

UC San Diego

Capstone Papers

Title

The Wise Use of Wetlands: Balancing Tourism and Protections for a Ramsar Site in Curaçao.

Permalink

<https://escholarship.org/uc/item/9gg0h6jt>

Author

Mark, Danielson

Publication Date

2019-06-01



MINISTERIO DI
TRÁFIKO, TRANSPORTE I PLANIFIKASHON URBANO



MINISTERIE VAN
GEZONDHEID, MILIEU & NATUUR

Designing a Management Plan for Ramsar Wetland of International Importance #2355: Klein Curaçao



Mark R. Danielson
MAS Candidate: Marine Biodiversity and Conservation
Scripps Institution of Oceanography



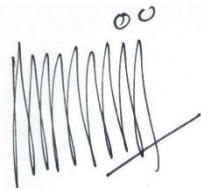
Designing a Management Plan for Ramsar Wetland of International Importance

#2355: Klein Curaçao

Mark R. Danielson



Ute Zischka (Capstone Advisory Committee Chair), Waitt Institute



Dr. Mark Vermeij, CARMABI Research Station



Dr. Stuart Sandin, Scripps Institution of Oceanography, UC San Diego

Marine Biodiversity and Conservation
Masters of Advanced Studies
Scripps Institution of Oceanography
University of California San Diego
June 2019

Table of Contents

1. Executive Summary	4
2. Background	4
2.1. The Ramsar Convention	4
2.2. Ecological Character	5
2.3. Threats and Issues	6
3. Methodology	7
3.1. Off-Site Work	7
3.2. On-Site Work	8
4. Challenges	9
5. Deliverables	9
5.1. Regulations and Requirements for Access Permits	10
6. Acknowledgements	10
7. References	11

1. Executive Summary

The following report outlines the final project required for the completion of the Masters of Advanced Studies in Marine Biodiversity and Conservation program at Scripps Institution of Oceanography. The project, *Designing a Management Plan for Ramsar Wetland of International Importance #2355: Klein Curaçao*, was completed with the collaboration of the Waitt Institute, CARMABI, Scripps Institution of Oceanography, the Curaçaoan Ministerio di Tráfiko, Transporte i Planifikashon Urbano (Ministry of Traffic, Transport & Urban Planning), or VVRP, and the Ministerie van Gezondheid Milieu en Natuur (Ministry of Health & the Environment), or GMN. The methodology consisted of a preliminary literature review, a site visit to Klein Curaçao, and meetings with local stakeholders, as well as government officials from VVRP and GMN. The management plan has been revised to take into account feedback given through the stakeholder engagement and meetings with the ministry officials and will be submitted to the government of Curaçao for review and implementation.

2. Background

2.1. The Ramsar Convention

The mission of the Ramsar Convention is “the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world” (Ramsar Convention Secretariat 2010). By signing the Ramsar Convention, Contracting Parties commit to the “wise use” of wetlands, international cooperation on shared and transboundary wetlands, and to designate sites within their territories as Wetlands of International Importance to ensure effective management of the areas. These sites have become part of what is known as the Ramsar List and such areas are generally known as Ramsar areas.

The Kingdom of the Netherlands designated Klein Curaçao, within the jurisdiction of Curaçao, as its 55th Wetland of International Importance (Ramsar site #2355) in 2018. Management plans for all Ramsar Sites are expected to be implemented by Contracting Parties in order to promote the conservation and wise use of wetlands in through Resolution 5.7 and Resolution VIII.14 of the Ramsar Convention. The government of Curaçao reached out to the Waitt Institute to help with the development of such a management plan.

One of the foundations of the Ramsar Convention is the “wise use” of wetlands, which is defined as “the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development” (Ramsar Convention Secretariat 2010). When a site is designated, the government makes a commitment to preserve the ecological character of that wetland and, in 1998, the government of Curaçao signed the National Ordinance Foundations for Nature Management and Protection (Landsverordening grondslagen natuurbeheer en -bescherming), which made the implementation of the goals of the Ramsar Convention law.

2.2. Ecological Character

Klein Curacao is a small, uninhabited island that lies approximately 11km southeast of the coast of Curacao in the Caribbean Sea. It is 2 km long and 800 m wide flat island with a maximum elevation of 5 m above sea level (Vermeij and Chamberland 2012).

The fringing reef bordering the East coast of the island is considered to be in near-pristine condition and one of the best examples of healthy coral reef habitat in the Caribbean (Vermeij and Chamberland 2018) (see Figure 1). They support dense populations of Elkhorn coral and gorgonians, which provide ecological processes including calcification and nitrogen fixation. In addition, branching corals such as Elkhorn coral protect the coastline by dissipating wave energy (Mumby et al. 2008). These branching corals and gorgonians provide shelter for large numbers of adult and juvenile fish species, as well as other marine organisms. The fringing coral reefs around the island exhibit high coral cover, often exceeding 50% and sometimes up to 100%, as well as higher fish biomass than similar sites around the Caribbean (Waitt Institute 2017). Many of the coral species found in these coral reef communities are endangered or critically endangered according to the IUCN, including elkhorn coral (*Acropora palmata*), staghorn coral (*Acropora cervicornis*), boulder star coral (*Orbicella annularis*), and mountainous star coral (*Orbicella faveolata*).



Figure 1: Marine life surrounding Klein Curaçao, including elkhorn coral (A) and gorgonians (B). (Images taken by Mark Vermeij 2018).

The terrestrial habitats are also important for certain marine species and provide critical nesting areas for the endangered Green sea turtle (*Chelonia mydas*) and a large breeding population of least terns (*Sternula antillarum*) (Vermeij and Chamberland 2018). Inland wetlands in the form of saline or brackish pools and marshes occur in depressions around the island after heavy rainfall. There is little plant life on land due to excessive grazing by goats and phosphate mining that had begun in the 19th century, however some plants are returning to the island thanks to local restoration efforts in recent years (Vermeij and Chamberland 2018) (see Figure 2). The Caribbean Research and Management of Biodiversity (CARMABI) Foundation has been introducing native drought and salt-resistant plants, such as Button mangrove (*Conocarpus erectus*), and vegetation is now successfully dispersing across the island (Debrot and Wells 2008) (see Figure 2).

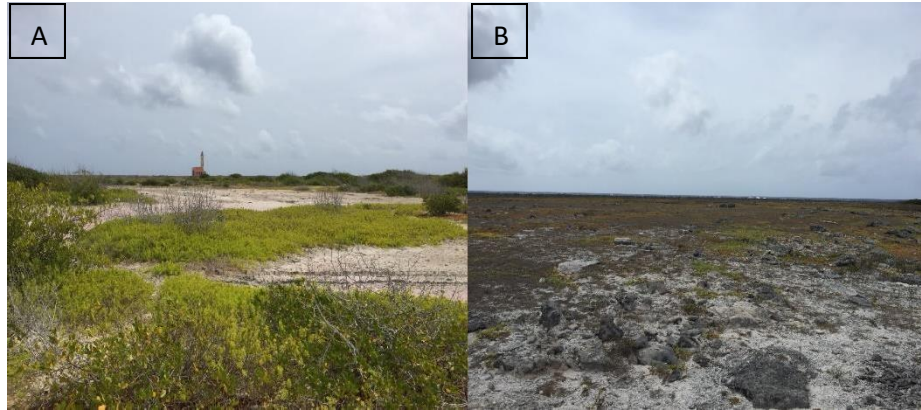


Figure 2: Vegetation that has recovered due to restoration efforts on Klein Curaçao. Some areas on the island have limited vegetation and remain flat, with no bushes or trees present (B). (Images taken by Mark Danielson 2019).

2.3. Threats and Issues

Recreational tourism to Klein Curaçao is unregulated and, according to previous estimates, the island was visited by over 600 people per week, but that number has likely increased since then (Vermeij and Chamberland 2018). The threats posed by unregulated tourism to Klein Curaçao are further expanded upon in the final management plan and are summarized below.

The carrying capacity, or number of tourists the area can support over a particular time while maintaining the ecological character of the area, for Klein Curaçao is unknown. The unique characteristics of an area are taken into account when calculating this, so this was not feasible for the timeline of the development of this plan. However, the management actions included in the plan call for a future study to determine the carrying capacity of Klein Curaçao in order to provide a solid limit to the number of tourists that should be allowed.

Disturbances caused by uncontrolled tourism that negatively affect the wildlife and ecosystems of Klein Curaçao include development of more buildings for tour operators, risk of an increase in pollution due to the presence of toilets with running water, vehicles driving over sensitive wetland habitat and vegetation, damage due to foot traffic of visitors not staying on a designated trail, increased litter, anchoring on coral, and feeding wildlife (see Figure 3). Regulations and requirements for tour operators are required to control what is allowed through an access permit system with inspections.



Figure 3: Threats to the ecological character of Klein Curaçao. Tractors pulling boat trailers and driving over beach and wetland habitats cause damage and can threaten nesting sea birds and turtles (A) and (C). Construction of buildings on the island have not gone through permitting processes and may have caused damage to the environment or be unsafe (B). Tour operators throw leftover food in the ocean to feed fish, sea birds, and endangered sea turtles, thereby changing their natural diet (D). (Images taken by Mark Danielson 2019).

3. Methodology

The methodology of this project was split up into work done on Curaçao (on-site) and work that was done either before or after the site visit to Curaçao (off-site).

3.1. Off-site Work

The first steps in developing the management plan was preparing a draft to work with and get feedback on from the people I met with on Curaçao. An extensive literature review was done using documents provided by the Waitt Institute, such as an economic valuation of Curaçao's marine resources and a scientific assessment of the status of the coral reefs there, as well as documents from the government of Curaçao and Dr. Mark Vermeij of CARMABI. These included the proposal submitted to the Ramsar Secretariat for Klein Curaçao, which consisted of important background information on why the site was designated. In addition, I used a project from a previous student to review management plans from other protected areas around the Caribbean to understand what strategies worked and use them as a basis for the plan I drafted. In addition, examples of management actions from other protected areas around the Caribbean were research in order to provide justifications for the management actions I proposed.

The draft management plan written before the visit to Curaçao was revised based on feedback and suggestions received from people on Curaçao during the on-site work to form the final plan.

3.1. On-site Work

While on Curaçao, I scheduled a site visit to Klein Curaçao by going with one of the larger tour operators. The goal was to see the site for myself, get a better understanding of how the tour operators do business there, and what threats and issues I saw that should be specifically addressed in the management plan.

The remainder of the time spent on Curaçao was used to meet with government officials, representatives from the Coast Guard and harbor master, the tourism board, fishermen, and local conservation groups (see Figure 4). The meetings were set up through the Waitt Institute site coordinator for the Blue Halo Curaçao program, so relationships had already been established and the purpose of the meetings was clear. Specific talking points for each meeting were established based on information I needed from each group. I received feedback on the management strategies I proposed in order to address the threats posed by the unregulated tourism on Klein Curaçao based on the knowledge of the stakeholders I met with. In addition, I wanted to include what actions they felt would be most effective in achieving what they saw as the most important issues.

Some of the most important meetings were with representatives from the Ministerio di Tráfiko, Transporte i Planifikashon Urbano (Ministry of Traffic, Transport & Urban Planning), or VVRP, and the Ministerie van Gezondheid Milieu en Natuur (Ministry of Health & the Environment), or GMN. These two ministries have authority over Klein Curaçao and the environmental protection of nature on the island and I met with the Policy Director for VVRP and the Senior Advisor to GMN twice to go through the draft management plan before and after the stakeholder meetings to review the revisions I had made and culminated in the final management plan (see Figure 4).



Figure 4: Meetings on Curaçao with Faisal Dilrosun (A), the Curaçao Tourism Board (B), Cynthia Devere of the Coast Guard (C), and the final meeting with Faisal Dilrosun, Endirah Palm, and Miriam Jonker. (Images taken by Mark Danielson 2019).

4. Challenges

Developing a management plan for this newly designated Ramsar Site posed several challenges. The stakeholder meetings would prove to be a critical aspect of the project because I had never been to Klein Curaçao and I do not know as much about what type of management strategies would be most effective in this situation. Getting feedback on the draft that I initially produced through the off-site work was critical and including the ideas of those I met with in the product was important, so a major challenge was incorporating all the information I had gathered in the new plan.

I was unable to meet with tour operators to hear their feedback and propose and explain why more regulation in this management plan is necessary. I felt that conversations with those whom this plan would affect most, the tour operators, could have been useful in developing a relationship between the ministries in charge and the users of the site. I was advised not to meet with the tour operators or discuss the management plan with them due to past instances where too much involvement of conflicting user groups had halted progress on projects similar to this on Curaçao. Ultimately, I was producing a management plan for the VVRP and GMN ministries, so taking the advice of their representatives I met with was the best option.

5. Deliverables

The deliverable product this project culminated in was the final management plan of which the overall goal of which is to ensure the wise use of Klein Curaçao as a Ramsar wetland by protecting the ecological character of the island while promoting sustainable use.

The following objectives includes management actions to be taken in order to achieve that particular objective and address the threats and issues listed above. These are further expanded upon in the final management plan.

It should be noted that the authority to carry out these management actions would be given through the VVRP and GMN ministries to the appropriate bodies.

1. Objective 1: Establish access permit system with regulations and requirements that promote the protection and sustainable use of Klein Curaçao.
2. Objective 2: Enforce permit requirements and regulations.
3. Objective 3: Prevent further damage to the ecosystems within the site and restore natural and cultural resources.
4. Objective 4: Raise awareness and support for protections of Klein Curaçao through outreach and education.
5. Objective 5: Improve the scientific understanding of the area and overall effectiveness of the adaptive management plan.
6. Objective 6: Maintain sustainable resources for long term implementation of the management plan.

The following page lists the regulations and requirements for tour operators to comply with in order to possess an access permit, which Objective 1 refers to.

5.1. Regulations and Requirements for Access Permits

On the following page is a list of regulations and requirements for tour operators to comply with in order to possess an access permit and do business on Klein Curaçao.

- Vessels must use available moorings. Anchoring within 60m depth prohibited.
- Users/visitors must comply with marked trails and restricted area signs based on nesting activity.
- Users/visitors must follow a “pack-it-in, pack-it-out” rule in order to limit waste (including ashes from fires).
 - Feeding wildlife is prohibited.
 - Littering is prohibited.
- Collection of shells, corals, sea fans, or other animal/plant material is prohibited.
- Any fires outside of designated fire rings are not allowed. Firewood must be brought with the person and not collected from the island.
- Strictly prohibited to physically harm or touch vegetation.
- Vehicles will not be allowed on the island except with special permit issued by VVRP or GMN.
- Introducing flora and fauna to the Ramsar Site is prohibited (exceptions for authorized restoration programs).
 - Pets are prohibited.
- Toilets/facilities using running water or a septic system are to be replaced with authorized (from GMN) composting toilets. Composting toilets are for public use and should be positioned in several locations adjacent to areas of human use.
- Harassment or harming of birds, turtles, and other protected species is prohibited (including feeding).
- All users must adhere to fishing laws and regulations of Curaçao (see Appendix 4).
- Public use of drones will be prohibited. Drones may only be used by restoration/monitoring program authorities for aerial images.
- Camping is only allowed with a permit and a reservation.
- Due to the number of accidents, kite surfing within the Ramsar Site is prohibited within 100 meters of snorkelers and divers, as well as the vessels running those trips.

6. Acknowledgments

This project would not have been possible without the guidance and support of my Capstone Advisory Committee, which included Ute Zischka (Waite Institute), Dr. Mark Vermeij (CARMABI), and Dr. Stuart Sandin (Scripps Institution of Oceanography).

Special thanks to Endirah Palm, Blue Halo Curaçao site coordinator, for organizing all the meetings in Curaçao, as well as Faisal Dilrosun, Senior Advisory to the GMN Ministry, and Miriam Jonker, Policy Director for the VVRP Ministry, for their help and support for this project.

7. References

- Debrot, A. O., and Wells, J. (2008). Curaçao. In: Wege, D. C., Anadón-Irizarry, V., and Vincenty, M. *Important bird areas in the Caribbean: Key sites for conservation*. Cambridge: BirdLife International. 143 – 149.
- Mumby, P. J., Broad, K., Brumbaugh, D. R., Dahlgren C. P., Harborne, A. R., Hastings, A., Holmes, K. E., Kappel, C. V., Micheli, F., and Sanchirico, J. N. (2008). Coral Reef Habitats as Surrogates of Species, Ecological Functions, and Ecosystem Services. *Conservation Biology*, 22(4): 441 – 451.
- Ramsar Convention Secretariat. (2010). Wise use of wetlands: Concepts and approaches for the wise use of wetlands. *Ramsar handbooks for the wise use of wetlands*, 4th edition, vol. 1. Ramsar Convention Secretariat, Gland, Switzerland. <https://www.ramsar.org/sites/default/files/documents/library/hbk4-01.pdf>. Accessed on: 04/12/2019.
- Vermeij, M. J. A. and Chamberland, V. F. (2012). Information Sheet on Ramsar Wetlands (RIS) – 2009-2012 version. http://www.ramsar.org/ris/key_ris_index.htm. Accessed on: 04/12/2019.
- Vermeij, M. J. A. and Chamberland, V. F. (2018). Ramsar Information Sheet for Site no. 2355, Klein Curaçao, Netherlands. https://rsis.ramsar.org/RISapp/files/RISrep/NL2355RIS_1809_en.pdf. Retrieved on 04/12/2019.
- Waitt Institute. (2017). Marine Scientific Assessment: The State of Curaçao’s Coral Reefs. http://waittinstitute.org/wp-content/uploads/2017/07/Marine-Scientific-Assessment_May-2017-Part1.pdf. Retrieved on 04/12/2019.