Niue's Sixth National Report

Convention on Biological Diversity

August 2020

Department of Environment

GOVERNMENT OF NIUE

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Executive summary

Niue lies in the heart of the Polynesian triangle with the Samoan archipelago to the north, the Cook Islands to the east and the Kingdom of Tonga to the west, at coordinates of 19° South and 169° West. It is an independent, self-governing nation in free association with New Zealand. The total land area is 261 km^2 (26,146 ha) surrounded by 390,000 km^2 of exclusive economic zone (EEZ). Average land height above sea level is 23 metres and the highest point is just under 70 metres. Niue's population has declined since the 1970s, from a high of 4,990 (recorded in 1971) to a low of 1536 (recorded 2009). The most recent census data recorded a population of 1716 (2007 Census).

Niue's environment remains an important priority for the government and it is one of the seven pillars under the Niue ke Monuina (National Strategic Plan 2016-2026). The national strategy promotes sustainable use and management of natural resources and the environment for present and future generations. The key threats to Niue's biological diversity are cyclones and droughts, although other pressures, including solid waste and pollution, are largely kept in check due to the limited population. There are very few endemic species found in Niue but some are highly susceptible to human activities and natural disasters. The peka (flying fox), lupe (Pacific pigeon) and the uga (coconut crab) are hunted for food and as such their numbers are on the decline.

This 6th National Report of Niue to the Convention on Biological Diversity (CBD) provides an overview of activities and progress carried out to implement the national biodiversity strategy and action plan (NBSAP), and contribute to the Global Biodiversity Strategy and the Aichi Biodiversity Targets (ABT). The report follows the guidelines agreed to in Decision XIII/27 of the Conference of the Parties that was held in Cancun, Mexico.

Information on the targets being pursued at the national level

The national targets are based on the broad goals agreed and endorsed under Niue's National Biodiversity Strategy and Action Plan 2015. The goals include the protection of biological diversity, developing national frameworks, engaging with communities and strengthening traditions and customs, institutional strengthening, financial sustainability, and improving education and increasing awareness of all Niueans. Under these goals are eight themes and a number of objectives, with the overall vision of an environmentally friendly nation in which conservation and the sustainable management of biological resources support all the living community. The themes and objectives of Niue's National Biodiversity Strategy and Action Plan align closely with the global Strategic Plan for Biodiversity and the associated Aichi Biodiversity Targets, under the Convention on Biological Diversity.

Implementation measures taken, assessment of their effectiveness, and associated obstacles and scientific and technical needs to achieve national targets

The designation of the Niue Moana Mahu Marine Protected Area has been the most significant new progress made by the country. 127,000 km^2 of ocean, including the Beveridge Reef Nukutulueatama Special Management Area, is enshrined into law for the conservation of many unique migratory and resident marine species. The newly established Moana Mahu, together with community managed protected areas around the island, make up 40% of the total area under conservation, exceeding the 10% global target. On the terrestrial biome, over 20% of the land is under conservation management, which exceeds the global target of 17%. Understanding of species populations has been enhanced through research and collaboration with scientific partners. Many of the significantly important species are threatened by cyclones, hunting and predation by invasive species. With the increase in protected sites in the marine and terrestrial environments, species populations are starting to improve. In turn, this has provided economic opportunities for the country through eco-tourism ventures, such as whale-watching.

There are also great progress and achievements made in the area of climate change with a strong path developed under the Energy Road Map and the National Action Plan on Climate Change and Natural Disaster. There is a national commitment to reduce greenhouse gas emissions and a focus on renewable energy. Waste management continues to be a challenge but progress is being made through recycling, reducing and reusing waste resources. Many of the hazardous waste and big bulky waste will need to be shipped abroad for safe disposal and recycling. Taoga Niue codifies the protection of the Niue culture, artefacts and traditional knowledge and holders. Vagahau Niue ensures that the Niuean language is the official language of the country, thus strengthening its use and value for the future. These provide the necessary empowerment tool for local communities and all Niueans. With a small economy and population, Niue has many challenges that needs to be addressed. Limited national resources and a limited work-force means that many of the government's aspirations and targets rely heavily on enduring partnerships with regional and international organisations.

Assessment of progress towards each national target

Thematic areas under the NBSAP were assessed based on the information available including reports by researchers and discussions with government staff. The recently completed State of the Environment Report provided information that was useful in the assessment of progress. Many of the activities had been actioned or they continue to be developed and implemented as resources are secured. Progress has been achieved and exceeded in some areas, whereas in others the activities are either in progress, or are yet to start. Many of the activities are captured in sectoral work plans including those under water resources (Department of Utilities & Department of Health), climate change (Department of Utilities & Transport), traditional knowledge (Taoga Niue) and marine ecosystems (Fisheries Department). These action plans will need to be consolidated and streamlined so that an effective and comprehensive update on the progress being made to the nation's NBSAP.

Description of the national contribution to the achievement of each global Aichi Biodiversity Target

Niue has made significant progress towards achieving the Aichi Biodiversity Targets. The most notable is Target 11, where it has exceeded the set global targets. Other progress being made includes invasive species management (Target 9), agriculture and forestry management (Target 7), and updating the nation's biodiversity strategy and action plan (Target 17). There are two key challenges for Niue when it comes to progressing NBSAP activities: the first is attributed to the limited financial and human resources and the second is the lack of a clear indicator and monitoring plan, that would be useful to identify how much progress is being made and the impact of these activities in improving biodiversity outcomes.

Updated biodiversity country profile.

An update of Niue's biodiversity country profile includes new knowledge and threats to the country's biodiversity. Much of the information is updated based on the State of the Environment Report 2019. New environmental managers and stakeholders are also updated with their contact information.

The overall assessment of Niue's progress has been positive despite the insurmountable obstacles faced by a small-inhabited country facing global challenges. Good policies and strategies are helping guide the country on its journey forward. Valuing and conserving what is important to the people – that is the environment, culture, language, traditions and ceremonies and the respect of taoga and the magafaoa, sets an example and a reminder to the world of Niue's uniqueness.

Acronyms

ABS – Access and Benefit Sharing

ABT – Aichi Biodiversity Target

AusAID – Australia Agency for International Development

CBD - Convention on Biological Diversity

DOE – Department of Environment

EEZ Exclusive Economic Zone

EIA Environmental Impact Assessment

FAO Food and Agriculture Organization of the United Nations

GEF Global Environment Facility

GHG – Green House Gases

GoN – Government of Niue

HA (ha) - Hectare

HCFC - Hydrochloroflurocarbon

HFC - Hydroflurocarbon

HH – House Hold

IUCN – International Union for Conservation of Nature

MPA – Marine Protected Area

NBSAP – National Biodiversity Strategy and Action Plan

NEMS National Environmental Management Strategy

NGO Non-Government Organisation

NISERM – Niue Strategic Energy Road Map

NISSAP – National Invasive Species Strategy Action Plan

NR – National Report

NOW – Niue Oceans Wide

NSP – National Strategic Plan

NZ – New Zealand

NZAID – New Zealand Agency for International Development

PILN – Pacific Invasives Learning Network

POP – Persistent Organic Pollutant

PVC – Polyvinyl chloride

R2R – Ridge to Reef

SDG – Sustainable Development Goals

SLM – Sustainable Land Management

SOE – State of Environment

SPC – Secretariat for the Pacific Community

SPREP – Secretariat of the Pacific Regional Environment Programme

SPWRC – South Pacific Whales Research Consortium

UNCCD – United Nations Convention on Combating Desertification

UNDP United Nations Development Programme

UNFCCC – United Nations Framework Convention on Climate Change

Acknowledgements

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Many thanks to Paul Anderson, from SPREP's Environmental Monitoring and Governance Programme, for his oversight, input and guidance during the report preparation process. SPREP's staff further provided support and contributions based on the outcomes and the progress of their activities in Niue.

The generous contributions of all government departments, the civil society and the non-governmental sector in Niue through country-wide consultations and public fora have been a vital source of information in developing many of the reports and plans that are cited in this 6NR. We thank the Niue people for their support and love.

Introduction

Niue (Fig. 1) lies in the heart of the Polynesian triangle with the Samoan archipelago to the north, the Cook Islands to the east and the Kingdom of Tonga to the west, at coordinates of 19° South and 169° West. It is an independent, self-governing nation in free association with New Zealand. The total land area is 261 km^2 (26,146 ha) surrounded by 390,000 km^2 of exclusive economic zone (EEZ). Average land height above sea level is 23 metres and the highest point is just under 70 metres.

Figure 1. Map of Niue

Niue's population has declined since the 1970s, from a high of 4,990 (recorded in 1971) to a low of 1536 (recorded 2009) (Fig. 2). The most recent census data recorded a population of 1716 (2007 Census). Niue is in a challenging position as the population on the island steadily declines, with a corresponding increase in those living overseas, particularly New Zealand (23,883 in 2013 NZ Census). A number of measures to counteract this high migration and to attract Niueans back to the island have been initiated with limited success (NBSAP 2015).

Niue's environment remains an important priority for the government and it is one of the seven pillars under the Niue ke Monuina (National Strategic Plan 2016-2026). The national strategy advocates for sustainable use and management of natural resources and the environment for present and future generations. The key threats to Niue's biological diversity are cyclones and droughts, although other pressures, including solid waste and pollution, are largely kept in check due to the limited population. There are very few endemic species found in Niue but some are highly susceptible to human activities and natural disasters. The peka (flying fox), lupe (Pacific pigeon) and the uga (coconut crab) are hunted for food and as such their numbers are on the decline.

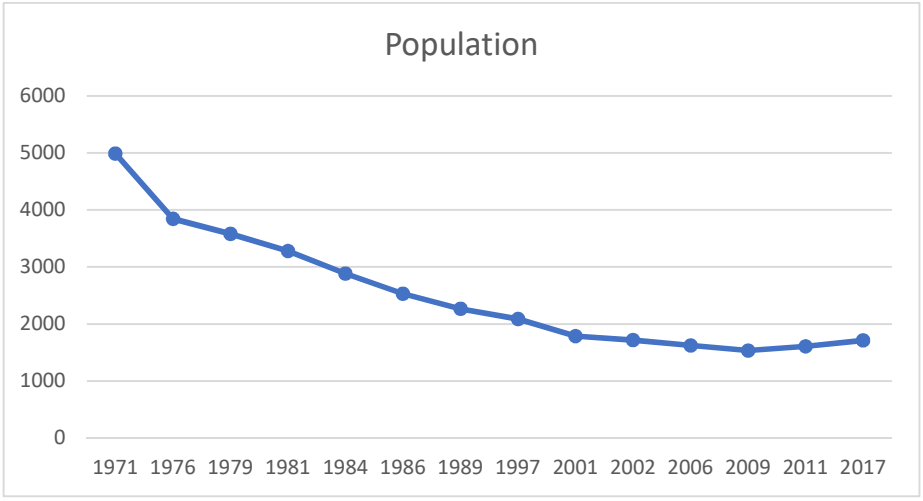

Figure 2. Population of Niue since the 1970s - Source: Niue's State of Environment Report 2020

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The report covers the following sections.

i. Information on the targets being pursued at the national level;
ii. Implementation measures taken, assessment of their effectiveness, and associated obstacles and scientific and technical needs to achieve national targets;
iii. Assessment of progress towards each national target;
iv. Description of the national contribution to the achievement of each global Aichi Biodiversity Target;
v. Updated biodiversity country profile.

The indigenous and local community contributions towards achieving biodiversity outcomes are captured in the various sections of the report. Community and national consultations that led to the development of a number of government plans and strategies were also used to collect information invaluable for the assessment of progress and the preparation of this report.

Section I. Targets being pursued at the national level

Niue's biodiversity targets are captured under the revised 2015 National Biodiversity Strategic Action Plan. There are six goals with eight thematic areas.

NBSAP Goals:

(i) Protection of biological diversity
(ii) Policy, planning and institutional frameworks
(iii) Local communities and customs
(iv) Institutional strengthening
(v) Financial sustainability
(vi) Environmental education and awareness

Thematic Focus

i. Conservation and sustainable management of terrestrial habitats
ii. Conservation of terrestrial species
iii. Conservation and sustainable management of marine ecosystems and species
iv. Management of invasive species
v. Management of waste and pollution
vi. Management of water resources
vii. Climate change
viii. Traditional knowledge and access to benefit sharing

National Target 1: Protection of biological diversity

To retain and enhance existing biodiversity, maintaining sufficient remaining habitats and ecosystems to support the population of all species and their genetic diversity.

Rationale for the national target

Biodiversity loss in small island countries like Niue can have devastating consequences on the ecological processes that sustain life and well-being of the nation. Natural disasters and human activities are the main drivers for biodiversity loss. This target aims to prevent further declines of species by preserving as much remaining natural habitat as possible, and focusing on increasing the population of iconic and significantly important species.

Generating biodiversity information to enhance our understanding of the species and their environment has been a key focus of the Government and stakeholders. The National Biodiversity Strategic Action Plan developed in 2015 through a national-wide consultative process, has the protection of Niue's biodiversity as a priority target.

Level of application

National

Relevance of the national targets to the Aichi Biodiversity

Main related Aichi Biodiversity Targets

By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Other related Aichi Biodiversity Targets

Other relevant information

- Niue – State of Environment Report 2020. Alofi, Niue.
- Niue National Strategic Plan 2016-2026. Ko e tohi faktaokatoka gahua ha Niue. Alofi, Niue.
- Niue National Environment Management Strategy
- Frost, IA., & Berrymann, NR 1966. The timber resources of Niue Island. NZ Forest Service. 25p.
- Whistler, A. & Atherton, J. 1997. Botanical survey of the Huvalu Forest Conservation Area. Niue. SPREP. Apia. 76p.
- Krausse, M. Dymond, J. Shepherd, J. 2002. Land cover map of Niue Island. Lincoln, NZ. Landcare Research.
- Department of Agriculture, Forestry and Fisheries 1998. National Forestry Policy. Vol. 1 & 2. Alofi, Niue
- Department of Agriculture, Forestry & Fisheries. 2008. Forest management plan for Niue. Alofi, Niue. 36p.
- Nemaia, F. 2004. National Action Plan addressing degradation and drought. UNCCD. Secretariat. Govt. NZ. 73p.
- This target provides the rationale for the Ridge to Reef Project, as well as many other national and regional projects relating to Niue.

Relevant websites, web links and files

www.gov.nu/wb/

www.sprep.org/members/niue

www.spc.int/our-members/niue/details

www.fao.org/evaluation/evaluation-digest/evaluations-detail/en/c/1103080/

https://niue-data.sprep.org

https://niue-data.sprep.org/dataset/niue-forest-related-resources

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National Target 2: Policy, planning and institutional frameworks

To integrate the conservation and sustainable use of biological diversity into Government development policies and plans.

Rationale for the national target

Biodiversity conservation is recognised as a shared responsibility. Some Government agencies have a direct role in biodiversity conservation, while others undertake activities that can have positive or negative effects on it. It is therefore important for the policies and plans of all these to have regard for the conservation and sustainable use of biodiversity. Many of the laws relating to the protection of Niue's biodiversity needed to be amended to keep pace with changing circumstances. The Ridge to Reef project provided a much needed review of the environmental laws of Niue. The nations vision for the future, recognises the environment and climate as key pillars to the well-being of the people.

Level of application

National

Relevance of the national target to the ABTs

Main related ABTs

ABT 4. Sustainable production and consumption.

Other related ABTs

ABT 2. Biodiversity values integrated. ABT 3. Incentives reformed.

Other relevant information

- Government of Niue. 2013. Niue's National Invasive Species Strategy and Action Plan 2013-2020. Alofi, Niue. 38p.
- Government of Niue. 2010. National Integrated Waste Management Strategy 2010-2015. Alofi, Niue. pp. iii+4-47.

- Government of Niue. 2015. Niue Strategic Energy Road Map 2015-2025. Government of Niue. SPC. Suva, Fiji. 68.
- Government of Niue 2016. Ko e tohi fakatokatoka gahua ha Niue. Niue National Strategic Plan 2016-2026. Alofi, Niue. 36p.

Relevant websites, web links & files

https://niue-data.sprep.org

www.gov.nu/wb/

www.sprep.org/members/niue

www.spc.int/our-members/niue/details

National Target 3: Local communities and customs

The focus of this goal is to improve the understanding of the people about biodiversity. This in turn will help motivate them, and with support, will lead to the conservation and sustainable use of Niue's biological resources. Any benefits from the resources to be shared amongst the stakeholders.

Rationale for the national target

The daily activities and decisions taken by village communities have a massive bearing on the state of Niue's terrestrial and marine biodiversity. Initial consultations with village communities have found their willingness to help protect biodiversity. By providing further support and encouragement, in particular recognising their local and traditional knowledge and integrating these into the overall management of Niue's biological resources, will ultimately lead to the successful implementation of this national goal. This will be beneficial to Niue's biodiversity and to its people.

Level of application

National – all communities and villages

Relevance of the national target to the ABTs

Main related ABTs

Traditional Knowledge

Other related ABTs

ABT1. Awareness of biodiversity increased

ABT7. Sustainable agriculture, aquaculture and forestry

Other relevant information

Vagahau Niue Act 2012.

Ridge 2 Reef Project

Relevant websites, web links & files

www.gov.nu/wb/

www.sprep.org/members/niue

www.spc.int/our-members/niue/details

https://niue-data.sprep.org

National Target 4: Institutional strengthening

To strengthen in-country capabilities in planning and implementing sustainable natural resources management programmes.

Rationale for the national target

To fully achieve the implementation of the country's NBSAP a concerted and coordinated approach is needed at all levels and among all the local organisations, villages and people. This is well within the scope and capability of the Department of Environment and Niue. Cognizant of the limitation attributed to a low population and with limited local resources, outside assistance must be a key component of Niue's plan if success is to be achieved. As a national target, this becomes a priority in terms of project development and partnership arrangement.

Level of application

National

Relevance of the national target to the ABTs

Main related ABTs

ABT 17. Biodiversity strategies and action plans

Other related ABTs

ABT 2. Biodiversity values. ABT 4. Sustainable production and consumption. ABT 20. Mobilizing resources from all sources

Other relevant information

- Ridge to Reef Project.
- Government of Niue. 2013. Niue's National Invasive Species Strategy and Action Plan 2013-2020. Unpublished Report. Alofi, Niue. 38p.
- Government of Niue. 2010. National Integrated Waste Management Strategy 2010-2015. Unpublished Report. Alofi, Niue. pp. iii+4-47.
- Government of Niue. 2015. Niue Strategic Energy Road Map 2015-2025. Government of Niue. SPC. Suva, Fiji. 68.
- Government of Niue 2016. Ko e tohi fakatokatoka gahua ha Niue. Niue National Strategic Plan 2016-2026. Alofi, Niue. 36p.

Relevant websites, web links & files

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www.sprep.org/members/niue

www.spc.int/our-members/niue/details

https://niue-data.sprep.org

National Target 5: Financial sustainability

Develop local, national, and regional financial mechanisms for conservation and sustainable management of biodiversity resources

Rationale for the national target

The development of financial mechanisms is a key to achieving many actions in this strategy. There are currently considerable international efforts being made to identify appropriate mechanisms, such as conservation trust funds. Lessons learned from such efforts will need to be adapted and applied to the Niuean situation during the implementation of the NBSAP.

Level of application

National

Relevance of the national target to the ABTs

Main related ABTs

ABT 20 – Mobilizing resources from all sources.

Other related ABTs

ABT 3. Incentives reformed

Other relevant information

Financial sustainability remains a challenge for Niue, therefore reliance on partnership arrangements must be a key aspect of the country's' planning. Local efforts to generate monetary support through a tourism levy continue to be on the agenda for the government.

- Government of Niue. 2013. Niue's National Invasive Species Strategy and Action Plan 2013-2020. Unpublished Report. Alofi, Niue. 38p.
- Government of Niue. 2010. National Integrated Waste Management Strategy 2010-2015. Unpublished Report. Alofi, Niue. pp. iii + 4-47.
- Government of Niue. 2015. Niue Strategic Energy Road Map 2015-2025. Government of Niue. SPC. Suva, Fiji. 68.
- Government of Niue 2016. Ko e tohi fakatokatoka gahua ha Niue. Niue National Strategic Plan 2016-2026. Alofi, Niue. 36p.

Relevant websites, web links & files

www.gov.nu/wb/

www.sprep.org/members/niue

www.spc.int/our-members/niue/details

https://niue-data.sprep.org

National Target 6: Environmental education and awareness

To strengthen environmental education, raise awareness and improve information sharing to enhance the conservation and sustainable use of Niue's biological resources.

Rationale for the national target

Biodiversity conservation requires commitment from all the people. This will be attained if they have the necessary information on the importance and values of biodiversity, on the threats to it and on the means to achieve its conservation and ensure that any use is sustainable.

Level of application

National

Relevance of the national target to the ABTs

Main related ABTs

ABT1 – Awareness of biodiversity increased

Other related ABTs

ABT 2. Biodiversity values integrated

ABT 17. NBSAP update

ABT 19. Improved knowledge

Other relevant information

Environmental education and awareness raising are important activities of the various government departments and NGOs. It is also an impact target under the NBSAP. Raising awareness at the community level by the local non-government organisation (Oma Tafua) and the South Pacific Whales Research Consortium (SPWRC), and working in partnership with the government have led to better management of the whale tourism market in the country. The Reef to Ridge Project has also contributed to enhanced community engagement and increased the sharing of information on Niue's biodiversity. Schools often have activities that focus around biodiversity related issues such as conservation of Niue's unique species.

- Government of Niue 2016. Ko e tohi fakatokatoka gahua ha Niue. Niue National Strategic Plan 2016-2026. Alofi, Niue. 36p.
- Government of Niue 2015. National Biodiversity Strategy Action Plan.

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Section II. Implementation measures, their effectiveness, and associated obstacles or needs to achieve national targets

Conservation and sustainable management of terrestrial habitats

Figure 2. Niue is regaining more green areas, as agricultural land is converted to secondary forest

Key objectives include the conservation and management of natural habitats, establishing conservation areas, manage land clearance, manage agricultural land, and the protection and conservation of caves and their fauna.

Major measure or action taken to implement the NBSAP

The major contributions towards the conservation and sustainable management of terrestrial habitats are the designation and the protection of primary forest under the Huvalu Forest Conservation Areas and the Hakupu Heritage and Cultural Park. These two conservation areas make up just over 20% of the total land mass. Overall, over 70% of Niue is forested (primary and secondary forests). Recent aerial mapping has shown that more land areas are being converted to green space (Figs 2 & 5).

Land type changes showed an increase in mature forest (2468 hectares) from 1994 to 2001 (Fig. 3; Table 1). The increase is largely attributed to secondary forests converting to mature forests (2,042 ha).

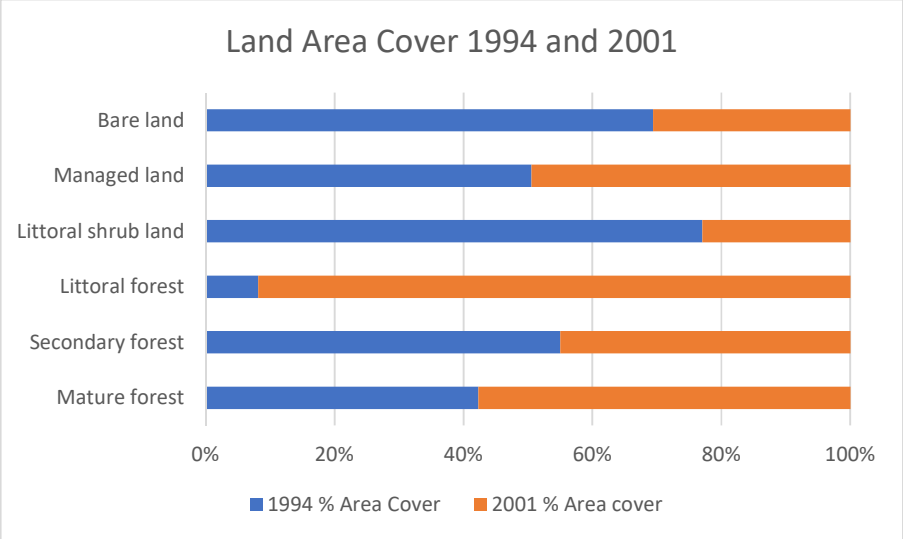


Figure 3. Land area cover changes from 1994 to 2001. Source. SOE 2019

In a global forest resource assessment, Tauasi (2010) calculated that since 1981, Niue has lost around 100 ha of forest areas per annum. This estimation did not take into account the population trend, which reached its lowest number in 2009 (1536 people). With fewer people, removal of forest trees dropped significantly.

	1994		2001	
Land Types	Land Area (ha)	% Area Cover	Land area (ha)	% Area cover
Mature forest	6805	26.0	9273.8	35.5
Secondary forest	11232.6	43.0	9190.5	35.2
Littoral forest	131	0.5	1471	5.6
Littoral shrub land	1637.5	6.3	487.6	1.9
Managed land	5449.9	20.8	5329.1	20.4
Bare land	886.1	3.4	390.1	1.5
Total land area	26142.1		26142.1	

Table 1. Niue's land types (Source: SOE 2019)

The Huvalu Forest Conservation Area was established in 1992 (Fig. 4). Scientific surveys carried out by Whistler & Atherton (1997), Brooke (1998) and Bereteh (1999) have enhanced knowledge and confirmed the significant biodiversity status of this area. It hosts the remains of the original rainforests that covered much of Niue. Prior to the 1950s evidence suggests that Niue was well forested, with up to 90% forest cover. Land clearing for agriculture, and for use of forest products, has had a major impact on forest cover since the island was settled about 1500 years ago. Between 1990 and 2005, Niue lost 17.7% of its forest cover, or around 3,000 hectares. The expansion of agriculture was the chief cause of the forest loss, where government incentives supported the growing of taro for export. The 2004 cyclone Heta did enormous damage to the whole island, with some 60% of trees damaged.

Figure 4. Huvalu Forest Conservation Area located between Hakupu and Liku villages.

Comparative studies using forest cover maps have shown that from 1966 to 1994 primary forest was reduced by 30%, with the greatest percentage reduction occurring from 1981 to 1994. This intensified period of deforestation occurred at a time where Niue was undergoing its most rapid depopulation. As the population declined caused by out-migration, the pressure on harvesting forest trees also declined. Recent surveys have revealed much of the de-forested areas are regenerating and agricultural land is converting back to secondary forests (Fig. 5).

An important component of conserving habitats and protecting biodiversity is the engagement of communities to support the management actions and to foster ownership of the resources. Community engagement through celebrating environment days, ocean days, world wetland day, world forestry days, world water days, earth day, world ozone day, and other various themes that focus on conservation and sustainable management of resources strengthen this stewardship to the natural environment.

Figure 5. Land cover maps over three time spans (1994, 2001 and 2008) – Source: Newsome 2017.

Linking conservation to creating economic opportunities for the local communities can also provide the incentive to protect and preserve biodiversity. Walking tracks and trails and interesting geological features encourage the community to maintain pride in their environment and surroundings and to tell cultural stories unique to Niue. Use of technology, such as touch screens and interactive displays, further enhances the experience of visitors and provide incentives to communities and the government to maintain a healthy environment for Niue's residents and visitors (Fig. 6)

Figure 6. Interactive displays and information boards provide excellent engagement with visitors and locals about specific sites and points of interests.

Effectiveness: (effective, partial effective, ineffective, unknown)

Partially Effective.

There has been significant progress on this theme, specifically the implementation and intervention of the GEF funded projects including FPAM and the Ridge to Reef project, raising community awareness, mapping protected areas using LIDAR based surveys, environmental impact assessment and improved monitoring of caves. However, there are also activities that have been stalled due largely to capacity challenges. These include sustainable funding, logging and reforestation work, legislation development and implementation. The group assessment agreed to rate the outcome as partially effective.

Tools or methodology used for the assessment of effectiveness

Assessment was based on a number of factors, in particular the land area that is being protected. Through aerial surveying, the vegetation has increased considerably for the country with well over 70% of the land classified as forests. About a third of this forest area is under conservation. How effective is the area being protected is difficult to assess at this time, except that a number of biological assessments have revealed an improved population of native species. Communities and government agencies worked in partnership to develop management plans. Some of the management plans are endorsed and implemented. Legislation for further protection of Niue's natural resources is at various stages of development including drafting, consultation and reviewing.

Provide other relevant information to illustrate how the measure has resulted in or is expected to result in outcomes that contribute to NBSAP implementation.

The two key areas for the government and stakeholders to focus on is developing management plans for the conservation areas and providing the necessary legislative support to ensure that these conservation sites are fully protected. Ensuring that these conservation sites is a priority for the government and that further funding support and activities will enhance the significance of these sites.

Obstacles encountered and any scientific and technical needs to address them? Include cooperation, capacity development activities or need for guidance materials and websites, web links and files

Three key obstacles identified were:

i. Legislative development and implementation – Two key legislations are currently on hold
ii. Capacity building – ongoing to build local capacity to undertake regular assessments and surveys
iii. Sustainable financing

Gaps

- Protected area management plans – including agreement on enforcement with communities
- Legislation stalled – Forestry Bill and Wildlife Amendment Bill
- Policy stalled – Sustainable Land Management
- Cave fauna guidelines
- Alignment of institutional framework, policies and plans

Conservation of terrestrial species

Figure 7. Uga or the coconut crab is the largest crabs found on the island

Key objectives are to document native species and their status, conserve native species (peka, uga, hega, lupe and other bird species, olive small-scaled skink, flora), and maintaining a reference collection on Niue's flora.

Measures taken to implement the NBSAP

Conservation of Niue's terrestrial species goes hand in hand with the conservation and protection of their habitats (see Theme 1: Conservation and Sustainable Management of Terrestrial Habitats). A good 20% of Niue's land mass is under conservation, providing 5405 hectares of potential refuge for native species.

The vulnerability of native species living in a small island environment cannot be overstated. A cyclone of the highest magnitude can wipe out an entire population of endemic species in a matter of days or weeks. This is a sad reality faced by island species. The best scenario for those trying to protect these species is to provide sufficient refuges and a healthy ecosystem that will ensure some resilience to the population should disaster strikes.

Documenting Niue's native fauna and flora, their taxonomic and population status is an ongoing priority and effort. Twenty endemic faunal species have recently been recorded. Cave faunal survey has been completed (Millar 2017)

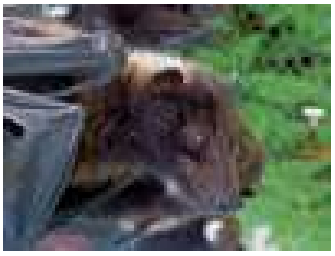
Endemic species

Understanding Niue's biodiversity has been a focus of the government over the past several decades. Endemism is low both in the terrestrial and marine biomes, with only a few species recorded only from Niue or limited to Niue and one other country (Table 2).

Scientific Name	Common Name	Status
Lalage maculosa whitmeei	Polynesian triller	endemic
Aplonis tabuensis brunnescens	Polynesian starling	endemic
Ptilinopus porphyraceus whitmeei	Purple capped fruit dove	endemic
Ecsenius niue	Comb-tooth blenny	Endemic. Reported from Beveridge Reef and Alofi wharf
Laticauda schistorhynchus	Niuean flat-tailed sea snake	Endemic. Restricted range. Vulnerable in the Red List. Reproduce on land hence vulnerable from habitat loss due to development and climate impact
Nacaduba niueensis	Niuean blue butterfly	endemic
Utetheisa maddisoni	Niuean rattlebox moth	endemic
Empoasca clodia	Niuean Clodia leaf hopper	endemic
Empoasca niuensis	Niuean leaf hopper	endemic
Macrovanua angusta		endemic
Rhinolaemus niueensis		endemic
Elytrurus niuei		endemic
Paracoccus niuensis		endemic
Vatusila niueana		endemic
Orcovita gracilipes		endemic
Pugiodactylus agartthus		endemic
Dantya ferox		endemic
Cenchritis (or Tectarius) niuensis		endemic
Pandanus niueensis	Niuean screwpine pandanus	endemic
Psychotria insularum		endemic

Table 2. List of Niue's endemic species.

Flying foxes (Peka)



The Tongan flying fox or peka (*Pteropus tonganus*) is the only native mammal found in Niue. The flying fox is a protected species, although hunting is permitted during December. Anecdotal evidence suggests that hunting continues throughout the year. Brooke (1998) undertook a peka survey and found that the population (between 1900 and 3,700) was small given the available habitat. Brooke & Tschpka (2002) carried out another survey and found the population at between 2040 and 4080 bats. It was estimated that up to 1500 peka were harvested per season, which exceeds a recommended harvest of 750 per annum. In 2004, Cyclone Heta struck the country and an estimated 95% of the peka population perished, with only about 60 individuals left (Brooke 2004; Butler et al. 2012). Recent surveys undertaken in 2017 and 2019 for the Ridge to Reef Project indicated peka population to be still recovering and in a vulnerable state. The population is far below what it needs to be for a safe and healthy population (Fig. 8). The vulnerability of flying fox populations on small islands makes them vulnerable to extinction.

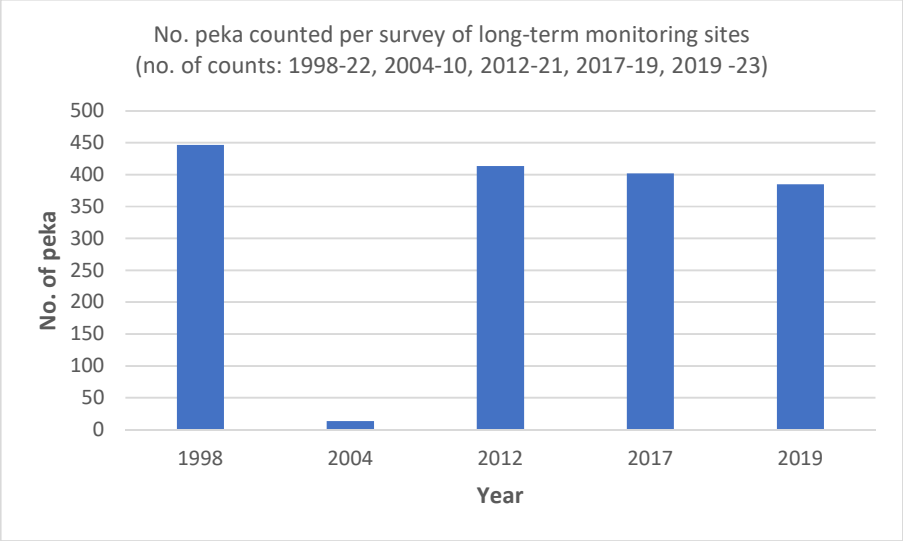


Figure 8. Peka count from 1998 to 2019

Coconut Crab (Uga)

Uga (Fig. 7) is a delicacy and around 60% of households actively participate in hunting them. In 1989, only 30% of households were recorded as actively participating in the hunting of uga (Table 3). The average number of uga harvested is 27 per household, a slight increase from 24/household in the 1989 Census. Hakupu, Avatele, Makefu, Hikutavake and Liku households harvested the highest number of uga (well over 40 uga per household). 93% of households set hunting trails to catch the uga. A ban on exporting uga overseas has been in place since 2014, due to overharvesting. The government recognises the demand from overseas will lead to over-exploitation of uga.

Uga	Hunt	Total uga caught	Average per HH
Alofi South	52	1221	10
Alofi North	26	646	12
Makefu	15	715	42
Tuapa	19	654	20
Namukulu	1	15	4
Hikutavake	11	710	39
Toi	8	305	34
Mutalau	19	1043	31
Lakepa	10	278	15
Liku	18	1078	41
Hakupu	30	2365	55
Vaiea	10	363	24
Avatele	35	2027	48
Tamakautoga	25	964	28
TOTAL	**279**	**12,384**	**27**

Table 3. Uga harvested per household

Aviafauna

Niue has 32 bird species excluding the three extinct species (Niue Night Heron - *Nycticorax kalavikai*, Niuafo'ou Megapode (*Megapodius pritchardii*) and the Niue Rail (*Gallirallus huiatua*). A number of birds are vagrants or migrants, whereas others are resident breeding birds. Sixteen of the 32 species are considered native and two introductions (fowl and the red-vented bulbul). Niue's bird population fluctuates significantly due to weather events, for example the population of the Pacific Imperial Pigeon, or Lupe (*Ducula pacifica*), declined by up to 64% after Cyclone Heta in 2004. Nearly 10 years later the lupe population had increased (Fig. 9) in some sites (e.g. Vinivini and Fue) but remained low in others (e.g. Mutalau). The recovery at some areas was attributed to the 3-year moratorium and the recovery of habitats and food trees that birds rely on. Unfortunately, the lupe and other species like the peka are still threatened by hunting (Butler et al. 2012).

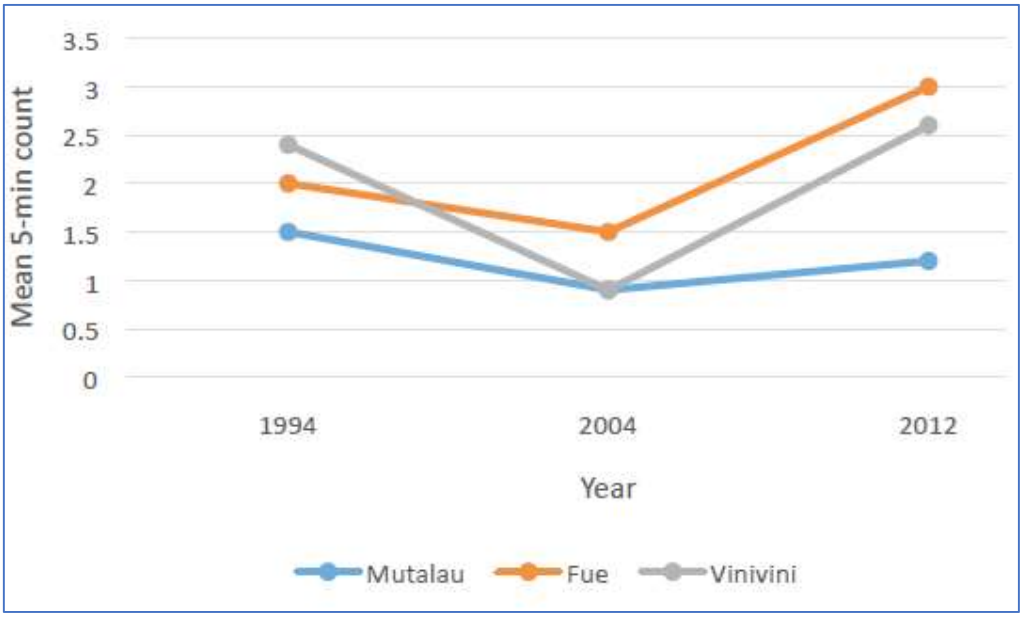


Figure 9. Mean 5-minute bird count results for pigeons along transects in Mutalua, Fue and Vinivini from 1994 to 2012 (Source: SOE 2019)

Other bird populations are stable or declining, including the Polynesian Starling, the White-rumped Swiftlet and the Blue-crowned Lorikeet(see above) indicating that other threats are present. Niue has three endemic bird subspecies: Polynesian Triller – *Lalage maculosa whitmeei*, Polynesian Starling – *Aplonis tabuensis brumnescens*; and Purple-capped Fruit-dove – *Ptilinopus porphyraceus whitmeei.* Fourteen bird species breed on the island, and 14 are vagrant or migrant shore and seabirds. The hega or the Blue-crowned lorikeet is becoming rare with concerns for its population (Butler et al. 2012). The many coloured fruit dove has recently been sighted from the island. Catastrophic cyclones are the biggest threat to Niue's bird population due to their direct impacts on the birds, but also indirect impact on the habitat and food trees that many of the birds rely on.

Herpetofauna

Figure 10. Olive small-scaled skink (Emoia lawesii). Photo (Hathaway et al. 2017)

Knowledge on Niue's reptiles is good and up-to-date following recent surveys undertaken by Hathaway, Buehler, Rex and Fisher (2017). Nine species of skink and gecko are recorded and most are common (Table 4). The Olive small-scaled skink (Fig. 10) is listed as endangered and is of a conservation concern. The skink is also found from American Samoa, but genetic studies may reveal two distinct species. Recent surveys have found new individuals after more than 30 years since they were last seen (Hathaway et al. 2017). Habitat loss and invasive species (specifically cats and rats) are key threats to the survival of this and other reptiles in Niue. The House gecko is a recent introduction and is an aggressive species that has been blamed for the population decline of native geckos.

Three turtle species are recorded from Niue – the loggerhead (*Caretta caretta)* is recently confirmed from Niue waters, hawksbill (*Eretmochelys imbricata*) and the green-shell (*Chelonia mydas*) (Friedland *et al.* 2017). All three species are of conservation concern, with the hawksbill turtle listed as critically endangered (close to extinction), the green-shell turtle as endangered and the loggerhead turtle as vulnerable. Although the loggerhead population in the South Pacific is distinct and has been assessed as critically endangered (a step toward extinction), none of the turtles breed on the island. No estimates of turtle numbers are available. Turtles were eaten in the past, but they are now a protected species (Domestic Fishing Regulations 1996). The main threats are from the fishing industry and predation of turtle eggs and hatchlings.

Two sea kraits are found, the endemic Niue sea krait or katuali (*Laticauda schistorhyncha*) and the blue-banded sea krait (*L. laticaudata*). The blue-banded sea krait is rarely encountered or seen around the island. The Niue Banded Sea snake is common around Niue especially near the intertidal areas on the west side of the island. The loss of habitats, foraging and nesting areas due to sea level rise and coastal developments are the key threats to this species. It is listed as Vulnerable in the IUCN Red List and is a protected species under the Niue Domestic Fishing Regulations. The snake is an iconic species that is also important for the tourism sector.

Scientific name	Common name	Status & IUCN Red List NE – Not Evaluated; LC – Least Concern; EN - Endangered
Lepidodactylus lugubris	Mourning gecko	Native & Common - NE
Nactus pelagicus	Pacific slender-toed gecko	Native & Common - LC
Gehyra oceanica	Oceanic gecko	Native & Rare - LC
Hemidactylus frenatus	House gecko (an IAS of recent introduction)	Recent introduction & Common - LC
Emoia cyanura	White-bellied copper-striped skink	Native & Common - LC
Emoia impar	Dark-bellied copper-striped skink	Native & Common - LC
Emoia lawesi	Olive small-scaled skink	Native & Common - EN

Lipinia noctua	Pacific moth skink	Native - NE
Cryptoblepharus poecilopleurus	Snake-eyed skink	Native - LC
Laticauda schistorhyncha	Niue sea krait	Native - VU
Laticauda laticaudata	Blue-banded sea krait	Native - LC

Table 4. Reptiles of Niue. Source: Tongatule et al. 2015

Flora

The Niue flora is defined as comprising all vascular plants (flowering plants, gymnosperms, and ferns). Plant species can be classified by their distribution; they are either native, i.e., they occur naturally in the area (arriving by non-human transport), or they are alien, i.e., they are introduced species (having arrived by direct or indirect human transport). The first flora of Niue was compiled by the American botanist Dr Truman Yuncker (1943), with additional contributions and an updated flora by Bill (W) Sykes (1970). A comprehensive checklist of the native and naturalised flora was included in Whistler and Atherton (1997). The flora comprises approximately 159 native flowering plant species (125 dicots and 34 monocots) in addition to 25 ferns and two fern allies, for a total of 186 vascular plant species. Niue does not have endemic plants but a number of native plants are of conservation concern (*Bulbophyllum distichobulbum*, *Cenchrus caliculatus, Nicotinia fragrans*, and *Solanum amicorum*) (Fig. 11).

Rare Plants of Niue

Bulbophyllum distichobulbum - a small epiphytic orchid is restricted to only two islands—Niue and to the island of Tutuila in American Samoa, and thus has a very restricted range.

Cenchrus caliculatus is a large littoral grass that was probably once common throughout Polynesia but is now becoming rare and displaced by introduced species. It is rare in Niue and has not been collected since 1981.

Nicotiana fragrans—This small littoral herb is found only in Tonga, Niue, Ono-i-Lau (Fiji), and the Isle of Pines (New Caledonia). On Niue appears to be restricted to several coastal locations on the north end of the island, specifically on littoral limestone cliffs.

Solanum amicorum is found only in Tonga and Niue. It is rare on Niue in coastal areas and thickets on the west side of the island.

Figure 11. Four rare endemic and native plant species of Niue. (Source: Whistler 2013).

Vegetation cover and changes can be seen in this snapshot comparison (Table 5), between 1994 and 2001. The changes observed are the high increase in mature forest from 26% to 35.5% and the reduction in secondary forests presumably attributed to conversion to mature forest.

	1994		2001	
	Land area (ha)	% Area cover	Land area (ha)	% Area cover
Mature forest	6805.0	26	9273.8	35.5
Secondary forest	11232.6	43	9190.5	35.2
Littoral forest	1313.0	5	1471.0	5.6
Littoral shrub land	5449.9	1.7	487.6	1.9
Managed land	5449.9	20.9	5329.1	20.4
Bare land	886.1	3.4	390.1	1.5
Total land area	26142.1		26142.1	

Table 5. Comparison of land area changes between 1994 and 2001 (Source: Nemaia 2004)

The lack of logging or expansion of the agriculture sector into primary forest areas ensure that these forested sites remain productive from an ecological perspective, providing the necessary habitats and food for native species. Any encroachment through infrastructure developments or human settlement can undermine Niue's primary forest areas. The engagement and leadership by the village councils and all Niuean residents can contribute to the management and sustainable use of Niue's forest resources. Catastrophic cyclones are a serious threat to Niue's primary forest and species, and the prediction of more catastrophic cyclones for the region is a concern.

Secondary forests will likely increase in cover, as more agricultural plots are left to fallow or abandoned by out-migrating landholders. Threats to secondary forests are primarily from invasive plants and uncontrolled burning. The use of bulldozers for land clearing destroys native biodiversity and undermines soil health. Littoral or coastal forests are likely to be impacted due to the current push to develop tourism and build facilities along the coastline. Efforts to monitor this development need to ensure there is a balance between economic development and the integrity of the littoral forest system. A Forest Management Plan has been developed containing provisions for commercial

forestry, should the industry be revived (SOE 2019). This includes having a sustainable harvesting rate to ensure careful management of Niue's forest resources.

Effectiveness: (effective, partial effective, ineffective, unknown)

Measure has been effective

There have been considerable efforts towards understanding the status of Niue's iconic terrestrial species. The baseline information has allowed the government to put in place conservation measures to safeguard species populations and habitats. These measures include banning the export of uga to overseas countries, the moratorium to prevent the hunting of peka and lupe, and the control of ammunition being issued to gun-holders. The protection of Huvalu rainforest has provided refuge to many species. While these efforts are a great recognition to the work of all stakeholders, there are gaps that need to be progressed, such as the protection of endangered native flora. The implementation and enforcement of national laws is another challenge that the government grapples with, as part of its efforts to protect and conserve Niue's terrestrial species.

Tools or methodology used for the assessment of effectiveness

Assessment was based on identifying the number activities under this goal and those that have been progressed, as opposed to those still in the pipeline. Reports and documentations were also used to assess progress made. Local experts provided additional information and contributed to the overall effectiveness rating.

Provide other relevant info to illustrate how the measure has resulted in or is expected to result in outcomes that contribute to NBSAP implementation.

A number of restrictions are in place including banning the export of the coconut crab (uga) overseas since 2014 and controlling the issuing of ammunition to gun holder.

Obstacles encountered and any scientific and technical needs for address them? Include cooperation, capacity development activities or need for guidance materials and websites, web links and files

Enforcement of legislation continues to be a key obstacle in ensuring that terrestrial species are fully protected. Village councils have expressed their concerns with regards to the implementation of national and village bylaws, such as the shooting season for pigeons and bats. It is imperative that a new phase should focus on empowering communities to develop village guidelines and rules that they themselves can regulate and enforce.

Further capacity challenge remains with regards to identifying and protecting of Niue's critically rare and endangered flora. This may necessitate working collaboratively with the New Zealand government and international experts. As noted in the Cave fauna survey report, there is a dire need for specialists or taxonomists to assist with identifying species.

Conservation and sustainable management of marine ecosystems and species

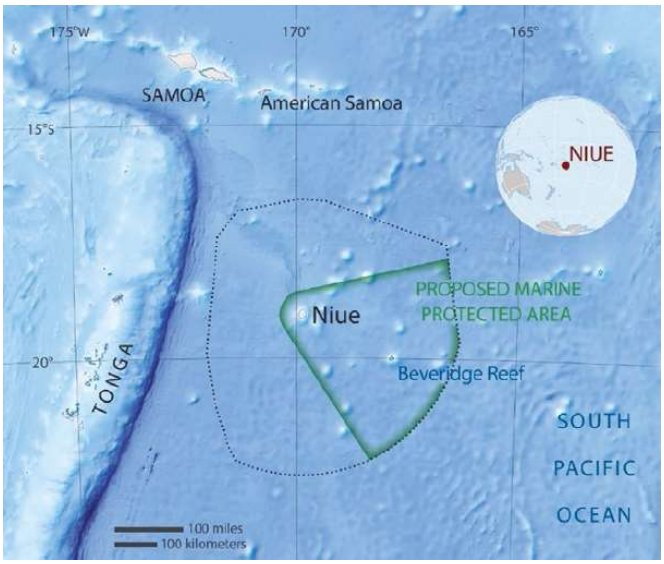


Figure 12. Map of the new MPA

Key objectives are sustainable management of coastal and inshore habitats, creation and management of marine conservation areas, sustainable management of inshore and offshore fisheries, conservation of threatened marine species, preservation of cultural and traditional practices, adequate resourcing of the fisheries authority and minimising pollution to the marine environment.

Major measure or action taken to implement the NBSAP

One of the biggest achievements is the establishment of the Niue Moana Mahu Marine Protected Area, which includes the Beveridge Reef Nukutulueatama Special Management Area under the Maritime Zones Amendment Act 2019 and the Niue Moana Mahu MPA Regulations 2020 (Fig. 12). The area being protected is around 127,000 km^2 constituting approximately 40% of Niue's exclusive economic zone (EEZ). A scientific survey undertaken in 2017 provided data that supported the designation of this site for protection. The population of Grey-reef shark was found to be the highest at this site than anywhere else in the world (Table 6) Furthermore, the fish biomass and population of many endangered species (giant clams, echinoderms – Fig. 13) were greater at Beveridge Reef than around Niue (Friedlander *et al.* 2017).

Location	Mean MaxN	Reference
Beveridge Reef	5.1	Friedlander et al. 2017
Palmyra Atoll	1.08	Bradley et al. 2017
Raja Ampat (Indonesia)	0.5	Jaiteh et al. 2016
Niue	0.44	Friedlander et al. 2017
Great Barrier Reef (Australia)	0.26	Espinoza et al. 2014
Fiji	0.2	Goetze & Fullood 2013

Table 6. Mean MaxN for the Grey reef shark from various locations (Source: Friedlander et al. 2017)

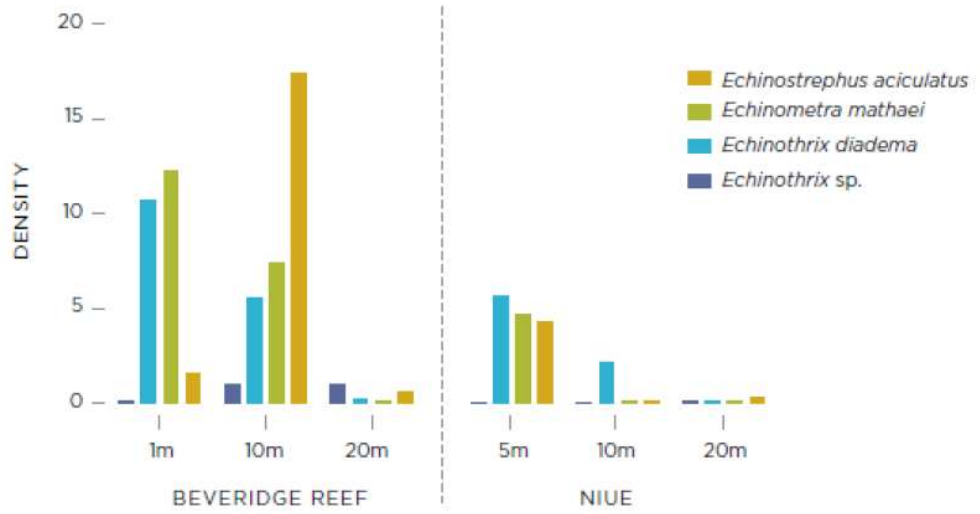


Figure 13. Comparison of echinoderm distributions between Beveridge Reef and Niue island. (Source: Friedlander et al. 2017)

The designation of the Moana Mahu protected area ensures that Niue meets and indeed exceeds its commitment under the Aichi Biodiversity Target 11: *By 2020, at least … 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems.*

The work of various partners including Tofia Niue, Oceans 5 Niue Oceans Wide (NOW), the Secretariat of the Pacific Community and the National Geographic Pristine Seas and the government has resulted in this globally significant achievement.

In addition to the Niue Moana Mahu marine protected area, some smaller initiatives by the government and local communities are also contributing to national efforts to conserve and sustainably use marine resources (Table 8).

Conservation Area	Management Arrangement	IUCN Category and Year of establishment	Size (ha)
Huvalu Forest Conservation Area	Community	VI 1992	126
Anono Marine Reserve	Government	VI 1998	27.67
Alofi North - Makefu	Community	2002	35
Moana Mahu MPA	Government	2020	12700000

Table 7. Marine conservation sites of Niue.

The use of traditional bans (fono and tapu) in certain marine areas to mark respect to passing of a chief, can provide additional conservation measures that communities can use to protect marine resources.

Another important national achievement has been the effort to safeguard whale migration and visitation and creating whale-watching tourism to support the local economy. There is an estimated

5,000 Oceania humpback whales recorded in the South Pacific. This is the smallest of all humpback populations globally and the projection does not follow those in other parts of the world, where they are increasing (Constantine et al. 2012). It is for this reason that humpback research needs to be constant and management efforts need to be adapted to safeguard Oceania humpbacks. The deep bathymetry close to the island provides an important wintering area for many whale species, especially deep divers like sperm whales and beaked whales (see Table 8). Each year the number of visiting whales increases (Fig. 14). Several of the whales in Niue have been matched to others sighted in the Cook Islands, Tonga and the Kermadec Islands, New Zealand. Another individual seen in 2011 revisited the island in 2015.

Common Name	*Species*	Niue	Common Name	*Species*	Niue
Blue whale	*Balaenoptera musculus*	L	Pygmy killer whale	*Feresa attenuata*	L
Humpback whale	*Megaptera novaeangliae*	R	Short-finned pilot whale	*Globicephala macrorhynchus*	R
Bryde's whale	*Balaenoptera edeni*	L	Bottlenose dolphin	*Tursiops truncatus*	L
Sei whale	*Balaenoptera borealis*	R	Common dolphin	*Delphinus delphis*	L
Fin whale	*Balaenoptera physalus*	L	Spinner dolphin	*Stenella longirostris*	R
Antarctic Minke Whale	*Balenoptera acutorostrata*	L	Pantropical spotted dolphin	*Stenella attenuata*	L
Dwarf Minke whale	*Balaenoptera bonaerensis*	R	Striped dolphin	*Stenella coeruleoalba*	L
Sperm whale	*Physeter macrocephalus*	R	Melon-headed whale	*Peponocephala electra*	L
Dwarf Sperm Whale	*Kogia simus*	L	Risso's dolphin	*Grampus griseus*	L
Pygmy Sperm Whale	*Kogia breviceps*	L	Fraser's dolphin	*Lagenodelphis hosei*	L
Killer whale	*Orcinus orca*	L	Rough-toothed dolphin	*Steno bredanensis*	L
False killer whale	*Pseudorca crassidens*	L	Cuvier's beaked whale	*Ziphius cavirostris*	R
Blainville's beaked whale	*Mesoplodon densirostris*	R*			

Table 8. List of cetacean species reported, or likely to be present in the waters of Niue. "R" Indicates the species has been recorded. "L" Indicates the species has not been recorded but is likely to be present. R (Andrews 2005) a pod of at least four individuals was filmed to the west of Beveridge Reef on Oct. 1, 2016 by Friedlander et al. (2017). (Source: SOE 2019).*

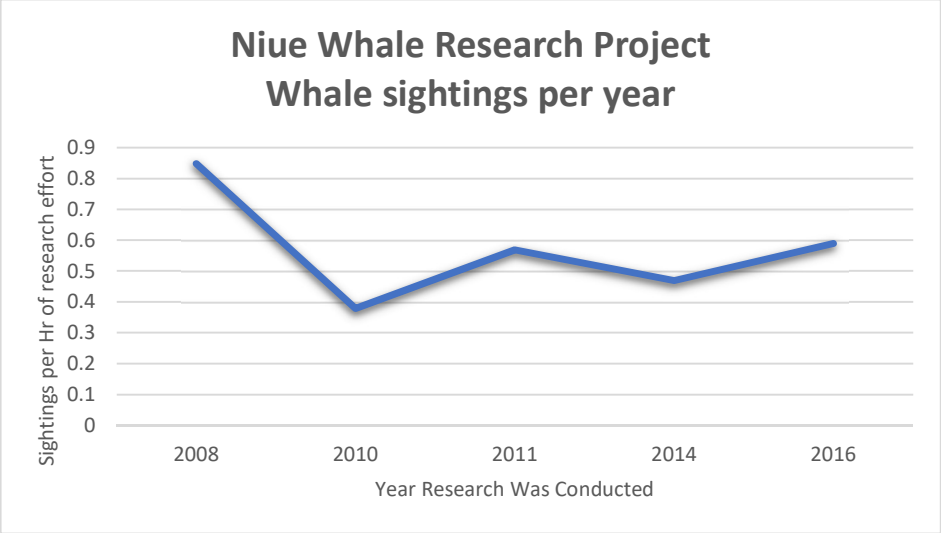


Figure 14. Number of whale sightings per year. (Source: Olive Andrews, SPWRC – unpublished data)

The low national population has contributed to keeping coastal fishing pressure within reasonable condition. The current marine conservation areas need some protection, as available data show no significant differences between fish biomass within and outside of these protected areas (Table 9).

Commercial fishing in the EEZ has been low and the number of fishing licences being issued remains within the Government's plans. Better catch records are needed in this sector to allow for improved management of offshore and inshore fisheries stocks.

Depth (m)	Alofi MPA	Open	% diff.
5	83.1 (49.1)	84.8 (57.7)	-2.0
10	55.1 (36.5)	72.6 (36.0)	-24.0
20	47.6 (34.9)	52.4 (35.2)	-9.0

Table 9. Fishing effort between open and protected areas. (Source: SOE 2019)

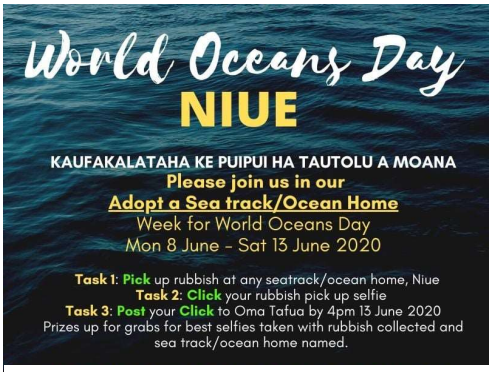


Figure 15. Local NGO Oma Tafua continues to promote international environmental events such as World Ocean Day.

Effectiveness: (effective, partial effective, ineffective, unknown)

Partial effective

Achievements are noted for whale protection and awareness raising, as well as the status of the marine resources. Niue has passed Whale Watching Regulations 2016. The designation of the Niue Moana Mahu Marine Protected Area and the Beveridge Reef Nukutulueatama Special Management Area is the highlight for Niue, as it not only effectively meets its commitment to the global biodiversity strategy and targets, it also protects and conserves the population of grey sharks in the world. Unfortunately, there are some outstanding activities that will need a concerted effort to address in the near future including marine pollution, traditional conservation areas and preservation of traditional knowledge in fisheries.

Tools or methodology used for the assessment of effectiveness

Assessing the number of activities being implemented and guidance from local experts on the impact of these actions.

Provide other relevant info to illustrate how the measure has resulted in or is expected to result in outcomes that contribute to NBSAP implementation.

Further information can be found in the Niue's State of the Environment Report 2019.

Obstacles encountered and any scientific and technical needs for address them? Include cooperation, capacity development activities or need for guidance materials and websites, web links and files

Securing resources, including funding and building local technical capacity and maintaining a pool of local experts, remain a key challenge and an obstacle for consistent management of Niue's biological resources and environment.

Management of invasive species

Figure 16. Controlling Epipremnum pinnatum

Invasive species are a threat to native species, agricultural production and the wellbeing of communities (GoN SOE 1993; NISSAP 2015: 5). Invasive animals predate on native birds, reptiles and other species, thereby reducing the overall function of a healthy ecosystem (Powleslands 2004). Invasive weeds outcompete native plants and can colonise vast tracts of land. Managing these invasive weeds is often costly and can be harmful to the environment due to the toxic nature of chemicals being used. Invasive insects, including the yellow crazy ants and the little fire ants, are a real threat to Niue and its species, such as the coconut crab, peka and birds. Fruit flies impact agriculture production and some insects, like mosquitoes, are carriers of diseases.

The focus for invasive species management in Niue includes actions against invasive species with high impact on native biodiversity and enhancing the national framework to address all aspects of invasive species. This means reviewing legislation, policies, plans and strategies, identifying priority species and areas to boost biosecurity measures, raising awareness and engagement of villagers and government departments and building the capacity of staff to effectively manage, control and eradicate new incursions.

Major measure or action taken to implement the NBSAP

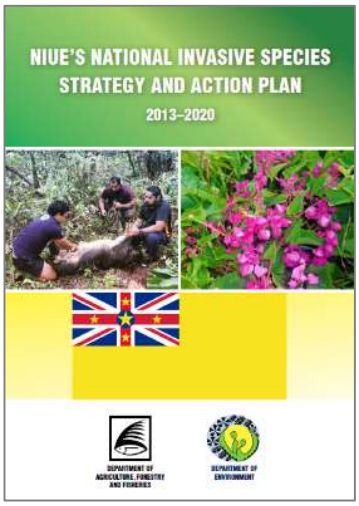


Figure 17. National Invasive Species Strategy and Action Plan cover

Niue is an active partner in the regional Pacific Invasives Learning Network, overseen by SPREP. It has appointed an Invasive Species Coordinator, and has developed a National Invasive Species Strategy and Action Plan (Fig. 17), under the NBSAP. A number of invasive species workshops and awareness raising activities have been undertaken to raise the profile of invasive species and to encourage reporting of invasive species by villagers. Controlled work on invasive plants have been undertaken, including weed spraying and burning. Feral pigs are a problem in mature rainforest areas, especially the damage they can do to coconut crabs (uga). Efforts to address them include trapping and shooting. A pig management plan was developed and implemented, although there are some challenges that need to be addressed. The pig management plan recognises that eradicating feral pigs is an impossible task due to the lack of management of domestic piggeries. The plan focuses on assisting households in managing their pigs, thereby reducing the source population for feral pigs. A bounty scheme with an allocated budget of NZD5000 per annum was used as an incentive to manage feral pigs. The effectiveness of this scheme is questionable, as a survey revealed that some of the tails submitted under the bounty scheme were from the domestic rather than feral population.

Invasive plant species have been documented by various botanists including Yuncker (1940), Sykes (1970), Whistler & Atherton (1997), Space and Flying (2000) and Space et al. (2004). Space and Flynn (2000) provided a more invasive species focused approach, which later provided a good ground for the post-cyclone Heta invasive plant species assessment.

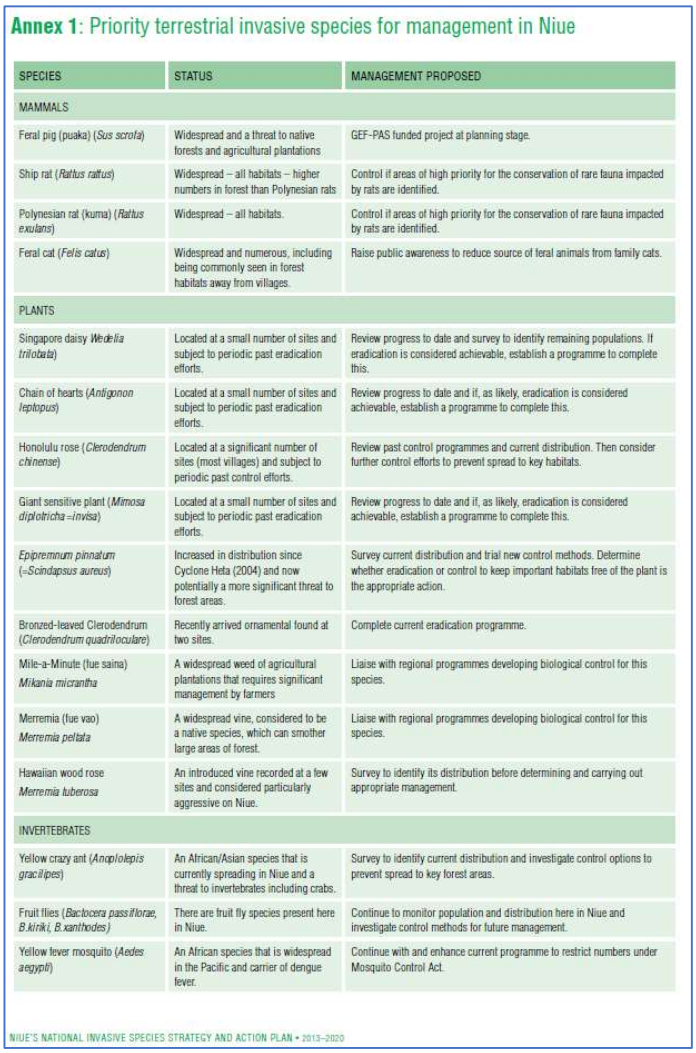
Niue has focussed on eradicating a few serious invasive plant species including *Antigonon leptopus* (Chain of hearts), *Clerodendrum chinense* (Honolulu rose), *Epipremnum pinnatum* cv., *Mimosa diplotricha* (Giant sensitive weed) and *Sphagneticola trilobata* (Singapore daisy). Space *et al.* (2004) noted great progress made and that only a few more sites were left to be eradicated for *A. leptopus* (2 sites left), *C. chinense* is widespread but controlled through slashing and mowing, *M. diplotricha* (2 sites) and *S. trilobata* (20 sites). Since cyclone Heta, many of the problematic species have increased in distribution (Space *et al.* 2004).

Invasive species remain an important issue for the government that it has prioritised it for the new GEF funding stream.

The invasive species officer's capacity has been enhanced through training by regional and international experts in fields such as pesticide use and safety, invasive species biological traits, and developing strategies to combat outbreaks and new introductions.

The rehabilitation of sites is an ongoing activity for Niue's invasive species teams and one that does require the support and engagement of villagers and landholders, as many of the problematic species are found on un-occupied private land.

One of the remaining gaps for Niue is to assess the presence of marine invasive species, as any threat will have a serious impact on the food security of the people.



Annex 1: Priority terrestrial invasive species for management in Niue

SPECIES	STATUS	MANAGEMENT PROPOSED
MAMMALS		
Feral pig (puaka) (*Sus scrofa*)	Widespread and a threat to native forests and agricultural plantations	GEF-PAS funded project at planning stage.
Ship rat (*Rattus rattus*)	Widespread – all habitats – higher numbers in forest than Polynesian rats	Control if areas of high priority for the conservation of rare fauna impacted by rats are identified.
Polynesian rat (kuma) (*Rattus exulans*)	Widespread – all habitats.	Control if areas of high priority for the conservation of rare fauna impacted by rats are identified.
Feral cat (*Felis catus*)	Widespread and numerous, including being commonly seen in forest habitats away from villages.	Raise public awareness to reduce source of feral animals from family cats.
PLANTS		
Singapore daisy *Wedelia trilobata*)	Located at a small number of sites and subject to periodic past eradication efforts.	Review progress to date and survey to identify remaining populations. If eradication is considered achievable, establish a programme to complete this.
Chain of hearts (*Antigonon leptopus*)	Located at a small number of sites and subject to periodic past eradication efforts.	Review progress to date and if, as likely, eradication is considered achievable, establish a programme to complete this.
Honolulu rose (*Clerodendrum chinense*)	Located at a significant number of sites (most villages) and subject to periodic past control efforts.	Review past control programmes and current distribution. Then consider further control efforts to prevent spread to key habitats.
Giant sensitive plant (*Mimosa diplotricha=invisa*)	Located at a small number of sites and subject to periodic past eradication efforts.	Review progress to date and if, as likely, eradication is considered achievable, establish a programme to complete this.
Epipremnum pinnatum (=*Scindapsus aureus*)	Increased in distribution since Cyclone Heta (2004) and now potentially a more significant threat to forest areas.	Survey current distribution and trial new control methods. Determine whether eradication or control to keep important habitats free of the plant is the appropriate action.
Bronzed-leaved Clerodendrum (*Clerodendrum quadriloculare*)	Recently arrived ornamental found at two sites.	Complete current eradication programme.
Mile-a-Minute (fue saina) *Mikania micrantha*	A widespread weed of agricultural plantations that requires significant management by farmers	Liaise with regional programmes developing biological control for this species.
Merremia (fue vao) *Merremia peltata*	A widespread vine, considered to be a native species, which can smother large areas of forest.	Liaise with regional programmes developing biological control for this species.
Hawaiian wood rose *Merremia tuberosa*	An introduced vine recorded at a few sites and considered particularly aggressive on Niue.	Survey to identify its distribution before determining and carrying out appropriate management.
INVERTEBRATES		
Yellow crazy ant (*Anoplolepis gracilipes*)	An African/Asian species that is currently spreading in Niue and a threat to invertebrates including crabs.	Survey to identify current distribution and investigate control options to prevent spread to key forest areas.
Fruit flies (*Bactocera passiflorae, B.kirki, B.xanthodes*)	There are fruit fly species present here in Niue.	Continue to monitor population and distribution here in Niue and investigate control methods for future management.
Yellow fever mosquito (*Aedes aegypti*)	An African species that is widespread in the Pacific and carrier of dengue fever.	Continue with and enhance current programme to restrict numbers under Mosquito Control Act.

NIUE'S NATIONAL INVASIVE SPECIES STRATEGY AND ACTION PLAN • 2013–2020

Figure 18. Priority invasive species, their impacts and management actions

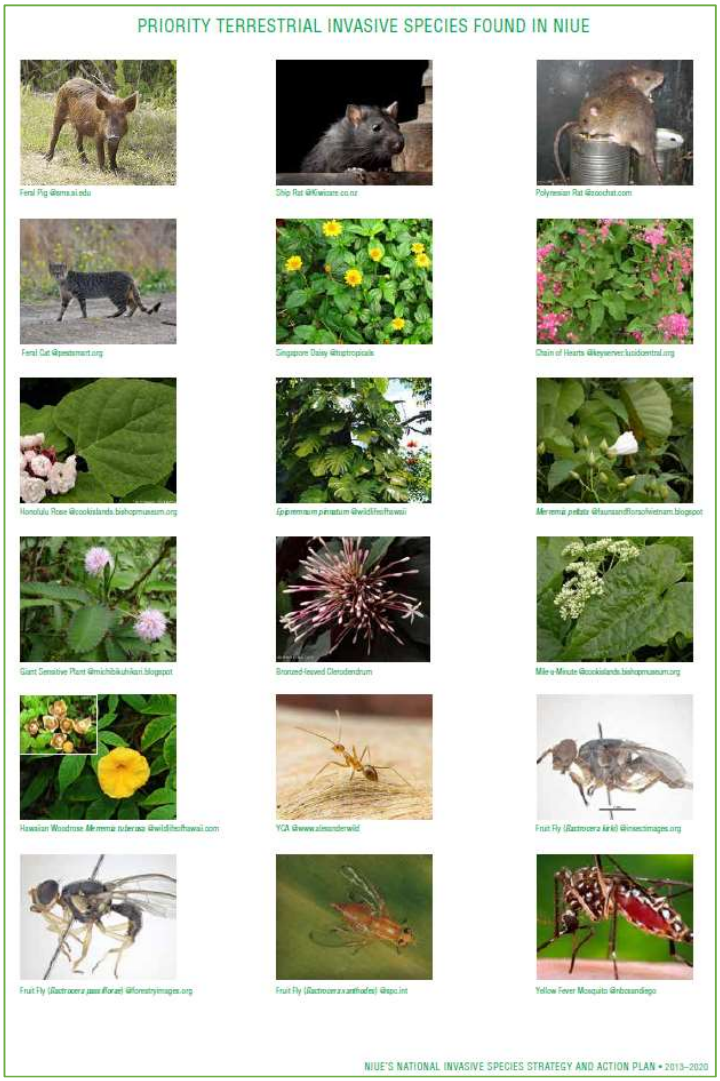


Figure 19. Priority invasive species for Niue

Figure 20. Invasive Species Coordinator giving a school presentation

Effectiveness: (effective, partial effective, ineffective, unknown)

Partial Effective

While there has been progress and actions made to address invasive species, it is acknowledged that this is an ongoing threat that will continue to require resources, both in manpower as well as funding support. Marine invasive species remain a challenge especially for the implementation of a surveying and monitoring program. The lack of technical capacity, taxonomic expertise and resources continue to be a major obstacle in achieving this national target.

Tools or methodology used for the assessment of effectiveness

Assessment was based on the number of activities being progressed and scored by the local expert team.

Provide other relevant info to illustrate how the measure has resulted in or is expected to result in outcomes that contribute to NBSAP implementation.

Refer to the State of Environment Report 2019 for additional information.

Obstacles encountered and any scientific and technical needs for address them? Include cooperation, capacity development activities or need for guidance materials and websites, web links and files

One of the challenges faced by Niue is the lack of human capacity to implement national plans and strategies. The low population means the work-pool available is severely limiting, despite available opportunities for capacity development. Major invasive species activities rely on recruiting staff from other units, which means those staffs work responsibilities are put on hold.

Management of waste and pollution

Figure 21. One of the billboards design to raise awareness about littering

Waste has a serious impact on Niue's environment. The porous nature of Niue's soils means that waste dumped on land will breakdown and may contaminate the underground water lens. All waste disposed in the open tip can become hazardous to the marine environment, especially during cyclones. Asbestos waste is dangerous to human health, and large bulky waste is ideal refuge for

vermin and other pests. Niue developed a national Integrated Waste Management Strategy, which needs reviewing and updating.

Key objectives are managing waste collection and disposal, recycling of waste, managing persistent organic pollutants and monitoring the impact to the environment from waste.

Major measure or action taken to implement the NBSAP

The Department of Environment is responsible for the management of waste in Niue. It operates three waste sites at Makato, Mutalau and Vaiea. Makato is the main site that caters for all domestic and commercial waste. Vaiea waste site is used mostly by villagers that live nearby, and Mutalau has not been used since 2005. Illegal dumping of waste remains a major challenge on the island.

Recycling is an important part of Niue's waste management strategy. Due to limited capacity, only aluminium cans are recycled through the Catholic Church Mission. These cans are crushed before being shipped to NZ for further processing. The crusher is often in need of repair with specialist parts being imported from NZ. The crusher can take time to fix, leading to cans being dumped at waste sites. While there's considerable variation in the volume of cans being recycled since 2004, the trend is positive with more cans being processed (Fig. 22)

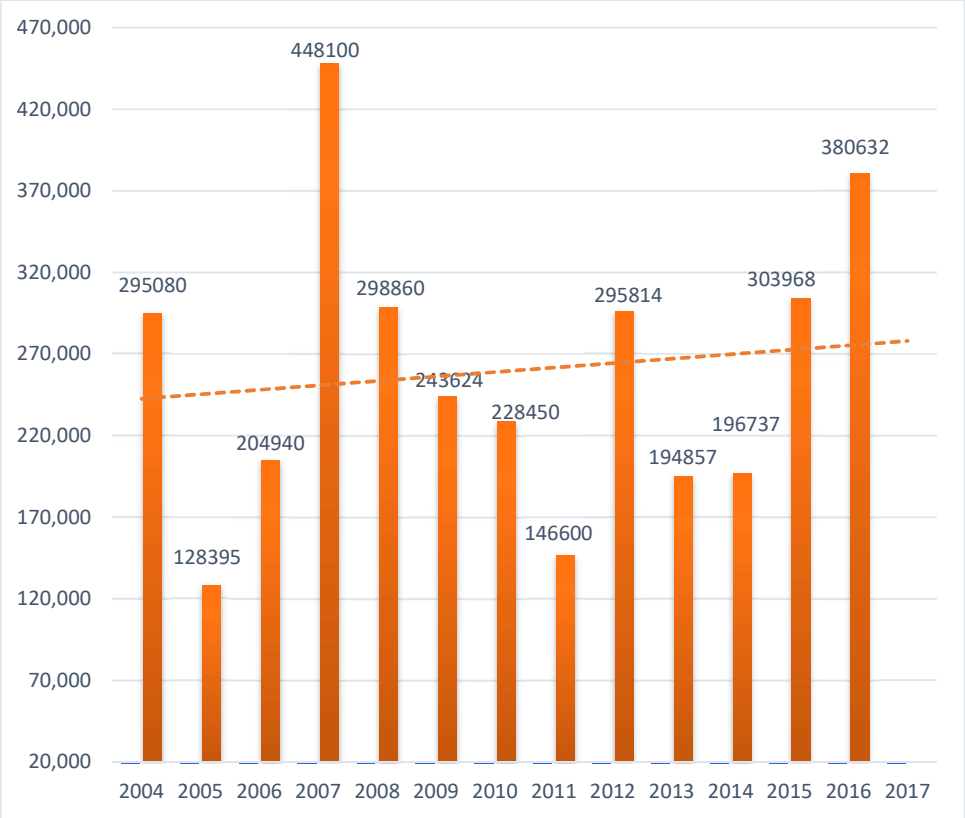


Figure 22. Number of cans being recycled from year 2004 to 2016. (Source: Catholic Mission –SOE 2020).

Domestic and commercial waste is collected weekly (twice weekly in the capital Alofi). The waste reduction strategy has seen a slight decrease in waste generated per person from 0.36kg/person/day

in 2000, to 0.27g/person/day in 2010. Organic material was the most dominant waste type generated in 2000 (59%) but was replaced by inorganic waste (49%) in 2010. An assumption is that more people are composting organic waste, and perhaps there continues to be an issue with the amount of imported inorganic waste (plastic and packaging) that needs further scrutiny.

Figure 23. Derelict and abandoned cars are an eyesore and an environmental problem. (Photo: P. Anderson)

Abandoned derelict vehicles, discarded construction materials, large household appliances and broken-down equipment are serious threats to the environment. While communities generate most of the large solid waste, cyclones also contribute to the problem. Efforts to manage this in the past included shipping 50 containers full to NZ for scrap metal.

While medical waste is relatively small compared to other waste categories, its threat to human health and the environment remains a priority for the government in terms of its management. The Niue Foou Hospital has developed a clinical waste management policy that specifies how the different types of hospital waste should be managed. Most of the waste generated from the clinic is incinerated through a wood-fired incinerator, with the ash disposed at the Makato waste site. Chemical waste is disposed down the drain at a rate of 20 litres per month.

Managing waste from biosecurity operations is another environmental challenge, due to possible introductions of diseases and pests. Waste from incoming vessels is incinerated at the Makato waste site. A recent review of the kettle style burner incinerator used for biosecurity waste has found it not to be optimal for its purpose (ENVIRON 2014). The volume of waste from vessels is not recorded.

A more serious problem is asbestos, discarded electronic goods and other hazardous waste. Many of the houses built in the 1960s used asbestos cement sheets due to their perceived durability. Over the past 50 or more years, many of these places were abandoned as families migrated overseas. The tropical climate (high humidity, salt spray and hot sun) has degraded many of the houses. Cyclones often expose deteriorating asbestos sheeting, which becomes a serious health hazard to the people. Efforts to manage asbestos sheeting resulted in much of the material being stockpiled at Huihui. Approximately 143 containers of asbestos have been removed from the island, and another 3 container loads, including old bitumen tanks lined with asbestos, remain to be removed.

As Niue families continue to embrace technology with computers, mobile phones, tablets, printers and smart television sets: the result is an increased urgency on how to manage e-waste. The majority of broken-down technology is stockpiled at the Huihui site. A small proportion is being recycled locally through Vili Franchise Ltd and the rest of the e-waste is segreated at the Makato waste site. Some e-waste is illegally dumped at uninhabited land. Batteries primarily from private vehicles are stored also at Huihui, with the aim of them being shipped overseas for recycling.

A collection site at Amanau for discarded oil primarily from the Niue Power Corporation (NPC), the Public Works Department and private garages was destroyed by cyclone Heta in 2004. Since then, approximately 12,000 litres of discarded oil from NPC, and mechanical workshops, is stored in a tank ready for shipment to NZ where it can be recycled. Ten industrial bulk containers (IBC) with a carrying capacity of 1000 l each has been installed at the Amanau site to manage oil waste. The main threat from waste oil is the potential contamination of the groundwater lens.

Figure 24 A billboard poster on persistent organic pollutants, as part of a public awareness campaign

Managing Persistent Organic Pollutants (POPs) is a priority and a challenge for Niue. Niue has signed up to the Stockholm Convention and has put in place a number of policies and actions to manage POP. In 2003, an inventory was completed with a number of contaminated sites identified. Pesticides were the main POPs identified (60 mt), followed by PCB liquid (12.5mt). A POPs National Implementation Plan was developed in 2005, and it is being updated (2020) in line with Niue's obligations to the Stockholm Convention. The revised plan will include public awareness as one of its key components (Fig. 24). A total of 3,971 kilograms of chemicals and chemical containers were removed from Niue and transported overseas for proper disposal. There are still some chemicals in Niue, which could not be collected, including acids, copper fungicide, lime sulphur spray, laboratory chemicals, and methyl bromide (Anon. 2011). Testing of local food sources for POPs found no definite levels in any of the samples (GoN 2005). A comprehensive strategy for preventing the generation of POPs is already detailed in the Niue NIP, and it addresses cross-cutting issues, such as waste incineration (quarantine, medical & solid waste), and public awareness on better solid waste disposal.

Effectiveness: (effective, partial effective, ineffective, unknown)

Partial effective

Niue's efforts to protect its environment through the management of waste continue to progress despite some significant challenges. Most of the waste generated is difficult to dispose of due to limited land availability and the porous nature of the soil. Many of the waste needs to be treated before they can safely be disposed. The infrastructure needed for such an operation is not found on island, hence the need to ship it abroad. These operations can be costly and with limited financial

resources, the problem is exacerbated. Assistance has been provided through GEF in the Australian Government for waste management intervetonson on Niue.

On the other hand the waste generated per capita for Niue households is one of the lowest in the region – 0.27kg/person/day compared to Samoa 0.38kg/person/day, Solomon Islands 0.95kg/person/day and Fiji 1.50kg/person/day (Richards & Haynes 2013)

Tools or methodology used for the assessment of effectiveness

Assessment undertaken by local experts through identifying actions achieved and the depth of implementation.

Provide other relevant info to illustrate how the measure has resulted in or is expected to result in outcomes that contribute to NBSAP implementation.

- Waigani Convention
- Pacific Regional Solid Waste Management Strategy
- Stockholm Convention
- Review and update the Waste Management Strategy for NIue

Obstacles encountered and any scientific and technical needs for address them? Include cooperation, capacity development activities or need for guidance materials and websites, web links and files

A number of challenges exist with regards to waste management in Niue. Capacity both human and financial will continue to determine the success or otherwise of local strategies. Infrastructure to manage hazardous waste will be difficult to develop on island, and therefore working in partnership with other countries is the most viable solution. Support from partners such as regional organisations (SPREP, SPC) is needed to develop national mechanisms and build awareness to engage communities to work in increasing recycling, reusing and reducing efforts.

Management of water resources

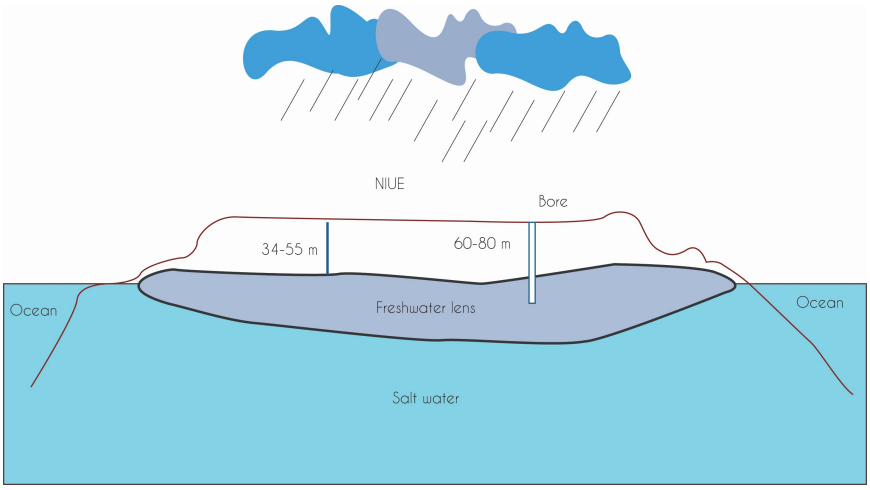


Figure 25. Schematic of the water table lying beneath Niue island

Key objectives include water resources management framework, prevent contamination of ground water lens, water quality testing programme and reduce pollution from land-based sources. The objective also includes harvesting rainwater system as part of the climate change response.

Measures taken to implement the NBSAP

Figure 26. The location of water bores and reservoir tanks around the island (Source: Niue AMP 2016)

Managing Niue's water resources is well at advanced stage with key legislation passed (Niue Water Act 2012, Water Regulations 2017), Well head Protection Regulations 2019, a Water Safety Plan developed, a Water Steering Committee established and with the shared responsibility among the three departments (Department of Utilities, Department of Environment and the Health Department).

The main public water supply for Niuean households is the groundwater lens that is pumped into 22 reservoirs, before being reticulated into 18 systems and distributed to households via a 113 km pipe network (Fig. 26). The groundwater is recharged via rainfall infiltration and the rate of recharge exceeds the rate of extraction. Domestic use accounts for 80% of the water consumption with the remaining water users being agriculture (15%) and commercial (5%). Water use per person per day was 350 litres in 2006, which was reduced to 200 litres per day by 2015. There is an ambitious target to reduce the water use to 150 litres per person per day. There is additional demand on the system during the tourist season around June to September each year. As government continues to develop and

promote the tourism sector, it is likely that water demand will increase.

Niuean households' access to stable and safe water is near 100%. The number of households with outside and inside taps was high and stable at around 80–90% between 2006 and 2011, whereas there was an decline in the number of households with rainwater fed water tanks, from 53% in 1997 to 14% in 2011 (Fig. 27). Under the PACC and GCCA PSIS climate change adaptation projects, supported by GEF, the European Union and the Australian Government, the number of households with rainwater fed water tanks increased to 65% in 2015. Access to alternative water sources, such as wells, remained stable at two to three per cent.

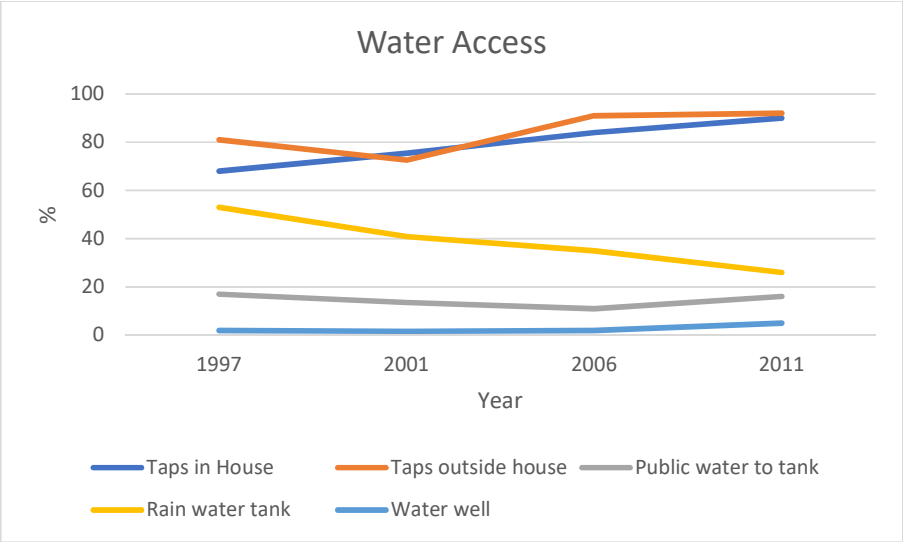


Figure 27. Percentage of households with access to water from 1997 to 2011. (Source: SOE 2019).

The groundwater lens is at most risk of contamination from sites where extractions take place. By controlling and managing activities around extraction sites, the risk can be minimised. Agricultural activities including keeping of live animals and the use of pesticides are seriously scrutinised to eliminate contamination of water. These activities need to be kept well away from extraction sites. Septic tanks using substandard materials are another threat to the groundwater system, as well as to the health of all residents. A pilot project funded by the European Union and GIZ to demonstrate an environmentally friendly sewage system with the potential to upscale and replicate. The project was dependent on funding support from international partners.

Water is being tested on a quarterly basis through a joint effort between the Department of Utilities and the Department of Health. Niue's underground water source contains essential trace elements, including chloride, sulphate, calcium, iron, magnesium and sodium (Hasan and Hetutu 2010). The concentration of these trace elements varies depending on the location of the bore and extraction depths. For example, extractions at depths of 70 m (which includes bores in the southern and central part of the island) yield high levels of chloride (529 ppm) making the water hard, compared to shallow bores where the chloride ranges from 10 to 32 ppm. Chloride plays an important role in the hardness of the water (range from 0-120 ppm for soft to moderate and 149 to 396 ppm for hard). Other trace elements, including barium, iron, manganese, strontium, and zinc, contribute to the hardness of the water. Water hardness does not have any harmful impact to health, but WHO guidelines are being considered for hardness in drinking water.

The bacterial contamination of the drinking water has been detected in a number of sites around Niue. Testing by the Department of Health focuses on total coliforms and *E. coli*. The main source of

pathogens in drinking water is through contamination from human or animal waste. Cyclones and heavy rains can facilitate the contamination of the groundwater lens. Sub-standard reservoir construction and maintenance can increase the risk of contamination. Data from 2011 to 2016 on total coliform and *E. coli* showed various levels of contamination in some of the bores, reservoirs and taps. There was a downward trend in the total number of contaminated sites between 2011 and 2016 (Fig. 28). Where contamination is detected, sites are thoroughly investigated and tanks sanitised before they can be used.

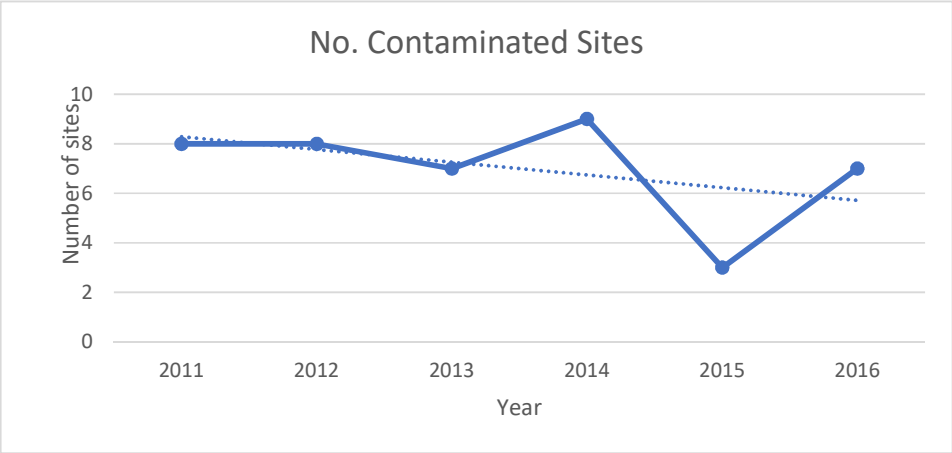


Figure 28. Contaminated sites since 2011 showing fluctuations but an overall decline (Source: SOE 2019)

Effectiveness: (effective, partial effective, ineffective, unknown)

Partial effective

By demonstrating the effective protection of Niue's water resource, it proves that the same commitment can be used to protect other ecosystems. The main challenge remains with resource availability to assist with ongoing monitoring and protection of Niue's groundwater lens and distribution to communities. Water security is another key factor that the Government is addressing by working with partners and communities to install locally made water tanks.

Tools or methodology used for the assessment of effectiveness

Assessment undertaken by reviewing actions achieved or progressed under the NBSAP and through input of local experts.

Provide other relevant info to illustrate how the measure has resulted in or is expected to result in outcomes that contribute to NBSAP implementation.

The State of Environment report that was recently endorsed by the Government highlights areas that need to be addressed. These areas contribute to the implementation of the NBSAP.

Obstacles encountered and any scientific and technical needs for address them? Include cooperation, capacity development activities or need for guidance materials and websites, web links and files

Financial and human capacity challenges are the key areas that need consistent attention to ensure that the implementation of this NBSAP objective is achieved. Another vital issue is the aging infrastructure of the reticulation system, which has contributed to the contamination. A robust coastal water monitoring system needs also to be developed and implemented.

Climate change

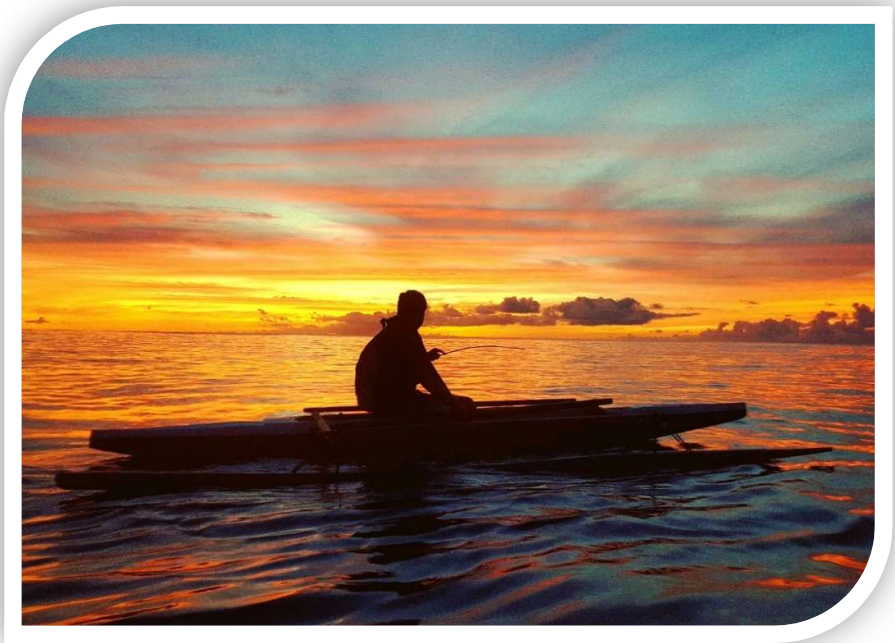


Figure 29. Fishing is important to many households in Niue.

As a small Pacific nation, Niue is extremely vulnerable to the harmful impacts brought about by the changing climate. Extreme weather conditions, such as devastating tropical cyclones and prolonged droughts, can decimate biodiversity and put people's lives at risk. The inundation of the freshwater lens by the rising sea will make living on the island challenging. Other indirect impacts may include loss of coral reefs and associated fauna and flora, putting food security at risk. Niue's climate change focus includes raising the awareness of communities on the causes and effect of climate change, collecting and managing climate data, implementing effective adaptation responses, and putting in place mitigating measures that will contribute towards a meaningful global effort in addressing this threat.

The impact of climate change cuts across the various sectors. It is pertinent that sectors consider climate proofing themselves to safeguard losses and any detriment to their welfare.

Measures taken to implement the NBSAP

Some of the major climate change measures taken by Niue include being a signatory to the United Nations Framework on Climate Change Convention and the Kyoto Protocol and lending its voice with the rest of the Pacific Island Countries and Territories demanding climate actions. In addition, Niue was one of the first countries to phase out ozone depleting substances such as, Hydrochloroflurocarbon (HCFC) and is progressing towards phasing out Hydroflurocarbons (HFC).

The Niue National Strategic Plan is the national plan for the country, comprising of seven pillars, which are the foundations in supporting the nation towards prosperity. The pillars provide the overall guidance for the various sectors to develop strategies and plans. Climate change and the Environment pillar makes up one of the seven national pillars with the overall aspiration of sustainable use and management of natural resources and environment for present and future generations.

CLIMATE CHANGE AND NATURAL HAZARDS

A safe and resilient Niue to impacts and challenges of climate change

Having an integrated approach towards increasing Niue's resilience to climate change by strategically addressing risk and vulnerability will be done by creating a well-planned and funded platform to adapt, mitigate and manage disaster risk through partnerships at the national, regional and international levels

Niue has implemented a number of national climate change policies as part of its response to safeguard communities and to contribute to global climate change efforts. Some of these national polices are outlined below.

In 2009, the National Climate Change Policy was developed with a vision of: *A safer, more resilient Niue to impacts of climate change and towards achieving sustainable livelihoods.* Six objectives were developed:

i. Awareness raising
ii. Data collection, storage, sharing and application
iii. Adaptation
iv. Mitigation
v. Governance and mainstreaming
vi. Regional and international cooperation

In 2012, a Joint National Action Plan for disaster risk management and climate change was developed to address gaps relating to the vulnerability to climate change impacts and disasters. Five priority areas are identified:

i. Strong and effective institutional basis for disaster risk reduction / climate change adaptation
ii. Strong public awareness and improved understanding of the causes and effects of climate change, climate variability and disasters
iii. Strengthened livelihoods, community resilience, natural resources and assets
iv. Strengthened capacity to adapt renewable energy technologies and improve energy efficiency
v. Strengthened disaster preparedness for effective response

The Niue Strategic Energy Roadmap 2015-2025 provides the national framework to implement adaptation and mitigation measures. There are three key focal areas under the Roadmap and targets (Table 10).

Energy Roadmap Goals	Targets
Renewable energy integration to the grid	By 2025 – 80% of energy generated from renewables
Energy efficiency in the electricity and transport sectors	By 2020 – power losses maintained at 4% (baseline is 5.2% in 2011) Power generation efficiency maintained above 4kWh/litre By 2020 – 10% electricity savings on residential, commercial and government By 2020, fuel-efficient vehicles is 1% Households to use 90% LPG for cooking
Reliable energy supply	Fuel supply security days to increase to 60 days Averaged forced outage to below 5.4% SAIDI (System average interruption duration index) to be less than 200 mins per customer

Table 10. Niue's Energy Roadmap focuses on renewable energy, energy efficiency and cost effective (Source: NiSERM)

In combatting climate change threats, one of the key responses has been adaptation in the water security area. The threat to Niue's ground-water lens from sea-level rise prompted the government to work with GEF, the Australia Government, UNDP and SPREP partners to provide water tanks for the majority of Niue residents

Localised data collection is vital to understanding patterns, influence and impacts of a changing climate to Niue and globally. Installation of infrastructures that are able to provide real-time data will assist decision makers develop appropriate responses and generate accurate information to assist their stakeholders and communities in their daily activities. The installation of a tidal gauge at the Alofi port provides real-time measurements to Niue's Meteorological Office providing information for short and long-term planning.

Effectiveness: (effective, partial effective, ineffective, unknown)

Partial Effective

Capacity and coordination remains a key factor that has hindered the progress on some of the activities under this goal.

Tools or methodology used for the assessment of effectiveness

The effectiveness score is derived from the number of NBSAP activities being implemented and consultations with local experts.

Provide other relevant info to illustrate how the measure has resulted in or is expected to result in outcomes that contribute to NBSAP implementation.

- State of the Environment Report 2019
- Niue's Joint National Action Plan for Disaster Risk Management and Climate Change 2012
- Niue Strategic Energy Road Map 2015-2025
- National Climate Change Policy 2009
- National Determined Contribution (NDC) under the Paris Agressment (PA)
- National Communications to the UNFCCC

Obstacles encountered and any scientific and technical needs to address them? Include cooperation, capacity development activities or need for guidance materials and websites, web links and files

Human and financial resources remain as obstacles to Niue's achievement of its plans. Global factors strongly influence and dictate the progress on some of the objectives and plans. Coordination also remains a concern with some activities remaining ad hoc. A consolidated stocktake needs to be carried out to include non-governmental organisations, the private sector and government agencies, to identify integrated approaches to climate change for the country. Global and regional factors strongly influence and dictate the progress on some of the objectives of the plan.

Traditional knowledge and access to benefit sharing

Figure 30. Taoga Niue craft

Biodiversity is intimately linked to the ownership of land and the cultural identity of the people of Niue. Niue's ability to curb the erosion and loss of traditional knowledge has been difficult, and there are many reasons for this. Despite the threats to traditional customs, the people of Niue still practice conservation measures such as the use of *fono* or *tapu* to protect land and/or sea sites. This practice remains strong in Niue.

The national biodiversity goal is to encourage, where appropriate, the use of traditional knowledge for the conservation of Niue's biodiversity. It is acknowledged that some of this traditional knowledge is *tapu* in some communities; therefore, adequate protection must be put in place to prevent its misuse or abuse. The knowledge holder and their communities must benefit from the use of their information.

Major measure or action taken to implement the NBSAP

TAOGA NIUE

Promote, strengthen and integrate Taoga Niue cultural heritage, language, values and identity

Tāoga Niue is the culmination of all elements that symbolise the tagata Niue through its identity, Vagahau Niue, culture and heritage. Recognising the importance of Tāoga Niue for the well-being of the tagata Niue and the need to preserve the Niuean culture and heritage is part of the strong connection to living on Niue.

All residents and visitors embrace and respect Taoga Niue

To develop, sustain and enhance the sovereign and ethnic identity of the people of Niue through their own distinctive language, customs and traditions, arts and craft, history and the environment

Taoga Niue actively integrated from the home to the national level

Vagahau Niue, the arts, customs and traditions and history will be enhanced with the support of key stakeholders at all levels. This will be reflected by the ownership of Taoga Niue, namely the magafaoa, village and national as well as government sectors.

The cultural bridge with Niueans abroad is strengthened

Niueans living abroad are important and the cultural bridge with those living in Niue will continue to feature and will complement efforts in other sectors to rebuild Niue's population. This is Niue's link to its cultural diaspora.

Figure 31. Taoga Niue is a priority for the Government's National Strategic Plan

The culture and traditions of Niue are enshrined through the passing in Parliament of two key legislations: Vagahau Niue Act 2012, and Taoga Niue Act 2012. These legislations ensure the protection of Niue's culture, traditional knowledge, artefacts and language.

The Taoga Niue Act establishes a number of key instruments including the Department of Taoga Niue, the Taoga Niue Council, controlling the export of antiquities and protected objects, and protecting traditional knowledge and expressions of culture. The holders of traditional cultural rights must give prior and informed consent before their traditional knowledge can be used. The Act further provides how to obtain a prior and informed consent from traditional owners, through the Director of the Department of Taoga Niue.

The Vagahau Niue Act 2012 recognises Vagahau Niue as the official language of Niue and it establishes the Niue Language Commission to protect and promote the language. Official government communications must be in Vagahau Niue, or translated to Vagahau Niue as soon as practicable. The work of the Department of Taoga Niue has focused on documenting traditional knowledge around cultural sites. Documentation is through video interviews with landowners and mapping of sites. Some of the sites are included in eco-tourism ventures and are promoted through Tourism Niue such as Anapala (freshwater source), Avaiki (where first Niue forefathers landed), Hio (site where the Peruvian 'black birder' Irole was wrecked in 1877 and Matapa Chasm (bathing site for Niue kings). Some cultural sites are recognised based on religious links (e.g. Peniamina's Grave and Tomb Point). While tourism sites are often a priority for government and villages in terms of maintenance, the majority of lesser-known sites are located in villages where access can be challenging and maintenance sporadic. Taoga Niue's work provides attention to the lesser-known sites, capturing the knowledge and stories associated with the sites.

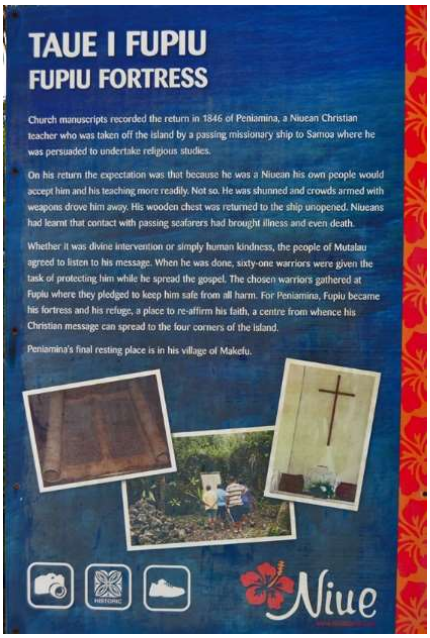


Figure 32. Tourism Niue promotional material

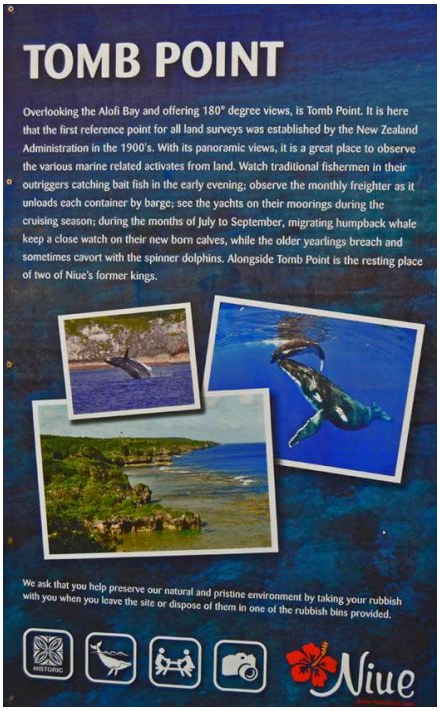


Figure 33. Tourism Niue promotional material

The Niue National Strategic Plan prioritises Taoga Niue as one of its key pillars. A key part of the strategy is recognising the role played by Niueans residing overseas in not only strengthening cultural ties but encouraging population growth.

Culture and traditional practices and ceremonies remain alive in Niue with special celebrations of cultural days for the villages.

Figure 34. One of the tourism sites that has cultural significance

Figure 35. Agriculture is vital for Niue's food security

Figure 36. Social interactions for the elders help with strengthening Niue's culture, crafts and society

It is 10 years since the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from their use was adopted by the Conference of the Parties to CBD. Niue recognises the importance of being part of this international instrument but is yet to draft and submit the necessary paperwork to fulfil this aspiration. Through a recent regional project implemented by SPREP, Niue is hoping that it will be able to accede and develop legislative support to comply with the Protocol.

Effectiveness: (effective, partial effective, ineffective, unknown)

Partial effective

Achieved half of the objectives

Tools or methodology used for the assessment of effectiveness

Progress has been in made in the two objectives of documenting and protecting traditional knowledge. The Taoga Niue Act 2012, provides the necessary protection of cultural artefacts and traditional knowledge holders. Documentation of the knowledge has been challenged by resources and capacity, as well as the dwindling number of traditional knowledge holders.

Provide other relevant information to illustrate how the measure has resulted in or is expected to result in outcomes that contribute to NBSAP implementation.

With the work of Taoga Niue, together with other government departments and village communities, real progress is being made to identify cultural sites of significance and customs or practices associated with these sites. Some of these sites will be accorded national protection to ensure that they continue to tell the stories of Niue's history.

Obstacles encountered and any scientific and technical needs for address them? Include cooperation, capacity development activities or need for guidance materials and websites, web links and files

Traditional knowledge is being eroded world over, and Niue is not immune. Some of the cultural practices are being replaced with modern versions. Some people frown when cultural ceremonies are held, labelling them as backward or outdated practices. Niue has a unique situation whereby the biggest population of Niueans resides in New Zealand and Australia. This often means that cultural ceremonies held overseas use food, materials and money as substitutes for what would be available in Niue. Novel values and societal worth are associated with these items, which eventually are imported into Niue and adopted.

The work by Taoga Niue to document cultural sites is challenging due to the knowledge holders residing overseas or are passing on. While the technology is available and is being used by staff, there is still a capacity issue with regards to skilled staff to undertake cultural mapping and to liaise with community elders. Funding constraints also remain a challenge.

The translation of scientific and technical information to the Niuean language remains problematic due to limited resources.

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Section III. Assessment of progress towards each national target

Theme 1. Conservation and sustainable management of terrestrial habitats

Progress & Date of Assessment:

Progress	Indicator	Evidence used	Level of confidence.
	Land area under conservation	20% of the land area (5405 ha) is protected under the Huvalu Forest Conservation Area and the Hakupu Heritage and Cultural Park. Four tapu (no-go) areas are designated within the Huvalu Forest Conservation Area covering an area approximately 100 hectares. Villages have declared small protected areas within their jurisdictions, and these are being developed and will be documented by the government. Niue's rainforest has declined to half of what it once was. Human settlement, agricultural conversion, extreme climate events (cyclones and droughts) and invasive species are contributing factors to forest decline. The population decline due to migration has led to reduced agricultural activities. The abandoned agricultural lands have reverted into secondary forests. A few pockets of primary forests remain intact in the heart of the island, with a big proportion found at the Huvalu Forest Conservation Area. Agriculture is important to most Niuean people, and most households have a plot used for planting crops. About three per cent of the total land area is used for agriculture. Taro is the main crop planted, followed by bananas, cassava, yams, lime, passionfruit, vanilla, and noni. The livestock kept is mostly pigs and poultry, as previous efforts to farm cattle, goats and sheep were unsuccessful. Land degradation has been exacerbated through a number of practices, including disc ploughing, the shifting nature of agriculture combined with significantly reduced fallow periods, large-scale land clearance for export cropping of taro, and increased reliance on synthetic fertilisers and herbicides. Niue's soil condition is variable but generally well drained and porous.	High – Based on good evidence

		Legislative framework enacted, drafted or being developed with a focus to conserve and sustainably manage terrestrial resources. Capacity training on resource management, assessment and documentation is ongoing and continues to be a priority for all government agencies. Knowledge on Niue's biodiversity and ecological systems has increased due to surveys and assessments undertaken by experts. The inputs and contributions of locals and villages are critical in this knowledge process. Surveys and assessments include botanical survey, soil conditions and types, and populations of birds, mammals, reptiles, insects and land crabs. National strategic plans and policies including from various government agencies have recognised the environment as a key factor in their business plans. The Niue Strategic Plan 2016-2030 enshrined the importance of environment as one of its pillars over the coming decade. Community and village level management plans need to be supported and developed to ensure clear understanding on what can and cannot be done in conservation sites. Awareness activities to highlight conservation and sustainable management of resources, are celebrated and displayed during village days, as well as internationally celebrated events (e.g. World Environment Days). Ongoing projects focus on conservation and sustainable management of Niue's resources, especially with a strong engagement of village communities. Securing long-term financial resources for the management and ongoing biodiversity assessments and surveys remains a challenging aspect for the government. Important legislation drafted remains to be passed in parliament, especially those focusing on forest management and conservation. Management plans for the protected areas to be developed and endorsed. Community engagement and participation need ongoing support.	
OVERALL PROGRESS & DATE OF ASSESSMENT		Progress but insufficient – June 2020 Niue's assessment on the progress made under the conservation of land area is seen as sufficient but with more effort needed. While the global target under the Aichi Biodiversity Target of 17% of terrestrial areas to be conserved, Niue has exceeded this by	

	conserving 20% of its terrestrial area. The most pristine of forests, homed to the Hakupu and Liku communities, are conserved under the Huvalu Forest Conservation Area. A number of studies have found the intact forests to support diverse and unique native species including the peka, lupe and uga. The Huvalu Forest Conservation Area has a draft management plan that is still in need of approval and endorsement by the communities.

Monitoring & Other relevant information

Protection of terrestrial biodiversity goes hand in hand with the conservation of their habitats. Fortunately, a big proportion of Niue's primary forests is protected under the two conservation sites (Huvalu FCA and Hakupu CP). Through aerial mapping, it provides the government the information on how land is being used and managed. Over the years, forest cover has increased due to the conversion of agricultural lands to secondary forests. Unfortunately, secondary forests are comprised of fast-growing invasive trees and vines including *Epipremnum pinnatum, Merremia peltata, Clerodendrum quadriloculare* and *Mikania micrantha.*

Additional information useful for monitoring of conservation areas is gauged through the Agricultural Census, Village inspeciestions, as well as the population census. The activities undertaken by villages can be used to correlate land-use changes. Reviewing of policies and plans, as well as the development of new ones provide opportunities to reflect on effective systems and provide recommendations for improvement. All these systems are *ad hoc* at best but a more coordinated approach is needed to track progress and streamline future planning. A regular approach to reviewing the NBSAP and developing the country's State of Environment reports go a long way to addressing a good monitoring system.

Collecting data has traditionally been a priority for the government but the means to do this has often been the hurdle. The recent collaboration with SPREP and partners on utilising the Inform project, of building national and regional capacity to implement MEAs by strengthening planning and the state of environmental assessment and reporting in Niue and the Pacific, has provided a means for data repository and harvesting.

Theme 2: Conservation of Terrestrial Species

Including under this section are the objectives (1- 7) covering Niue's native and iconic species (peka, uga, hega, lupe, and the herpetofauna.

Progress	Indicator	Evidence used	Level of confidence.
	Population of native species improved	Very few endemic species are found in Niue, and those that are known are rare and vulnerable to extirpation. The only native mammal, the Peka or flying fox, is a protected species but hunting is permitted during the month of December. Peka was harvested in very high numbers between 1000 to 1500, beyond the recommended harvest of 748 per annum in a 1998 survey (Brooke 1998). The population crashed after the 2004 Cyclone Heta, with about 95% exterminated, and a mere 60 individuals were recorded. A population target of 8,000 individuals is estimated to be desirable to allow for the current harvesting and to withstand future cyclones (SOE 2019). Nine skink and gecko species are recorded for Niue and most are common (Table 4). The Olive small-scaled skink is a conservation concern and is listed as endangered under the IUCN Red List. Recent surveys have found new individuals after more than 30 years since they were last reported (Hathaway et al. 2017). The House gecko is a recent introduction and is an aggressive species that has been blamed for the population decline of native geckos. Uga is a delicacy and around 60% of households actively participate in hunting them. In 1989, only 30% of households were recorded as actively participating in the hunting of uga (see Table 3). The average number of uga harvested is 27 per household, a slight increase from 24 per household in the 1989 Census. Hakupu, Avatele, Makefu, Hikutavake and Liku households harvested the most. Niue has 32 bird species excluding the three extinct species (Niue Night Heron - *Nycticorax kalavikai*, Niuafo'ou Megapode (*Megapodius pritchardii*) and the Niue Rail (*Gallirallus huiatua*). Some birds are vagrants or migrants, and others are resident breeding birds. Niue's bird population fluctuates significantly due to weather events, for example the population of the Pacific Imperial Pigeon, or Lupe (*Ducula pacifica*), declined by 28-64% after Cyclone Heta in 2004. Nearly 10 years later the lupe population had increased (Fig. 9). The recovery was attributed to a 3-year	High – Based on partial evidence

		moratorium, the abundance of lupe's preferred fruits and the absence of another category 4 + cyclones. Cyclones are the most serious threat to native species causing population crash and years of slow recovery. The destruction of habitats, the lack of fruits and food, and the defoliation of forests making species vulnerable to be hunted are the reasons why native species populations crash. Declaring a moratorium on the hunting of all native species after cyclones is the most effective method to safeguard population. This was carried out after cyclone Heta in 2004, which led to a rapid recovery of the peka. The presence of invasive rats, wild cats and feral pigs provides additional threats to native species. These invasive species prey on native species, or outcompete them for habitat and food. Although no data exist on the impact caused by the export ban on the coconut crab (uga), it can only be assumed that overall, this has had a significant positive effect on the population of species. Local harvest remains high and particularly in areas close to intact primary forests.	
	Vegetation types and areas protected	Surveys completed updating the classification of Niue's vegetation types. Four vegetation types documented in the 1993 SOE based on the Forestry sector (open areas, coastal forest, light forest and merchantable forest). Seven land categories were used by Nemaia (2004) for land types including mature forest, secondary forest, littoral forest, littoral shrub land, managed land and bare land. Overall, there is a net gain in mature forests from 1994 to 2001 primarily due to secondary forests maturing. The littoral forest and shrub land had some minor gains, with managed land and bare land contracting.	
OVERALL PROGRESS & DATE OF ASSESSMENT		On Track to Achieve – June 2020	

Monitoring & Other relevant information

Ongoing biodiversity surveys and assessments continue to build knowledge on the state of Niue's native species. Strengthening the connection between species and their habitats will ensure that any monitoring can track the ecosystem and species indicators. Agricultural census and population census provide data that can be used for tracking of activities that influence the state of the ecosystem and species.

Hunting pressure needs to be closely monitored through gun and ammunition control and regular surveys with hunters. The village council needs to be provided with information on the impact of hunting on native species and recommendations that would help safeguard species.

Theme 3: Conservation and sustainable management of marine ecosystems and species

This theme covers eight objectives of the NBSAP ranging from management of costal inshore, pollution of the marine environment, threatened species and resourcing the Fisheries division.

Progress	Indicator	Evidence used	Level of confidence.
	Area of marine ecosystems under conservation	One of the biggest achievements is the establishment of the Niue Moana Mahu MPA and the Beveridge Reef Nukutulueatama Special Management Area. The area being protected is around 127,000 km^2 or approximately 40% of Niue's exclusive economic zone (EEZ). A scientific survey undertaken in 2017 provided data that supported the designation of this site for protection. The population of Grey-reef shark was found to be the highest at this site than anywhere else in the world (Table 5). Furthermore, the fish biomass and population of many endangered species (giant clams, echinoderms – Fig. 13) were greater at Beveridge Reef than around Niue (Friedlander *et al.* 2017).	High – Based on partial evidence
	Population and trend of marine species	Another important national achievement has been the effort to safeguard whale migration and visitation and creating whale-watching tourism to support the local economy. There is an estimated 5,000 Oceania humpback whales recorded in the South Pacific. This is the lowest of all humpback populations globally and the projection does not follow those in other parts of the world, where they are increasing (Constantine et al. 2012). It is for this reason that humpback research needs to be constant and management efforts need to be adapted to safeguard Oceania humpbacks. The deep bathymetry close to the island provides an important wintering area for many whale species, especially deep divers like sperm whales and beaked whales (see Table 7). Each year the number of visiting whales increases (Fig. 14). Several of the whales in Niue have been matched to others sighted in the Cook Islands, Tonga and the Kermadec Islands, New Zealand. Another individual seen in 2011 revisited the island in 2015.	High – Based on partial evidence

	Fish catch	The low national population has contributed to keeping coastal fishing pressure within reasonable condition. The current marine conservation areas need some protection, as available data show no significant differences between fish biomass within and outside of these protected areas (Table 8). Commercial fishing in the EEZ has been low and the number of fishing licences being issued remains within the Government's plans. Better catch records are needed in this sector to allow for improved management of offshore and inshore fisheries stocks.	Medium – Based on partial evidence
OVERALL PROGRESS & DATE OF ASSESSMENT		Progress but insufficient – June 2020	

Monitoring & Other relevant information

Monitoring of this theme is not streamlined and quite variable. With cetacean monitoring, the presence of a local NGO, Oma Tafua, and the participation of the public and the private sector (whale watch tours, hotels) has contributed to a good data that can be used to assess the number and species of whales visiting Niue. This has led to the development of a national framework for the protection of these species. Domestic fisheries on the other hand have not been diligently monitored due to lack of human capacity and resources. Some data do exist and need further assessment. One of the key activities of this theme is to provide support to the Fisheries authority to assist them with managing Niue's marine resources. This action will need to be accelerated and prioritised so that good data can be collected to allow for better management regime. The pelagic fishery is monitored through the number of vessels that hold a Niue issued licence. Data from these vessels are captured and included in the Fisheries Division's Annual Report.

Theme 4: Management of invasive alien species

The assessment of theme 4 is based on three indicators – invasive species managed, area saved from invasive species and national framework established to address invasive species.

Progress	Indicator	Evidence used	Level of confidence
	Number of invasive species managed (detected, under control or eradicated)	Niue has listed priority invasive species present in the country, as well as the top ten species for managing (NISSAP 2013). Surveys of a selected invasive species revealed interesting scenarios that have informed management actions. Feral pigs are recognised as a serious invasive species in Niue's NISSAP causing harm to agricultural production, forests and uga populations. SPREP and the Government commissioned a report by Jack Craw (2016) on how best to manage the feral pig problem. Craw (2016) found feral pig populations are best managed by managing domestic piggeries. This is because feral pigs and domestic pigs were mixing creating a bigger feral pig population. Prior to Craw's report a bounty was used to encourage villages to kill feral pigs for a monetary reward. Craw found this method ineffective, as many of the claimants owned up to submitting tails from domestic pigs, rather than from the feral population. Efforts to eradicate invasive plants include *Antigonon leptopus, Mimosa diplotricha, Clerodendrum chinense, Epipremnum pinnatum* and *Sphagneticola trilobata* have made good progress but some are beyond eradication (*E. pinnatum*) and only control options will allow the government to manage this. Three priority invertebrate species – *Anoplolepis gracilipes,* fruit flies (*Bactocera* spp.) and *Aedes aegypti*. Ongoing monitoring for the fruit flies due to their economic and security impacts on Niue's agriculture industry.	High – Based on evidence

	Size of forests/land regenerated following removal of invasives	Early in 2004, cyclone Heta struck Niue causing severe damage to Niue's vegetation. Three months after the cyclone, a survey by Space et al. (2004) was commissioned by the government to search for new invasive plant species and to assess the expansion in range and vigour of species previously recorded. The survey found light-loving species that take advantage of disturbance and new openings in the forest have become more prevalent, including several species of *Crotalaria*, *Leucaena leucocephala*, *Justicea betonica*, *Mikania micrantha*, two *Salvia* species, *Stachytarpheta cayennensis* and *S. jamaicensis*, several large grass species, *Tithonia diversifolia* and the indigenous vine, *Merremia peltata*. Many species have expanded their range and will likely cause problems to native species.	Low – Based on partial evidence
	Activities to raise awareness/engagement of communities	In a small country where there is a serious limitation on human resources, it is necessary for staff to wear many different hats in order to progress the department's workload. In an ideal world, an invasive species coordinator is appointed to focus solely on invasive species activities. In Niue's case, the management of invasive species is a responsibility for the officer who is also needed to assist with waste management, climate change and biodiversity conservation duties. Unless more funding and people can be sourced, making invasive species a core position will remain a long-term aspiration. Niue has established a national multi-agency and cross sector national committee with the purpose of overseeing the implementation of the NISSAP and the NBSAP. An additional aim was to include invasive species at a high-level government forum. There is no mechanism at this stage to facilitate this activity, other than opportunistic meetings with ministers on biodiversity related matters. Efforts to continue to promote this high-level attention on invasive species should continue.	Medium – Based on partial evidence
OVERALL PROGRESS & DATE OF ASSESSMENT		On Target to Achieve – June 2020	

Monitoring & Other relevant information

The monitoring related to this target is partial. The activities under the objective are captured in various reports (GEF-6 preparatory document – power point; NISSAP 2015-2020), which are reporting requirements to donor agencies. Under the NISSAP, monitoring is to be conducted annually by the invasive species coordinator, and that an independent reviewer is to be engaged in a mid-term review of the Strategy. There needs to be an ongoing database within the Department that keeps track of outputs, as well as other important metrics that would be useful in future project development. At the current best there is a sort of a system that keeps tabs on activities being implemented, although the lack of a proper repository system means that activities and reports are often difficult to find when it comes to reviewing of activities. The hope that with the currently implemented INFORM system being spearheaded by SPREP and countries, there is a secure repository system that will make tracking of activities easier. See SPREP (https://pacific-data.sprep.org)

Theme 5: Management of waste and pollution

Five objectives of this theme include waste recycling, collection, disposal, POPs, and monitoring.

Progress	Indicator	Evidence used	Level of confidence
	Volume of waste generated, collected and managed	100% of Niue households have access to regular solid waste collection. Solid waste is collected and disposed off weekly, and in some places twice weekly. Recycling collection is carried out fortnightly since 2018. A Clean Niue Campaign funded by NZAID in 2004, focuses on removing abandoned vehicles from communities. Waste Management Plan first developed and endorsed in 2000 by cabinet. Recommendations in the management plan were partially implemented due to resource constraints (staff and funding) Niue is party to the Waigani Convention, which bans the importation of hazardous and radioactive wastes to Pacific Island Countries. The Convention enables countries like NZ and Australia to receive hazardous wastes exported from Pacific Island Countries. The Dept. of Environment is responsible for regulating solid, liquid and hazardous waste management in Niue, and also for providing waste management services such as waste collection recycling and disposal in partnership with other stakeholders. A waste collection system is outsourced with residential waste collected twice weekly. The country is divided into three zones for collection purposes. Commercial and businesses are responsible for their own waste management. Target to reduce waste household and commercial by 25% Over the last ten years the quantity of solid waste disposed has reduced per capita but may increase as visitor numbers increase.	High – Based on partial evidence

		Kg of waste generated per person per day remains one of the lowest in the Pacific Island region (0.27kg/person/day) Aluminium cans, scrap metal and lead acid batteries are recycled. Most of these are sold and shipped overseas for further processing.	
OVERALL PROGRESS & DATE OF ASSESSMENT		On target to achieve – June 2020	

Monitoring & Other relevant information

The monitoring related to this target is partial.

Data are collected for waste collection and recycling. The Catholic Church Mission that coordinates the recycling of aluminium cans do keep a good record of the volume of cans being recycled.

Theme 6: Management of water resources

Under this theme there are 4 objectives

Objective 1: Complete the establishment of a framework for the management of water resources

Progress	Indicator	Evidence used	Level of confidence
	Household having access to potable water	Water supply infrastructure began in 1950s with the digging of a well in Fonuakula and drilling of bores fitted with pumps driven by windmills between 1950 to 1963. From 1964 to 1968 piping was installed from bores to village tanks and village standpipes and pressure pumps were used in some villages. Windmill and diesel driven pumps were replaced with electrical motor driven pumps in 1971. Reticulation piping was extended to taps for each household from 1983-1984. Drilling of 70m of 125mm PVC cased bores was undertaken in 1990/1991 for each village, and all fitted with electrical centrifugal pumps. From 1992 to 1996, steel tanks for village water supplies was constructed. From 1997 to 1999, AusAID supported the improvement in the operation and maintenance of water supply system and a new electrical switchboard was installed, which allowed for the detection and ultimately the reduction of system leakage by 50%, which occurred mostly at households. As of 2011, 99% of Niuean households have access to public piped water. Regular monitoring of household focuses on the number of taps inside and outside homes, water tanks and the connection of piped water to water tanks and access to other sources of water (e.g. well).	High – Based on partial evidence
	Drinking water quality maintained at safe levels	Water is being tested on a quarterly basis by the Department of Health. Trace elements found in the underground water lens are of a safe level. Water hardness is variable but generally considered safe. Contamination of water sites can be facilitated by cyclones and heavy rain. Substandard constructions of tanks can also lead to water contamination. Foraging animals or keeping animals close to water sites can also cause water problems. Bacterial contamination was detected in some of the sites being monitored, although most of the contamination were total coliform counts. The presence of E. coli in a number of sites including Tuapa Reservoir, Vaiea Reservoir 2 and Mutalau Reservior is concerning	Low – Based on limited evidence

		as it indicates faecal contamination and potential health problems for residents. When this occurs, investigation is carried out and sterilization of all contaminated equipment is done before they can be used.	
	Volume of underground water levels sufficient for all residents	The main source of freshwater in Niue is groundwater in the form of a freshwater lens of approximately 200 sq. km in area (the total area of Niue Island, 261 sq. km) with 50-60 sq km contained in a 1 km strip around the coastline. The surface of the lens is 34 – 55 m below ground level. An estimated 132 million m^3/yr of water recharges the aquifer. Assuming 30% of this is available as sustainable yield, this provides an initial estimate of the sustainable yield of 39.7 million m3/yr or as a daily pro-rated yield this equates to 108,820 m^3/d or 1,260l/s. This rate far exceeds the current rate of extraction, estimated at 2000m^3/d (Levi & Siohane 2009). The government has put in plans to reinstate household rainwater catchments, not only as a source of emergency supply, but also as a conservation measure and an alternative supply (Niue AMP 2016).	High – Based on comprehensive evidence
OVERALL PROGRESS & DATE OF ASSESSMENT		Progress but insufficient – June 2020	

Monitoring & Other relevant information

The monitoring related to this target is adequate. Due to the importance of water to the security, health and wellbeing of the country, this is heavily monitored and regulated. Regular monitoring by the government departments ensure data are being collected and assessed. Legislative framework and water management plans provide the necessary support to ensure that government staff are working with communities to achieve the best possible outcome for all Niueans.

Theme 7: Climate change

Four key objectives under this theme cover awareness, mitigation and adaptation measures, collection of climate data, and green house gas emissions

Progress	Indicator	Evidence used	Level of confidence
	Adaptation measures to reduce the impacts of climate change	Conservation of environment and habitats not only ensures the integrity of ecological systems and functions, but the protection of critically endangered and rare species. Niue has met the global targets of protecting and conservation over 20% of terrestrial habitats and over 40% of marine and coastal habitats. The protection of these habitats builds resilience against climate impacts. Much of the recently enacted legislation contributes to ensuring that sectors and key issues are safeguarded, which in turn contributes towards climate resilience. The Maritime Zones Amendment Act 2019, Biosecurity Act 2016, Meteorological Services Act 2013, Environment Act 2015, Niue Moana Mahu Marine Protected Area Regulations 2020 are some of the recently enacted legislation. Policies such as the Niue National Strategic Plan, the National Climate Change Policy, the Joint National Action Plan, the Energy Roadmap and the National Biodiversity Strategic Action Plan put climate change as a key priority to address. Climate change awareness programs and actions have been an important area for many government agencies, non-governmental organisations and the private sector. Promotion of programs, such as the installation of water-tanks for water security and upgrading meters for electricity, often have climate change as one of the drivers. Students from the local school also participate in environmental awareness activities with a climate change focus.	High – Based on partial evidence

		With the devastating impacts caused by the category 5 cyclone Heta in 2004, some of the key government infrastructures are now relocated to inland areas, as opposed to rebuilding on vulnerable sites closer to the coast. The main hospital is one facility that is now relocated inland. Localised data collection not only provides useful information for sectors but also improves the accuracy of modelling globally. Niue has a weather station collecting data for over 60 years, and relies on data collection from neighbouring countries to provide further information useful for Niue sector planning.	
	Greenhouse gas emissions	Niue's contribution to global GHG emissions is negligible (<0.0001%); and overall, Niue is a net sink. The country is working to reduce its emissions further, in particular in the energy sector. Fossil fuel remains the key source for Niue's GHG emissions. A range of measures is proposed to reduce GHG emissions including reducing dependence on fossil fuel, improving energy efficiency, exploring renewable energy and improving cost-effectiveness of energy services.	High – Based on partial evidence
OVERALL PROGRESS & DATE OF ASSESSMENT		On Target to Achieve – June 2020	

Monitoring & Other relevant information

A monitoring framework will be established.

Theme 8: Traditional knowledge and access to benefit sharing

Two key objectives are to document and protect traditional knowledge and to ensure equitable sharing of benefits from use.

Progress	Indicator	Evidence used	Level of confidence
	Traditional knowledge valued and integrated into national policies	Niue's culture and heritage (taoga) is enshrined in Niue's law (Taoga Niue Act 2012) and the language is also protected and strengthened through the Vagahau Niue Act 2012. The legislation establishes the government department (Taoga Niue) to coordinate all matters relating to the culture, history and heritage. This includes establishing an expert advisory council (Taoga Niue Council) and control the export of artefacts that are of national cultural and historical significance. It further stipulates the protection of traditional knowledge and expressions of culture. The Department of Taoga Niue is charged with promoting, strengthening and integrating Taoga Niue cultural heritage, language, values and identity under the Niue National Strategic Plan – Ko e tohi Fakatokatoka Gahua ha Niue.	High – Based on partial evidence
	Accession to the Nagoya Protocol on ABS	Niue has implemented measures to protection traditional knowledge holders from being exploited through the Taoga Niue Act 2012. Niue is implementing a regional project with the aim of raising awareness locally and becoming a party to the Nagoya Protocol. A national workshop was held in 2019 with villagers and government staff attending to learn more about the project purpose and expected outcomes. A bioprospecting legislation has been discussed but is yet to be drafted.	Moderate – Based on partial evidence
OVERALL PROGRESS & DATE OF ASSESSMENT	Progress but insufficient – June 2020		

Monitoring & Other relevant information

Monitoring related to this target is partial.

Traditional knowledge is part of Niue's Taoga. It is valued and legislative support exists under the Vagahau Niue Act 2012 and the Taoga Niue Act 2012. A national framework exists under the Taoga Niue Council and the Department of Taoga Niue that provides the oversight in monitoring aspects as per the legislation.

Section IV. National contributions in achieving Aichi Biodiversity Targets

Aichi Targets	National Contributions	2030 Agenda for Sustainable Development & SDGs
Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society		
 By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably	Awareness raising initiatives are a key activity for many organisations and government departments. Awareness raising and community engagement cover a wide range of environmental issues (e.g. waste, soil health, invasive species, persistent organic pollutants, culture and traditional knowledge, health, climate change and fisheries); each initiative builds knowledge and fosters caring for the environment and biodiversity. There is emphasis on engaging school students in environmental activities, and many of the awareness materials developed by the schools are displayed throughout buildings in Alofi. Village farmers are included in government's capacity building programs, where sustainability and environmental stewardship are encouraged and promoted. While no specific indicators can be found to corroborate the level of awareness of the community, it is safe to state that most Niueans value many of the resources provided by nature. The engagement by villagers and community leaders to embrace the management of Huvalu Forest Conservation Area provides a good indication of a brighter future.	Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development Goal 12: Ensure sustainable consumption and production patterns 12.2 By 2030, achieve the sustainable management and efficient use of natural resources

 By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	Niue's National Strategic Plan (Ko e Tohi Fakatokatoka Gahua ha Niue) calls for working together to protect the people and the environment – Tanaki, Leveki, Puipui, Anoiha. This is a high-level roadmap setting out the government's priorities over the next decade. Seven national development pillars guide sector strategies, plans and programs. The Environment is one of these pillars and, which also include Social Services (harmonious and safe community) and Taoga Niue (cultural heritage and values). The Infrastructure pillar advocates for the sector to ensure minimum adverse impacts on the environment and resilience to natural hazards.	Goal 1: End poverty in all its forms everywhere It is acknowledged that Niue does not have extreme poverty to the level seen in other parts of the world. However, one of the targets under this Goal is to assist those vulnerable to reduce exposure and vulnerability to climate related extreme events and other economic, social and environmental shocks and disasters. Given the vulnerability of Niue to cyclones and droughts, efforts by the government to address the national targets will help achieve this SDG Goal.
 By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	Some of the incentives such as the Moui Faka Niue scheme that provided subsidies to landowners to encourage agricultural production had led to loss of primary forests. The economic focus on promoting exports also led to large-scale farming that involved the use of disc ploughing to clear land. The 2009 Agriculture Census noted that 600 acres of land was cleared using bulldozers. An additional consequence of land clearing is the declining soil fertility. The Government has since advocated the need for sustainable use and management of the soil, forest and biodiversity (National Strategic Plan 2016-2026). The understanding and awareness on soil types and activities that can contribute to soil health and therefore better crop yield has been enhanced through recent studies and research. Another incentive that the government employed was a bounty for every feral pig that was caught. Hunters were paid a small cash incentive to bring in the tail of every feral pig. Unfortunately, domesticated pigs were killed in order to claim the cash incentive. Feral pig numbers remain problematic and a rethink of the scheme was highly recommended.	 Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Goal 14: Conserve and sustainable use the oceans, seas and marine resources for sustainable development 14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.

 By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	The Niue National Strategic Plan 2016-2026 provides the vision for the country with a focus on a number of pillars. Environment and Climate change pillar advocates sustainable use and management of Niue's natural resources and environment for present and future generations. Supporting the Infrastructure pillar ensures the sustainable use and management of key infrastructure that is climate proof and resilient. Under the Niue NSP, sector wide plans are developed, including sustainable production and consumption and the conservation of Niue's natural resources. The conservation of landscape and seascape provide insurance for the current and future generations, as well as putting in place measures, such as regulating harvesting of species and promoting good environmental stewardship to all Niue resident. Niue's declaration of 20% of its landscape and 40% of its seascape for conservation purposes ensures sustainable production and consumption of these resources. Agriculture and the Fisheries sector are also guided by the Finance and Economic Development pillar of the Niue NSP 2016-2026, where it encourages the economic viability and the sustainable and responsible use of these resources. The Niue Pelagic Management and Development plan (2012),	Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Goal 14: Conserve and sustainable use the oceans, seas and marine resources for sustainable development Goal 12: Ensure sustainable consumption and production patterns 12.2 By 2030, achieve the sustainable management and efficient use of natural resources
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use		
 By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	Niue was once covered with forest of tall trees and dense canopy and understory, until the arrival of the people some 1000 years ago. Major deforestation took place from the 1950s, primarily for timber and also to make way for agriculture production. By 1994, 5450 hectares was considered managed (usually for agricultural purposes) declining to 744 by 2009. Incentives to boost agriculture production accelerated the clearing of the land. These plots are now abandoned	Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in

	as most farmers have moved to New Zealand and Australia, and are now reverting to secondary forest. Today, forest decline has plateaued and evidence is pointing towards a positive recovery of around 36%, largely due to managed land reverting to secondary forest. This gain together with the 35% of mature forests make up a significant forest cover for the island. There is discussion within the Department of Agriculture, Forestry and Fisheries to implement a sustainable land management plan and the forestry legislation.	particular forests, wetlands, mountains and drylands, in line with obligations under international agreements. 15.2 By 2020, promote the implementation of sustainable management of all types of forests, health deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. SDG 6: Ensure availability and sustainable management of water and sanitation for all. 6.6 – By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.
 By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	Whereas the small population of Niue has helped kept the marine resources in fair condition, the lack of data makes it difficult to assess the state of these resources. Recent surveys of fish biomass found the remote Beveridge Reef having two times greater biomass than sites around Niue. Fishing is limited due to the challenging access to the sea and rough conditions. The west side of the island is where most of the subsistence fishing takes place. 64% of fishing is on the inshore, 31% exclusively offshore. Community perception and anecdotes can also be important in gauging the state of marine resources. The 1990 Cyclone Ofa caused serious impacts to Niue's reefs, and community noted prized species such as giant clams, lobsters and shellfish were difficult to obtain. Shells used for community crafts were also rare to get. Fish catch was also noted to be declining.	Goal 14: Conserve and sustainable use the oceans, seas and marine resources for sustainable development 14.6 By 2020, prohibit certain forms of fisheries subsidies, which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.

	Niue has substantial legislation (Domestic Fishing Act 1995), as well as policies and management plans to help manage its fishery resources. Within the legislation, there are provisions to declare marine reserve or a fono for fishing over any part of the reef. Certain species, their life-stages (e.g. crustaceans carrying eggs) and size are prohibited from harvesting. Fishing is prohibited on Sunday. Capacity to undertake monitoring and surveying, and enforcing the law remains a challenge for the country. Community engagement in the management of marine resources is a possible way forward, and continuing the dialogue between the government and landowners must be strongly encouraged.	
 By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	Agriculture contributes to the national economy. Agriculture is an important strategic economic development of the country. It is predominantly of subsistence nature focusing on food crops such as taro, bananas, cassava, sweet potato, yams, vegetables and mixed tropical fruit trees. Traditional farming methods of slash and burn posed risk to soil fertility. This practice was replaced with clearance by bulldozers – which also affect negatively on the soil conditions. The traditional farming practice of allowing plots to be fallowed for seven years has been ignored in some cases, resulting in inferior yields, according to some of the experienced farmers. Invasive species are a serious problem for agriculture production, and the use of herbicides is a concern given the porous nature of the soil and the underground water lens. Over the past decade agriculture focus has been on vanilla (*Vanilla tahitensis*), kava (*Piper methysticum*) and nonu (*Morinda citrifolia*). Farmers of these crops are being certified as organic producers. The Niue Vanilla International sells its certified vanilla to the United States	Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements. 15.2 By 2020, promote the implementation of sustainable management of all types of forests, health deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. SDG 6: Ensure availability and sustainable management of water and sanitation for all.

	of America and Europe, but it needs more suppler to meet the growing demand in the international market.	6.6 – By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.
 By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	Pollution is a priority issue of the Government and it is included in three major themes of the NBSAP (Theme 3 Conservation of marine ecosystems; Theme 5 Waste & Pollution; Theme 6 Water Resources). Niue has developed its Integrated Waste Management Strategy and Action Plan as a key national instrument towards addressing waste and pollution at the national level. Other legislative and policy documents support the urgent attention needed for this including the fisheries regulations and the water management plan. One of the key challenges facing Niue is the safe disposal of sewage due to the porous nature of the soil and the proximity to the coastal areas. Efforts to address the enrichment of the coastal areas and contamination of the ground-water lens have focussed in improving the sewerage system through the amending the building code and encouraging households to upgrade their aging septic system to a locally made dual polyethylene septic tank.	 SDG: 12 Responsible consumption and production 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment. Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development. 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.
 By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	The Government has prioritised invasive species as a key threat to biodiversity and conservation efforts. Theme 4 of the NBSAP focuses on the management of invasive alien species, specifically understanding the impacts caused by invasive species to biodiversity, economy, livelihood and health of the people. Enhancing national frameworks and implementing a coherent approach towards addressing invasive species is another important consideration of the invasive species work. Strengthening legislative support to safeguard border biosecurity is an important consideration. Undertaking on-	15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species

	the-ground actions to control, and manage invasive species, has been a key activity under the NBSAP. In addition, Niue developed a joint National Invasive Species Strategy and Action Plan 2013-2020 (NISSAP) between the Department of Environment and the Department of Agriculture, Forestry and Fisheries. The NISSAP clearly identifies the pathways where invasive species are transported into the country, and within the country. The Plant Protection and Quarantine Division under DAFF is the key unit that checks incoming biological goods arriving into the country, whether by plane, ship, mail or visiting yachts. Each item is inspected and checked to see if it is on the banned list of goods to be brought into the country. Additional invasive species work focuses on fruit flies, where assistance from SPC is provided. Other invasive plants including the Singapore daisy (*Sphagneticola trilobata*), giant sensitive weed (*Mimosa diplotrica*) and chain of love (*Antigonon leptopus*) are targeted for removal. Biological control agents have also been employed to control Lantana and the results have shown a positive trend in managing this environmental weed. Invasive plants brought in through the ornamental trade are another challenge, and community engagement work is undergoing with trying to control the fireworks tree (*Clerodendrum quadriloculare*). Feral pigs are a major challenge in forested areas, especially at Huvalu Forest Conservation Area. Assistance from Landcare Research, New Zealand had been sought to provide management options and these are now being considered in a new project funded by GEF. Awareness raising is also a key activity for the government and engagements with villages have focused on issues such as quarantine export/import procedures, plant protection, sustainable land management practices and forestry management practices. School awareness activities are also important and is a key activity under a new government invasive species project.	

 By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	While regular monitoring of Niue's coral reefs remains a challenge, the sporadic surveys by visiting researchers with the participation of local government staff and non-governmental personnel, have provided data on the state of Niue's coral reefs. Friedlander and his team of researchers carried out the most recent survey of Niue and the Beveridge Reef in 2017. 121 coral species from 12 families are recorded, of which 18 species are considered rare. Coral composition varies between the island and Beveridge Reef, indicating that the source for some of the species on Beveridge Reef may have come from a different place. The dominant *Acropora* species on Niue were typical of those that thrive in mostly sheltered places, whereas those on Beveridge Reef were generally adapted to strong currents. Coral cover varies considerably depending on location, depth and exposure to currents and wind. Around Niue, Dalzell et al. (1993) recorded between 5-35% of live coral cover in the west and north coast (between Tepa Point and Liha Point). Coral cover from Liha Point to Vaigata was between 40-70% (mean cover 57.5%). Yeeting (2003) recorded 30% live coral cover in the Alofi area, whilst conducting ciguatera surveys. Fisk (2007) recorded 20-50% live coral cover around the Omahi Sea Track in 2003, and three months after the 2004 Cyclone Heta, another survey recorded 1-9% live coral cover around the Namoui Marine reserve (Fisk 2007). A year after Cyclone Heta, live coral cover was 7% in Avatele (compared to 2% recorded four months after Cyclone Heta hit) but along the north and west coasts it was less than 2%, reflecting the destructive path of the cyclone (Kronen *et al.* 2008). The east side of the island fared better from Cyclone Heta, recording 29% live coral cover, dominated by Tamakautoga (40%) and Tuapa (10%) (Kronnen *et al.* 2008). Three years after Cyclone Heta, average live coral cover was 19% around the island, and 15% at Beveridge Reef (Bruno & Selig 2007). Nearly a decade after the last coral reef assessment was carried out in Niue,	 13. Take urgent action to combat climate change and its impacts. 14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.

	live coral cover was found to be the same (19% around the island and 15% at Beveridge Reef) (Friedlander et al. 2017). Some areas on the eastern side of the island recorded 26% coral cover, compared to 8% on the windward side. A typical healthy live coral cover in the Pacific islands is usually around 20-40%, with crustose coralline algae and live rock dominating the substratum.	
Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity		
 By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	Niue has exceeded this global Aichi Target. The recent declaration of the Niue Moana Mahu MPA ensures that 40% of Niue's marine area is conserved. The Beveridge Reef is an important reef system containing the highest density of Grey-reef sharks in the world. In addition, small village managed marine conservation areas, including the Anono Marine Reserve, Alofi North to Makefu and the Huvalu Forest Conservation Area (marine component), are protected and included in the national commitment. On the terrestrial side, the Huvalu Forest Conservation Area and the Hakupu Heritage & Cultural Park make up just over 20% of the land under conservation status.	Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development. 14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans. 14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.
 By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of	The conservation of the Niue Moana Mahu Marine Protected Area covering 40% of Niue's exclusive economic zone, and with a focus on the Beveridge Reef Nukutulueatama Special Management Area, Niue has contributed to the protection of threatened species including the Grey Reef Shark and a number of whale species. Developing plans and guidelines, especially around the whale watching tourism sector,	 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.

those most in decline, has been improved and sustained.	have further enhanced Niue's leading role in the conservation of these majestic creatures. Many of Niue's terrestrial fauna and flora are considered locally threatened due to their small population, limited habitats and vulnerability to climatic events. Efforts to protect species of cultural significance, such as peka, lupe and uga have made a difference and contributed to their recovery after cyclones. The need to raise awareness and value the roles these species to the environment and society must continue. There is also a need to continue to monitor and assess the state of Niue's biodiversity to ensure that any further decline in population must be addressed and specific actions to safeguard species be implemented.	
 By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	Niue's genetic resources have helped built food security in neighbouring countries, including Samoa that lost all its taro varieties to an outbreak of a phytophora disease. Similarly, Niue has benefited from genetic resources of other countries through new crop varieties used for farming, such as in the vanilla industry. The use of these resources needs to be done in an appropriate way to ensure that they benefit vulnerable communities. The issue of bio-prospecting is included in the NBSAP, where there is concern by communities on the potential misuse or abuse of their genetic resources by outsiders. A national framework has been raised as a way to protect Niue's genetic diversity.	15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed
Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services		
 By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-	The protection of ecological systems is vital to the wellbeing of all Niueans. Food, economic opportunities and building materials are some of the services provided by Niue's ecosystems. The protection and conservation of these ecosystems have been described in other sections of this 6th National Report, including the conservation of the Huvalu Forest Conservation Area and the Niue Moana Mahu Marine	13.b Promote mechanisms for raising capacity for effective climate change related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalised communities.

being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	Protected Area. The tenure system in Niue means that most matters relating to land needs the engagement of villagers; this is important when it comes to developing conservation sites. One of the biggest ecosystems that affect all Niuean is the groundwater lens that spans the entire length of the island. The protection of this system is the responsibility of all Niueans. The government has put in place measures to manage the extraction, use and distribution of this resource. Monitoring the quality of the water is an ongoing process that is full of challenges. These challenges are usually attributed to limited resources both financially and human capacity. Water and septic tanks are manufactured locally providing employment opportunities for Niueans, and a cheaper option than sourcing them from overseas. This also ensures that the quality of the work complies with the Niue Building Code. The water tanks provide security and an alternative water source in case the groundwater lens become unusable. Whereas the septic tanks are installed to reduce contamination of groundwater lens and coastal waters due to substandard septic systems.	Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
 By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	The Niue National Strategic Plan 2016-2026 links the Environment and Climate Change as one of the important pillars of the country. By elevating these two issues at the highest level emphasises the need for all government sectors and the wider community to put in place measures that take into account the environment and climate change. Efforts to protect and restore terrestrial and marine resources and habitats go a long way towards capturing carbon stocks, and hence contributing to global effort. Waste, water, energy, agriculture, forestry and fisheries are some of the key sectors that have developed policies and plans with the environment as a key consideration. The demand and incentives to utilise natural resources aren't present at the moment, which means	13.b Promote mechanisms for raising capacity for effective climate change related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalised communities.

	that areas that had been utilised in the past will naturally be restored. This is probably not a sustainable approach in the long term, hence the need to develop a national sustainable development plan to consider the various scenario and their impacts.	
 By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	Although Niue has yet to ratify the Nagoya Protocol, it recognises its importance in safeguarding genetic resources and the traditional knowledge of all Niueans. Niue has enacted legislative measures to protect traditional knowledge through the Taoga Niue Act 2012. The language, which is also an important taoga is also protected and promoted through the Vahaga Niue Act 2012. The capacity within the country is a major obstacle for the delay in signing up to the Nagoya Protocol. Niue is currently implementing the ABS Capacity Development Initiative, which focuses on building capacity, ratifying the Protocol, putting in place systems and plans and working collaboratively at the regional level with other countries and organisations. It has identified its national focal point, but is yet to draft its first national report.	8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products. 12.8b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products. 15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building		
 By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	Niue has updated its NBSAP in 2015, and this sixth report provides a snapshot on the implementation stage of the NBSAP. Niue is also a member and an active participant in regional initiatives and planning for the conservation of species. A review of Niue's Environmental legislation provides additional insight on areas where the country can improve the delivery of biodiversity outcomes through reforming national instruments and institutions.	15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

 By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	The tenure system recognises and values the culture and traditions of Niue. The Constitution of Niue (1974) recognises two important clauses relating to traditional knowledge, including the use of vahaga Niue, or the Niuean language as the official language of parliament (English as the second official language), and the protection of customary land. Government legislation has enhanced the participation of all Niueans in decision making that affects their communities, and also protect traditional knowledge and customs. The Village Councils Act 2016 empowers local communities to manage issues such as prevention of pollution of water sources and land resources. Village councils are given the power to develop plans for sustainable use of coastal, reef and seafood and respond to natural disasters. Taoga Niue Act 2012 strengthens the protection of Niue's culture and traditions and in particular establishes key national infrastructure (e.g. Department of Taoga Niue and the Taoga Niue Council) to oversee the implementation of the Act. Antiquities and objects of national cultural significance and objects of national historical significance are controlled and any export will require government approval. Traditional knowledge and expressions of culture are also protected. Cultural standards are promoted and the legislation lent support to the implementation of the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage Language is another important consideration of this target, and the Vahaga Niue Act 2012 promotes the use of the Niue language as the official government language. Biodiversity assessments and surveys often take into consideration the input from local communities. Local communities participate in surveys and provide their local knowledge and observations on species behaviour and areas where they may be found.	2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilisation of genetic resources and associated traditional knowledge, as internationally agreed

	Traditional knowledge through craft making, making canoes, fishing and farming the land is shared in close-knit families and communities.	
 By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	The focus of the government to improve knowledge through scientific surveys and partnering with key research institutions throughout the region and internationally, has resulted in new information that has led to the implementation of new conservation areas (Moana Mahu and the Beveridge Reef Special Managed Area). Niue, being a developing nation, has benefited from close south-south and north-south collaborations with institutions such as the NZ LandCare Research, Oceans 5, National Geographic Pristine Seas, the South Pacific Whale Research Consortium, University of the South Pacific, University of Hawaii, and nationally through public-private partnership with Tofia Niue. Some of the biodiversity research undertaken has been hindered by the lack of taxonomists or the availability of a limited pool of taxonomists that are able to assist with identifying species and genetic diversity of Niue. The support of Japan, Australia, New Zealand and China in national infrastructure developments, waste and pollution management, and in climate change adaptation and mitigation all contributes towards the protection of Niue's biodiversity and resources. The additional support by regional organisations such as SPREP and SPC has also enhanced and secured the sharing and access to information relating to Niue's biodiversity. The INFORM project currently being implemented by SPREP, focuses on building Niue's capacity to implement MEAs by strengthening planning and state of environmental assessment and reporting. A dedicated online database provides a secure repository of data that are used for environmental assessment and planning.	Goal 7. Affordable and Clean Energy. 7. A enhance international cooperation to facilitate access to clean energy research and technology. 7. B. expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries and small island developing states. Goal 9. Industry, Innovation and Infrastructure. 9. A Facilitate sustainable and resilient infrastructure development in developing countries through financial, technological and technical support to small island developing countries. Goal 13. Climate Action Goal 17. Partnerships. 16. 6 Enhance North-South, South-South regional and international cooperation to science, technology and innovation The participation of government and NGO staff in surveys and research had helped in building and enhancing skills and share knowledge.

 By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	The environment sector falls within the Ministry of Natural Resources, which is the least funded when compared to the five other central ministerial portfolios. Approximately, NZD1.2-1.6 million is allocated for the ministry (based on 2013-2019 figures), of which 23% is earmarked for the Environment Department (2018-2019 figures). Since the ABTs were adopted, Niue has increased its funding allocation to around 30% from 2010 to 2019. This percentage increase could be seen as substantial in many situations, although as noted by CBD the cost for implementing the Biodiversity Strategic Plan is enormous. Niue's NBSAP recognises securing resources as a key to the implementation of the NBSAP. It further recognises its own limitations to provide the necessary financial resources to fulfil the implementation of the strategy. A key strategy to support the NBSAP is to collaborate with international, regional and bilateral partners. Niue's priorities will be at the forefront of these collaborations and partners are strongly encouraged to consider them. Opportunities through the Global Environment Facility and the Council of Regional Organisations Partners are also an important consideration. Bilateral relations with New Zealand, Australia and Japan will provide additional opportunities to support the implementation of the NBSAP. Niue is also looking at establishing a conservation trust fund, user fees and environment tax, as other means of supporting the NBSAPs work and to enhance activities towards achieving the SDGs. Niue's secured funding under GEF-4: Forestry and Protected Area Management, and GEF-PAS Regional Invasive Species Project. GEF-5 See: https://www.thegef.org/country/niue	Goal 10: Reduce inequality within and among countries. 10.1 By 2030, progressively achieve and sustain income growth of the bottom 40% of the population at a rate higher than the national average. 10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status. Goal 17. Partnership. 17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection. 17.3 Mobilize additional financial resources for developing countries from multiple sources.

Section V. Updated Biodiversity Country Profile

Status and trends of biodiversity, including benefits from biodiversity and ecosystem services

Niue lies in the heart of the Polynesian triangle with the Samoan archipelago to the north, the Cook Islands to the east and the Kingdom of Tonga to the west, at coordinates of 19° South and 169° West. It is an independent, self-governing nation in free association with New Zealand. The total land area is 261 km^2 (26,146 ha) surrounded by 390,000 km^2 of exclusive economic zone (EEZ). The average land height above sea level is 23 metres and the highest point is just under 70 metres.

Niue's population has declined since the 1970s, from a high of 4,990 (recorded in 1971) to a low of 1,536 (recorded 2009) (Fig. 2). The most recent census data recorded a population of 1,716 (2017 Census). Niue is in a challenging position as the population on the island steadily declines, with a corresponding increase in those living overseas, particularly New Zealand (23,883 in 2013 NZ Census). A number of measures to counteract this high migration and to attract Niueans back to the island have been initiated with limited success (NBSAP 2015).

Niue's environment remains an important priority for the government and it is one of the seven pillars under the Niue ke Monuina (National Strategic Plan 2016-2026). The national strategy advocates for sustainable use and management of natural resources and the environment for present and future generations. The key threats to Niue's biological diversity are cyclones and droughts, although other pressures, including solid waste and pollution, are largely kept in check due to the limited population. There are very few endemic species found in Niue but some are highly susceptible to human activities and natural disasters. The peka (flying fox), lupe (Pacific pigeon) and the uga (coconut crab) are hunted for food and as such their numbers are on the decline.

The freshwater supply of Niue comes from underground source and rain catchments. The rainfall infiltrates the porous coral and topsoil of the island until it reaches the saline water that lies underneath, where its lower density allows it to form a pool over the salt water. This lens provides the freshwater used for human consumption, agriculture and industry.

Niue's biodiversity is fairly limited due to its origin, geographic location, age and availability of habitat. There are 31 bird species, two terrestrial mammals, 5 reptiles, 376 invertebrates, 4 insect pests, 8 land crabs a number of marine mammals, 2 reptiles, 240 fish, 25 invertebrates, and 175 plants species recorded on Niue. Additionally, 43 of the 70 known coral genera in the Pacific Islands have been recorded in Niue. There are also two endemic bird sub-species and one endemic sea snake; other endemic species probably exist among invertebrates but have not been fully surveyed.

Main pressures on and drivers of change to biodiversity (direct, indirect)

The main drivers that significantly impact Niue's biodiversity are the population and extreme climate events. The current low population has helped alleviate pressure on the environment that is seen in other parts of the Pacific. The short-term population increases from tourism and returning residents, and the export and import of goods, are some of the issues that influence Niue's society and environment. Extreme drought can easily impact agriculture and vegetation of the island, due to the soil condition. Droughts also impact on the underground water lens, which could affect the health of community. Severe cyclones can be devastating to the environment, often wiping out bird population and impacting the food for many other species. Ocean surges on the land can caused erosion along

coastal areas, and impact coral reefs. Cyclones can open up forests allowing invasive species to invade pristine areas causing harm long after the cyclone subsides.

Measures to Enhance Implementation of the Convention

The vision of Niue's NBSAP (2015) is for an environmentally-friendly nation in which conservation and the sustainable management of biological resources support all the living community.

Niue has identified six biodiversity goals:

i. Protection of biological diversity;
ii. Policy, planning and institutional frameworks;
iii. Local communities and customs;
iv. Institutional strengthening;
v. Financial sustainability; and
vi. Environmental education and awareness.

These goals are further developed into eight themes:

- Conservation and sustainable management of terrestrial habitats
- Conservation of terrestrial species
- Conservation and sustainable management of marine ecosystems and species
- Management of invasive species
- Management of waste and pollution
- Management of water resources
- Climate change
- Traditional knowledge and access to benefit sharing

Niue's NBSAP was developed on the basis of the Environment Act 2003 (amended in 2015). Biodiversity is also included in Niue's National Strategic Plan under the Environment and Climate Change pillar. It is also considered in a number of other national documents the National Inshore Fisheries Management Plan, the Energy Roadmap, the Joint National Action Plan for disaster risk assessment and climate change, the Environment (Development Consent and Environmental Impact Assessment) Regulations and the Domestic Fishing Regulation.

Actions taken to achieve the 2020 ABT

Raising awareness on the importance of the environment has been a significant achievement for Niue, with the majority of households engaged in the protection and conservation of Niue's fauna and flora. The smallness of the country means that environmental initiatives are widely shared between and amongst communities. The governance also encourages coordination and collaboration from the village level, to inter-departmental sectors and to the ministerial level. This does not mean that there aren't serious challenges to be addressed at all levels in Niue, but a framework does exist that allows for discussion based on respect of the culture and lineages.

The development of Niue's National Strategic Plan (Ko e Tohi Fakatokatoka Gahua ha Niue) provides the over-arching blue-print for all government sectors, and society to work towards. This high-level roadmap sets out the government's priorities, of which the environment and climate change is one of the key pillars. All sector plans are required to align with this national vision and regular monitoring will reflect in the implementation of the plan.

In terms of biodiversity achievements, Niue has exceeded the global Aichi Targets. The recent declaration of the Niue Moana Mahu MPA ensures that 40% of Niue's marine area is conserved. The Beveridge Reef is an important reef system containing the highest density of Grey-reef shark in the world. In addition, small village managed marine conservation areas, including the Anono Marine Reserve, Alofi North to Makefu and the Huvalu Forest Conservation Area (marine component), are protected and included in the national commitment.

On the terrestrial side, the Huvalu Forest Conservation Area and the Hakupu Heritage & Cultural Park make up just over 20% of the land under conservation status. These conservation sites have initiatives to strengthen the capacity of the community to manage the local conservation area, with the focus being on the sustainable use of the resources of these areas.

A framework to guide the management and development of Niue's coast was developed with the Coastal Management Development Policy (2008), allowing for the maintenance and enhancement of resilience by coastal biodiversity components for adaptation to climate change. As a result of the Coastal Management Development Policy, the Integrated Coastal Management and Development Plan and the National Tuna Fishery Management and Development Plan were developed for some species are protected and conserved on Niue.

All marine mammals are protected, including the humpback whale, the minke whale, pilot whales and the spinner dolphin; all species of shark and ray in the EEZ are protected as well. There is a regulated shooting season for pigeons and flying foxes in place, re-opened after the lifting of a five-year ban imposed following the great devastation of Cyclone Heta in 2004. Since then, monitoring surveys of their numbers were undertaken to gauge recovery rates before re-opening of the shooting season. Traditional methods of protecting an area are also sometimes put in place for the conservation of species. These methods (tapu and fono) are restrictions usually put in place because the area is sacred or vital to the breeding of certain species.

Various programmes are in place on Niue to reduce pressures on biodiversity. Measures to reduce pollution and its impacts have been taken through the National Oil Pollution Regulation, National Waste Management Plan and regular awareness programmes. These are done to educate the public as well as to reduce pollution impacts on biodiversity through activities such as the removal of scrap metal off the island. To address alien invasive species, the Agriculture and Quarantine Act and associated regulations are enforced to reduce impacts.

A national committee is to be established in Niue to oversee protection of traditional knowledge, as well as access and *sui generis* mechanisms for the protection of traditional knowledge. Traditional practices are integrated into conservation and management of marine resources. Niue involved various stakeholders in the preparation of its biosafety framework. The participation of local communities is promoted at the national level through NBSAP review processes, national planning processes and development initiatives, and at the regional level, through the Secretariat of the Pacific Regional Environment Program (SPREP) and the Biodiversity Roundtable.

Support mechanisms for national implementation, e.g. legislation, funding, capacity-building, coordination, mainstreaming

Niue's legislative system takes into account many aspects of biodiversity conservation. As a requirement under the Environment Act (2015), the Environment Impact Assessment Regulation was set up as a legal framework to guide development initiatives in the country. An integrated approach in developing the EIA Regulation was taken to include social and economic issues and iterations as well. An organic farming policy was also developed to regulate organic-related activities at the farm level. Other legislation in place including the Biosafety Act Taoga Niue Act, Water Resources Act, and

Vagahau Niue Act. The Biosafety legislation is for the protection of health, environment, and agriculture and the facilitation of trade in the country's animal and plant products through the creation of a comprehensive regime to control the import and export of plants and animals, and the internal control of pests. The Taoga Niue Act is in place for culture and heritage conservation while the Water Resources Act focuses on the integration and improvement of water management strategies.

Mainstreaming within the different sectors of Niue takes shape in different forms. In agriculture, some farmers enhance biodiversity while increasing productivity and employment potential through organic farming systems, mainly of vanilla and nonu (*Morinda citrifolia*), which encourages subsistence mixed-farming to diversify available food crops during adverse climatic conditions such as droughts and cyclones. In water development, a rainwater harvesting project was introduced. Each household is fitted with catchment tanks, reducing pressure on the underground water system. In forestry, community initiatives are combining livelihood development with forest conservation; "tapu" areas are seen as an effective measure and is strongly supported and adopted by communities. In tourism, vigorous promotions of eco-tours are in place targeting a niche market. In energy, EU funded renewable energy projects are already underway. The introduction of the use of gas stoves and solar heaters for each household is subsidised by the Government. Proposals for wind turbo energy are being developed to assist with electricity generation; furthermore, bio-gas initiatives have been introduced as an alternative for the consideration of the Government.

Mechanisms for monitoring and reviewing implementation

The Environment Act provided for the establishment of the Department of Environment as the focal agency for the implementation of all environmental agreements, and further provided for the establishment of an Environment Council to coordinate the work of government departments regarding the different requirements of the CBD, UNCDD and UNFCC.

The Government's National Strategy Plan also provides the pillars that all government sectors are required to align with. The review of each sector's annual work-plan feeds into the national strategy plan and adjustments will be made accordingly to the sector's needs and capacity. The population and agriculture censuses provide additional data that contribute to the monitoring, reviewing and progress for households in a wide-range of activities, from waste to agriculture production. These are useful to the overall monitoring of the state of the environment and the level of impact caused by household activities.

There are plans for monitoring species of national significance but these are challenged by the human capacity as well as financial resources to implement them. Co-partnering with regional and international organisations to undertake resource monitoring has provided the information needed for making appropriate recommendations on the management of Niue's biodiversity.

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