

# PROPOSAL FOR THE NANUALELE NATURAL AREA RESERVE

August 2019

## I EXECUTIVE SUMMARY

Five unique coastal parcels on the shores of Hana, on the island of Maui, are proposed for inclusion in the State of Hawai'i Natural Area Reserve System (NARS). The proposed Nanualele NAR contains unique anchialine pools, land-locked small bodies of water that connect to the ocean subterraneously, and habitat for extremely rare plants and animals.

## II INTRODUCTION (General)

The proposed Nanualele NAR would include an area of approximately 20 acres of coastline in Hana, Maui TMKs (2) 1-3:007:001; (2) 1-3:007:025 and (2) 1-3:007:026 and (2) 1-3:007:028 and (2) 1-3:007:024 (Figure 1).

The proposed NAR contains remnant coastal wet sedgeland and hala forest that would serve as an example of this rare historical ecosystem. Geologically, this area is coastal lowland.

There are records of 3 rare species found in the area or historically known from the area (see Appendix 1) including the endangered damselfly, *Megalagrion xanthomelas* which is frequently found utilizing the anchialine pools as habitat. This is currently the only Maui location where we know this endemic species to be. The proposed Reserve falls within federally-designated critical habitat for the Hawaiian Monk Seal.

The private landowner, Hana Ranch Partners, L.L.C., offered to donate this parcel to the State of Hawai'i, to be used for conservation purposes in perpetuity.

Figure 1: Map of proposed Nanualele Natural Area Reserve.

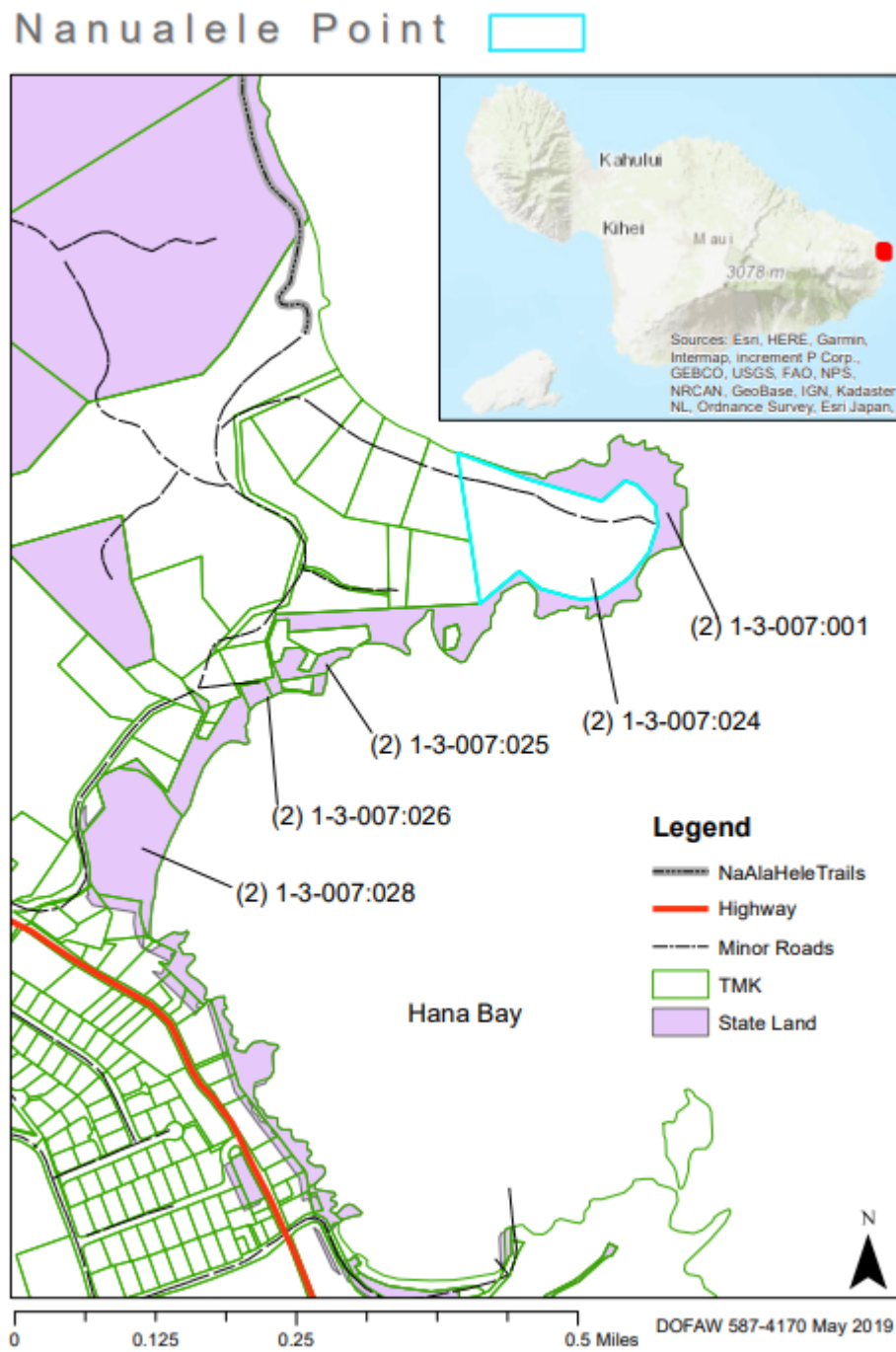




Figure 2: Anchialine Pool at proposed Nanualele Natural Area Reserve.

### III BACKGROUND AND HISTORY

#### *Past Land Use, Previous Studies, and Conservation History*

The State has surveyed and collected genetic material from rare species within the proposed Nanualele NAR. The Division of Forestry and Wildlife (DOFAW) and the Division of Aquatic Resources (DAR) have been collaborating on anchialine pool work including the conservation of *Megalagrion xanthomelas* at Nanualele.

In addition, Nanualele is potential habitat for the Endangered Hawaiian Bee, *Hylaeus anthracinus*. Staff have not had a chance to do a thorough search to establish if they are currently in the area but the site has potential to support them and should be a considered for reintroduction.

#### *Present Land Use and Access*

This undeveloped area is in the Conservation District, Resource subzone. The boundary

of the proposed NAR include the northern point and the northern coastal section of Hana Bay. Access to the parcels are currently done along the coast making management difficult. Designation of this area as a Natural Area Reserve is anticipated to benefit access for management and the public as this area would become public land.



Figure 2: Anchialine Pool at proposed Nanualele Natural Area Reserve.

#### *Cultural/Recreational Uses*

Nanualele is the northern point of Hana Bay, highly used since pre-contact times. Nanualele was a marker for many voyages. Mathew Kalalau, son of John Kalalau, native of Lualailua identified names of the rocks and inlets that make up Nanualele indicating that this site was of importance to the people of the area.

The main recreational activity is swimming or fishing.

#### IV JUSTIFICATION (Specifics)

##### *Scientific Value*

Nanualele provides important coastal habitat for rare and endangered biodiversity and valuable as a location to study critically endangered species, as well as monitor efforts at species conservation. It also provides a remnant coastal wet sedgeland, and hala forest; this forest can be significantly enhanced with management. The point at Nanualele includes three anchialine pools which provide opportunity for study of wetland species.

##### *Representativeness*

Nanualele represents remnant of what was a rare coastal hala, ‘ohi’a forest ecosystem and anchialine pool complex. Hawai‘i Revised Statutes Chapter 195 established the NARS “to preserve in perpetuity specific land and water areas which support communities, as relatively unmodified as possible, of the natural flora and fauna, as well as geological

sites, of Hawai‘i.” Currently, no NARS exist in Hana, Maui nor NARs with windward Hala forests. Finally, the other NARS on Maui do not have populations of *Megalagrion xanthomelas*.

#### *Natural Communities and their Status*

Male and female *Megalagrion xanthomelas* including tandem pairs have been observed at the anchialine pools at Nanualele. The pools are heavily vegetated with *Bacopa* and at least one pool is densely populated with mosquito fish. The hala, ‘ohi’a forest ecosystem has been invaded and requires maintenance.

#### *Rarity*

Very nearby shorelines have an endangered sedge (*Cyperus pennatiformis* var *pennatiformis*) and grass (*Ischaemum byrone*) which could be recovered at Nanualele. Male and female *Megalagrion xanthomelas* have been observed at the anchialine pools on the point. The coastline is also Hawaiian Monk Seal (*Monachus schauinslandi*) Critical Habitat.



Figure 4: male *M. xanthomelas*



Figure 5: Female *M. xanthomelas*



*Figure 6: Ischaemum byrone*



*Figure 7: Cyperus pennatiformis var pennatiformis*

### *Biological/Ecological Design*

Designating Nanualele a NAR would establish a band of protected coastline. Sea level rise threatens all coastal land and habitat for rare coastal species. Anchialine pools on the property provide unique habitat in a windward location for endangered species not found anywhere else on Maui.

### *Location and Size*

The makai boundary of the parcels follows the northern coast of Hana Bay and includes 10 acres of Nanualele Point. The mauka boundary abuts and surrounds multiple residential properties in Hana. Elevation ranges from sea level to less than 40 ‘.

### *Threats (Human/Biological)*

Human threats: There is a general lack of awareness of how to help protect and preserve natural resources of Native Hawaiian and regional culture and history. Trampling is the most common source of damage from people. Trash and human waste, vandalism, and poaching also contribute to resource degradation. Other impacts to resources include destruction of archeological structures, rock removal and vandalism, creation of new trails and damage to existing trails, and protected species harassment. Protected species harassment specifically includes disturbance of endangered and protected marine animals: Hawaiian Monk Seals disturbed while resting and molting on shore; sea turtles disturbed while basking on shore; spinner dolphin resting period disturbed by swimmers; and swimming sea turtles chased and touched by swimmers.

Invasive Species: The introduction and spread of alien species has contributed significantly in the past and is invasive species. The anchialine pools and Hala forest have been invaded by invasive species. Limited access to the property prevents proper management from taken place to control invasive species. Threats include the introduction of new and/or more aggressive alien species; competition with existing introduced plant species; introduced insects; predators on native plant seeds; woody plant species growing around anchialine pools and archeological sites; marine alien fish and invertebrates intentionally introduced to anchialine pools.

Climate change: Sea Level Rise, vegetation shifts, phenological changes, alterations in wildlife behavior, and other significant ecological impacts can be expected.

Marine Debris: Marine debris from around the world washes up on the shores of Nanualele. Immediate clean up is necessary to prevent possible impacts to marine life and seabirds from entanglement in nets and lines or from ingesting plastics. Upslope disruption of hydrology from well drilling or other changes to underground water flow: The proper functioning of anchialine pools is dependent on the natural influx of underground freshwater.

### *Present Level of Protection*

This area is in the Conservation district, subdistrict resource and bordered by personal homes on one boundary. If designated a NAR, the area would benefit from the highest level of conservation protection and management.

### *Long-term Ecological Viability/Environmental Consequences of No Action/Urgency*

Designating this important section of coastal hala forest, and windward anchialine pools, a NAR would enhance the ability of the System to participate and contribute to conservation and restoration actions of this rare ecosystem and associated species. Long range planning will incorporate climate change scenarios and available sea level rise modeling. The long term management goals will be maintaining clean and healthy Monk Seal habitat, establishing or enhancing healthy populations of endangered invertebrate species, restoration of the sedge wetland and hala forest and protection of the anchialine pools.

## V. MANAGEMENT NEEDS

### *Threats Requiring Management*

Management priorities include improving access for management and the public and removal of invasive plant species. Removing growing non-native vegetation and vegetation detritus from the pools will allow recruitment of anchialine ecosystem and endemic shrimp and insects. Outplanting will preserve populations of very rare and endangered species. Infrastructure to support management may also be required including monitoring equipment.

## VI. PUBLIC SUPPORT

### *Agencies, Organizations, and Individuals Contacted\**

\*Interested parties will be notified and a formal public hearing and comment period will occur for this nomination pursuant to Hawai'i Revised Statutes § 195-4.

## I. SPECIES LIST

## Appendix 1 - Species of the Proposed Nanualele NAR and Vicinity

Type	Family	Species	Intro	Common/ Hawaiian Name
Dicot	Acanthaceae	<i>Asystasia gangetica</i> (L.) T.Anderson	nat	Chinese violet, coromandel
Dicot	Aizoaceae	<i>Sesuvium portulacastrum</i> (L.) L.	ind	‘ākulikuli, sea purslane
Dicot	Anacardiaceae	<i>Schinus terebinthifolius</i> Raddi	nat	Christmas berry, wilelaiki, nani o Hilo (Moloka‘i)
Dicot	Araliaceae	<i>Schefflera actinophylla</i> (Endl.) Harms	nat	octopus tree, umbrella tree
Dicot	Asclepiadaceae	<i>Hoya australis</i> R.Br. ex Traill	nat	
Dicot	Asteraceae	<i>Pluchea carolinensis</i> (Jacq.) G.Don	nat	sourbush, marsh fleabane
Dicot	Asteraceae	<i>Sonchus oleraceus</i> L.	nat	sow thistle, pualele
Dicot	Bataceae	<i>Batis maritima</i> L.	nat	pickleweed, ‘ākulikuli kai
Dicot	Bignoniaceae	<i>Spathodea campanulata</i> P.Beauv.	nat	African tulip tree, fountain tree
Dicot	Boraginaceae	<i>Tournefortia argentea</i> L.f.	nat	tree heliotrope
Dicot	Casuarinaceae	<i>Casuarina equisetifolia</i> L.	nat	common ironwood, paina
Dicot	Clusiaceae	<i>Calophyllum inophyllum</i> L.	pol	kamani, kamanu, Alexandrian laurel
Dicot	Combretaceae	<i>Terminalia catappa</i> L.	nat	tropical almond, Indian almond, false kamani, kamani haole, kamani ‘ula
Dicot	Convolvulaceae	<i>Ipomoea indica</i> (Burm.) Merr.	ind	koali ‘awa, koali ‘awahia, koali lā‘au (Ni‘ihau), koali pehu
Dicot	Convolvulaceae	<i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> (L.) Ooststr.	ind	pōhuehue, puhuehue, beach morning glory
Dicot	Fabaceae	<i>Canavalia cathartica</i> Thouars	nat	maunaloa
Dicot	Fabaceae	<i>Canavalia sericea</i> A.Gray	nat	silky jackbean, pōhue
Dicot	Fabaceae	<i>Chamaecrista nictitans</i> subsp. <i>patellaria</i> var. <i>glabrata</i> (Vogel) H.S.Irwin & Barneby	nat	partridge pea, laukī
Dicot	Fabaceae	<i>Vigna marina</i> (Burm.) Merr.	ind	mohihihi, lemuomakili, nanea, nenea, ‘ōkolemakili, pūhili, pūhilihili, pūhilihili, wahine ‘ōma‘o, beach pea
Dicot	Goodeniaceae	<i>Scaevola taccada</i> (Gaertn.) Roxb.	ind	naupaka kahakai, huahekili, naupaka kai, auaka (Ni‘ihau)
Dicot	Malvaceae	<i>Hibiscus tiliaceus</i> L.	ind?	hau
Dicot	Malvaceae	<i>Thespesia populnea</i> (L.) Sol. ex Corrêa	ind?	mihi, portia tree
Dicot	Menispermaceae	<i>Cocculus orbiculatus</i> (L.) DC.	ind	huehue, hue, hue‘ie, ‘inalua
Dicot	Moraceae	<i>Ficus microcarpa</i> L.f.	nat	Chinese banyan, Malayan banyan
Dicot	Myrsinaceae	<i>Ardisia elliptica</i> Thunb.	nat	shoebutton ardisia
Dicot	Oxalidaceae	<i>Oxalis corniculata</i> L.	pol?	yellow wood sorrel, ‘ihi ‘ai, ‘ihi ‘awa, ‘ihi maka ‘ula, ‘ihi mākole
Dicot	Passifloraceae	<i>Passiflora foetida</i> L.	nat	love-in-a-mist, running pop, wild water lemon, lani wai (Ni‘ihau), pohāpohā
Dicot	Phytolaccaceae	<i>Rivina humilis</i> L.	nat	coral berry, rouge plant
Dicot	Portulacaceae	<i>Portulaca oleracea</i> L.	nat	pigweed, ‘ākulikuli kula, ‘ākulikuli lau li‘i, ‘ihi
Dicot	Rhizophoraceae	<i>Rhizophora mangle</i> L.	nat	American mangrove, red mangrove
Dicot	Rubiaceae	<i>Morinda citrifolia</i> L.	pol	noni, Indian mulberry
Dicot	Scrophulariaceae	<i>Bacopa monnieri</i> (L.) Wettst.	ind	‘ae‘ae (Ni‘ihau)
Dicot	Solanaceae	<i>Solanum americanum</i> Mill.	ind?	glossy nightshade, pōpolo, ‘olohua, polopolo, pōpolohua (Ni‘ihau)
Dicot	Sterculiaceae	<i>Waltheria indica</i> L.	ind?	‘uhaloa, ‘ala‘ala pū loa, hala ‘uhaloa, hi‘aloa, kanakaloa
Dicot	Verbenaceae	<i>Lantana camara</i> L.	nat	lākana, lā‘au kalakala, lanakana (Ni‘ihau), mikinolia hihiu, mikinolia hohono, mikinolia kukū

Type	Family	Species	Intro	Common/ Hawaiian Name
Dicot	Verbenaceae	Stachytarpheta jamaicensis (L.) Vahl	nat	Jamaica vervain, öwi, oï
Monocot	Arecaceae	Cocos nucifera L.	pol	niu, lolani, coconut
Monocot	Commelinaceae	Commelina diffusa Burm.f.	nat	honohono, honohono wai, mākōlokolo, dayflower
Monocot	Cyperaceae	Cyperus javanicus Houtt.	ind	‘ahu‘awa, ‘ehu‘awa
Monocot	Cyperaceae	Cyperus laevigatus L.	ind	makaloa, makoloa, ehu‘awa
Monocot	Cyperaceae	Cyperus polystachyos Rottb.	ind	
Monocot	Cyperaceae	Fimbristylis cymosa subsp. spathacea (Roth) T.Koyama	ind	mau‘u ‘aki‘aki (Ni‘ihau)
Monocot	Cyperaceae	Fimbristylis cymosa subsp. umbellato-capitata (Hillebr.) T.Koyama	ind	mau‘u ‘aki‘aki (Ni‘ihau)
Monocot	Pandanaceae	Pandanus tectorius Parkinson ex Z	ind?	hala, pū hala, screwpine
Monocot	Poaceae	Digitaria ciliaris (Retz.) Koeler	nat	Henry's crabgrass, kūkaepua‘a
Monocot	Poaceae	Melinis minutiflora P.Beauv.	nat	molasses grass
Monocot	Poaceae	Sporobolus africanus (Poir.) Robyns & Tournay	nat	smutgrass, African dropseed, rattail grass
Pterido-phyte	Nephrolepidaceae	Nephrolepis brownii (Desv.) Hovenkamp & Miyam.	nat	
Pterido-phyte	Psilotaceae	Psilotum nudum (L.) P.Beauv.	ind	moa, moa nahele, pipi, ‘o‘omoa, upright whiskfern
Mammal	Phocidae	Monachus schauinslandi	nat	Hawaiian Monk Seal
Invert	Coenagrionidae	Megalagrion xanthomelas	nat	Orangeblack Hawaiian damselfly

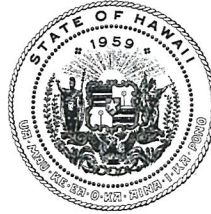
Nat= Native

Ind= Indigenous

Pol= Polynesian

Invert= Invertebrate

DAVID Y. IGE  
GOVERNOR OF HAWAII



**STATE OF HAWAII**  
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LAND  
STATE PARKS

Natural Area Reserves System Commission  
Kalanimoku Building  
1151 Punchbowl Street, Room 325  
Honolulu, HI 96813

Natural Area Reserves System Commission:

The Division of Forestry and Wildlife (DOFAW) has completed its review of the proposal for the creation of the Nanualele Natural Area Reserve (NAR) TMKs (2) 1-3:007:001 and (2) 1-3:007:024 and recommends NAR designation. Addition of this parcel to the NAR inventory will preserve in perpetuity a representative example of anchialine pools on the eastern coast of Maui not yet represented in the NAR inventory.

If you have any questions, or need additional information, please feel free to contact me Leah Laramie at 587-0051.

Sincerely,

A handwritten signature in blue ink, appearing to read "David G. Smith".

DAVID G. SMITH  
Administrator