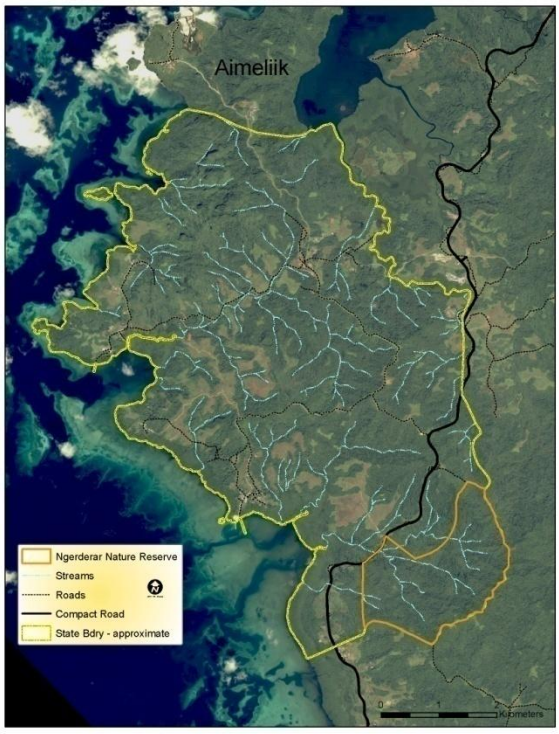
Ngerderar Watershed Conservation Area Management Plan 2011-2016

Adopted July 2011



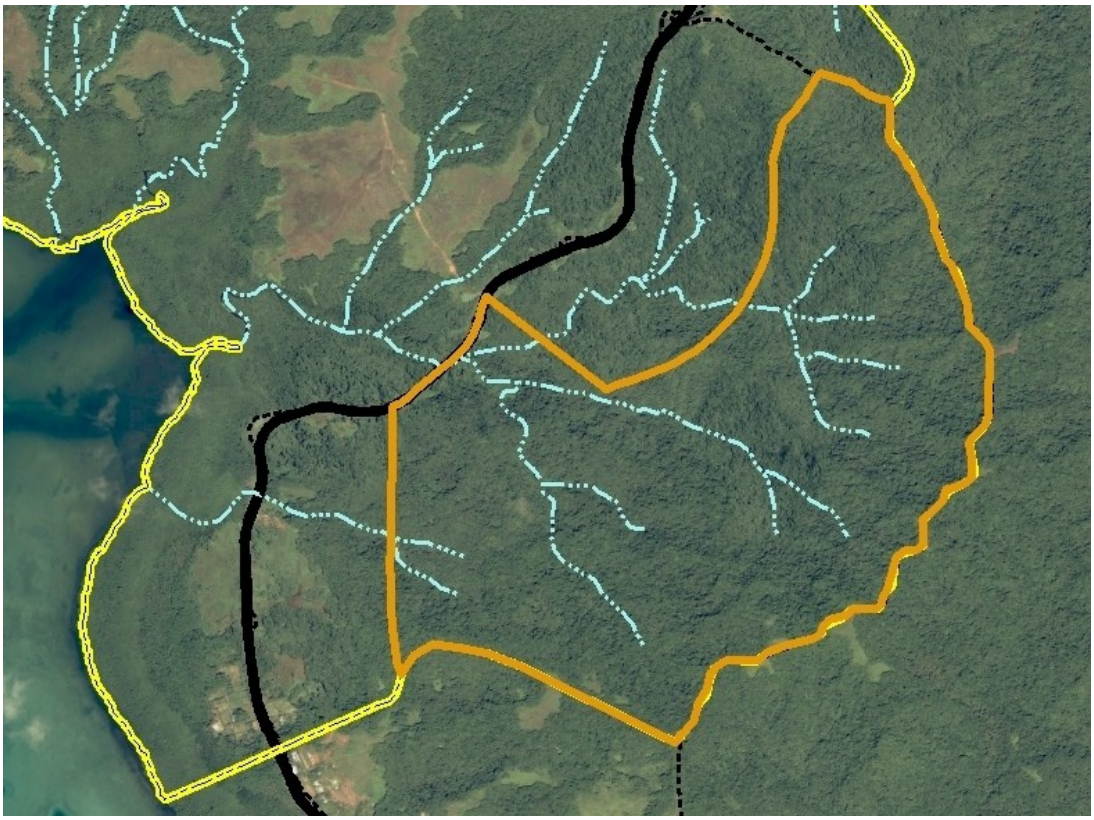
Aimeliik State, Republic of Palau

Prepared by the 9-member volunteer Ngerderar Watershed Conservation Board
with assistance from the Palau Conservation Society

Funding provided by the The Nature Conservancy, The David & Lucile Packard Foundation through the Ecosystem-Based Management (EBM) Project, and Palau's Sustainable Land Management (SLM) Project through the Office of PALARIS.

What this plan covers

Ngerderar Watershed Conservation Area, Aimeliik State



This Plan was developed by the nine-member volunteer Ngerderar Watershed Conservation Board in partnership with the Palau Conservation Society.

Quick Peek at the

Why manage these sites?

The Ngerderar Conservation Area contains superb ecological, biological, historical, and cultural sites all in one area. The area has intact and pristine forest, including old-growth forest, with a large variety of trees. The watershed has the full expected diversity of bird species, and has a concentration of Micronesian Pigeons. The watershed has very few bare areas and is not degraded. Entire subcatchments are protected and the site serves as a back-up water source. There is constant flow year-round, even during times of drought. The watershed is also home to a number of cultural sites and legends, and historical relics from World War II.

Management of the site is necessary, however, because of threats from poaching and from development adjacent to the Conservation Area. Management is feasible due to access and leadership and community support.

Micronesian Pigeon (Belochel)
Photo courtesy Belau National Museum

Quick Peek at the

What we want:

20-year Vision

- Excellent water quality and quantity
- Cultural and natural resources in a natural and healthy state
- Limited use of natural resources

Goal 1. Improved understanding of the area

- At least 75% of adults in Aimeliik with knowledge about conservation area boundary, cultural and historical significance, and natural resources
- At least 80% of middle school students in Aimeliik with knowledge of the cultural and natural importance of the site

Goal 2. Sustainable ecotourism

- A hiking trail, botanical garden, and kayaking tour
- Increasing revenues
- Site to be part of an Aimeliik ecotourism package

Goal 3. Clean and valued water

- Reduced sedimentation
- Tourism and other development that does not negatively impact water

Goal 4. Restored cultural sites

- At least one site being restored
- Sites registered on the National Registry

Goal 5. Safeguarded natural resources through improved enforcement

- No fires
- No hunting
- No logging
- Enforcement against non-compliers
- Fewer areas negatively influenced by invasive species

Quick Peek at the

Who is in charge?

Management Authority
This Management Plan proposes the continuation of the Ngerderar Watershed Conservation Board will have the joint responsibility with the Governor for implementing this Plan.

Composition of the Board

- The Board shall have at least five (5) members with 2-year terms.
- Members shall be named by the Governor, Legislature, Traditional Chiefs, Public Lands Authority, and Community (named by Governor).

Duties of the Board

Self-organization – The Board shall set and follow its own rules, procedures, and regulations
Hiring of staff – The Board may hire its own staff and/or use the staff and any resources of the offices of the Governor. Staff shall be employees of the State.
Supervision of staff – The Board shall oversee its own staff.
Implementation of the Plan – The Board shall ensure that activities are implemented.
Issuance of permits and permission – The Board shall jointly issue permits.
Develop regulations, fees, and procedures – The Board shall oversee the development of regulations, fees, and other procedures for restricted uses and issuance of permits.
Request expenditures – The Board shall request expenditures of PAN funds and other funds in the separate Ngerderar Watershed Conservation Area Fund.
Fundraising – The Board shall assist with procuring funds for the Conservation Area.
Annual Reports and Work Planning – The Board shall approve annual reports, work plans and budgets and submit these to the Governor.
Yearly Management Plan Review – The Board shall review yearly reports, write addendums to the Management Plan as needed, and submit these to the Governor.
5-year Management Plan Review – The Board shall initiate a comprehensive review and planning effort at the five-year mark.

Duties of the Governor

Hiring of staff – The Governor's Office shall initiate paperwork to hire staff.
Supervision of staff – The Governor shall oversee staff with the Board. Staff shall be employees of the state.
Implementation of this Plan – The Governor shall be jointly responsible for ensuring that activities are implemented.
Enforcement of provisions in ASPL 09-07 and this Plan – The Governor and his/her designees (e.g. Conservation Officers) shall have the authority to enforce provisions in ASPL 09-07 and in this Management Plan.
Issuance of permits and permission – The Governor shall jointly issue permits.
Management of separate fund – The Governor shall ensure that a separate fund entitled the Ngerderar Watershed Conservation Fund is created within the Aimeliik state treasury.
Budget requests – The Governor shall include the yearly budget request for the Ngerderar Conservation Area in the state's yearly request to the National Government.
Approve and issue expenditures – The Governor shall provide one signature (out of two required) approving expenditures of PAN funds and issue checks.
Annual Reports and Work Planning – The Governor shall finalize annual reports, work plans and budgets, and submit to the Olbiil ra Aimeliik for review.
Yearly Management Plan Review – The Governor shall review and approve yearly reports and addendums to Management Plan as needed.
5-year Management Plan Review – The Governor shall review and approve new Management Plans and call for public hearings.

Quick Peek at the

What personnel are needed?

Management Personnel
Under this Plan, three staff will be hired in 2011:

- Aimeliik Conservation Coordinator
- Conservation Officers (2 in 2011)
- Tour guides or Tour site staff (Number to be determined in 2014)

This Plan also proposes to utilize the services of existing State personnel, including the:

- State Attorney
- State Administrative Staff
- State Maintenance Staff

Quick Peek at the

Zones:

This management plan includes the following zones:

Tourist Zone

- Specific area to be decided after obtaining technical expertise. A tourist zone will include a trail that connects waterfalls, vista points, and cultural sites together. Tourists and limited tourist development will be allowed along the trail and at trailheads. Areas for a kayak tour (such as landing sites, etc.) will also be included in this zone. All activities require a permit, permission, or fee.

No-take/Controlled Access Zone

- All other areas in the Ngerderar Watershed Conservation Area are zoned as no-take areas with controlled access. All activities require a permit or permission.

Quick Peek at the

Restrictions:

NEVER ALLOWED/PROHIBITED (ALL ZONES)

- Use of heavy equipment for development
- Hunting of native species
- Logging/gathering of native plants and trees
- Littering or dumping
- Burning or fires
- Farming or agriculture

ALLOWED WITH A PERMIT (DEPENDING ON ZONE)

- Clearing of fallen trees in river
- Ecotourism development
- Tourism
- Educational activities
- Research and monitoring
- Invasive species removal
- Planting of native plants

A permit system will be developed in the first year

Quick Peek at the

What work needs to happen?

Year 1	Years 2-3	Years 4-5
Hiring, and setup of regulations, fines, and fees necessary to authorize and regulate activities Adult outreach and education Start annual kinrohoshi and community-based activities Establish enforcement system Conduct baseline biophysical and socio-economic monitoring Conduct tourism-related research	School-based education Ongoing adult outreach Ongoing community-based activities Ongoing surveillance and enforcement Ongoing biophysical monitoring Fundraising for tourism-related development Start tourism development, particularly trail	Continue tourism development, including hiring and training of staff, development of trail and tours, and advertising Ongoing activities, surveillance and enforcement, and biophysical monitoring Final review and analysis of Plan and monitoring data

Quick Peek at the

Costs and funding

It will cost $98,678 to implement all activities in the first year. Recurring costs over the five years are estimated at $56,277 per year. One-time costs will vary per year depending on the activities.

A sustainable financing plan calls for funding by the Palau PAN during the first year, with additional funding in following years. As activities are implemented, the Conservation Area will begin to generate its own revenues through ecotourism fees, fines associated with enforcement, and through grants or other fundraising efforts.

Estimated Recurring Costs

Activity	Category	Cost
Annual work plans developed and reviewed	Contract	1,000
Initial river cleanup held	Food	500
Annual invasive vine removal cleanups held	Food	500
Community meetings about Conservation Area held	Food	2,500
Tours for adults to learn about resources in the Conservation Area	Food	300
Tress planted in buffer zone and bare areas	Food	1,000
Radio and other media used to highlight the site	Gasoline	100
Water monitoring continued	Gasoline	100
Conservation Area monitored regularly	Gasoline	3,600
Tress planted in buffer zone and bare areas	Gasoline	500
Educational materials developed, including a list of benefits from the Conservation Areas; Resonsible development promoted	Supplies	1,000
Tours for adults to learn about resources in the Conservation Area	Transportation (Bus)	2,000
Coordinator	Personnel	15,000
Conservation Officer 2	Personnel	10,000
Conservation Officer 1	Personnel	10,000
Administration and Office supplies (17%)	Administration	8,177
		56,277

Quick Peek at the

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Forward

It is my great pleasure and privilege to present the Aimeliik State Ngerderar Watershed Conservation Area Management Plan. This, I can say, is one of the most notable achievements that I have had privilege to be part of on behalf of Aimeliik State.

I cannot say enough to express my gratitude and appreciation to the Aimeliik Natural Resource Management Committee (ANRMC), whose members committed their personal time and expense to work on this very important project with no compensation. Their only objective was to provide their best input and resources to create a product that will benefit Aimeliik State.

I am sincerely appreciative of and indebted to Palau Conservation Society and Ms. Anu Gupta for putting up so much resources and working so hard with our people, providing guidance and expertise for almost six (6) months to formulate the Ngerderar Watershed Management Plan. Without them, this plan would still be a dream.

The product itself is rich and authentic, being a result of intense discussion and debate by the State representatives that made up the Aimeliik Natural Resource Management Committee. I believe that as a result, this management plan is more practical and implementable because the people of Aimeliik contributed greatly to its development.

To the members of the ANRMC, Mcvey Kazuyuki-ANRMC Chairman, Buikmelachelbeluu Besechel Kiuluul, Legislator Lucio T. Obakerbau, Sechalraimul Melphy Blesam, Idolodaol Joshua Ngiraklang, Pauline Paul, and Wilbur O. Williams, Management of Palau Conservation Society and PCS expert Ms. Anu Gupta, and all that helped in the formulation and completion of this management plan, I sincerely thank you for a job well done!

Sincerely yours,

Governor Leilani N. Reklai
Aimeliik State

Introduction

Aimeliik has four conservation areas. In addition, activities and leases are restricted in all dock, shoreline, and mangrove areas, on all rivers and stream banks, and on offshore islands (ASPL 7-31, April 2003).

The four conservation areas are:

- A portion of the Ngaremeduu Conservation Area, ASPL 6-9, February 1999
- Imul Mangrove Conservation Zone, ASPL 7-16, February 2002
- Ngerchebal Island Wildlife Conservation Area, ASPL 8-17, June 2006
- Ngerderar Watershed Conservation Area, ASPL 09-07, August 2009

The Ngerderar Watershed Conservation Area Act of 2009 (ASPL 09-07) specifically mandated the creation of a management plan detailing and enumerating the types of activities permissible within the Ngerderar Watershed Conservation Area.

This management plan covers the Ngerderar Watershed Conservation Area (Figure 1). The focus of this Management Plan on the Ngerderar Watershed Conservation Area is to meet the specific mandate of ASPL 09-07. The laws establishing the Imul Mangrove and Ngerchebal Island Wildlife Conservation Areas did not mandate management plans. Ngaremeduu Conservation Area is managed by the three-state Conservation Area Coordinating Committee and there is a management plan in place.

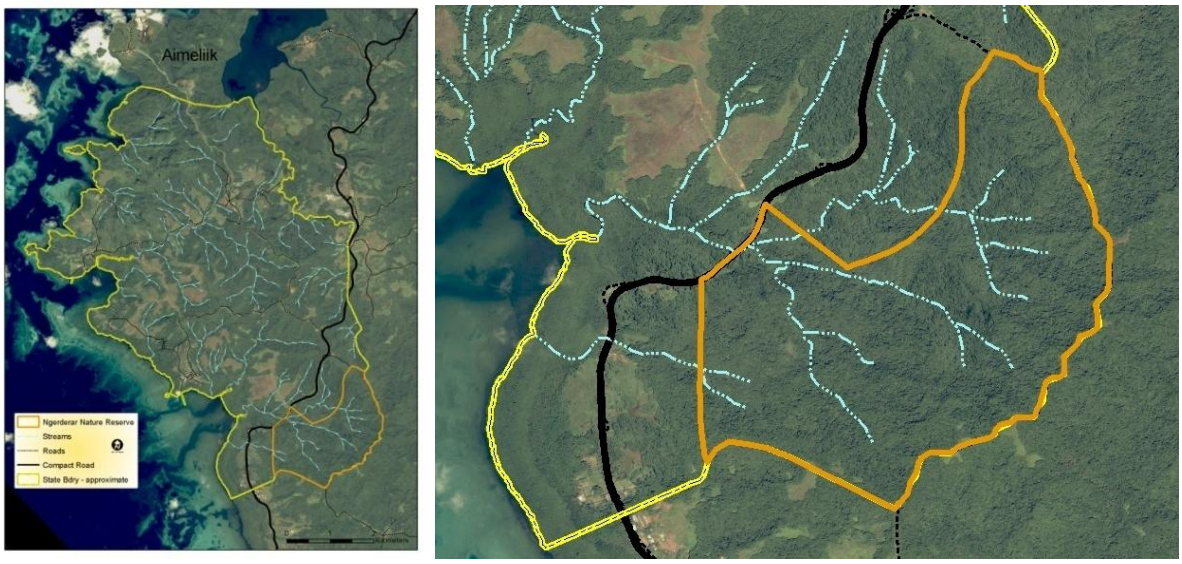


Figure 1. Ngerderar Watershed Conservation Area within Aimeliik State (left) and large (right). Map provided by PALARIS. The boundary presented here represents the intended boundaries (see section on Legislative Conflicts).

This Management Plan shall be a legal document governing the protection and use of the Ngerderar Conservation Area. Per ASPL 09-07, Section (7): "Any rule, regulation, or procedure included in the effective management plan shall have the full force and effect of law." This Plan gives a background to the Conservation Area and its natural and cultural resources. It outlines the main threats to the quality and integrity of the Conservation Area and details the actions and prohibitions necessary to mitigate these threats.

The completion of this Management Plan in April 2011 also coincided with the submission of Aimeliik's application to join the Palau Protected Area Network (PAN). The PAN application sought to establish the Ngerderar Watershed Conservation Area as a PAN site.

Legislative conflicts

1) Intended boundary versus legislated boundary. The intended boundary, as presented in Figure 1, is not that which was passed in ASPL 09-07. In early 2011, the Governor of Aimeliik developed amendments to ASPL 09-07 to reconcile the intended boundary with the legislated boundary. See Appendix 6 for legislative recommendations.

2) ASPL 09-07 and the amendments to ASPL 09-07 exclude a portion of the watershed draining in the Ngerderar River from the Ngerderar Watershed Conservation Area, along the northwestern corner. This excluded zone drains into the Conservation Area and some parts are on high-slope areas. Sediment and pollution may enter the conservation areas from these excluded zones. The state has issued leases in this area. This Plan recommends strict guidelines for any land use in this excluded area (e.g. no commercial or agricultural use) or inclusion of this area in the Conservation Area. See Appendix 6 for legislative recommendations.

3) ASPL 09-07 establishes the Ngerderar Watershed Conservation Board to develop the management plan and associated guidelines and criteria for activities, within 12 months of passage of ASPL 09-07. ASPL 09-07 also states that funds are to be administered and expended by the Governor "in collaboration, connection with the Board." Given the legislative intent for a Board that is active with implementation, this Plan calls for a Board to be established. The Board would jointly manage the Conservation Area for the next five years, including overseeing annual work planning and revisions to the Management Plan. In early 2011, the Governor of Aimeliik developed amendments to ASPL 09-07 to extend the timeframe of the management plan to 24 months from passage. In addition, the Governor indicated an intention to amend the legislation to streamline all governing authorities, including any Boards that may be established if Ngerderar becomes a PAN site. See Appendix 6 for legislative recommendations.

This Plan was drafted within the context of ASPL 09-07, and the allowable activities in the legislation are included in this Plan.

Management of the Conservation Area

Part A. Rationale and desires behind management

The management of the Ngerderar Conservation Areais guided by a broad vision and goals drafted by the Conservation Board. The vision takes a long-term perspective (20 years) and the goals take a shorter-term perspective (10 years).

20-year Vision

> "We the people of Aimeliik desire to foster, sustain, and promote the Ngerderar Watershed Conservation Area to conserve and protect our watershed to preserve water quality and quantity, for current and future generations. We want to maintain our cultural and natural resources in their natural and healthy state. We want to promote and maintain its natural beauty. We want to conserve the use of its limited natural resources."

10-year Management Goals

1. By 2021, youth and adults have been educated about the Ngerderar Watershed Conservation Area, so that they understand its historical and cultural significance, and the current and potential benefits of its natural ecosystems.
2. By 2021, tourists visit the Ngerderar Watershed Conservation Area, contribute to the Aimeliik economy, and sustain the management of the site.
3. By 2021, the people of Aimeliik and its neighbors know about and care for the value of Ngerderar water resources, and have enough clean water for sustainable use.
4. By 2021, cultural sites are maintained and restored, so as to add value to the site.
5. By 2021, natural resources are kept in a good and natural state. Current and potential threats have been minimized through improved law enforcement and traditional law (bul).

Parties Responsible for Implementing this Management Plan

Management Authority

This Management Plan proposes the continuation and enabling of the Ngerderar Watershed Conservation Board (the Board) to have joint responsibility for implementing this Plan with the Aimeliik Governor.

ASPL 09-07 established the Ngerderar Watershed Conservation Board. According to the legislation, the Board shall have at minimum five (5) members, representing and appointed by the

1. Office of the Governor
2. Traditional Council of Chiefs

3. Public Land Authority
4. Aimeliik Legislature
5. Community at large (appointed by the Governor)

ASPL 09-07 specifies the term for each Board Member at two years. ASPL 09-07 provides a compensation rate of $15.00 per board meeting or per day of Board duties for each Board Member.

Duties of the Board

- *Self-organization* – The Board shall select a permanent Chairperson and approve it own rules, procedures, and regulations regarding meetings, quorum, voting, and other matters essential to its duties.
- *Hiring of staff* – The Board may hire its own staff and/or use the staff and any resources of the offices of the Governor or other state executive branch agencies, with written authorization of the Governor. Staff shall be employees of the State.
- *Supervision of staff* – The Board shall oversee its own staff and shall provide guidance to state staff working on activities in the Management Plan.
- *Implementation of the Plan* – The Board shall ensure that activities in this Plan are implemented.
- *Issuance of permits and permission* – The Board shall develop guidelines for issuance of permits and shall provide at least one signature (out of two required) on all requests for permits and permission for restricted activities. The Board shall develop conditions for permits that are issued, if necessary.
- *Develop regulations, fees, and procedures* – The Board shall oversee the development of regulations, fees, and other procedures for restricted uses and issuance of permits.
- *Request expenditures* – The Board shall request expenditures of PAN funds and other funds in the separate Ngerderar Watershed Conservation Area Fund.
- *Fundraising* – The Board shall assist with procuring funds for the Conservation Area.
- *Annual Reports and Work Planning* – The Board shall approve annual reports, work plans and budgets and submit these to the Governor.
- *Yearly Management Plan Review* – The Board shall review yearly reports, write addendums to the Management Plan as needed, and submit these to the Governor.
- *5-year Management Plan Review* – The Board shall initiate a comprehensive review and planning effort at the five-year mark and follow procedures in ASPL 09-07 for approving the revised Plan.

Duties of the Governor

- *Hiring of staff* – The Governor's Office shall initiate paperwork to hire staff.
- *Supervision of staff* – The Governor shall oversee staff with the Board. Staff shall be employees of the state.

- *Implementation of this Plan* – Together with the Board, the Governor shall be responsible for ensuring that activities in this Plan are implemented.
- *Enforcement of provisions in ASPL 09-07 and this Plan* – The Governor and his/her designees (e.g. Conservation Officers) shall have the authority to enforce provisions in ASPL 09-07 and in this Management Plan, including issuing citations and fines, patrolling, making arrests, and prosecution of violators. The Governor shall request assistance from the National Government as necessary.
- *Issuance of permits and permission* – The Governor shall provide at least one signature on all requests for permits and permission for restricted activities, and will ensure that the Board provides a second signature.
- *Management of separate fund* – The Governor shall ensure that a separate fund entitled the Ngerderar Watershed Conservation Fund is created within the Aimeliik state treasury. The Fund shall be used for all funds appropriated by the Olbiil ra Aimeliik, permit fees or fines collected, or any other funds raised, donated, awarded, or earned specifically for the Conservation Area.
- *Budget requests* – The Governor shall include the yearly budget request for the Ngerderar Conservation Area in the state's yearly request to the National Government and/or Protected Area Network (PAN).
- *Approve and issue expenditures* – The Governor shall provide one signature (out of two required) approving expenditures of PAN funds and other funds in the separate Ngerderar Conservation Area Fund and shall issue checks based on requests.
- *Annual Reports and Work Planning* – The Governor shall finalize annual reports, work plans and budgets, and submit to the Olbiil ra Aimeliik for review.
- *Yearly Management Plan Review* – The Governor shall review and approve yearly reports and addendums to Management Plan as needed.
- *5-year Management Plan Review* – The Governor shall review and approve new Management Plans. The Governor shall call for public hearings for changes to the management plan, per ASPL 09-07.

Management Personnel

Under this Plan, three staff will be hired in 2011:

1. Aimeliik Conservation Coordinator
2. Conservation Officers (2 in 2011)
3. Tour guides or Tour site staff (Number to be determined in 2014)

This Plan also proposes to utilize the services of existing State personnel, including the:

1. State Attorney
2. State Administrative Staff
3. State Maintenance Staff

Appendix 1 lists roles and responsibilities of all authorities and personnel involved in this Management Plan.

Activity Restrictions and Permits

Zones

This management plan includes the following zones:

1. Tourist Zone
    a. Specific area to be decided after obtaining technical expertise. A tourist zone will include a trail that connects waterfalls, vista points, and cultural sites together. Tourists and limited tourist development will be allowed along the trail and at trailheads. Areas for a kayak tour (such as landing sites, etc.) will also be included in this zone. All activities require a permit, permission, or fee.
2. No-take/Controlled Access Zone
    a. All other areas in the Ngerderar Watershed Conservation Area are zoned as no-take areas with controlled access. All activities require a permit or permission.

- The Board shall retain the right to designate the boundaries of the Tourist Zone and to introduce new or additional zones, based on further analysis.
- The Board shall retain the right to develop individual use zones (e.g. for individual uses, such as ecotourism and educational uses) if it deems it appropriate.

Rationale for these zones

ASPL 09-07 set aside the Ngerderar Watershed Conservation Area specifically to provide water, enjoyment, and education for the people of Aimeliik and to act as a wildlife sanctuary. In its findings, ASPL 09-07 states that the area has highly erodible soil that should not be cleared of forest cover or used for unsustainable development or agricultural purposes. These two zones provide protection for the majority of the watershed, but with limited tourism development to ensure access for enjoyment and education.

The Board shall seek technical expertise to locate and build an eco-friendly hiking trail and kayak tour during the first year of implementation of this Plan. Technical expertise will also be needed in Year 2 and 3 in order to determine the feasibility of a botanical garden. **The Year 1 Work Plan includes an activity to seek technical expertise and conduct research to develop a hiking trail and kayak tour, and in so doing, propose boundaries for the zones.** The location of the trail/tour site shall depend on the findings of the technical expert, who shall be guided by the objectives of ASPL 09-07:

1. To provide for enjoyment and education
2. To maintain the ecological integrity and to provide for protection of native and endemic plants and wildlife

3. To provide opportunities for education, research, and monitoring
4. To preserve and maintain high water quality and quantity

Prohibited, Restricted, and Allowable Activities

The Ngerderar Watershed Conservation Area is a **no-take** and **low-impact** area. **Entry is limited** and restricted at all times. Development is prohibited, except in the Tourist Zone for the purposes of developing an eco-friendly hiking trail, kayak tour, or botanical garden. Table 1 lists prohibited and restricted activities in all zones. All activities are controlled and require some sort of permission, permit, or fee (paid fees for tourist access will constitute "permission").

Table 2. Restrictions by Activity - Terrestrial Conservation Areas

Activity	Tourist Zone	No-take / Controlled Access Zone
Clearing of fallen trees from waterways	**Allowable with permit, if below waterfall**	**Allowable with permit, if below waterfall**
Ecotourism – Clearing of land/Tree felling	**Allowable with permit/permission**	**Prohibited**
Ecotourism – Development and/or Construction	**Allowable with permit**	**Prohibited**
Ecotourism – Development and/or Construction – Use of heavy machinery	**Prohibited**	**N/A (Prohibited)**
Ecotourism – Tourist Entry	**Allowable with permit/fee, only on trail (no going off-trail, no backcountry hiking)**	**Prohibited**
Educational activities	**Allowable with permit/permission**	**Allowable with permit/permission**
Research and monitoring	**Allowable with permit/permission**	**Allowable with permit/permission**
Enforcement	**Allowable by state authorized personnel**	**Allowable by state authorized personnel**
Hunting/taking of native animals	**Prohibited**	**Prohibited**
Collection/gathering/taking of native plants	**Prohibited**	**Prohibited**
Removal of invasive species (animal or plant)	**Allowable with permit/permission**	**Allowable with permit/permission**
Planting of native plants	**Allowable with permit/permission**	**Allowable with permit/permission**
Littering / Dumping of trash	**Prohibited**	**Prohibited**
Burning	**Prohibited**	**Prohibited**
Farming/Agriculture	**Prohibited**	**Prohibited**

Restricted Activities Requiring Permit/Permission

The following activities may require a permit or permission, depending on zone:

- Ecotourism – Development and/or construction, including clearing of land or felling trees

    - Conditions for the permit will require that materials are built using local materials and culturally-appropriate styles
    - The use of heavy equipment is prohibited
- Ecotourism – Tourist Entry
- Educational activities
- Hunting of invasive species
- Research and monitoring

Developing a Permit/Permission/Fee and Fine System
During the first year of implementation, the Board and Governor will implement a simple permission system for restricted activities requiring permit/permission. Permission shall be documented on paper (either with letters or internal memos) and have at least one signature from a Board Member and one signature from the Governor.

During the first year, the Board and Governor will also develop a fine and penalty system for violations to this Plan.

During the first year the Board shall seek technical expertise for developing a permit/fee system for ecotourism development and visitation. **Development of the specific mechanisms to implement the permit/fee structure (whether MOU, Executive Order, laws, etc.) are included as activities in the medium-term (2012-2013)**. In particular, the Board shall seek technical expertise regarding the following points:

- Cost of permit/fee
- Timing/Duration of permit/fee
- Number of people covered by permit/fee
- Number of days covered by permit/fee
- Number of sites covered by permit/fee
- Process for applying for and issuing permits/fees
- Process for monitoring and assessing fees/fines for permits

For all zones, permits, prohibitions, restrictions, and allowable activities, the Board retains the right to change designations as necessary.

Management Objectives

The Conservation Board identified and analyzed target-based and process-based threats (see Background Information) to hypothesize underlying causes of those threats. This was done during a two-meeting brainstorming effort. Then, the Conservation Board identified possible solutions to each threat or underlying cause. This table is included in Appendix 2 as the Threat-Cause-Solution table.

The Conservation Board then drafted objectives for each goal, cross-referencing against the Threat-Cause-Solution Table and the Vision. Objectives were first written to directly counter threats. Then the Conservation Board assessed its Goals and Vision and wrote additional objectives that were not specifically related to threats, but which would help achieve the Vision. Thus objectives in this Plan address both threats to biodiversity and sustainable development issues.

Goal 1. By 2020, youth and adults have been educated about the Ngerderar Watershed Conservation Area, so that they understand its historical and cultural significance, and the current and potential benefits of its natural ecosystems.

Objective 1-1. By December 2016, 75% of people from Aimeliik and neighboring states know about the number of streams, kinds of trees, and types of animals in the conservation area.

Objective 1-2. By December 2016, 80% of students in the 6^{th} to 8^{th} grade at Aimeliik Elementary School are aware of the cultural significance and potential benefits of the Ngerderrar Watershed Conservation Area.

Objective 1-3. By December 2016, 75% of adults in Aimeliik's population know the boundary of the conservation area and the location and significance of historical sites.

Goal 2. By 2020, tourists visit the Ngerderar Watershed Conservation Area, contribute to the Aimeliik economy, and sustain the management of the site.

Objective 2-1. By December 2016, a hiking trail, botanical garden, and kayaking tour are in place.

Objective 2-2. By December 2016, the amount of revenue generated by the Conservation Area has increased every year.

Objective 2-3. By December 2016, tours to the Ngerderrar Conservation Area are part of a package of all sites in Aimeliik, with a single fee.

Goal 3. By 2020, the people of Aimeliik and its neighbors know about and care for the value of Ngerderar water resources, and have enough clean water for sustainable use.

Objective 3-1. By December 2016, the amount of sediment in the river is decreased by 25% or to the natural level.

Objective 3-2. By December 2016, development and tourist activities in or near the Conservation Area do not change the flow or amount of water flowing into the river and do not introduce any new sediment, chemicals, pollution, or other impurities into the Conservation Area, and any tourist development in the conservation area (trail, hut, markets, etc.) will be built using local materials and without using heavy equipment.

Goal 4. By 2020, cultural sites are maintained and restored, so as to add value to the site.

Objective 4-1. By December 2016, a system for maintaining and restoring historical and cultural sites will be in place and at least one site is being restored.

Objective 4-2. By December 2016, sites are registered on the National Registry

Goal 5. By 2020, natural resources are kept in a good and natural state. Current and potential threats have been minimized through improved law enforcement and traditional law (bul).

Objective 5-1. By December 2016 there will be no fires in the Conservation Area, and regulations and penalties for arsonists will be in place

Objective 5-2. By December 2016 there will be no hunting (with particular emphasis on pigeons, bats, and chickens) in the conservation area

Objective 5-3. By December 2016 there will be no logging in the conservation area

Objective 5-4. By December 2016 the amount of land in the Conservation Area negatively impacted by invasive species will be reduced annually or near zero.

Five-Year Strategic Plan, 2011-2016

Activities were drafted to meet each objective. During drafting of this Plan, activities were reorganized by Strategy, to be consistent with PAN requirements. The First Year Work Plan (next section) lists activities by objective and goal.

A Glance at Activities by Year

Year 1	Years 2-3	Years 4-5
• Hiring, and setup of regulations, fines, and fees necessary to authorize and regulate activities • Adult outreach and education • Start annual kinrohoshi and community-based activities • Establish enforcement system • Conduct baseline biophysical and socioeconomic monitoring • Conduct tourism-related research	• School-based education • Ongoing adult outreach • Ongoing community-based activities • Ongoing surveillance and enforcement • Ongoing biophysical monitoring • Fundraising for tourism-related development • Start tourism development, particularly trail	• Continue tourism development, including hiring and training of staff, development of trail and tours, and advertising • Ongoing activities, surveillance and enforcement, and biophysical monitoring • Final review and analysis of Plan and monitoring data

Strategies and Activities by Category

Administrative and Legal /Authoritative Strategies

Administrative Strategies include those activities necessary to ensure legal implementation of the Plan in the Ngerderar Watershed Conservation Area, as well as hiring necessary staff.

- ***Administration is a major focus of this Management Plan in the first year (Year 1).*** The first year is dedicated to ensuring that the Board and staff are enabled and organized and that necessary legislation, regulations, fees, fines, and permits are researched and developed.
- The second year should see passage of all relevant legislation.
- The fourth and fifth years are dedicated to expanding personnel to include tour-related personnel and to implementing the plan with appropriate oversight and accountability.

Short-term Activities (1 Year)

1. Board and Governor hire personnel (Coordinator and Conservation Officers)

2. Coordinator, Board, and State Attorney conduct research to develop permit/fee/fine systems and regulations for:
    a. Fines and penalties for prohibited and restricted activities (e.g. illegal hunting, logging, fires/arson)
    b. Fees for ecotourism development and visitation
    c. Permits for all other restricted activities (e.g. education, research)
    d. Restrictions in the upland zone draining into the Conservation Area (excluded zone)
    e. Regulations for buffer zone legislation
3. Coordinator supervises a study to determine if a single fee for visitation to all Aimeliik sites is feasible and to determine cost
4. Coordinator develops annual work plan and budget for submission to PAN
5. Board sources and identifies opportunities for capacity building for staff

Medium-term Activities (2-3 Years)

1. Governor includes annual budget requests in annual requests to national government
2. Governor and Board fundraise for tourism-related development
3. Governor and Board hire and train tour guides or other tour-related staff (if funds allow)

Long-term Activities (4-5 Years)

1. Governor and Board hire and train tour guides or other tour-related staff
2. Board and Governor establish relationships/partnerships with tour agencies
3. Governor and Board ensure funds are spent according to plans

See Appendix 6 for legislative recommendations.

Additional Planning needed:

- Yearly work plans
- Individual capacity building and professional development plans for new staff (particularly Coordinator, Conservation Officers, and State Finance Personnel reporting to the PAN). These plans will be developed as needed, when personnel are hired.

Education, Outreach, and Tourism Strategies

Education, outreach, and tourism strategies will raise awareness about the site and its natural and cultural resources. Strategies include holding community visits, developing a school-based educational program, advertising sites to tourists and visitors, and *in situ* education.

- ***Adult-based community outreach is a focus in Year 1***.
- ***School-based education and outreach is a focus in Years 2 and 3***.
- The fourth and fifth years include ongoing education and new tourist-oriented advertising.

Short-term Activities (1 Year)

1. Coordinator works with partners to develop educational materials, including a list of benefits from the Conservation Area for distribution to the community
2. Board and Coordinator hold community meetings about conservation area, with information on:
    a. Boundary
    b. Burning and fires
    c. Logging
    d. Hunting
    e. Prohibitions
    f. Historical and cultural sites
    g. Other interesting sites (waterfalls)
3. Coordinator works with partners to use radio and other media to highlight the site, particularly its border, prohibitions, and cultural sites
4. Coordinator and Board develop and lead tours for adults to learn about the Conservation Area
5. Coordinator and Board use multiple media to promote responsible development practices, particularly in the excluded zone draining into the Conservation Area
6. Coordinator and Conservation Officers make and post at least three (3) signs (two at ends, one in middle) along the Compact Road, with information on:
    a. Boundary
    b. Prohibitions
    c. Interesting sites
7. Coordinator and Conservation Officers develop and distribute maps of the Conservation Area to the schools

Medium-term Activities (2-3 Years)

1. Coordinator develops school-based educational program, with printed materials, classroom visits, and two-way learning (e.g. essay contests)
2. Coordinator and Conservation Officers conduct school field trips to Conservation Area
3. Board and Coordinator conduct regular community field trips (for adults)
4. Coordinator and Board work with partners to develop advertising for tourist agencies and hotels (written media, television/radio, internet)

Long-term Activities (4-5 Years)

1. Coordinator continues education programs and field trips for adults and youth
2. Coordinator and Board continue advertising to tourist agencies and hotels (written media, television/radio, internet)

Additional Planning necessary:

- School education program. A plan will need to be developed to include the number and type of school visits, materials needed, target grades, activities, etc.

Maintenance and On-the-Ground Strategies

Maintenance and on-the-ground strategies include activities that require physical labor for the benefit of establishing trails or restoring/maintain ecosystem health. Strategies include cleanups, removal of invasive plants, replanting in bare areas, and development of a trail, kayak tour, and other tourist facilities.

- The first years are dedicated to ongoing activities, such as cleanups and replanting.
- ***Development of a trail, kayak tour, and tourist-related facilities is a major focus of this Plan in Years 2 and 3 (or sooner if technical expertise and funds allow)***.

Short-term Activities (1 Year)

1. Community conducts annual invasive vine cleanup (kinrohoshi)
2. Community conducts comprehensive initial cleanup of river (up to waterfall)
3. Community and Conservation Officers plant trees in bare areas and in buffer zone

Medium-term Activities (2-3 Years)

1. Coordinator and Conservation Officers demarcate boundary
2. Community conducts annual invasive vine cleanups
3. Community maintains river and removes debris (up to waterfall) as necessary
4. Governor and Board establish relationship with Fire Substations to build support for stopping fires along the road when they start
5. National technical partners assist with removal of Unexploded Ordinances (UXOs)
6. Community and Conservation Officers continue planting trees in bare areas and buffer zones
7. Conservation Officers and State maintenance personnel build structure for market (e.g. summer house or tent), based on research showing where trail will be and where site entrance will be.
8. Coordinator supervises construction of trail and support structures at site (e.g. hut for collecting fees)

Long-term Activities (4-5 Years)

1. Coordinator, Conservation Officers, and Community participate in annual activities (cleanups, tree planting)
2. National technical partners assist with removal of Unexploded Ordinances (UXOs)
3. Coordinator supervises purchase of Kayaks and establishment of kayak tour (this shall be sooner if funds permit)
4. Coordinator supervises construction of Botanical garden (if feasible)

5. Tour Guides lead tours (this shall be sooner if funds permit)

Enforcement and Surveillance Strategies

Enforcement and surveillance strategies include those efforts to monitor users of the Conservation Areas for compliance with laws and regulations, and to stop non-compliance through policing of the areas and actual enforcement.

- ***Establishment of an Enforcement System in a major focus of this Management Plan in the first year (Year 1).*** The first year includes hiring and training of Conservation Officers and establishment of monitoring systems, daily tracking logs, and development of materials to support enforcement (e.g. citation booklets).
- ***Implementation of the Enforcement System is a major focus of this Management Plan in the second year and all following years (Year 2 and subsequent years)***. These years include ongoing enforcement and surveillance.

Short-term Activities (1 Year)

1. Conservation Officers trained in methods of conservation, permit systems, existing national and state laws, and methods of enforcement
2. Coordinator and Conservation Officers establish daily logs and develop paperwork system necessary to support enforcement
3. Conservation Officers monitor conservation areas on a regular and frequent basis
4. Coordinator and Conservation Officers develop a daily surveillance and enforcement plan (including methods for reporting and enforcing non-compliance)
5. Board and Coordinator establish necessary partnerships (e.g. with National Police or National Fish & Wildlife) to ensure enforcement of all applicable laws.
6. Governor requests assistance from National Government for enforcement of laws
7. Board and Coordinator work with Traditional Chiefs and Modern Law Enforcement to collaborate to enforce restrictions and penalties.

Medium-term to Long-term Activities (2-5 Years)

1. Conservation Officers enforce laws (to include apprehending perpetrators, checking permits, etc.)
2. Conservation Officers receive adequate training to be deputized.
3. Coordinator and Board establish a neighborhood watch system
4. Tour Guides and State personnel monitor permits and fees of visitors

Additional Planning necessary:

- Daily surveillance and enforcement plan, to include information on when and where surveillance will occur and methods for ensuring compliance with regulations.

- Short-term planning will occur by the Coordinator and Conservation Officers to ensure that training, development of citations and paperwork, and other enforcement activities occur effectively and efficiently.

Research and Monitoring Strategies

Research and monitoring strategies include efforts to monitor the effectiveness of the plan in the long- and short-term, and dedicated research towards filling gaps in understanding. Strategies include biophysical monitoring, socioeconomic monitoring, outcome monitoring, and targeted research. This Management Plan relies on technical partners for initial biophysical monitoring, but includes a strategy to build internal capacity to carry out all monitoring.

- ***Establishment of baseline conditions is a major focus of this Management Plan in the first year (Year 1).*** This includes collection of existing data and implementation of a socioeconomic survey. ***Targeted research to identify cultural sites, location of trail, natural history, etc. is also a major focus of this Plan in Year 1.***
- ***Comparing the effectiveness of this Management Plan against baseline conditions is a major focus of this Management Plan in the fifth year (Year 5).*** This includes follow-up monitoring and preparation of reports.

Short-term Activities (1 Year)

1. Coordinator and Technical partners develop and implement socioeconomic survey to establish baseline conditions
    a. Survey includes questions for women to determine interest in market near site
2. Coordinator collects data and establishes baseline conditions from national monitoring of
    a. Birds and Bats (BNM)
    b. Forests (BNM/Forestry)
3. Coordinator establishes monitoring system, collects data, and establishes baseline conditions through regular state monitoring of
    a. Non-compliance or enforcement actions (e.g. number of illegal logging violations, number of hunters apprehended)
    b. Fires
    c. Water quality (with PICRC)
    d. Permits
    e. Visitors
    f. Income (fees, fines) generated from, by, and/or for site
    g. Invasive species removed (area treated, number of animals removed during cleanups)
    h. Cultural sites restored
    i. Area replanted (e.g. square area or number of trees planted)
4. Coordinator or Governor supervises a contract to conduct a carrying capacity study to determine how many tourists can access the site and still maintain its objectives

5. Coordinator obtains technical advice for designing a trail and kayaking tour
6. Coordinator collects existing information and supervises collection of new information on the number and types of trees, streams, animals, etc. in the Conservation Area and develops a Natural History list
7. Coordinator supervises field visits to identify cultural sites, historical sites, and waterfalls or other interesting locations
8. Coordinator and Governor request Bureau of Arts and Culture to survey and register cultural sites in the Area
9. Community (Rubaks and Mechas) visit cultural sites and determine what should be restored (when and how)
10. Coordinator supervises a study to determine the cultural significance of the site and to record its stories
11. Coordinator and Board develop quarterly and annual reporting system to track activities and outcomes against objectives.

Medium-term Activities (2-3 Years)

1) Conservation Officers and other interested community members learn monitoring methods and implement biological/physical monitoring
2) All partners continue biophysical monitoring
3) Board and Governor request the National Government for assistance in documenting the locations of all Unexploded Ordinances (UXOs)
4) Coordinator and Board write quarterly and annual reports and distribute to all stakeholders.
5) Coordinator supervises a Feasibility Study for a botanical garden (where, what plants, focus, etc./)
6) Coordinator writes an implementation plan for botanical garden based on feasibility study

Long-term Activities (4-5 Years)

7) At five years, Coordinator and technical partners repeat socioeconomic survey
8) Coordinator works with technical partners to analyze biophysical data
9) Coordinator and Board write quarterly and annual reports and distribute to all stakeholders.

Additional Planning necessary:

- Implementation Plan for Botanical Garden
- Restoration Plan for cultural sites

Appendix 3 includes evaluation criteria, including indicators of long- and short-term conservation success. Appendix 4 is the Monitoring Plan, for collecting indicator data.

First Year Work Plan

Goal / Objective / Activity	General Strategy	Lead person	Who else involved	Q1	Q2	Q3	Q4	Priority	Indicator(s) of success	YEAR 1 Cost (description)	YEAR 1 Cost ($ estimate) (non-personnel)
All goals											
Coordinator and Conservation Officers hired	Administration	Governor	Board	x				High	Personnel hired/Paperwork completed	Advertising	300
Socioeconomic survey implemented	Research and Monitoring	Coordinator	PICRC (initially)				x	Low	Surveys conducted, data entered, report generated	Contract	1000
Baseline data collected from partners (birds, bats, water, forests)	Research and Monitoring	Coordinator	Technical Partners				x	Medium	Data collected, report generated	Gasoline	200
State-based monitoring system established	Research and Monitoring	Coordinator	Technical Partners				x	Medium	Tracking sheets developed, data collected	Personnel	
Annual work plans developed and reviewed	Administration	Coordinator	Technical Partners (initially)				x	High	Work plans developed and submitted to PAN	Contract	1000
Capacity building for staff	Administration	Board	Technical Partners (initially)		x			High	Staff participate in programs and report capacity raised	Contract	2000
Goal 1. By 2020, youth and adults have been educated about the Ngerderar Watershed Conservation Area, so that they understand its historical and cultural significance, and the current and potential benefits of its natural ecosystems.											
Educational materials developed, including a list of benefits from the Conservation Areas	Education and Outreach	Coordinator	Technical Partners			x		Low	Draft materials printed	Printing	500
Objective 1-1. By December 2016, 75% of people from Aimeliik and neighboring states know about the number of streams, kinds of trees, and types of animals in the conservation area.									75% of people in socioeconomic survey answer affirmatively to 2016 survey		
Tours for adults to learn about resources in the Conservation Area	Education and Outreach	Coordinator	Board				x	Low	Tours held, community participates	Transportation, food	3000: 2000 (bus); 1000 (food)
Existing and new information collected to develop Natural History List	Research and Monitoring	Coordinator	Technical Partners			x		Low	Natural history list created	Gasoline	200

Goal / Objective / Activity	General Strategy	Lead person	Who else involved	Q1	Q2	Q3	Q4	Priority	Indicator(s) of success	YEAR 1 Cost (description)	YEAR 1 Cost ($ estimate) (non-personnel)
Objective 1-2. By December 2016, 80% of students in the 6th to 8th grade at Aimeliik Elementary School are aware of the cultural significance and potential benefits of the Ngerderrar Watershed Conservation Area.									80% of students in 2016 follow-up survey answer affirmatively; Number of students reached equals 80% of middle school population		
Maps of Conservation Area developed and distributed to schools	Education and Outreach	Coordinator	Conservation Officers			x		Medium	Maps printed	Printing	540
Objective 1-3. By December 2016, 75% of adults in Aimeliik's population know the boundary of the conservation area and the location and significance of historical sites.									75% of people in socioeconomic survey answer affirmatively to 2016 survey		
Community meetings about Conservation Area held	Education and Outreach	Coordinator	Board		x			Low	Community meetings held, photographs taken, community members participate	Food	2500
Radio and other media used to highlight the site	Education and Outreach	Coordinator	Technical Partners			x		Low	Radio show, OTV segment	Gasoline	100
At least three signs posted in Conservation Area	Education and Outreach	Coordinator	Conservation Officers			x		Medium	Signs posted	Signs	3000
Research and field visits identify cultural sites, historical sites, waterfalls, etc.	Research and Monitoring	Coordinator	Technical Partners		x			Low	Field visits occur, sites visited, photographs taken	Transportation, food	12500: 12000 (vehicle); 500 (food)
Study conducted to determine cultural significance and record stories	Research and Monitoring	Coordinator	Rubak and Mechas		x			Low	Stories recorded	Gasoline, food, video and recording equipment	2500: 1000 (gas); 500 (food); 1000 (equipment)
Goal 2. By 2020, tourists visit the Ngerderar Watershed Conservation Area, contribute to the Aimeliik economy, and sustain the management of the site.											
Objective 2-1.By December 2016, a hiking trail, botanical garden, and kayaking tour are in place.									Hiking trail, kayak tour, botanical garden in place		
Technical advice for trail and kayak tour obtained	Research and Monitoring	Coordinator	Technical Partners		x			Low	Report produced with recommendations	Contract	2000

Goal / Objective / Activity	General Strategy	Lead person	Who else involved	Q1	Q2	Q3	Q4	Priority	Indicator(s) of success	YEAR 1 Cost (description)	YEAR 1 Cost ($ estimate) (non-personnel)
Objective 2-2.By December 2016, the amount of revenue generated by the Conservation Area has increased every year.									Revenue increases every year		
Carrying capacity study to determine number of feasible tourists	Research and Monitoring	Coordinator	Technical Partners		x			Low	Report produced with recommendations	Contract	2000
Fee and permit systems for ecotourism developed	Administration	State Attorney	Coordinator			x		Medium	Systems developed	Personnel	
Objective 2-3. By December 2016, tours to the Ngerderrar Conservation Area are part of a package of all sites in Aimeliik, with a single fee.									Single fee established and collected		
Study conducted to determine single fee for visitation to all sites	Administration	Coordinator	Technical Partners		x			Low	Report produced with recommendations	Contract	1000
Goal 3. By 2020, the people of Aimeliik and its neighbors know about and care for the value of Ngerderar water resources, and have enough clean water for sustainable use.											
Objective 3-1. By December 2016, the amount of sediment in the river is decreased by 25% or to the natural level.									Turbidity decreases		
Community meetings include information on burning, sediment, etc.	Education and Outreach	Coordinator	Board		x			Low	Community meetings include information, materials distributed, photographs taken	Food	Included above
Tress planted in buffer zone and bare areas	Maintenance	Community	Conservation Officers				x	Low	Number of trees planted; Area planted	Trees, Equipment, Food, Gasoline	3000: 1500 (equipment); 1000 (food); 500 (gasoline)
Initial river cleanup held	Maintenance	Community	Coordinator				x	Low	River cleaned; photographs, community members participate	Equipment, Food	500 (food)
Water monitoring continued	Research and Monitoring	Coordinator	EQPB				x	Medium	Data collected, report generated	Gasoline	100

Goal / Objective / Activity	General Strategy	Lead person	Who else involved	Q1	Q2	Q3	Q4	Priority	Indicator(s) of success	YEAR 1 Cost (description)	YEAR 1 Cost ($ estimate) (non-personnel)
Objective 3-2. By December 2016, development and tourist activities in or near the Conservation Area do not change the flow or amount of water flowing into the river and do not introduce any new sediment, chemicals, pollution, or other impurities into the Conservation Area, and any tourist development in the conservation area (trail, hut, markets, etc.) will be built using local materials and without using heavy equipment.									Water flow consistent (no declines not associated with rainfall); no decline in water quality; development uses local materials and methods		
Responsible development practices promoted	Education and Outreach	Coordinator	Board			x		Low	Materials developed and distributed	Printing	Included above
Restrictions developed for excluded upland areas draining into Conservation Area	Administration	State Attorney	Technical Partners	x				Medium	Restrictions passed	Personnel	
Regulations for buffer zone law developed	Administration	State Attorney		x				Medium	Regulations passed	Personnel	
Goal 4. By 2020, cultural sites are maintained and restored, so as to add value to the site.											
Objective 4-1. By December 2016, a system for maintaining and restoring historical and cultural sites will be in place and at least one site is being restored.									One site being restored		
Cultural sites studied and restoration plan developed	Research and Monitoring	Rubak and Mechas	Coordinator		x			Low	Restoration plan printed	Transportation, food	500
Objective 4-2. By December 2016, sites are registered on the National Registry									Sites registered		
Sites registered by Bureau of Arts and Culture	Research and Monitoring	BAC	Governor			x		Low	Communications between Governor's Office and BAC show agreement	Personnel	
Goal 5. By 2020, natural resources are kept in a good and natural state. Current and potential threats have been minimized through improved law enforcement and traditional law (bul).											
Fines, penalties, and regulations for prohibited and restricted activities developed	Administration	State Attorney	Coordinator	x				High	Regulations passed	Personnel	
Permit system for restricted activities (education, research) in place	Administration	State Attorney	Coordinator			x		High	Permit system in place	Personnel	
National government provides assistance with enforcing laws; Partnerships established	Enforcement	Governor	Board	x				High	MOUs in place	Personnel	

Goal / Objective / Activity	General Strategy	Lead person	Who else involved	Q1	Q2	Q3	Q4	Priority	Indicator(s) of success	YEAR 1 Cost (description)	YEAR 1 Cost ($ estimate) (non-personnel)
Traditional leaders and modern law enforcement officers collaborate to enforce restrictions and penalities	Enforcement	Conservation Officers	Traditional Chiefs		x			High	Enforcement records show involvement of all parties	Personnel	
Daily logs and paperwork established to support enforcement, including daily surveillance plans	Enforcement	Coordinator	Technical Partners	x				High	Daily logs filled in	Contract	1000
Conservation Area surveilled regularly	Enforcement	Conservation Officers					x	High	Daily logs show monitoring of site	Gasoline	3600
Objective 5-1. By December 2016 there will be no fires in the Conservation Area, and regulations and penalties for arsonists will be in place									No reports of fires in daily logs		
Information on fires included in education programs	Education and Outreach	Coordinator				x		Low	Information included on materials	Meetings and materials	Included above
Enforcement against arsonists	Enforcement	Conservation Officers		x				High	Fines assessed against perpetrators	Personnel	
Objective 5-2. By December 2016 there will be no hunting (with particular emphasis on pigeons, bats, and chickens) in the conservation area									No reports of illegal hunting, no records of perpetrators, biological monitoring shows no decline in birds and bats; socioeconomic survey indicates no hunting		
Information on hunting included in education programs	Education and Outreach	Coordinator				x		Low	Information included on materials	Meetings and materials	Included above
Enforcement against hunters in Conservation Area	Enforcement	Conservation Officers		x				High	Fines assessed against perpetrators	Personnel	

Goal / Objective / Activity	General Strategy	Lead person	Who else involved	Q1	Q2	Q3	Q4	Priority	Indicator(s) of success	YEAR 1 Cost (description)	YEAR 1 Cost ($ estimate) (non-personnel)
Objective 5-3. By December 2016 there will be no logging in the conservation area									No reports of illegal logging, no records of perpetrators, biological monitoring does not encounter evidence of logging; socioeconomic survey indicates no logging		
Information on logging included in education programs	Education and Outreach	Coordinator				x		Low	Information included on materials	Meetings and materials	Included above
Enforcement against loggers in Conservation Area	Enforcement	Conservation Officers		x				High	Fines assessed against perpetrators	Personnel	
Objective 5-4. By December 2016 the amount of land in the Conservation Area negatively impacted by invasive species will be reduced annually or near zero.									Square area affected by invasive species declines		
Annual invasive vine removal cleanups held	Maintenance	Community	Coordinator				x	Low	Number of cleanups, number of participants	Equipment, Food	500 (food)

Budget

Activity	Category	Cost
Coordinator and Conservation Officers hired	Advertising	300
	TOTAL ADVERTISING	**300**
Socioeconomic survey implemented	Contract	1,000
Annual work plans developed and reviewed	Contract	1,000
Capacity building for staff	Contract	2,000
Technical advice for trail and kayak tour obtained	Contract	2,000
Carrying capacity study to determine number of feasible tourists	Contract	2,000
Study conducted to determine single fee for visitation to all sites	Contract	1,000
Daily logs and paperwork established to support enforcement, including daily surveillance plans	Contract	1,000
	TOTAL CONTRACTS	**10,000**
Study conducted to determine cultural significance and record stories	Recording Equipment	1,000
Tress planted in buffer zone and bare areas	Field Equipment	1,500
	TOTAL EQUIPMENT	**2,500**
Initial river cleanup held	Food	500
Annual invasive vine removal cleanups held	Food	500
Community meetings about Conservation Area held	Food	2,500
Study conducted to determine cultural significance and record stories	Food	500
Tours for adults to learn about resources in the Conservation Area	Food	300
Research and field visits identify cultural sites, historical sites, waterfalls, etc.	Food	500
Cultural sites studied and restoration plan developed	Food	500
Tress planted in buffer zone and bare areas	Food	1,000
	TOTAL FOOD	**6,300**
Baseline data collected from partners (birds, bats, water, forests)	Gasoline	200
Existing and new information collected to develop Natural History List	Gasoline	200
Radio and other media used to highlight the site	Gasoline	100
Water monitoring continued	Gasoline	100
Conservation Area monitored regularly	Gasoline	3,600
Study conducted to determine cultural significance and record stories	Gasoline	1,000
Tress planted in buffer zone and bare areas	Gasoline	500
	TOTAL GASOLINE	**5,700**

Activity	Category	Cost
Maps of Conservation Area developed and distributed to schools	Printing	540
	TOTAL PRINTING	**540**
At least three signs posted in Conservation Area	Signs	3,000
	TOTAL SIGNS	**3,000**
Educational materials developed, including a list of benefits from the Conservation Areas; Resonsible development promoted	Supplies	1,000
	TOTAL SUPPLIES	**1,000**
Tours for adults to learn about resources in the Conservation Area	Transportation (Bus)	2,000
Research and field visits identify cultural sites, historical sites, waterfalls, etc.	Transportation (Vehicle)	2 2,000
	TOTAL TRANSPORTATION	**14,000**
Coordinator	Personnel	15,000
Conservation Officer 2	Personnel	10,000
Conservation Officer 1	Personnel	10,000
State Attorney	Personnel	6,000
	TOTAL PERSONNEL	**41,000**
Administration and Office supplies (17%)	**TOTAL ADMINISTRATION**	**14,338**
	TOTAL FIRST YEAR COST	**108,678**

Budget justification

This management plan outlines in clear detail the vision and goals of Aimeliik State, and the activities necessary to achieve the vision and goals. Estimated costs are linked directly to the annual work plan and are self-explanatory.

One-time and Recurring Costs

One-time costs will vary per year and will depend on the activities scheduled for the year. In the first year, one-time costs will be $46,240.

Recurring costs will be incurred every year for the next five years and will be approximately $56,277 per year. See Appendix 7 for details on one-time and recurring costs.

Sustainable Financing Plan

Sustainable financing is built into this Plan in the long-term. When all activities in this plan are completed, the Conservation Area will be generating revenue through tourism fees and through fines collected from non-compliance. Activities also include fundraising by the Board and Governor. In addition, this Plan relies on funding from the PAN to support, at a minimum, recurring costs and all costs in the first year.

Capacity Building Plan

One the internal strengths in Aimeliik is that there is currently high leadership cooperation and support and involvement in conservation. The state has already hired two staff as Conservation Officers who have participated in Conservation Officer training workshops. The community is also supportive of conservation. Thus, the state is immediately able to begin implementation of this Plan.

Currently, the state lacks the funding to support all required personnel, who are key to success of this Plan. Thus, their employment is contingent on receipt of funds from the PAN or other sources. Once these funds are received, all remaining positions can be filled. Another internal strength in Aimeliik is that there are already a number of people knowledgeable about conservation. Thus the state has the internal capacity to fill these positions.

Newly hired Coordinators and Conservation Officers will need to build capacity to understand and implement the Plan. As a member of BWA, Aimeliik State has access to networking and partnerships. **The Coordinator and Conservation Officers should immediately begin attending BWA meetings and shadowing BWA partners**. Conservation Officers have already been attending BWA meetings and should continue to do so.

As part of its facilitation services, the **Palau Conservation Society offers mentoring services** and will mentor the Coordinator and Conservation Officers in the first year. PCS, the PAN office, and other technical partners are also developing a training program for Conservation Officers. **Conservation Officers should also attend meetings of the Belau Locally Managed Areas Network (BLMA)**. In the meantime, PCS and other technical partners will facilitate information-sharing and mentoring by agencies with experience in conservation enforcement (such as Palau Fish and Wildlife, Helen Reef, EQPB, and Koror State).

The development of a permit system will need access to technical information. **The Coordinator and State Attorney should also attend meetings of the Palau Conservation Consortium and the Belau Locally Managed Area Network (BLMA)** to identify and network with sources of technical expertise. Several technical partners have included capacity building in their strategies.

Additionally, this Plan includes a budget line for capacity building to include training.

Process for reviewing plans

The Coordinator and Conservation Officers shall be responsible for ensuring that biophysical and process-based monitoring occurs and that data is incorporated into annual reports. Based on

yearly data, the Coordinator will draft annual work plans and reports and forward these to the Board for review. If the annual work plans require changes the Management Plan, the Coordinator shall develop a report detailing the changes and the rationale for the changes and forward this to the Board.

Once the Board has agreed to the yearly reports, work plans, and/or changes to the Management Plan, the changes will be forwarded to the Governor for review. Once the Governor has approved the changes to the Management Plan, it shall be adopted by signatures of the Board and the Governor.

At the five-year expiration of the Plan, the Board shall develop a new Management Plan and seek approval from the Governor, Legislature, and Traditional Leaders, per ASPL 09-07. The Governor may hold a public hearing to receive public feedback on the revisions.

Conflict resolution
In the case of conflicts between any parties in this Plan, the Board shall first approach the Traditional Leaders for advice on conflict resolution. If necessary, the Board may initiate facilitated meetings (with advice and facilitation provided by technical partners such as TNC or PCS) to assist with conflict resolution.

Additional Information

Definition of Community
For the purposes of this Management Plan, the definition of community includes all residents residing in Aimeliik's five villages, and those residents in Koror and elsewhere who maintain close ties to their families and land in Aimeliik. When this Plan refers to community activities, it assumes that activities will target all five villages, or that representatives of all five villages will be included in activities. Similarly, this Plan assumes that community activities will also have the support of the Governor, Traditional Leaders, and State Legislature.

As part of development of this Management Plan, the Conservation Board considered the impacts of various stakeholders on targets and on the success of this Plan. Zones, prohibitions, objectives, and activities were developed with these stakeholder groups in mind. Appendix 5 includes a list of relevant stakeholder groups and the general approach towards including the needs and perspectives of those groups in this Plan.

PAN Membership
The Ngerderar Conservation Area was nominated to the Palau PAN because it contains superb ecological, biological, historical, and cultural sites all in one area. The area has intact and pristine forest, including old-growth forest, with a large variety of trees. The watershed has the full

expected diversity of bird species, and has a concentration of Micronesian Pigeons. The watershed has very few bare areas and is not degraded. Entire subcatchments are protected and the site serves as a back-up water source. There is constant flow year-round, even during times of drought. The watershed is also home to a number of cultural sites and legends, and historical relics from World War II.

The Conservation Area and Climate Change

One of the strengths of the Ngerderar Watershed Conservation Area is that it is accessible and, with appropriate resourcing, management could minimize threats and thus minimize secondary pressures that exacerbate the impacts of climate change. Additionally, the Ngerderar River and its surrounding watershed are resilient even in the face of severe droughts, and continually produce water. Although currently not used as a public water source, it is maintained as a possible water source and as such increases community resilience to climate change. As an intact pristine forest, the watershed offers refuge for Micronesian Pigeons, which face a number of threats in addition to climate change.

Site Connectivity

The Ngerderar Watershed Conservation Area drains into the Imul Mangrove Conservation Area. Additionally, it abuts portions of the Ngerikiil Watershed in Airai. It is also part of the Middle Ridge Important Bird Area (IBA), and presumably species migrate from the protected area to other portions of the IBA.

IUCN Category

Ngerderar Watershed Conservation Area: **CATEGORY VI** *Managed Resource Protected Area*: protected area managed mainly for the sustainable use of natural ecosystems. The area contains predominantly unmodified natural forest systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of services (ecotourism) to meet community needs.

Background Information

Description of the Planning Process

A Management Plan is mandated by ASPL 09-07. This Plan utilized many existing documents, and several activities were completed as part of the development of this Plan.

In January 2010, natural resource agencies and the Aimeliik community participated in a three-day Conservation Action Planning (CAP) workshop. The workshop was led by The Nature Conservancy Micronesia Program and assisted by the Palau International Coral Reef Center, USDA Natural Resource Conservation Service, Babeldaob Watershed Alliance, Palau

Conservation Society, Bureau of Agriculture, Division of Forestry, Belau National Museum, and Sustainable Land Development/PALARIS. Twenty-one (21) residents from Aimeliik participated in the CAP, including the Governor, Traditional Chiefs, Speaker and other members of the Legislature, and other interested community members.

During the CAP, the community developed a state-wide vision:

> "We, the people of Aimeliik, want to pass on to the next generation the benefits of our abundant natural resources, vibrant economy, and respect for our heritage through promotion of sustainable development and preservation of our traditional knowledge and practices to improve our livelihood."

At the CAP, the community identified eight priority conservation targets: forests, savannas, rivers and streams, mangroves, seagrass beds, coral reefs, historical and cultural sites, and kmai. The community also developed objectives targeted at increasing fish populations and decreasing sedimentation. Many of the strategies proposed in the CAP document are included in this Management Plan, such as: strengthening bul and enforcement, clearing of waterways, regulation of land use, and increasing awareness of conservation and relevant laws.

In June 2010 the Governor of Aimeliik enabled the Ngerderar Watershed Conservation Board (established by ASPL 09-07), with nine members. Members were selected to represent the Office of the Governor, Traditional Council of Chiefs, Public Lands Authority, Aimeliik Legislature, and general Community. The Conservation Board began working with the Palau Conservation Society in July 2010 to draft this Management Plan. Through regular meetings (2-3 per month), one field visit, and community-based research conducted by Planning Team Members, the Conservation Board identified the content for this Plan. The Palau Conservation Society then put content from the Conservation Board together with other existing information to draft the final Plan. The Conservation Board approved the final draft of the Management Plan in April 2011, after which it was sent to the Governor and Speaker for approval.

Members of the Conservation Board:

- McVey Kazuyuki, Chair
- Legislator Lucio Obakerbau, Vice Chair
- Pauline Reklai, Secretary
- Besechel Kiuluul
- Joshua Ngiraklang
- Laiter Dolmers
- Melphy Blesam
- Olu Williams
- Prudence Techur

Facilitator and PCS representatives: Anuradha Gupta and Joyce Beouch

This Plan is in line with the CAP document produced by the wider community, and includes relevant targets and threats. This Management Plan focuses exclusively on management of the Conservation Area, and not on broader ecosystems or processes in the State. Thus, this Plan does not include every objective contained in the CAP document (e.g. the CAP document developed a fisheries-related objective; however, this objective was not relevant to Aimeliik's terrestrial conservation area). This decision was made for two reasons: 1) a desire to focus the management plan on discrete areas that could be realistically managed to ensure effective conservation of their resources, and 2) to meet the requirements of the PAN, which is a network of conservation areas with discrete boundaries.

Conservation Targets

Conservation targets include those species or features in the conservation areas that the Aimeliik community and Conservation Board wanted to conserve. Targets were identified through a brainstorming event and by consulting available documents such as the CAP document.

Targets were prioritized based on consensus by the Conservation Board. Priority Targets are listed below.

Priority Targets

Priority	Target
1	River (water)
2	Trees
2	Historical and Cultural Sites
3	Birds
3	River animals

Targets Ranked #1 in importance – Water was selected by the Conservation Board as the top priority target (because of the importance of natural water bodies to drinking water, downstream taro patches, and nearshore marine environments). The Vision for the Conservation Area prioritizes water, as does ASPL 09-07. This Plan's emphasis on regulations to control land uses, strict restrictions on access and entry, and kinrohoshi to clean waterways all address this priority target.

Targets Ranked #2 in Importance – Trees and Historical/Cultural Sites were selected by the Conservation Board as second priority targets. Trees were prioritized because of their role in providing habitat and food for birds and in filtering water, and because of current threats from illegal tree harvesting. Historical and cultural sites were prioritized because of their cultural significance and because of their potential to generate income as a tourist site and thus provide for further management. This Plan's emphasis on fines to control illegal logging and research, restoration, and tourism of cultural sites and historical sites all address these priority targets.

Targets Ranked #3 in Importance – Birds and River Animals were selected as a third priority target by the Conservation Board based on their importance to culture, tourism, and biodiversity and because of current threats from illegal hunting. This Plan's emphasis on improved enforcement addresses these targets.

All Targets

Rivers and streams

- Water
- Animals (Fish, Snakes, Crocodiles)

Trees

- Blacheos
- Uduid
- Kelecharm
- Bkau
- Elebioch
- Tonget
- Food produced by trees

Birds and Bats

- Belochel
- Biib
- Tutau
- Doldol
- Kuiud
- Rooster
- Laib
- Bekai
- Fruit Bats

Savannas

Cultural and Historical Sites

Threats to Targets

In this Management Plan, threats include both those immediate "target-based threats" that directly threaten the survival, health, or functionality of the conservation targets, and those "process-based threats or weaknesses" that would undermine the ability to implement effective management. Target-based threats were identified first through a brainstorming event and by consulting available documents such as the CAP document. Process-based threats and weaknesses were identified through a brainstorming event that utilized the Strengths-Weaknesses-Opportunities-Threats (SWOT) model. Process-based threats include both internal

weaknesses and external threats or risks, all of which may hinder the effective management and conservation of targets.

All threats (target-based and process-based) were considered for prioritization, either because of direct impacts on conservation targets or because of indirect impacts that could hinder management. Threats were prioritized based on simple voting whereby Conservation Board members selected their top five threats. Those threats with a higher priority level were selected by more Conservation Board members. The Conservation Board was advised to consider the *scope* of the threat (how widespread the threat is in terms of number of targets or population of targets affected), *severity* of the threat (how much damage it could cause to the survival, health, or functionality of targets), and *irreversibility* of the threat (how easily/realistically the negative effects of the threat could be stopped or reversed).

Priority Threats

Rank	Threat
1	Fire
1	Pollution and Sedimentation
2	Drought/ Climate Change / Less Water
3	Development
4	Illegal hunting (/Overhunting)
5	Road construction (road connecting Aimeliik to Airai)
6	Illegal Logging
6	Fertilizers
6	Invasive vines

Threats Ranked #1 in Importance –Fire, pollution, and sediment were selected as top priority threats because of their impact on the priority target of water. Impacts of fire in particular are nearly irreversible, possibly severe, and could impact the entire site. Increased education, enhanced surveillance and enforcement, and strict regulations, as proposed in this Plan, are designed to prevent fires, pollution, and sedimentation in the Conservation Area.

Threats Ranked #2 in Importance – Drought, possibly caused by climate change, was selected as a second priority threat because of its possible impact on reducing water quality and quantity, the priority target and in reducing food availability for birds. Drought, and climate change, has a high scope (applicable to all parts of the conservation area), high severity (applicable to all priority targets), and unpredictable irreversibility. Activities to protect the water source and forest in its pristine state, as proposed in this Plan, are designed to counteract the possibility of drought.

Threats Ranked #3 in Importance – Development, both legal and illegal, was ranked as a priority threat because of its high irreversibility and impacts on water. Development is seen as a threat both in the Conservation Area, from development of tourism-related facilities, and outside the Conservation Area, particularly in the excluded zone that drains into the Ngerderar River. Increased education and strict regulations, as proposed in this Plan, are designed to prevent the negative consequences of development inside and outside the Conservation Area.

Threats Ranked #4 in Importance – Illegal hunting (as this plan prohibits all hunting in the Conservation Area) is a threat because of its high irreversibility and because target species (pigeons, bats) are being illegally hunted currently. Increased education and enhanced surveillance and enforcement, as proposed in this Plan, are designed to prevent and punish illegal hunting.

Threats Ranked #5 in Importance – The long-term possibility that the old Japanese road from Aimeliik to Airai may be developed and paved is seen as a threat because it could lead to increased sedimentation, pollution, development, and illegal hunting. Increased education, as proposed in this Plan, is designed to build appreciation and support for the Conservation Area.

Threats Ranked #6 in Importance – Illegal logging, runoff from fertilizers, and invasive vines are all priority threats.

1) Illegal logging currently occurs and directly affects target trees, in addition to introducing sediment to the water source. Increased education, enhanced surveillance and enforcement are designed to prevent and punish illegal logging.
2) Runoff from fertilizers, particularly in the excluded zone draining into the Ngerderar River, is seen as a possible threat in the future. Strict regulations, including a ban on commercial farming, is designed to prevent introduction of fertilizers into the Conservation Area.
3) Invasive vines are a current problem in the Conservation Area. Annual cleanups are designed to remove invasive vines.

All target-based threats

Impacting trees and the food they produce

- Fire
- Logging
- Invasive vines
- Typhoons
- Clearing
- Drought

Impacting birds, bats, and river animals (fish, snakes, and crocodiles)

- Illegal hunting/Overhunting (including use of modern technologies)

- Visitor impacts (overvisiting)
- Fire
- Invasive species (monkeys, chelub, feral cats)

Impacting water quality and quantity

- Sedimentation (from development, logging, and pigs)
- Fertilizers and pollution
- Unexploded ordinances leaking (UXOs)
- Climate change/drought
- Development

Impacting savannas

- Fire
- Clearing (for farming)
- Erosion
- Road construction (e.g. Aimeliik to Airai Road)

All process-based threats

Internal weaknesses

- Some residents who don't accept Conservation, Conservation Area, or its boundaries
- Residents who are more concerned about money than conservation
- No regulations in place to conservation area (e.g. enforcement)
- Not enough personnel

External Risks and Threats

- Climate change
- Possibility of in adequate funds (e.g. from PAN)
- Possibility that full support (e.g. technical) is not available
- Development
- Hunters (from outside Aimeliik)
- Arsonists (from outside Aimeliik)

Opportunities and strengths that make management viable

Although there are a number of target-based and process-based threats, there are also a number of internal strengths and external opportunities that make management viable. This Management Plan capitalizes on many of these.

Internal Strengths

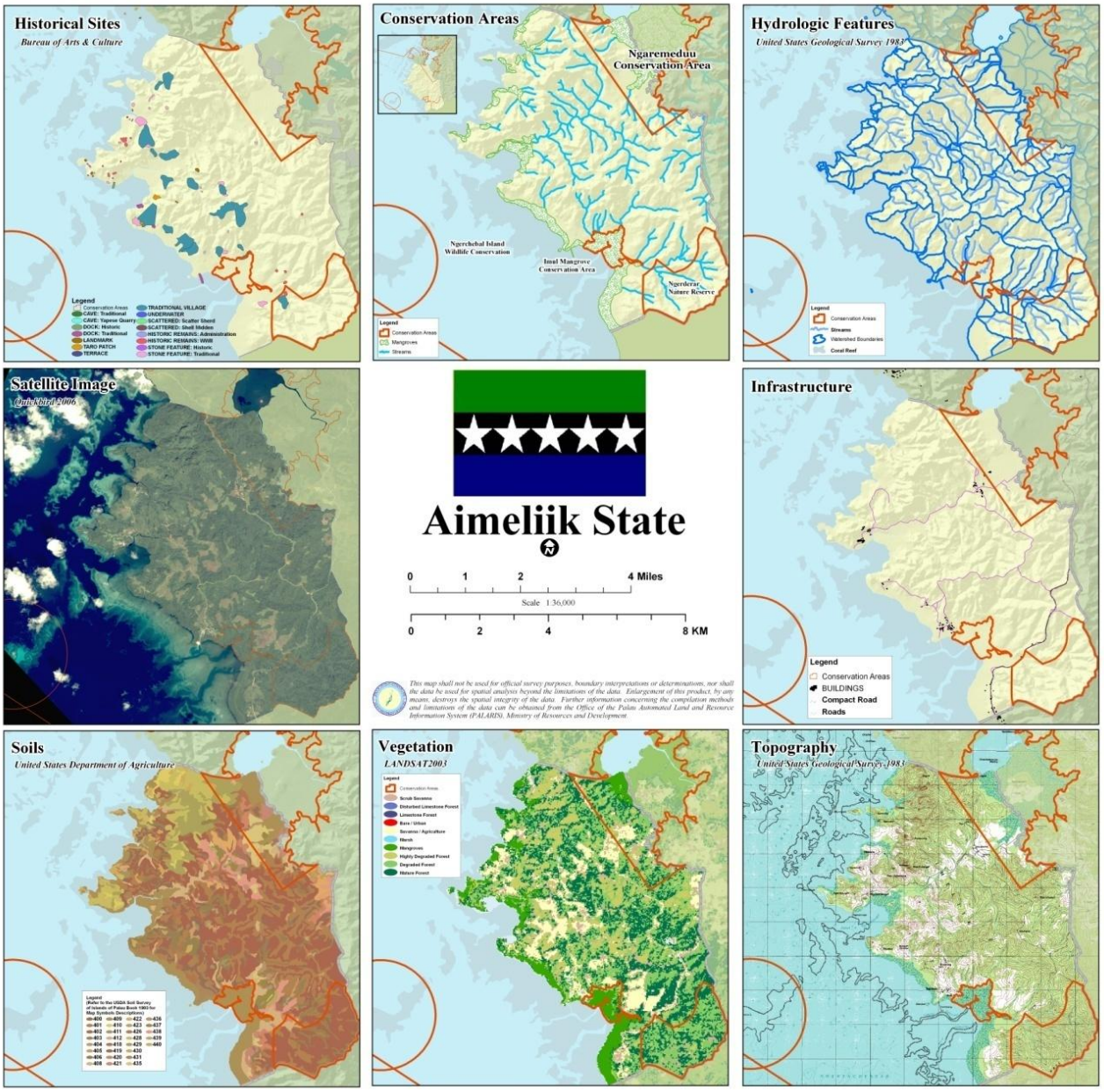
- Governor and Legislature work together closely and will support Conservation Area with relevant legislation
- People want to conserve – evident with the existing Conservation Areas (covering forest, water, and ocean)
- Community has similar beliefs

- Large younger generation that is active and participates in community events and youth program
- Healthy ecosystem
- No current problems with sedimentation
- Traditional system for enforcing laws is still strong

External Opportunities

- PAN and Grant funds currently available.
- Technical assistance is available (PCS, TNC, Arts & Culture, EQPB, Forestry, USDA, Agriculture, Belau National Museum, PVA, Fish & Wildlife).
- Existing and accessible technical knowledge (e.g. links to web developers, etc.)

Socioeconomic, cultural, and biophysical information



Location, Size, and Ownership

The Republic of Palau comprises a curved archipelago of approximately 350 islands lying between 4 and 8 degrees North latitude and between 131 and 135 degrees East longitude, at the western edge of the Caroline Islands, in a cultural region known as Micronesia.

The high island of Babeldoab covers 334 square kilometers (82,000) acres, accounting for over

80% of Palau's landmass. Aimeliik State is located in the southwest portion of Babeldaob on the east coast. Aimeliik State covers approximately 37.14 square kilometers (PALARIS, 2011). Aimeliik has five discrete villages: Imul, Ngerkeai, Chelechui, Ngchemiangel, Medorm. In 2005, the population of Aimeliik was 270 people in 78 households.

The Ngerderar Watershed Conservation Area (Center, 7°24'38"N, 134°31'35"E) is a terrestrial conservation area in the southeast part of the state. The conservation area includes the Ngerderar River east of the Compact Road and much of the watershed surrounding it (Figure 1). The upper boundary of the watershed is the natural ridge, which is also the location of an old Japanese road that connects Aimeliik to Airai and serves as the state border. The northwest and southwest boundaries are determined by a 2000-foot setback from the Compact Road. The Compact Road forms the boundary where the Ngerderar River exits the Conservation Area. The specific boundaries of the Conservation Area (GPS points) are listed in a proposed amendment to NSPL 09-07. The conservation area is located exclusively on state-owned land. The excluded zone (2000-foot area adjacent to the Compact Road) has state-authorized leases. The area comprises 3.8 square kilometers.

Figure 1. Ngerderar Watershed Conservation Area (area on right), with Compact Road and buildings. Also shown in the Imul Mangrove Conservation Area. Modified from PALARIS map.

Current Land Uses and Land Cover

The Conservation Area is covered with a mixture of mature primary forest and secondary forest, with a few small patches of savanna (Figure 2). In the past areas surrounding the lower reaches of the Ngerderar River were farmed or ancient village sites. There are no urban structures in the Conservation Area. A field visit to the area in mid-2010 confirmed that the area was covered with forest with only a few small savannas present. There were no bare areas visible in mid-2010. Savannas are generally on ridge tops and offer excellent views of the area.

Illegal hunting of Micronesian Pigeons (Belochel) occurs in the Conservation Area. According to informal surveys conducted by the Planning Team, one hunter called the area a "very popular hunting area." There are old and newer hunting trails visible from the Compact Road and the old Japanese Road. **Enhanced surveillance and enforcement actions are included to ensure that land uses are consistent with the objectives of this Plan.**

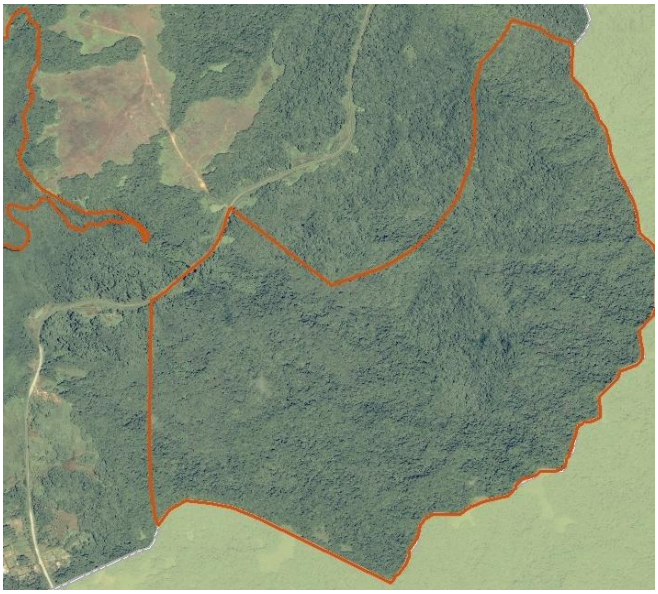


Figure 2a. Satellite image of the Ngerderar Watershed Conservation Area (2006). Modified from PALARIS map.

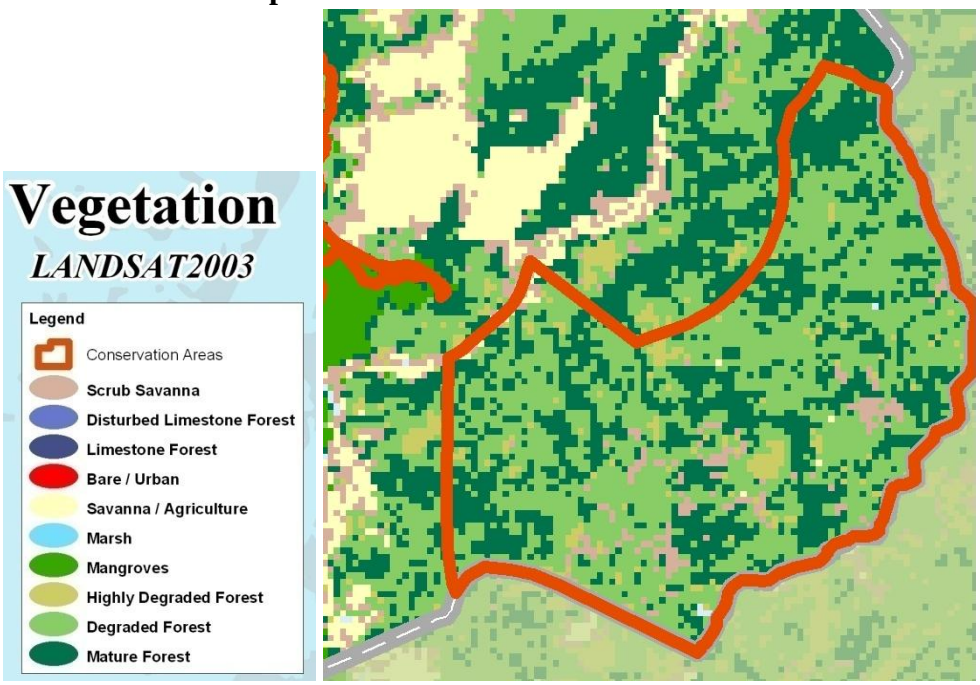


Figure 2b. Vegetation and land cover in the Ngerderar Watershed Conservation Area, 2003. Modified from PALARIS map.

Cultural and Historical Information

The Ngerderar Conservation Area is important to Aimeliik residents for cultural and socioeconomic reasons. According to research by the Planning Team, there are no registered cultural sites in the Conservation Area, but some are known from the Area, including a village platform and World War II remains (Figure 3). According to research by Planning Team members, areas in the the Conservation Area have at least two traditional names: Ngedelai and Ngerderar. The presence of traditional names indicates that the area has cultural significance, but the stories associated with the names are currently unknown and will require more research to uncover. There are also areas with World War II remains that may contain Unexploded Ordinances (UXOs). **This Plan includes several actions to research and register the Area's cultural and historical sites and to survey and remove UXOs.**

Figure 3. Cultural and Historical Sites in the Ngerderar Watershed Conservation Area. Modified from PALARIS map.

Biological and Ecological Information

For a group of Pacific Islands, Palau has remarkably biodiverse terrestrial environments. This is because of Palau's proximity to Southeast Asia and the age of the land, geologically the oldest in the Micronesian group.

Climate

Palau has a wet tropical climate, with little seasonal variation in temperature. The mean daily temperature throughout the year averages about 80º F (27ºC) with a daily range of about 10º F (7º C). Rainfall averages about 144 inches (370 cm) per year (US Army, 1956).

Geology and Soil

Babeldaob is a high island that originated in an underwater volcanic eruption. It was uplifted from the sea due to movement of the continental plates and is still gradually moving upwards. Babeldoab is underlain by basalt rock.

The most common soils in the Ngerderar Conservation Area are upland soils, which are made from highly weathered volcanic material (Figure 4). They are very easily eroded and when washed into the water, remain suspended, making the water cloudy. Thin organic soils in the 401 to 403 series (Aimeliik-Palau complex; 12-30; 30-50; and to 50-75% slopes) cover the watershed (USDA SCS, 1991). These soils are very deep and well drained, but when vegetation is removed in higher slope areas runoff is very rapid and hazard of water erosion is very high. Bare areas can be revegetated to reduce erosion. Areas under forest are more fertile than those under savanna. The soils are moderately suited to subsistence agricultural forest crop production. On higher slopes the soil is poorly suited for homesite development. Any development requires structures to divert runoff.

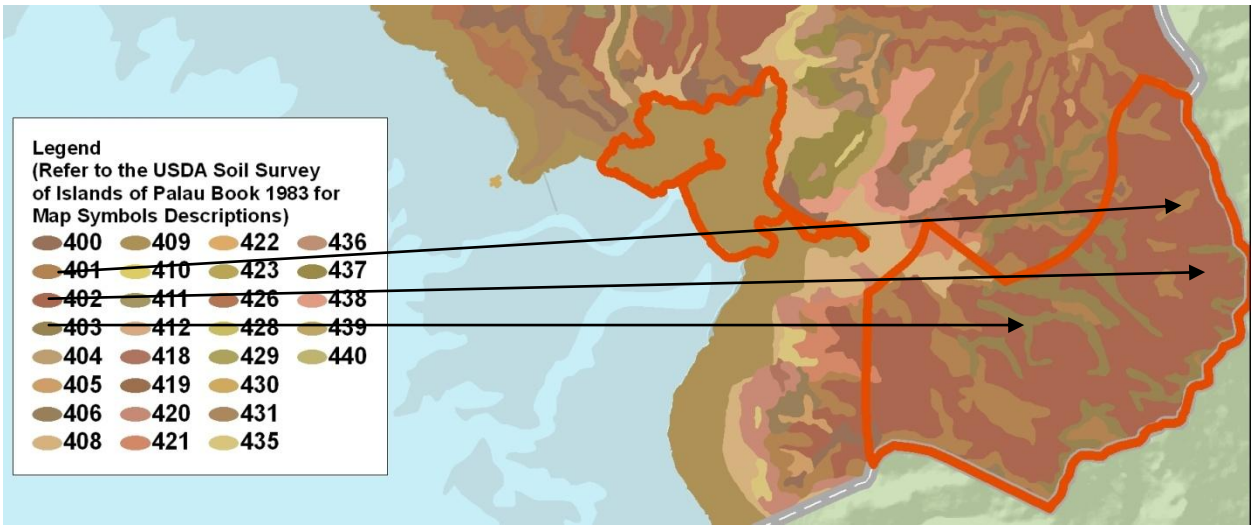


Figure 4. Soils in the Ngerderar Watershed Conservation Area. Modified from PALARIS map.

Water Resources

Three main tributaries drain into the Ngerderar River where it exits the Conservation Area (Figure 5a). The northwestern tributary draining into the Ngerderar River is not included in the Conservation Area (Figure 5b). According to research by Planning Team members, some state-authorized leases have been given to private users, although the 2010 field visit indicated that there were no current land uses in the excluded zone draining into the Conservation Area (Figure 2a). Some portions in the southwest corner of the Conservation Area drain directly to the ocean.

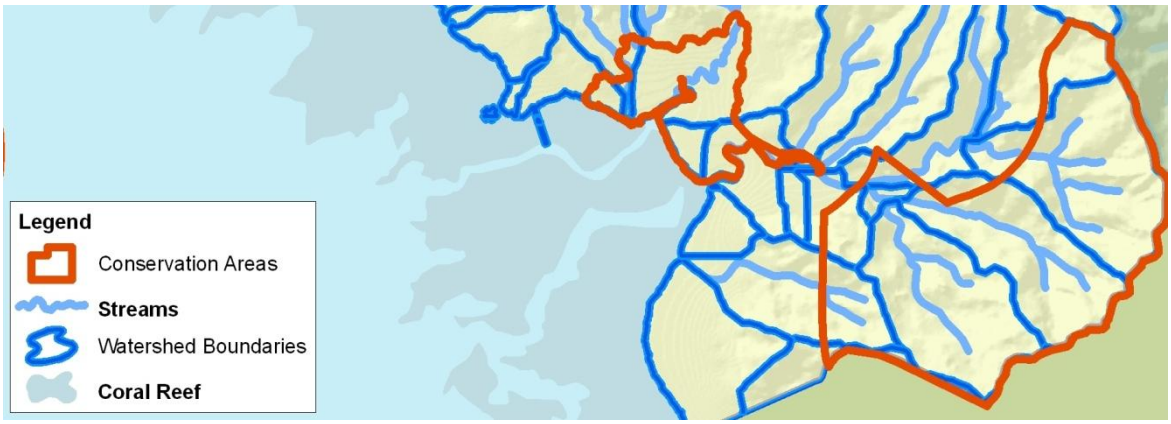


Figure 5a. Watershed boundaries, streams, and tributaries in the Ngerderar Watershed Conservation Area. Modified from PALARIS map.

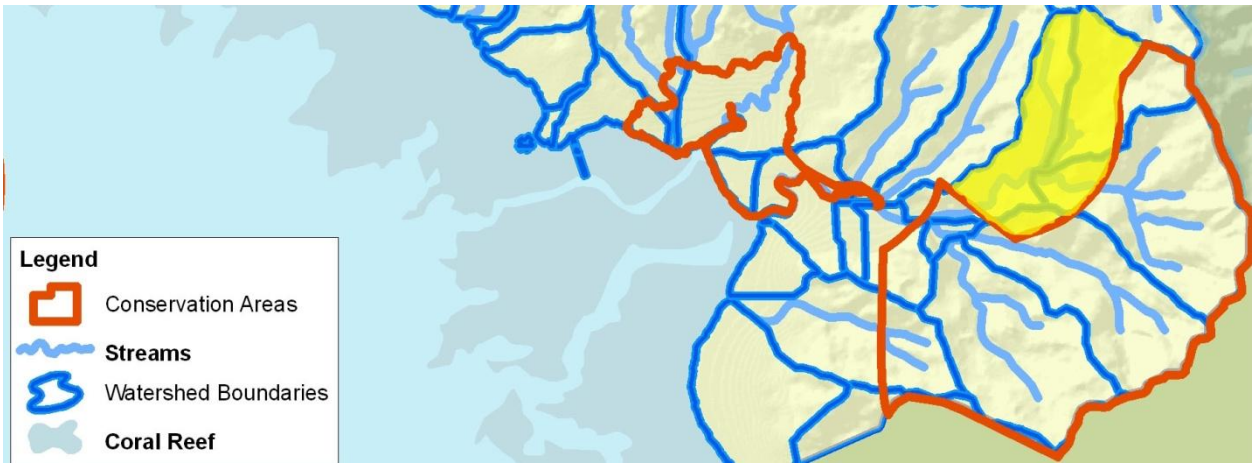


Figure 5b. Area shown in yellow drains into the Ngerderar River and is excluded from the Ngerderar Watershed Conservation Area. Modified from PALARIS map.

Water quality in the Ngerderar River is unknown, but visual inspection at different times during 2010 showed that water was clear and there was little sediment on the river bottom or banks.

In 2008 Aimeliik State became the fourth member of the Belau Watershed Alliance (BWA; formerly the Babeldaob Watershed Alliance). The BWA Mission is to protect, restore, and conserve water resources in Palau.

Vegetation

Upland forests in Palau are considered the most species-diverse in Micronesia (Stemmermann, 1981) and have the highest rate of endemism (Costion and Kitalong 2006). Forests on ridges have a higher species diversity with *Parinari corymbosa* often dominant, whereas forests on slopes and in valleys are less diverse and dominant with *Campnosperma brewvipetiolata* and *Pinanga insignis.* Costion and Kitalong (2006) divides upland forest into four categories: Upland, Lowland, Riparian, and Basaltic outcrop forests. Upland, lowland, and riparian forests

are found in the Conservation Area. Palau has approximately 200-250 endemic species of plants, of which approximately 40% are endemic to Babeldaob (Costion and Kitalong 2006).

In 2010 the Forestry Section of the Bureau of Agriculture, PCS, Aimeliik State Government, and USDA Forest Service conducted an intensive forest inventory of the Ngerderar Watershed and lands within a 2000 foot buffer along the Compact Road. The method, which involved establishment of 100 survey plots (more than 50 in the conservation area) and followed the "Field Instructions for the Inventory of Pacific Islands 2003."

Data from the survey has not been fully analyzed, but it provides a baseline for the Conservation Area and the locations of future monitoring stations. In each plot is a listing of trees (including counts and species), a measure of their diameter at breast height (DBH, a measure of the amount of wood in the forest), and a count of saplings, seedlings, and sprouts.

Preliminary data also offers some interesting comparisons between the conservation area and the buffer area surrounding the Compact Road. For instance, the average and maximum DBH, maximum and average number of species, and maximum and average number of trees per plot was higher in the conservation area than in the buffer zone. The buffer zone had a higher maximum and average number of saplings/seedlings/sprouts per plot. The maximum number of species counted in any one plot in the conservation area was 15, with the average around 6-8 species per plot. The maximum number of trees in any plot was 44, with the average number of trees around 20-25 per plot. 40 species of tree were measured for DBH. Some of the largest trees in the conservation area are Bkau, Chemeklachel, Kelecharm, Las, and Mahogany.

According to the State Wide Assessment of Forest Resources (Kitalong, 2010), the endemic tree *Terminalia crassipes* is only found along the Tabecheding, Ngerderar, Ngerdorch, and Ngerikiil Rivers.

Mammals

Palau has two native mammals, both bats. The Palau Fruit Bat (*Pteropus pelewensis*; Olik) is endemic to Palau. Polynesian Sheath-Tailed Bats (*Emballonura* semicaudata; Chesisualik) reside in caves. Fruit bats were surveyed in the Conservation Area in 1991 and 2005. Both Fruit Bats and Sheath-tailed bats were observed in 2005. In April 1991, 17 Fruit Bats were counted using or traversing the area during a 70-minute period; in May 2005, 28 Fruit Bats were counted.

Birds

162 species of birds have been reported from Palau (Olsen, 2010). 51 species nest and live in Palau all year round and as many as 12 are endemic (Pratt and Etpison, 2008). There are more bird species in Palau than in the Micronesian islands to the east, due to the relative proximity of land masses and the diversity of geology and habitats in Palau (Engbring 1988; Holm et al 2008).

Five of Palau's resident birds are listed as threatened or endangered by the International Union for the Conservation of Nature (IUCN). The Micronesian Megapode (bekai) is Endangered (EN), and the Palau Grove Dove (omekrengukl), Giant White-eye (charmbedel), Micronesian Imperial Pigeon (belochel), and Nicobar Pigeon (laib) are listed as Near-Threatened (NT).

In 2010, the Belau National Museum conducted bird monitoring along the Compact Road both along and beyond the Conservation Area (Stations 2-5; Olsen, 2010). Findings from this monitoring found that bird diversity near the Conservation Area was high. According to Olsen (2010), forest sites on Babeldaob typically exhibit average species richness (number of species) values of 7-9 species per site. In comparison, stations near the Conservation Area exhibited high species richness levels (9-13 species per station).

Olsen also found that the number of Palau Fruit Doves and Micronesian Pigeons were higher near the Conservation Area than elsewhere. At stations near the Conservation Area, the number of Fruit Doves ranged from 32-52. The average in Palau is 10-20 Fruit Doves per station. The number of Micronesian Pigeons ranged from 0-18, with several stations having far more pigeons than 5, which is the reference level proposed by Olsen (2010) for a "valuable forest area."

Table 1 lists birds that were counted in the Conservation Area in 2005. In 1991 and 2005, a survey transect went along the old Japanese Road starting in Aimeliik and traveling south for 2.7 km, so birds were surveyed both inside and outside the conservation area, in Aimeliik and Airai. Birds per station were calculated for Aimeliik and for Palau as a whole. Aimeliik appears to have a higher bird-per-station number for many key species, when compared to other locations.

Table 1. Estimate of bird abundance in the Conservation Area versus other places in Palau, based on 2005 survey

		2005 Birds-Per-Station (18 stations)	
English Name	**Palauan Name**	**Aimeliik (from PCS data)**	**Palau (VanderWerf, 2007)**
Endangered			
Micronesian Pigeon	Belochel	**1.61**	1.46
Endemic			
Palau Fruit Dove	Biib	**9.83**	7.72
Cicadabird	Kiuidukall	0.11	**0.24**
Caroline Islands White Eye	Chesisebarsech	**1.56**	0.87
Dusky White Eye	Chetitalial	**6.94**	3.80
Morningbird	Tutau	**1.00**	0.65
Palau Fantail	Melimdelebteb, Chesisirech	0.11	**0.43**
Palau Flycatcher	Charmelachull	**1.06**	0.99
Palau Bush-Warbler	Wuul	**3.33**	2.07

		2005 Birds-Per-Station (18 stations)	
English Name	**Palauan Name**	**Aimeliik (from PCS data)**	**Palau (VanderWerf, 2007)**
Palau Swiftlet	Chesisekiaid	**1.33**	0.82
Rusty-capped Kingfisher (Micronesian Kingfisher)	Cherosech, Ongelimadech	**0.61**	0.14
Regionally-Restricted			
Micronesian Honeyeater	Chesisebangiau	**1.50**	0.90
Micronesian Starling	Kiuid	3.17	**3.31**
Native			
Junglefowl	Malkureomel	**0.94**	0.66

Amphibians and Reptiles

Various species of snakes and lizards must occur in the conservation area, but no comprehensive surveys of these animals have been undertaken. The snakes that have been recorded elsewhere in Babeldaob include the *nguis* (Palau tree snake, *Dendrelaphis lineolatus*), *bersoech* (Pacific Island boa) and the Brahminy blind snake (*typhlops braminus*) (TTPI 1977). Skink species that also occur include the *chemaidechedui* (emerald or green skink, *Lamprolepis smaragdina)* and the endemic pandanus skink (*Aulacoplax 48eptosome*) which can be found in the crowns of pandanus trees (TTPI 1977) in savannas.

Freshwater fish

No comprehensive surveys of freshwater fish have been conducted in the conservation areas. Studies on freshwater habitats elsewhere in Babeldaob have shown that at least 40 species of fish need freshwater to survive (Bright 1979), and there are at least two endemic freshwater fish species (Gobies, *sicyopus sp.* And *Redigobius horiae*) (Bright and June 1981). The largest fish in Palauan freshwater is the *kitlel* (freshwater eel, *Anguilla marmorata*), of which the largest recorded specimen measured 3.7 feet (1.2 meters) (Bright and June 1981).

Freshwater Invertebrates

Little information is available on the terrestrial and aquatic invertebrates (such as snails, worms, shrimp and clams). Bright (1979) gives a list of insects, water mites, crustaceans and mollusks found in Lake Ngardok in Melekeok and mentions that there are at least 18 species of shrimp and crab occur in Palauan freshwater habitats, including some endemic species.

Conclusion

The Ngerderar Watershed Conservation Area includes one of Palau's most intact and pristine watersheds. It includes healthy forests and is a hotspot for bird populations and diversity. Management of the Area is feasible, and with adequate investment, the natural and cultural heritage of the site can be conserved in perpetuity.

Appendix 1: Roles and day-to-day responsibilities of authorities and personnel

Traditional Leaders

Role: Supervisory and Advisory role: Oversight of activities in the Conservation Area to ensure cultural appropriateness; conflict resolution if necessary

Responsibilities

- Name and approve their representative to the Board
- Approve Management Plan and changes to Plan
- Declare *bul* as necessary

State Government Leadership

Governor

Role: Supervisory and Implementer role: Joint oversight for implementation of the Plan and financial management of funds for the Conservation Area

Responsibilities

- Enable Board
- Name and approve representative to the Board
- Hire and jointly supervise Conservation Area, Maintenance, and Administrative staff
- Introduce and or/initiate legislation, regulations, and resolutions, if necessary
- Enforce provisions in Plan and ASPL 09-07
- Jointly issue permits/permission
- Jointly authorize expenditures
- Maintain and manage funds
- Assist with fundraising, including annual budget requests
- Initiate, issue, and approve annual reports, annual work plans, and changes to the Management Plan
- Participate in community outreach and relevant meetings

Legislature

Role: Implementer and Supporter role: Provide enabling legal environment to implement Plan

Responsibilities

- Name and approve representative to the Board
- Pass/Adopt legislation, resolutions, and/or regulations

Aimeliik State Public Lands Authority

Role: Advisory and Supporter role: Maintain consistency between public lands and Management Plan, provide information

Responsibilities

- Participate in joint meetings about Conservation Area
- Ensure leases are in compliance with Plan
- Keep Conservation Area personnel apprised of relevant changes

State Government Staff

State Attorney

Role: Implementer and Supporter role: Ensure consistency with laws and oversee development of regulations, legislation, and permits

Responsibilities:

- Assist with legislation and regulations
- Draft and/or review regulations on fines, development, and ecotourism
- Draft and/or review permit system and liability forms

State Administrative Personnel

Role: Supporter role: Manage funds and maintain accurate records of all expenditures

Responsibilities:

- Maintain financial compliance with Plan (two signatures for approval)
- Issue purchase orders, checks, and other financial documents
- Track spending and maintain all financial files
- Report regularly to Governor and Board
- Assist with preparation of yearly financial reports, annual work plans, and annual budget requests
- Assist with outreach and education (e.g. logistics)

State Maintenance Personnel

Role: Implementer role: Assist with field-based activities

Responsibilities:

- Assist with Education (e.g. distribution, installations, labor)
- Complete and maintain trail(s)
- Participate in cleanups and field trips

Conservation Area Leadership

Board of Directors

Role: Supervisory and Implementor role: Joint oversight for implementation of the Plan, direct implementation of leadership activities, and financial management

Responsibilities

- Self-organize
- Hire Area staff and jointly supervise staff
- Identify training opportunities for staff
- Jointly issue permits/permission
- Jointly authorize expenditures
- Track and request expenditures
- Initiate, issue, and approve annual reports, annual work plans, and changes to the Plan
- Participate in community outreach and relevant meetings
- Assist with fundraising
- Develop or strengthen partnerships and relationships with other agencies
- Assist with marketing/advertising of the site

Conservation Area Staff

Coordinator

Role: Coordinator and Implementer role: Ensure that all regulations are enforced and all management actions occur according to schedule. Work closely with the Board to coordinate management activities, review the Plan, and oversee all associated staff.

Responsibilities

- Coordinate and implement activities
- Follow up with leadership on administrative actions, including development of permit system
- Coordinate development of educational materials and programs
- Supervise and coordinate printing and distribution of educational materials, signs, etc.
- Coordinate and participate in community meetings, cleanups, restorations, etc.
- Draft additional necessary plans and forward to Board for review
- Jointly develop daily surveillance plans
- Hear daily reports from Conservation Officers on enforcement issues
- Supervise and coordinate monitoring activities and baseline studies
- Collect and analyze monitoring data and suggest changes to Management Plan as necessary
- Develop annual work plans and budgets
- Initiate expenditure requests based on activities

Conservation Officer

Role: Enforcer and Implementer role: Monitor compliance with prohibited and allowable activities and enforce non-compliance, participate in monitoring, educational, restoration, and other field-based activities.

Responsibilities

- Participate in daily enforcement and compliance monitoring, check permits
- Follow legal procedures for reporting and stopping prohibited activities (according to daily surveillance and enforcement plan)
- File incident reports and keep daily logs
- Participate in research and scientific monitoring
- Participate in visits/tours and briefings on allowable activities (including large groups, school groups)
- Ensure visitor safety
- Participate in training opportunities
- Assist with field-based actitivites (cleanups, placement of signs, invasive species removal, etc.)

Community and Partners
Aimeliik Community ***Role***: Supporter and Implementer role: Comply with the Plan and participate in kinrohoshi • Refrain from prohibited activities • Participate in community outreach • Participate in field-based activities (cleanups) • Capitalize on tourism opportunities
Technical Partners ***Role***: Supporter and Implementer role: Participate in implementation and capacity building • Assist with monitoring • Assist with capacity building • Assist with implementation

Appendix 2. Threat-Cause-Solution Table

This table was developed during the brainstorming phase of planning. Not all solutions were endorsed or included in the Final Plan. This table is included to indicate the rationale for many of the objectives and actions, and to assist with future planning.

Threat	Cause of Threat	Possible Solution
Fire	People clearing land for farming • Lazy/fast • Know, but care about other things more • Don't know impacts Enjoyment • Don't know impacts • Get rid of bees or snakes Accidental • Hunters smoking, clearing savanna • Lightening	• Law to prosecute • Restrictions for driving • Education (media/billboards) • Agriculture announcements • Provide alternatives (bees) • Get people to help (people afraid of snakes) • Stop people from coming into Conservation Area • Signs/prohibiting • Rangers • Collect lighters
Logging	Clearing entire area for one tree • Portable saw (chainsaw), easy to get • For safety • Easier to get out Use for firewood • Prefer wood, cheaper/free Summer houses • Permits allow to take as much as they want	• Signs about impact • Fines • Prohibit chainsaws • Law to stop firewood collection • Education about ecosystem • Change permits to be more specific with fees • Rangers • Monitoring
Clearing	For farming To build houses For trails For parks	• Close Conservation Area • Education about closure • Get expertise, money, and time for good trails • Rangers (monitoring) • Use of media and education
Hunting / Overhunting (birds and bats) Killing crocodiles (same solutions)	For money • Laws not strict • Lots of demand from lawmakers/officials • No other income sources • Easy to get them outside Modern technology To feed families	• Punishments in site • Stiff fines • Stiff traditional laws • Prohibit airguns/pellets • Education for whole community • 7 Rangers/ Increased enforcement • Training for conservation officers • Clearly marking boundary
Invasive vines	Naturally occurring in openings Transported in materials and equipment	• Kinrohoshi • Paid services to cut down • Get technical assistance from BOA
Invasive animals	People purposefully put animals Already there	• Rangers (stop new introductions) • Education • Rangers hunt/Deputize Rangers • Public safety/state authorized hunts • Monitoring

Appendix 3. Evaluation Criteria

Goal / Objective	Milestone	Milestone Year	Indicator(s) of success
Goal 1. By 2020, youth and adults have been educated about the Ngerderar Watershed Conservation Area, so that they understand its historical and cultural significance, and the current and potential benefits of its natural ecosystems.			1) Increasing buy-in and support among stakeholders between 2011 and 2016, with at least 75% supporting. 2) Increasing levels of stakeholders participating in activities and education programs.
Objective 1-1. By December 2016, 75% of people from Aimeliik and neighboring states know about the number of streams, kinds of trees, and types of animals in the conservation area.	Baseline established	Year 2	75% of people in socioeconomic survey answer affirmatively to 2016 survey
Objective 1-2. By December 2016, 80% of students in the 6th to 8th grade at Aimeliik Elementary School are aware of the cultural significance and potential benefits of the Ngerderrar Watershed Conservation Area.	Baseline established	Year 2	80% of students in 2016 follow-up survey answer affirmatively; Number of students reached equals 80% of middle school population
Objective 1-3. By December 2016, 75% of adults in Aimeliik's population know the boundary of the conservation area and the location and significance of historical sites.	Baseline established	Year 2	75% of people in socioeconomic survey answer affirmatively to 2016 survey
Goal 2. By 2020, tourists visit the Ngerderar Watershed Conservation Area, contribute to the Aimeliik economy, and sustain the management of the site.			1) Number of visitors increases. 2) Amount of income increases. 3) Revenue supports management.
Objective 2-1.By December 2016, a hiking trail, botanical garden, and kayaking tour are in place.			Hiking trail, kayak tour, botanical garden in place
Objective 2-2.By December 2016, the amount of revenue generated by the Conservation Area has increased every year.	At least some revenues generated	Year 2	Revenue increases every year
Objective 2-3. By December 2016, tours to the Ngerderrar Conservation Area are part of a package of all sites in Aimeliik, with a single fee.			Single fee established and collected
Goal 3. By 2020, the people of Aimeliik and its neighbors know about and care for the value of Ngerderar water resources, and have enough clean water for sustainable use.			1) Water quality is at acceptable levels, with no declines. 2) Water flow remains correlated to rainfall (no unexpected anthropogenic declines).
Objective 3-1. By December 2016, the amount of sediment in the river is decreased by 25% or to the natural level.	Baseline established	Year 2	Turbidity decreases or stays at naturally low levels
Objective 3-2. By December 2016, development and tourist activities in or near the Conservation Area do not change the flow or amount of water flowing into the river and do not introduce any new sediment, chemicals, pollution, or other impurities into the Conservation Area, and any tourist development in the conservation area (trail, hut, markets, etc.) will be built using local materials and without using heavy equipment.	Baseline established	Year 2	Water flow consistent (no declines not associated with rainfall); no decline in water quality; development uses local materials and methods

Goal / Objective	Milestone	Milestone Year	Indicator(s) of success
Goal 4. By 2020, cultural sites are maintained and restored, so as to add value to the site.			1) Number of successful restoration activities.
Objective 4-1. By December 2016, a system for maintaining and restoring historical and cultural sites will be in place and at least one site is being restored.			One site being restored
Objective 4-2. By December 2016, sites are registered on the National Registry			Sites registered
Goal 5. By 2020, natural resources are kept in a good and natural state. Current and potential threats have been minimized through improved law enforcement and traditional law (bul).			1) Decrease in hunting. 2) Decrease in area affected by invasive species. 3) Populations of birds and bats steady or increasing. 4) Native bird diversity maintained. 5) Forest indicators healthy. 6) Decrease in enforcement actions. 7) Decrease in logging. 8) Extent and square area of forest remains at baseline levels.
Objective 5-1. By December 2016 there will be no fires in the Conservation Area, and regulations and penalties for arsonists will be in place	Regulations and daily logs in place	Year 2	No reports of fires in daily logs
Objective 5-2. By December 2016 there will be no hunting (with particular emphasis on pigeons, bats, and chickens) in the conservation area	Enforcement and surveillance increased	Year 1	No reports of illegal hunting, no records of perpetrators, biological monitoring shows no decline in birds and bats; socioeconomic survey indicates no hunting
Objective 5-3. By December 2016 there will be no logging in the conservation area			No reports of illegal logging, no records of perpetrators, biological monitoring does not encounter evidence of logging; socioeconomic survey indicates no logging
Objective 5-4. By December 2016 the amount of land in the Conservation Area negatively impacted by invasive species will be reduced annually or near zero.	Baseline established	Year 2	Square area affected by invasive species declines

Appendix 4. Monitoring Plan

Target	Indicator	Lead Party	Methodology	Frequency
Goal 1. By 2020, youth and adults have been educated about the Ngerderar Watershed Conservation Area, so that they understand its historical and cultural significance, and the current and potential benefits of its natural ecosystems.				
All targets	Percent buy-in/support for Conservation Area	Year 1 - PICRC; Year 5 - Coordinator	Socioeconomic survey	Year 1 and Year 5
All targets	Percent adults knowledgeable about streams, trees, animals, boundary, historical sites	Year 1 - PICRC; Year 5 - Coordinator	Socioeconomic survey	Year 1 and Year 5
All targets	Percent middle school students knowledgeable about cultural sites and benefits of conservation	Coordinator; PCS	Pre- and post-survey in schools	Year 1 and Year 5
All targets	Number of stakeholder groups participating	Coordinator	Tally of stakeholders participating in events	Monthly
All targets	Number of community members participating	Coordinator	Tally of stakeholders participating in events	Monthly
All targets	Number of students participating	Coordinator	Tally of stakeholders participating in events	Monthly
Goal 2. By 2020, tourists visit the Ngerderar Watershed Conservation Area, contribute to the Aimeliik economy, and sustain the management of the site.				
All targets	Number of visitors	Coordinator/Tour guides/Conservation Area	Basic count of visitors	Monthly
All targets	Amount of income generated from site	State administrative personnel	Tally of income	Monthly
All targets	Percent of income returned to management of site	State administrative personnel	Tally of income versus spending	Yearly
All targets	Hiking trail, kayak tour, botanical garden in place	Coordinator	Visual census	Yearly
Goal 3. By 2020, the people of Aimeliik and its neighbors know about and care for the value of Ngerderar water resources, and have enough clean water for sustainable use.				
River (water)	Water quality- turbidity	PICRC	WiSci	Annual, plus at least once per year after an extreme rain event
River (water)	Water flow - cubic ft/sec	PICRC	WiSci	Annual, plus at least once per year after an extreme rain event
River (water)	Development uses local materials	Coordinator	Visual census	Yearly
Goal 4. By 2020, cultural sites are maintained and restored, so as to add value to the site.				

Target	Indicator	Lead Party	Methodology	Frequency
Historical and cultural sites	Number of restoration activities	Coordinator	Tally	Yearly
Historical and cultural sites	Number of sites restored	Coordinator	Tally	Yearly
Historical and cultural sites	Number of sites registered	Coordinator/Arts & Culture	Tally	Yearly
Goal 5. By 2020, natural resources are kept in a good and natural state. Current and potential threats have been minimized through improved law enforcement and traditional law (bul).				
All targets	Number of enforcement actions	Coordinator/State Administrative Staff	Count of daily logs and records	Monthly
All targets	Number of fires	Coordinator / Conservation Officers	Visual tally	Monthly
All targets	Number of permits	Coordinator / State administrative staff	Count of records	Monthly
All targets	Percent buy-in/support for regulations	Year 1 - PICRC; Year 5 - Coordinator	Socioeconomic survey	Year 1 and Year 5
Birds	Population of birds	BNM	National Bird Monitoring method	Monthly
Birds	Number of species	BNM	National Bird Monitoring Method	Monthly
Birds	Percent of people answering affirmatively to questions about hunting	Year 1 - PICRC; Year 5 - Coordinator	Socioeconomic survey	Year 1 and Year 5
Fruit Bats	Population of fruit bats	BNM	National Bird Monitoring method	Annual
Trees	Tree diversity	Forestry	Plot method	Year 1 and Year 5
Trees	Presence/absence of seedlings	Forestry	Plot method	Year 1 and Year 5
Trees	Percent of people answering affirmatively to questions about logging	Year 1 - PICRC; Year 5 - Coordinator	Socioeconomic survey	Year 1 and Year 5
Trees	Area affected by invasive vines	Coordinator	Tally of area treated during invasive species activities	Yearly
Trees	Extent and square area of forest	PALARIS/Coordinator	Digital map estimated with input from visual census	Annual

Appendix 5. Stakeholder Analysis

During development of this Plan, the Conservation Board identified a number of stakeholder groups who would have some influence over the success of this Plan. This table discusses the general approach for addressing stakeholder perspectives and influences.

Stakeholder Group	General Approach and notes
Governor, Legislature, and Public Lands Authority	• Governor, Legislature, and Public Lands Authority are represented on Board • Governor and State legislature are included as active participants
Traditional Chiefs	• Chiefs are represented on Board • Chiefs are included as active participants for enforcement and conflict resolution
Rangers	• Conservation Officers included in Plan, with clear duties • Capacity building plan for Conservation Officers included
Hunters and Loggers	• Education on purpose of No-take rules • Expanded surveillance and enforcement • Economic opportunities through tourism
Community	• Five villages represented on Board • Community outreach in each village plus field trips • Development of market and tourism opportunities • Kinrohoshi
Tourists / Tour companies / Hikers	• Development of a trail, kayak tour, and botanical garden • Advertising and increased information about the site • Development of permit and fee system
Developers	• Ecotourism allowed in one zones • Development of clear regulations and permit system • Clear restrictions and building codes
Technical Agencies	• Involvement in Plan, including implementation and monitoring • Technical review of draft Plan
Fire Station / UXO Partners	• Board and Governor will build a relationship with these partners

Appendix 6. Legislative recommendations (non-binding)

1. Governor and Legislature amend ASPL 09-07 to include and authorize the Board as proposed here. In particular, Section 6, Duties of the Board, may be amended to include the sections from this Plan under "Management Authority" with the headings "Duties of the Board" and "Duties of the Governor".
2. Governor and Legislature amend ASPL 09-07 to include final boundary
    a. This Plan recommends consideration of two possible boundary options, including
        i. The map on Page 1, based on coordinates in the draft amendments to ASPL 09-07, with subsequent regulations and restrictions on activities in the 2000-foot excluded zone in the north; or
        ii. The inclusion of the entire watershed (Figure 5b), possibly as a swap for those areas that drain away from the Ngerderar River
3. Governor and Legislature pass legislation or resolutions to adopt and authorize Management Plan
4. If necessary, in Year 2 and 3, Governor and Legislature pass legislation to restrict development in the excluded zone to low-impact residential development only, with restrictions on runoff, pollution, etc.
5. If necessary, in Years 2 and 3, Governor and Legislature pass legislation or otherwise authorize other permits, fees, and fines (for prohibited and restricted activities, for ecotourism development, permits, buffer zone regulations)

Appendix 7. Recurring and one-time costs for implementation of this Plan

Activity	Category	Cost	Type
Annual work plans developed and reviewed	Contract	1,000	Recurring
Initial river cleanup held	Food	500	Recurring
Annual invasive vine removal cleanups held	Food	500	Recurring
Community meetings about Conservation Area held	Food	2,500	Recurring
Tours for adults to learn about resources in the Conservation Area	Food	300	Recurring
Tress planted in buffer zone and bare areas	Food	1,000	Recurring
Radio and other media used to highlight the site	Gasoline	100	Recurring
Water monitoring continued	Gasoline	100	Recurring
Conservation Area monitored regularly	Gasoline	3,600	Recurring
Tress planted in buffer zone and bare areas	Gasoline	500	Recurring
Educational materials developed, including a list of benefits from the Conservation Areas; Resonsible development promoted	Supplies	1,000	Recurring
Tours for adults to learn about resources in the Conservation Area	Transportation (Bus)	2,000	Recurring
Coordinator	Personnel	15,000	Recurring
Conservation Officer 2	Personnel	10,000	Recurring
Conservation Officer 1	Personnel	10,000	Recurring
Administration and Office supplies (17%)	Administration	8,177	Recurring
		56,277	**Recurring yearly costs**

Activity	Category	Cost	Type
Socioeconomic survey implemented	Contract	1,000	One-time
Capacity building for staff	Contract	2,000	One-time
Technical advice for trail and kayak tour obtained	Contract	2,000	One-time
Carrying capacity study to determine number of feasible tourists	Contract	2,000	One-time
Study conducted to determine single fee for visitation to all sites	Contract	1,000	One-time
Daily logs and paperwork established to support enforcement, including daily surveillance plans	Contract	1,000	One-time
Study conducted to determine cultural significance and record stories	Recording Equipment	1,000	One-time
Tress planted in buffer zone and bare areas	Field Equipment	1,500	One-time
Study conducted to determine cultural significance and record stories	Food	500	One-time
Research and field visits identify cultural sites, historical sites, waterfalls, etc.	Food	500	One-time
Cultural sites studied and restoration plan developed	Food	500	One-time
Baseline data collected from partners (birds, bats, water, forests)	Gasoline	200	One-time

Activity	Category	Cost	Type
Existing and new information collected to develop Natural History List	Gasoline	200	One-time
Study conducted to determine cultural significance and record stories	Gasoline	1,000	One-time
Maps of Conservation Area developed and distributed to schools	Printing	540	One-time
At least three signs posted in Conservation Area	Signs	3,000	One-time
Research and field visits identify cultural sites, historical sites, waterfalls, etc.	Transportation (Vehicle)	12,000	One-time
State Attorney	Personnel	6,000	One-time
Coordinator and Conservation Officers hired	Advertising	300	One-time
Administration and Office supplies (17%)	Administration	6,161	One-time (will vary per year)
		36,240	**First-year's one-time costs.** **One-time costs will vary per year**