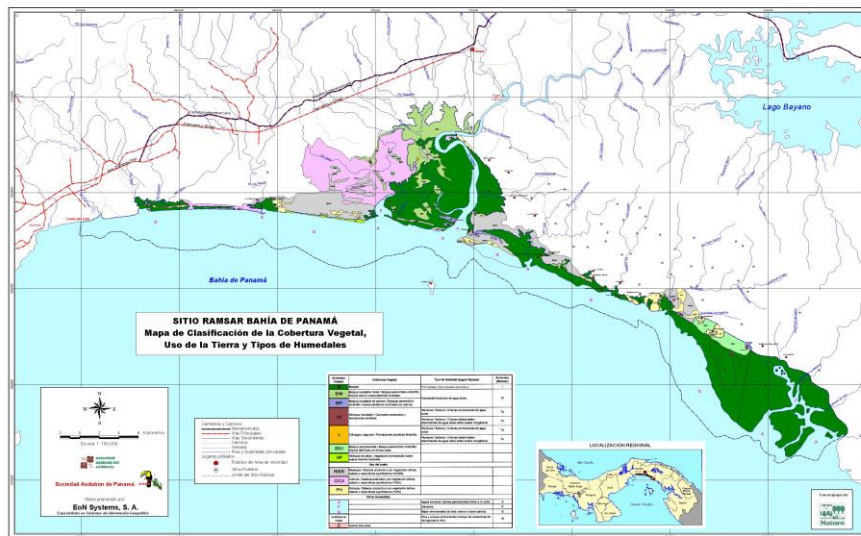


Figure 1. Panama Bay Wetlands (Ramsar Site/Sitio Ramsar 1319).

From http://sites.wetlands.org/reports/ris/6PA004SP_MAP_OVER_2002.pdf

Between 1 and 2 million shorebirds representing more than 30 species visit the Panama Bay mangroves and mudflats each year. These wetlands of upper Panama Bay are one of the most important areas for migratory shorebirds in the Neotropics. They converge on the area each autumn as the Northern Hemisphere winter begins. The extensive mudflats in front of the mangrove forests (In places some 5 km of mudflats are exposed during low tides.) are habitat for infauna that serves as food for the migratory birds. This is especially the case during the months of January and February when significant upwelling occurs in the waters of the Gulf of Panama. The 30 km area between Panama City and the mouth of the Bayano River is particularly important for the migratory shorebird populations. According to surveys, 80% of the migratory shorebird populations in the Panama Bay Wetlands utilize this area (Angehr, 2003; Watts, 1998).

The Western Sandpiper (*Calidris mauri*) is the most abundant species, and 31.5% of the global population passes through these wetlands annually. Because around 80% of these individuals are females,

experts estimate that about 50% of the females of this species utilize these wetlands. Additional species showing great abundance are the Semipalmated Sandpiper (*Calidris pusilla*) and the Semipalmated Plover (*Charadrius semipalmatus*). (Watts, 1998; Kaufmann, 2012)

The Gulf of Panama is Panama's richest fishing zone, particularly because of the extensive upwelling that occurs annually from January through March. Shrimp represents one of the country's largest exports (\$410 million in 2005, Kaufmann 2012), and most of the catch comes from the waters of the Gulf of Panama. Mangrove areas serve as important refuge areas for juvenile shrimp. Because mangroves between Panama City and Darién account for about one fifth of the country's mangrove forests on the Pacific Ocean, their importance to nation's fishery sector is significant.

Approximately 24 small communities are located in the area of influence of the wetland. The 1,155 residents include artisanal fishers and agricultural workers. The extreme western sector of the Panama Bay Wetlands abuts fast-growing metropolitan Panama City. The metropolitan area population has grown from 827,800 to 1,001,500 to 1,195,700 individuals from 1990 to 2000 to 2010 (an annual growth rate of over 7% per year during the two decades). The Juan Díaz Sub-District of Panama City to the north of western portion of the Panama Bay Wetlands counted over 100,600 persons in 2010 and also had a similar growth rate as the Metropolitan Area (Contraloría General, 2014). As the city has grown into the coastal wetlands from the north and west, these wetland areas are being converted to commercial and residential uses. This is particularly the case in the 20 to 30 km sector on the western boundary of the protected area.

2 CONSERVATION MEASURES

The Panama Audubon Society (SAP) has proved to be an important NGO stakeholder in Panama Bay Wetlands since 1998. Its efforts have been behind all of the conservation initiatives in this ecosystem (Angehr, 2003).

An initial recognition of the importance of the site came from BirdLife International that declared the Upper Bay of Panama an Important Bird Area (IBA) in 1998). The environmental group listed the area as an IBA site based on criteria A4i (1% biogeographic population of congregating waterbird species) and A4iii (20,000 waterbirds of one or more species (BirdLife International, 2014). BirdLife International now lists the Upper Bay of Panama site as an "IBA In Danger" for reasons that the paper will detail below.

Panama Bay wetlands entered the List of Wetlands of International Importance under the Ramsar Convention on 20 October 2003 as Site No. 1319 with extension of 489.19 km². The initiative for inclusion on the List originated with the Panama Audubon Society that developed much of the information that ANAM needed to submit to the Ramsar Secretariat for site evaluation.

In 2005 the Western Hemisphere Shorebird Reserve Network (WHSRN) recognized Upper Panama Bay to be a Site of Hemispheric Importance because it is visited by more than 500,000 shorebirds per year and also more than 30% of the biogeographic population of a shorebird species (Western Hemisphere Shorebird Reserve Network, 2014). The area is also recognized by Conservation International as an important component of the Mesoamerican Biodiversity Hotspot, one of 35 areas in the world that this environmental organization has identified as containing the greatest biodiversity.

Not until 2009 did the Panamanian Government designate the area as a Wildlife Refuge with an extension of 856.52 km² within the National System of Protected Areas (SINAP). The Panama Bay Wildlife Refuge extends further to the east than the Ramsar Site. In some areas, the Wildlife Refuge's seaward boundary is located further than that of the Ramsar Site. The National Environment Authority administers the country's protected areas, including the Panama Bay Wildlife Refuge. Nevertheless, ANAM has no full-time staff at the site and as of May 2014 had not developed a management plan.

The Panamanian Audubon Society (SAP) has proved to be the key NGO leader in Panama Bay Wetlands since 1998. In 2012, the SAP completed its Conservation Plan for the Panama Bay Wetlands (Kaufman, 2012). This document was the product of numerous meetings and focal groups of stakeholders and proposes a vision for the protected area in 2020. For example, the plan proposes a conservation goal of no loss of mangroves in 2020 compared with data from 2000. Similarly, the number of Western Sandpipers in 2020 should be the same as reported in bird counts in 1988, 1991, and 1997. The number of shorebirds in the mudflats in 2020 should be similar to those reported in historic data. The goals of the SAP Conservation Plan will hopefully be integrated into the management plan for the protected area that ANAM must eventually prepare.

3 THREATS

Pollution. Until recently all of Panama City's untreated sewage entered Panama Bay in numerous outfalls and streams. The new wastewater treatment plant for Panama City located in former mangrove areas inside the protected area was inaugurated in August 2013. The outfall for the sewage effluent is located in the lower reaches of the Juan Díaz River at its entrance to Panama Bay. This new treatment plant will improve water quality of Panama Bay near the city. However, the question remains as to the impact of the large volume of effluent that will be released in a small area that is also one of the most important sites for migratory shorebirds.

Trash. Plastic trash, along with other solid wastes, litters the beaches and mudflats near Panama City. Much of this litter enters the waters in streams that pass through urban neighborhoods. This litter poses threats to shorebirds, reduces the recreational use and aesthetic value of the coastal zone.

Urban Expansion and Development. The far western portion of the Panama Bay Wetlands – extending about 30 km between Panama City and the mouth of the Bayano River – today is an area of intense urban development that threatens the western portion of the protected area. In 2000 an expressway (Corredor Sur) was inaugurated connecting the city to the international airport. This road bisected the wetland and has increased accessibility to the areas south to the Pacific Ocean – mangrove forests that extend from the coast several kilometers landward.

In 1980 the Ministry of Housing (MIVI) developed its First Urban Plan that established the first zoning for the metropolitan area. The Plan classified this wetland area as an “Ecological Reserve”. Subsequently, the General Metropolitan Plan of 2000 zoned the wetland areas south of the expressway in three categories: Ecological Reserve, Wildlife Reserve, and Green Urban Space. This planning exercise failed to describe the activities that could be allowed in these land use categories. Nor did the ANAM recognize these wetlands as a protected area with the National System of Protected Areas (SINAP).

The first large residential/commercial development in the area was Costa del Este constructed between 1997-98 on the site of the old municipal dump, as well as in an area of mangroves that were cut and filled (Angehr, 2003). Today some 20 projects are in various stages of planning and construction in the wetland area south of the expressway between the city and the international airport. These projects include upscale residential communities and condominiums, golf courses, private schools, the city's new wastewater treatment plant, and some industrial storage facilities close to the airport. All of these projects have involved removal of wetland and mangrove vegetation and subsequent fill with several meters of soil.

The removal of mangrove vegetation, subsequent deposition of several meters of fill, and canalization of streams in the wetland corridor from Panama City to the airport all have serious implications for the regional hydrology. The high-density middle-low income suburbs north of the expressway (Corredor Sur) in the Juan Díaz Sub-District already experience serious flooding with heavy rain periods of October-November. The National System of Civil Protection (SINAPROC) conducted a vulnerability study more than a decade ago reporting that during heavy rains 10 communities in the Juan Díaz Sub-District (corregimiento) with over 10,000 inhabitants were vulnerable to flooding from the Juan Díaz River (Crítica, 1999). The expressway is effectively a dike that creates a barrier for natural drainage into the mangrove forest. Removal and fill of the wetland vegetation will alter regional hydrology even more leading to increased flooding events in the low lying areas to the north, particularly low-lying areas near the Juan Díaz River. Additionally, because the new residential areas built on fill to the south of the expressway are middle-upper income projects, these developments also raise serious environmental justice issues.

Residents of flooded neighborhoods of Juan Díaz located to the north of the expressway are developing an increased awareness that the flooding they experience may be caused by the expressway and the wetland fill to the south (La Prensa, 2012a, 2012b, 2012c, 2013a; Wetlands International, 2013). In October 2013, Juan Díaz residents closed the expressway requesting that the Municipality and the Ministry of Public Works resolve their problem (La Prensa, 2013b).

Climate Change. Great uncertainty surrounds the actual impacts that climate change will have on Pacific coast of Panama. These may include changes of precipitation, as well as altered, more intense rainfall patterns that could lead to increased flooding. Sea level rise is a certainty. The tidal range in Panama Bay can reach 6 meters. The possible combination of the highest tides, heavy rain events, and sea level rise point to extreme vulnerability of flooding to these coastal areas. The coastal wetlands can mitigate the potential damage from flood events, but only if they remain intact and also have space to migrate inland. The current conversion of wetlands to residential and commercial developments and channelization of streams does not bode well for the environmental security of the area.

Agricultural Expansion. Large areas of rice cultivation exist to the east of the international airport adjacent to wetlands and even inside the protected area. Not only do these agricultural activities lead to wetland habitat loss, they also are sources of agrochemicals to the wetland ecosystem and could potentially impact the health of migratory shorebirds.

Overfishing. With the increase in the number of commercial shrimping vessels in the 1960s, the shrimp landings from the Gulf of Panama have decreased. In the 1960s, the landings of white shrimp from the Gulf of Panama reached 5.4 millions pounds while by 2005, landings had steadily decreased to merely 1.2 millions pounds (Kaufman, 2012). This appears to be evidence of overfishing.

4 RECENT DEVELOPMENTS

Despite the protected area status of the Panama Bay Wetlands, on 27 April 2012 the Panamanian Supreme Court issued a temporary suspension of the resolution that created the Panama Bay Wildlife Refuge (AG-0072-2009). The court's "logic" was that the National Environment Authority (ANAM) had not carried out proper procedures for public consultation in the designation prejudicing private landowners in the protected area. Developers, however, have had their eyes on these coastal areas adjacent to Panama City for urban expansion and tourist development for several years. Simultaneously, President Ricardo Martinelli announced that he hoped that within a year the area would be a new Cancun.

Less than one month after the Supreme Court opinion temporarily suspending the Panama Bay protected area, the Panamanian Aquatic Resources Authority (ARAP), the government institution with authority over mangroves outside protected areas, promulgated a resolution (Resolución J.D. No. 20 de 23-V-2012) that reduced the fees for clearing mangroves for commercial developments from \$150,000 to \$10,000 per hectare. The same resolution also reduced the fees for illegal clearing of mangroves from \$300,000 to \$40,000 per hectare. The interest of the government was clear – facilitate the conversion of coastal wetlands to commercial and residential developments.

Subsequently in June 2012, the Panama City Municipality emitted a decree (Municipal Decree No. 2339) that prohibited earth-moving, fill, and construction within the Panama Bay Wetlands (La Prensa, 2012c). However, my personal observations, as well as those of collaborators, indicate that the prohibitions of the decree were never implemented.

Within the past year, some 21 residential, industrial, and tourist projects have been initiated or proposed in the wetland areas adjacent to Panama City, and 4 of these are located within the protected area. All of these projects involve mangrove clearing, reclamation, increasing land elevation several meters, and channelization of streams. Despite these significant adverse environmental impacts, the environmental assessment for these projects has been superficial. The ANAM has classified most of the projects as Category I and II for the purposes of the Environmental Impact Assessment process. Only Category III projects involve a comprehensive, in-depth environmental review with ample public participation. In many cases, promoters of these projects include individuals from the highest levels of government in Panama.

The ANAM has also attempted to reduce the area of the Ramsar Site and has initiated communication with the Ramsar Secretariat on this issue (La Prensa, 2012e). To date, however, the Ramsar Secretariat has yet to respond to the Panamanian Government's request.

A coalition of Panamanian environmental groups and fishers has organized against the government actions. Concerns include loss of habitat and biodiversity, impacts on migratory shorebird populations, reductions in offshore shrimp harvests, and increased vulnerability to flooding of adjacent low income residential communities, as well as irregularities in the environmental permitting process and the precedent of eliminating a protected area to allow development. These efforts include environmental education campaigns in the media; marches and protests; appeals for international solidarity from environmental groups; meetings with residents of communities north of the expressway affected by flooding; lobbying government institutions; communication with the Ramsar Secretariat and a communiqué circulated at Ramsar COP-11 in 2012 in Bucharest, Romania (La Prensa, 2012d; Panama /Panama Audubon Society, 2012); and the formulation of a coalition (Panamanglar Network at www.panamanglar.org) of some 19 Panamanian environmental groups opposing government policies (Wetlands International 2013).

Recently in 23 December 2013, the Panamanian Supreme Court reversed its previous decision and reinstated the protected area designation for the Panama Bay wetlands. The judicial opinion noted that removal of the protection of the coastal zone established in the protected area would expose the wetland and its buffer zone to activities that are incompatible with policies of conservation and protection for the natural and cultural resources set forth in the legislation and management plan, requiring a guarantee that the

wetland ecosystem functions and characteristics will be maintained in conformance with the obligations of the Ramsar Convention on Wetlands

The Court also called on ANAM to aggressively defend the public interest in the Panama Bay Wetlands and noted that ANAM's actions have demonstrated a lack of diligence in carrying out its responsibilities that has resulted in a generalized lack of public confidence in the institution.

While this opinion represented a victory for conservation sectors, mangrove clearing is still occurring in Panama Bay wetlands adjacent to Panama City. A new presidential administration, led by the political party opposed to Martinelli, assumed power for a 5-year period in July 2014. Unlike the Martinelli administration, the incoming leaders have developed an environmental agenda in conjunction with several Panamanian environmental leaders. Hopefully, the future human activities in these wetland areas will be more in accord with the rational use principles of the Ramsar Convention. This will present significant challenges, however, because of the strong economic interests that powerful commercial sectors wield in the rapidly growing Panama City metropolitan area.

5 DISCUSSION AND RECOMMENDATIONS

The case of the Panama Bay Wetlands highlights the great weaknesses of the Panamanian governmental institutions that have responsibilities for the management of the area. ANAM has no permanent personnel in the protected area and lacks the technical expertise necessary to develop a Flood Emergency Plan for urban areas adjacent to the wetlands. In the decade since the designation as a Ramsar Site, ANAM has still not prepared a management plan for the area. The Environmental Impact Assessment process has merely served to justify wetland conversion; large projects have been classified as projects having minimal environmental impact and cumulative impacts of multiple projects have been ignored. Zoning regulations have not been enforced, and authorities have done little to limit activities that are incompatible with maintenance of the ecosystem functions of the wetland. ANAM is actively attempting to shrink the extension of the Ramsar Site. These actions and policies are clear evidence that the national authorities do not support Panama's international obligations under the Ramsar Convention on Wetlands nor carry out their responsibilities as stewards of national patrimony.

The abandonment of the Panama Bay Wetlands by authorities has many explanations. Many private inholdings exist inside the boundaries of the protected areas – even in mangrove areas. Many of these land titles extend back in time prior to the constitutional prohibitions on private ownership of mangroves. Panama City is growing eastward into areas adjacent to the coastal wetlands (and in some cases into the protected area). Powerful commercial and real estate investors and developers who are often closely linked high level government officials exert great pressure to convert lands that they consider “useless” into developments that will earn them a profit.

In general, despite the efforts of the Panama Audubon Society and other environmental groups, Panamanian society lacks a clear understanding of the social, economic, and ecological importance of the Panama Bay Wetlands. The urban population does not feel a strong identification with coastal wetlands, partly because Panamanian environmental groups have yet to create successful methods to work with urban communities. Institutional fragmentation has created another challenge to protection of the wetlands. While ANAM administers protected areas, the Panama Aquatic Resources Authority (ARAP) has authority over mangroves and coastal/marine resources, the Ministry of Housing and Territorial Planning (MIVIOT) develops and should implement zoning plans, the Ministry of Health (MINSA) operates the wastewater treatment plant inside the protected area, the Ministry of Public Works constructs roads in the wetlands, and the Municipalities grant construction permits. (La Prensa, 2012e). No interagency coordinating commission exists to promote cooperation and consistent planning among these different authorities. Such a commission should also include representatives of the group that has proved to be the true stewards of the Panama Bay Wetlands – the Panama Audubon Society. Urban growth must be planned to protect the various ecosystem services of the Panama Bay Wetlands, and plans must be implemented effectively. This is crucially important in the western portion of the Panama Bay wetlands adjacent to Panama City. As an adaptation measure for climate change and sea level rise, the Panama Bay coastal wetlands must be protected and left intact. Otherwise, thousands of low-income residents will become increasingly vulnerable to flooding. The outcome of the Panama Bay Wetlands saga will set precedent for future conflicts surrounding protected areas in Panama and the Central American region, as well as for the significance of designation of sites as Wetlands of International Importance under the Convention on Wetlands.

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