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Pacific Islands Region

corals

Acropora globiceps

:: Biological Information

MORPHOLOGY

Colonies of *Acropora globiceps* have finger-like branches. The size and appearance of branches depend on degree of exposure to wave action but are always closely compacted. Colonies exposed to strong wave action have pyramid-shaped branchlets. Colonies can be uniform blue (which may photograph purple) or cream, brown, or fluorescent green in color.



Photos copyright: Douglas Fenner

REPRODUCTION

Acropora globiceps is a hermaphroditic (having both male and female gametes) spawner with lecithotrophic (yolk-sac) larvae.

:: Spatial Information

GEOGRAPHIC RANGE

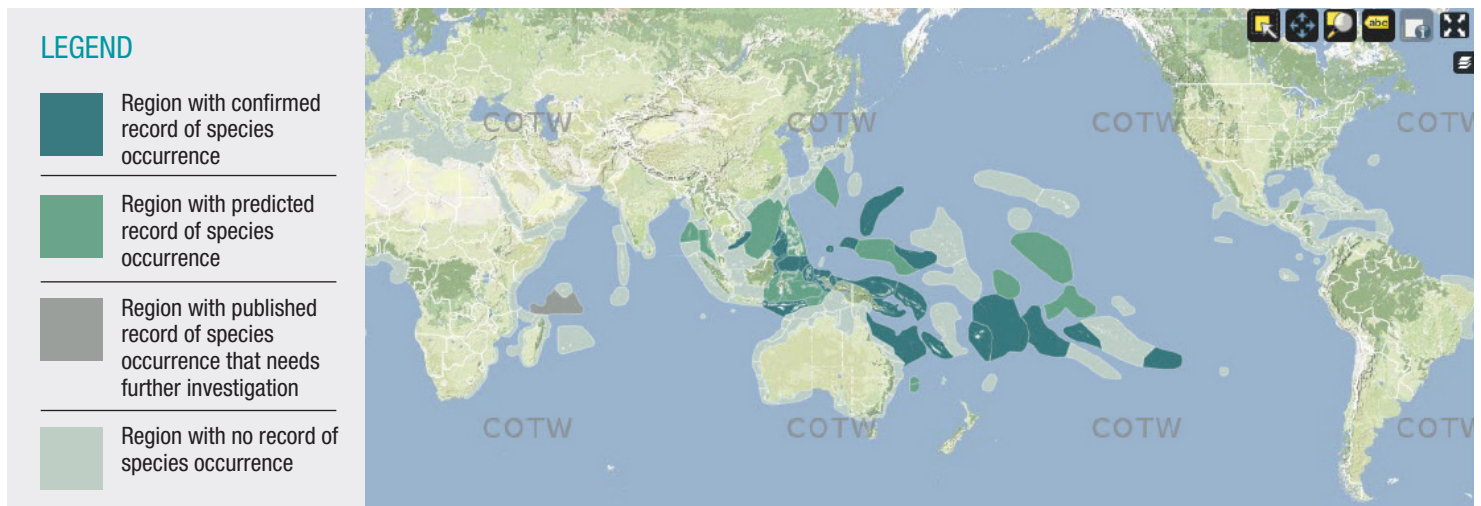
Based on confirmed observations and strong predictions of occurrence in areas that have not yet been surveyed sufficiently, *Acropora globiceps* is likely distributed from the oceanic west Pacific to the central Pacific as far east as the Pitcairn Islands.

For more information contact:

NMFS Pacific Islands Regional Office
1845 Wasp Blvd., Bldg. 176
Honolulu, HI 96818

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Veron JEN, Stafford-Smith MG, Turak E and DeVantier LM (in prep.) Corals of the World www.coralsoftheworld.com

OCCURRENCE IN U.S. JURISDICTIONS

Based on the information below we consider *Acropora globiceps* to occur in Guam, the Commonwealth of the Northern Mariana Islands (CNMI), American Samoa, and the Pacific Remote Island Areas (PRIA).

Guam: Wallace (1999) lists a specimen of *Acropora globiceps* from Guam in the North Queensland Museum collection. Veron (2014) lists this species in the “Marianas” but is not specific about whether it is in Guam and/or CNMI. Randall and Myers (1983) and Randall (1995; 2003) do not list it in Guam, nor does Burdick (2014), but Randall and Burdick (in preparation) do. Brainard *et al.* (2011) indicate that it has been reported from the “Northern Marianas Islands” but do not mention Guam. The IUCN Red List indicates it is known from Guam, but does not give the source.

CNMI: D. Fenner has a photo from CNMI that shows this species clearly. Veron (2014) lists this species in the “Marianas” but is not specific about whether it is in Guam and/or CNMI. Randall (1995; 2003) does not list it in Guam or CNMI, nor does Burdick (2014), but Randall and Burdick (in preparation) list it from the Mariana Islands, but it is not clear if they list it from CNMI. Brainard *et al.* (2011) indicate that it has been reported from the “Northern Marianas Islands” by the IUCN Red List. The IUCN Red List indicates it is known from the “Northern Mariana Islands,” but does not give the source.

PRIA: Kenyon *et al.* (2010) report *Acropora globiceps* at Kingman Reef and Palmyra Atoll in the PRIA. Williams *et al.* (2008) report it from Palmyra.

American Samoa: *Acropora globiceps* was reported in American Samoa by Fisk and Birkeland (2002), Coles *et al.* (2003), Maragos and Kenyon (2004), Didonato *et al.* (2005), Brainard *et al.* (2011) and Fenner (2013) with photographs included. D. Fenner has examined the type specimen in the Smithsonian, and American Samoa specimens match it very closely. Veron (2014) reports it from “Samoa” but likely means “American Samoa” since he indicates in notes that all species found in the Tuvalu-Samoa-Tonga ecoregion have been found in American Samoa.

HABITAT TYPES AND DEPTH

Acropora globiceps occurs on upper reef slopes, reef flats, and adjacent habitats in depths ranging from 0 to 8 meters.

:: Demographic Information

RELATIVE LOCALIZED ABUNDANCE

Relative localized abundance refers to how commonly a species is observed on surveys in a localized area. Veron (2014) reports that *Acropora globiceps* occurred in 3.2 percent of 2,984 dive sites sampled in 30 ecoregions of the Indo-Pacific. It was given an abundance rating on a scale of 1 (low) to 5 (high) at each site where it occurred, based on how common it was at that site. *Acropora globiceps* had a mean abundance rating of 1.95. Based on this semi-quantitative system, the species' abundance was characterized as "uncommon."

ABSOLUTE OVERALL ABUNDANCE

Absolute overall abundance refers to a rough qualitative minimum estimate of the total number of colonies of a species that currently exist throughout its range. These estimates were calculated based on results from Richards *et al.* (2008) and Veron (2014). The absolute abundance of *Acropora globiceps* is likely at least tens of millions of colonies.

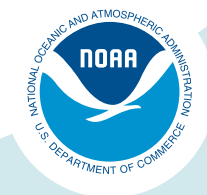
:: Why is this Species Threatened?

Acropora globiceps is susceptible to the three major threats identified for corals including ocean warming, disease, and ocean acidification, as well as many of the other threats to corals. Despite its distribution from southeast Asia to the central Pacific, *Acropora globiceps* occurs primarily in a limited depth range of 0 to 8 meters. Shallow reef areas can be physically diverse and complex, but are often subjected to frequent changes in environmental conditions, extremes, high irradiance, and simultaneous effects from multiple stressors, both local and global in nature. Future projections of climate change impacts to coral reef environments indicate that a shallow depth range, in combination with its other biological, demographic, and spatial characteristics, contributes to a risk of extinction within the foreseeable future for *Acropora globiceps*.

Literature Cited

- Brainard, R. E., C. Birkeland, C. M. Eakin, P. McElhany, M. W. Miller, M. Patterson, and G. A. Piniak. 2011. Status review report of 82 candidate species petitioned under the U.S. Endangered Species Act. NOAA Technical Memorandum NMFS-PIFSC-27. 530 pp.
- Burdick, D. 2014. Guam ReefLife. www.guamreeflife.com.
- Coles, S. L., P.R. Reath, P.A. Skelton, V. Bonito, R.C. DeFelice, and L. Basch. 2003. Introduced marine species in Pago Pago Harbor, Fagatele Bay, and the National Park Coast, American Samoa. Bishop Museum Technical Report No. 26. Honolulu. 182 pp. (including a summary of species data from 16 other reports).
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- Fisk, D. and C. Birkeland. 2002. Status of coral communities on the volcanic islands of American Samoa, a re-survey of long-term monitoring sites. Report to Dept. Marine and Wildlife Resources, 135 pp.
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- Maragos, J. and J. Kenyon. 2004. Rose Atoll coral data compiled from US Fish and Wildlife Service 1994 "Townsend Cromwell" 2002 and "Sette" 2004 surveys. http://hercules.kgs.ku.edu/hexacorall/anemone2/reference_detail.cfm?ref_number=1934&type=Unpublish.

- Randall, R.H. and D. Burdick. (in preparation) book on corals of the Marianas.
- Randall, R. H. 1995. Biogeography of reef-building corals in the Mariana and Palau Islands in relation to back-arc rifting and the formation of the Eastern Philippine Sea. *Natural History Research* 3(2):193-210.
- Randall, R. H. 2003. An annotated checklist of hydrozoan and scleractinian corals collected from Guam and other Mariana Islands. *Micronesica* 35(36):121-137.
- Randall, R. H. and R. F. Myers. 1983. Guide to the Coastal Resources of Guam. Vol. 2. The Corals. University of Guam, Mangilao, Guam:129.
- Richards, Z. T., M. J. H. van Oppen, C. C. Wallace, B. L. Willis, and D. J. Miller. 2008. Some Rare Indo-Pacific Coral Species Are Probable Hybrids. *PLoS ONE* 3(9):e3240.
- Veron, J. E. N. 2014. Results of an update of the Corals of the World Information Base for the Listing Determination of 66 Coral Species under the Endangered Species Act. Report to the Western Pacific Regional Fishery Management Council, Honolulu.
- Wallace, C. C. 1999. Staghorn corals of the world: a revision of the coral genus *Acropora* (Scleractinia; Astrocoeniina; Acroporidae) worldwide, with emphasis on morphology, phylogeny and biogeography. CSIRO Publishing, Collingwood, Australia.
- Williams, G.J., J.E. Maragos, and S.D. Davy. 2008. Characterization of the coral communities at Palmyra Atoll in the remote central Pacific Ocean. *Atoll Research Bulletin* 557: 1-30.





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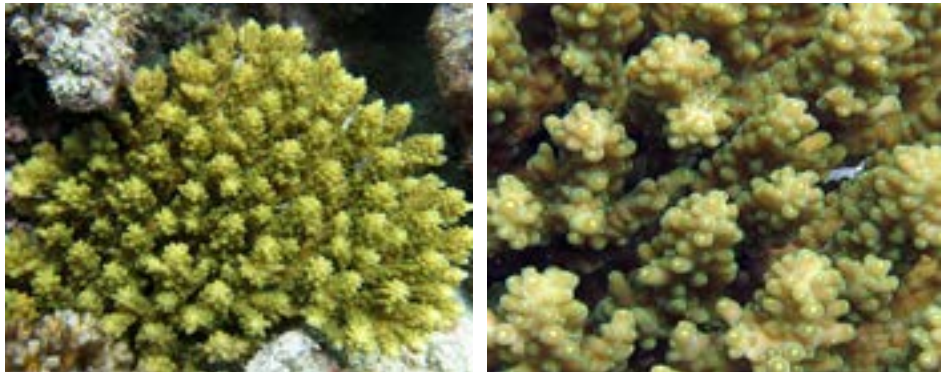
corals

Acropora retusa

:: Biological Information

MORPHOLOGY

Colonies of *Acropora retusa* are flat plates with short, thick finger-like branches. Branches look rough and spiky because radial corallites are variable in length. Colonies are typically brown or green in color.



Photos copyright: Douglas Fenner

REPRODUCTION

Acropora retusa is a hermaphroditic (having both male and female gametes) spawner with lecithotrophic (yolk-sac) larvae.

:: Spatial Information

GEOGRAPHIC RANGE

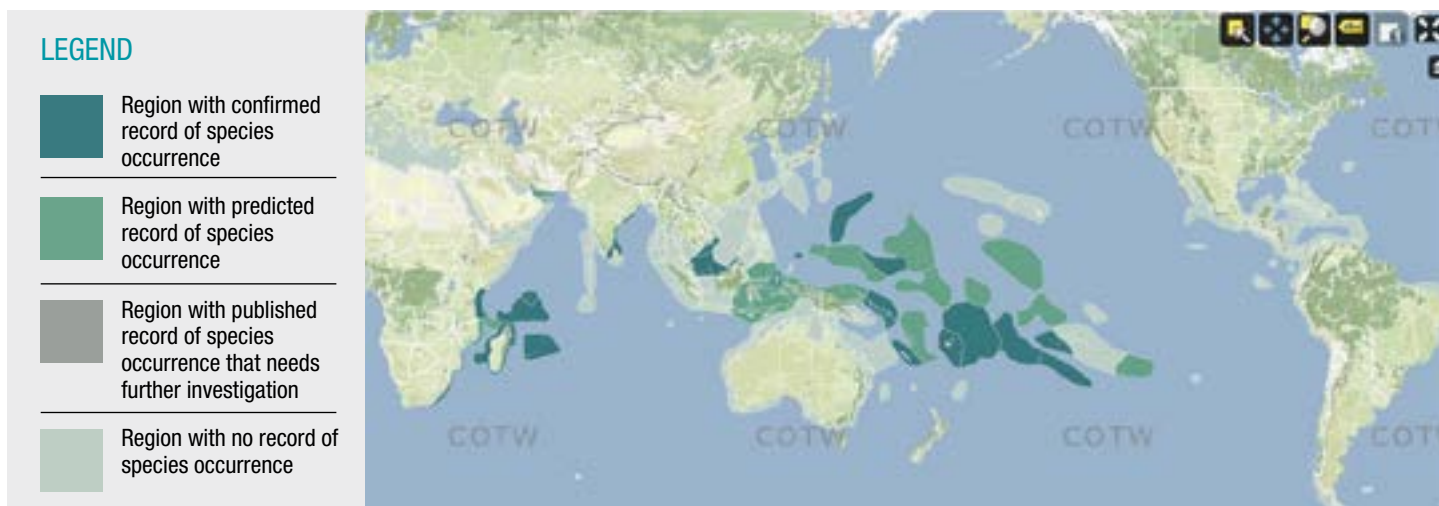
Based on confirmed observations and strong predictions of occurrence in areas that have not yet been surveyed sufficiently, *Acropora retusa* is likely distributed in the western Indian Ocean, the east coast of India, and from Vietnam east to the Pitcairn Islands.

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OCCURRENCE IN U.S. JURISDICTIONS

Based on the information below we consider *Acropora retusa* to occur in Guam, American Samoa, and the Pacific Remote Island Areas (PRIA), but not the Commonwealth of the Northern Mariana Islands (CNMI).

Guam: Randall and Myers (1983), Randall (1995; 2003), Wallace (1999), Brainard *et al.* (2011) and Burdick (2014) do not report it from Guam. Veron (2014) reports it from the “Marianas” but does not distinguish Guam from CNMI. Wallace *et al.* (2012) report a sample from Guam in the Museum of Tropical Queensland collection. The Final Coral Supplemental Information Report indicates that there are other tentative records from Guam.

PRIA: Kenyon *et al.* (2010) report *Acropora retusa* from Johnston Atoll, Howland Island, and Kingman Reef in the PRIA. Williams *et al.* (2008) do not report it from Palmyra Atoll.

American Samoa: Brainard *et al.* (2011) reports *Acropora retusa* from American Samoa, which appears to derive from data collected by Fenner. Veron (2014) reports *Acropora retusa* from “Samoa” which likely means American Samoa, since in his notes he comments that all species he reports from the Tuvalu-Samoa-Tonga ecoregion are found in American Samoa. Wallace (1999) and Wallace *et al.* (2012) do not report it from American Samoa. Fenner (2013) reports it from American Samoa based on photographs and samples.

CNMI: Randall and Myers (1983), Randall (1995; 2003), Wallace (1999), Brainard *et al.* (2011), and Wallace *et al.* (2012) do not report it from CNMI. While Veron (2014) reports it from the “Marianas,” he does not distinguish Guam from CNMI, and with no confirmed records of occurrence from CNMI we currently do not consider that *A. retusa* occurs there. However, as survey effort increases it is possible *A. retusa* may be observed within CNMI in the future.

HABITAT TYPES AND DEPTH

Acropora retusa occurs in shallow reef slope and back-reef areas, such as upper reef slopes, reef flats, and shallow lagoons, and its depth range is 0 to 5 meters.

:: Demographic Information

RELATIVE LOCALIZED ABUNDANCE

Relative localized abundance refers to how commonly a species is observed on surveys in a localized area. Veron (2014) reports that *Acropora retusa* occupied 0.5 percent of 2,984 dive sites sampled in 30 ecoregions of the Indo-Pacific. It was given an abundance rating on a scale of 1 (low) to 5 (high) at each site where it occurred, based on how common it was at that site. *Acropora retusa* had a mean abundance rating of 1.21. Based on this semi-quantitative system, the species' abundance was characterized as "rare."

ABSOLUTE OVERALL ABUNDANCE

Absolute overall abundance refers to a rough qualitative minimum estimate of the total number of colonies of a species that currently exist throughout its range. These estimates were calculated based on results from Richards *et al.* (2008) and Veron (2014). The absolute abundance of *Acropora retusa* is likely at least millions of colonies.

:: Why is this Species Threatened?

Acropora retusa is susceptible to the three major threats identified for corals including ocean warming, disease, and ocean acidification, as well as many of the other threats to corals. Despite its distribution from parts of the western Indian Ocean to much of the central Pacific, *Acropora retusa* occurs primarily in a limited depth range of 0 to 5 meters. Shallow reef areas can be physically diverse and complex, but are often subjected to frequent changes in environmental conditions, extremes, high irradiance, and simultaneous effects from multiple stressors, both local and global in nature. *Acropora retusa* is also characterized as rare where it is found. Future projections of climate change impacts to coral reef environments indicate that a shallow depth range, in combination with its other biological, demographic, and spatial characteristics, contributes to a risk of extinction within the foreseeable future for *Acropora retusa*.

Literature Cited

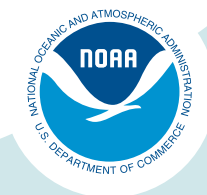
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- Burdick, D. 2014. Guam ReefLife. www.guamreeflife.com.
- Fenner, D. 2013. Field guide to the Coral Species of the Samoan Archipelago: American Samoa and (independent) Samoa. Version 1.0. Dept. Marine & Wildlife Resources, American Samoa. pdf. 422 pp.
- Kenyon, J., J. Maragos, and D. Fenner. 2010. The Occurrence of Coral Species Reported as Threatened in Federally Protected Waters of the US Pacific. *Journal of Marine Biology*, vol. 2011, Article ID 358687, 12 pages.
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- Randall, R. H. 2003. An annotated checklist of hydrozoan and scleractinian corals collected from Guam and other Mariana Islands. *Micronesica* 35(36):121-137.
- Randall, R. H. and R. F. Myers. 1983. Guide to the Coastal Resources of Guam. Vol. 2. The Corals. University of Guam, Mangilao, Guam:129.
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- Veron, J. E. N. 2014. Results of an update of the Corals of the World Information Base for the Listing Determination of 66 Coral Species under the Endangered

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Wallace, C. C. 1999. Staghorn corals of the world: a revision of the coral genus *Acropora* (Scleractinia; Astrocoeniina; Acroporidae) worldwide, with emphasis on morphology, phylogeny and biogeography. CSIRO Publishing, Collingwood, Australia.

Wallace, C. C., Done, B. J., and Muir, P. R. (2012) Revision and catalog of worldwide staghorn corals *Acropora* and *Isopora* (Scleractinia: Acroporidae) in the Museum of Tropical Queensland. *Memoires of the Queensland Museum/Nature* 57: 1-255.

Williams, G.J., J.E. Maragos, and S.D. Davy. 2008. Characterization of the coral communities at Palmyra Atoll in the remote central Pacific Ocean. *Atoll Research Bulletin* 557: 1-30





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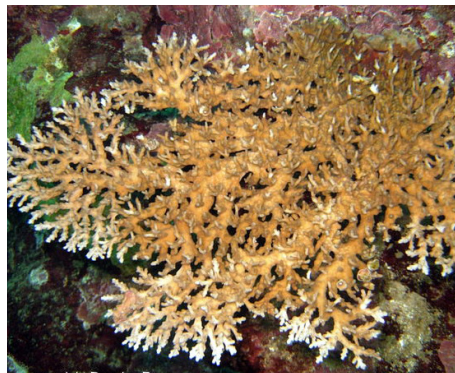
corals

Acropora speciosa

:: Biological Information

MORPHOLOGY

Colonies of *Acropora speciosa* form thick cushions or bottlebrush branches. Colonies are cream or light brown in color with delicately colored branch tips.



Photos copyright: Douglas Fenner

REPRODUCTION

The reproductive characteristics of *Acropora speciosa* have not been determined, but other similar species of *Acropora* are hermaphroditic (having both male and female gametes) spawners with lecithotrophic (yolk-sac) larvae.

:: Spatial Information

GEOGRAPHIC RANGE

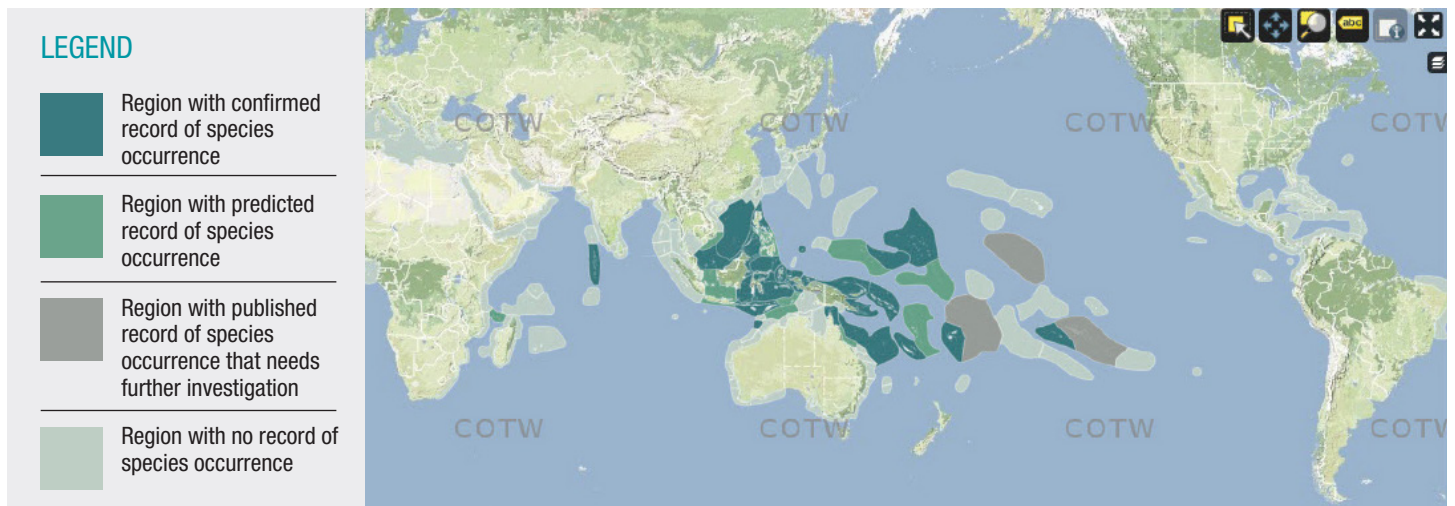
Based on confirmed observations and strong predictions of occurrence in areas that have not yet been surveyed sufficiently, *Acropora speciosa* is likely distributed from Indonesia to the Marshall Islands in the western and central Pacific. It also occurs in the Maldives in the Indian Ocean and at least one site in French Polynesia.

For more information contact:

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OCCURRENCE IN U.S. JURISDICTIONS

Acropora speciosa has not yet been reported from Guam and the Commonwealth of the Northern Mariana Islands (CNMI). Based on the information below we consider *Acropora speciosa* to occur in the Pacific Remote Island Areas (PRIA) and American Samoa.

PRIA: Kenyon et al. (2010) reports *Acropora speciosa* from Kingman Reef in the PRIA and Brainard et al. (2011) report it from Kingman based on that record. Wallace (1999) and Williams et al. (2008) do not report it from any of the PRIA. Veron (2014) does not provide information on the presence or absence of coral species in the PRIA.

American Samoa: Brainard et al. (2011) report that Fenner has found it on Tutuila in American Samoa but not on other islands in the archipelago. Veron (2014) reports it from “Samoa” which implies it is in American Samoa, since he says in notes that all species found in the Tuvalu-Samoa-Tonga ecoregion are found in American Samoa. Fenner (2013) also reports it from American Samoa, based on photographs and samples. Wallace (1999) and Wallace et al. (2012) do not report it from American Samoa. The Final Coral Supplemental Information Report indicates that *Acropora speciosa* has been confirmed from Tutuila by J. Maragos.

HABITAT TYPES AND DEPTH

Acropora speciosa occurs on lower reef slopes and walls, especially those characterized by clear water and high *Acropora* diversity, in a depth range of 12 to 40 meters.

:: Demographic Information

RELATIVE LOCALIZED ABUNDANCE

Relative localized abundance refers to how commonly a species is observed on surveys in a localized area. Veron (2014) reports that *Acropora speciosa* occupied 8.3 percent of 2,984 dive sites sampled in 30 ecoregions of the Indo-Pacific. It was given an abundance rating on a scale of 1 (low) to 5 (high) at each site where it occurred, based on how common it was at that site. *Acropora speciosa* had a mean abundance rating of 1.60. Based on this semi-quantitative system, the species’ abundance was characterized as “common.”

ABSOLUTE OVERALL ABUNDANCE

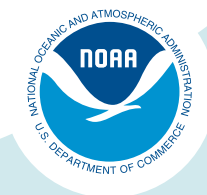
Absolute overall abundance refers to a rough qualitative minimum estimate of the total number of colonies of a species that currently exist throughout its range. Based on information from Richards *et al.* (2008), *Acropora speciosa* had the 9th lowest population of the 15 rare *Acropora* species they studied. They provide a population estimate of 10,942,000 colonies, and an effective population size of 1,204,000 colonies.

:: Why is this Species Threatened?

Acropora speciosa is susceptible to the three major threats identified for corals including ocean warming, disease, and ocean acidification, as well as many of the other threats to corals. Despite its apparently broad geographic range, the best available information indicates that *Acropora speciosa* has an effective population size of 1,204,000 colonies. Because of the widespread nature of the global threats to corals, a threat event has the potential to impact many colonies at once so a species with a relatively small effective population size may have a high proportion of genetically unique individuals affected by threats at any given time within the foreseeable future. This, in combination with its other biological, demographic, and spatial characteristics, contributes to a risk of extinction within the foreseeable future for *Acropora speciosa*.

Literature Cited

- Brainard, R. E., C. Birkeland, C. M. Eakin, P. McElhany, M. W. Miller, M. Patterson, and G. A. Piniak. 2011. Status review report of 82 candidate species petitioned under the U.S. Endangered Species Act. NOAA Technical Memorandum NMFS-PIFSC-27. 530 pp.
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- Richards, Z. T., M. J. H. van Oppen, C. C. Wallace, B. L. Willis, and D. J. Miller. 2008. Some Rare Indo-Pacific Coral Species Are Probable Hybrids. *PLoS ONE* 3(9):e3240.
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- Wallace, C. C., Done, B. J., and Muir, P. R. (2012) Revision and catalog of worldwide staghorn corals *Acropora* and *Isopora* (Scleractinia: Acroporidae) in the Museum of Tropical Queensland. *Memoires of the Queensland Museum/Nature* 57: 1-255.
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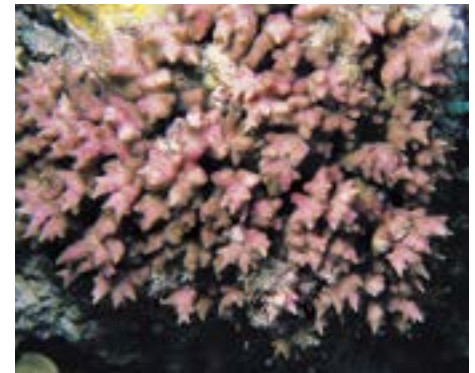
corals

Seriatopora aculeata

:: Biological Information

MORPHOLOGY

Colonies of *Seriatopora aculeata* have pencil-thick, short, tapered branches, usually in fused clumps. Colonies are pink or cream in color.



Photos copyright: Douglas Fenner (left), J.E.N. Veron (right)

REPRODUCTION

The reproductive characteristics of *Seriatopora aculeata* have not been determined, but other species of *Seriatopora* are hermaphroditic (having both male and female gametes) brooders (expelling sperm but egg fertilization is internal).

:: Spatial Information

GEOGRAPHIC RANGE

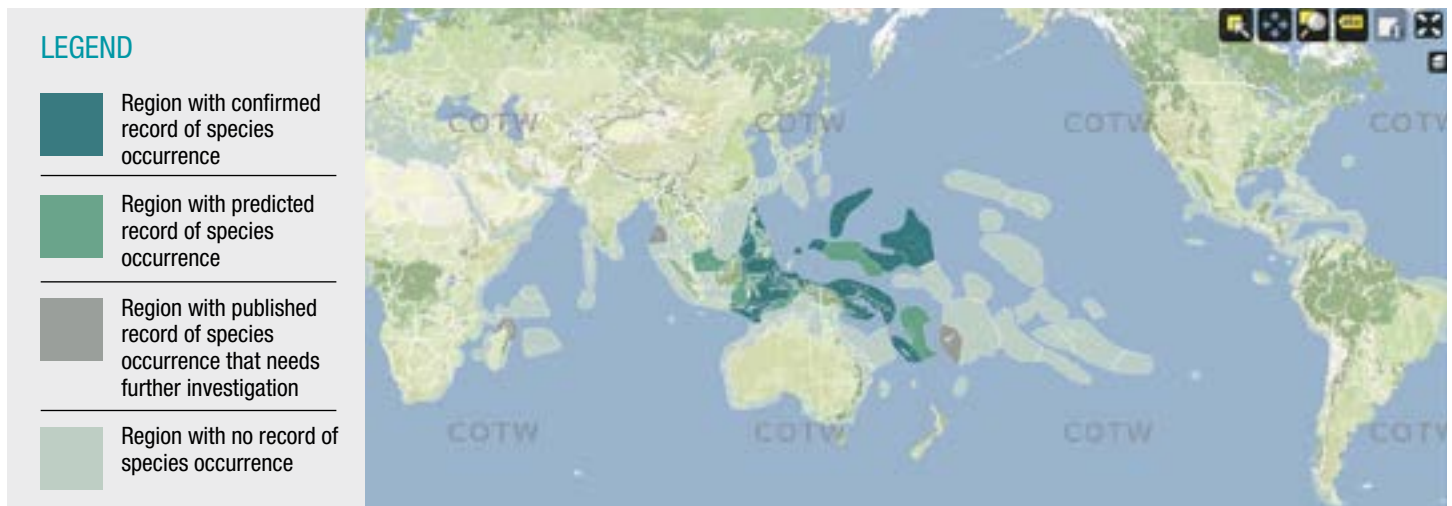
Based on confirmed observations and strong predictions of occurrence in areas that have not yet been surveyed sufficiently, *Seriatopora aculeata* is likely distributed mostly within the Coral Triangle area (the Philippines to Timor Leste and east to the Solomon Islands), as well as adjacent areas in the western Pacific from the Mariana Islands down to New Caledonia.

For more information contact:

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OCCURRENCE IN U.S. JURISDICTIONS

Seriatopora aculeata has not yet been reported from American Samoa and the Pacific Remote Island Areas (PRIA). Based on the information below we consider *Seriatopora aculeata* to occur in Guam and the Commonwealth of the Northern Mariana Islands (CNMI).

Guam: Randall and Myers (1983) and Burdick (2014) report this species from Guam, while Randall (1995; 2003) reports it from the Marianas archipelago but does not distinguish Guam from CNMI. Veron (2014) reports it from the “Marianas” but does not distinguish Guam from CNMI. Brainard *et al.* (2011) do not report it from Guam.

CNMI: Randall (1995; 2003) reports it from the Marianas archipelago but does not distinguish Guam from CNMI. Veron (2014) reports it from the “Marianas” but does not distinguish Guam from CNMI. Brainard *et al.* (2011) write that the IUCN Red List reported it from the “Northern Marianas Islands” but the source was not reported. Houk (P. Houk, pers. comm., 2014) reports that *S. aculeata* is common around Saipan.

HABITAT TYPES AND DEPTH

Seriatopora aculeata occurs in a broad range of habitats on the reef slope and back-reef, including but not limited to upper reef slopes, mid-slope terraces, lower reef slopes, reef flats, and lagoons in a depth range of 3 to 40 meters.

:: Demographic Information

RELATIVE LOCALIZED ABUNDANCE

Relative localized abundance refers to how commonly a species is observed on surveys in a localized area. Veron (2014) reports that *Seriatopora aculeata* occupied 10.3 percent of 2,984 dive sites sampled in 30 ecoregions of the Indo-Pacific. It was given an abundance rating on a scale of 1 (low) to 5 (high) at each site where it occurred, based on how common it was at that site. *Seriatopora aculeata* had a mean abundance rating of 1.7. Based on this semi-quantitative system, the species’ abundance was characterized as “common.”

ABSOLUTE OVERALL ABUNDANCE

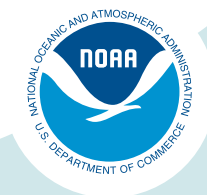
Absolute overall abundance refers to a rough qualitative minimum estimate of the total number of colonies of a species that currently exist throughout its range. These estimates were calculated based on results from Richards *et al.* (2008) and Veron (2014). The absolute abundance of *Seriatopora aculeata* is likely at least millions of colonies.

:: Why is this Species Threatened?

Seriatopora aculeata is susceptible to the three major threats identified for corals including ocean warming, disease, and ocean acidification, as well as many of the other threats to corals. A significant proportion of its current known geographic range is within the Coral Triangle area. This area is projected to have the most rapid and severe impacts from climate change and localized human impacts for coral reefs over the 21st century. Multiple ocean warming events have already occurred within the western equatorial Pacific (which includes the Coral Triangle area) that suggest future ocean warming events may be more severe than average in this part of the world. A range constrained mostly to this particular geographic area that is likely to experience severe and increasing threats indicates that a high proportion of the population of this species is likely to be exposed to those threats over the foreseeable future. This, in combination with its other biological, demographic, and spatial characteristics, contributes to a risk of extinction within the foreseeable future for *Seriatopora aculeata*.

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GUAM LAND USE PLANNING

**Bureau of Statistics & Plans
Guam Coastal Management
Program
(www.bsp.guam.gov)**

**Francis L.G. Damian
March 2018**

THEME: CURRENT TREND WITH AN EMPHASIS ON GUAM'S FUTURE!

OBJECTIVE: Taking a look at where we've been, what we've done, and how we can get better!

Cooke Street & Mother Waldron Park



Cooke Street & Mother Waldron Park



Cooke Street & Mother Waldron Park



Cooke Street & Mother Waldron Park



Cooke Street & Mother Waldron Park



What is a Comprehensive Land Use Plan?

The **comprehensive plan**, also known as a **general plan**, **master plan** or **land-use plan**, is a document designed to guide the future actions of a community. It presents a vision for the future, with long-range goals and objectives for all activities that affect the local government.

What are the goals of a Land Use Plan?

The purpose of a Land Use Plan is to accomplish three goals:

1. To understand the current conditions and resources for Guam and determine what trends are taking place.

What are the goals of a Land Use Plan?

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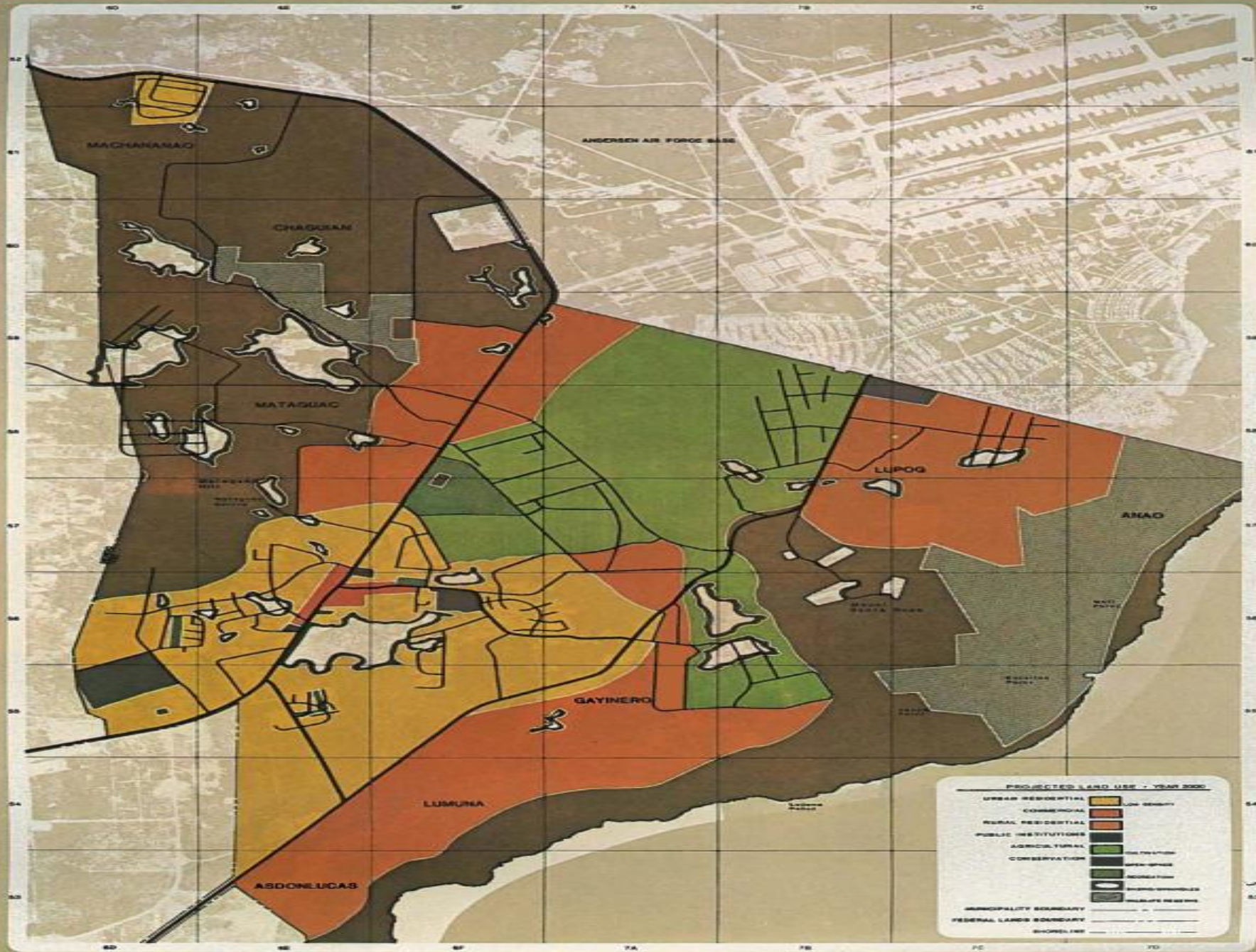
2. To define growth opportunities available and decide what tools are required to take advantage of these opportunities.

What are the goals of a Land Use Plan?

The purpose of a Land Use Plan is to accomplish three goals:

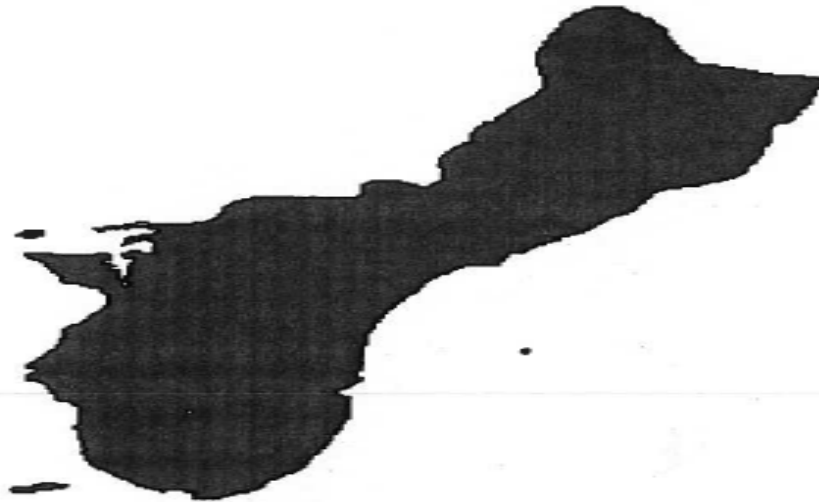
3. To establish a vision for Guam's future and develop a current Land Use Plan that guides each facet of the community toward that general vision.

KABALES NA PLANU PARA
GUAHAN
GUAM
COMPREHENSIVE DEVELOPMENT PLAN





I Tano'-ta Land Use Plan



Guam Land Use
Commission

FIRST GUAM LEGISLATURE
1952 (SECOND) Regular Session

CERTIFICATION OF PASSAGE OF AN ACT TO THE GOVERNOR

This is to certify that Bill Number 221, "An Act to establish zones in the Territory of Guam and to regulate the uses of land, heights of buildings and yard spaces therein, to adopt a map showing said zones, to define the terms used in this Act, to provide for its adjustment, amendment and enforcement, and to prescribe penalties for violations thereof; which Act is adopted pursuant to Section 21 of Article 3, Public Lands Act", was on the 7th day of July, 1952, duly and regularly passed.



A. B. WON PAT
Speaker



North and Central Guam Land Use Plan

Bureau of Statistics and Plans—Government of Guam • September 2009

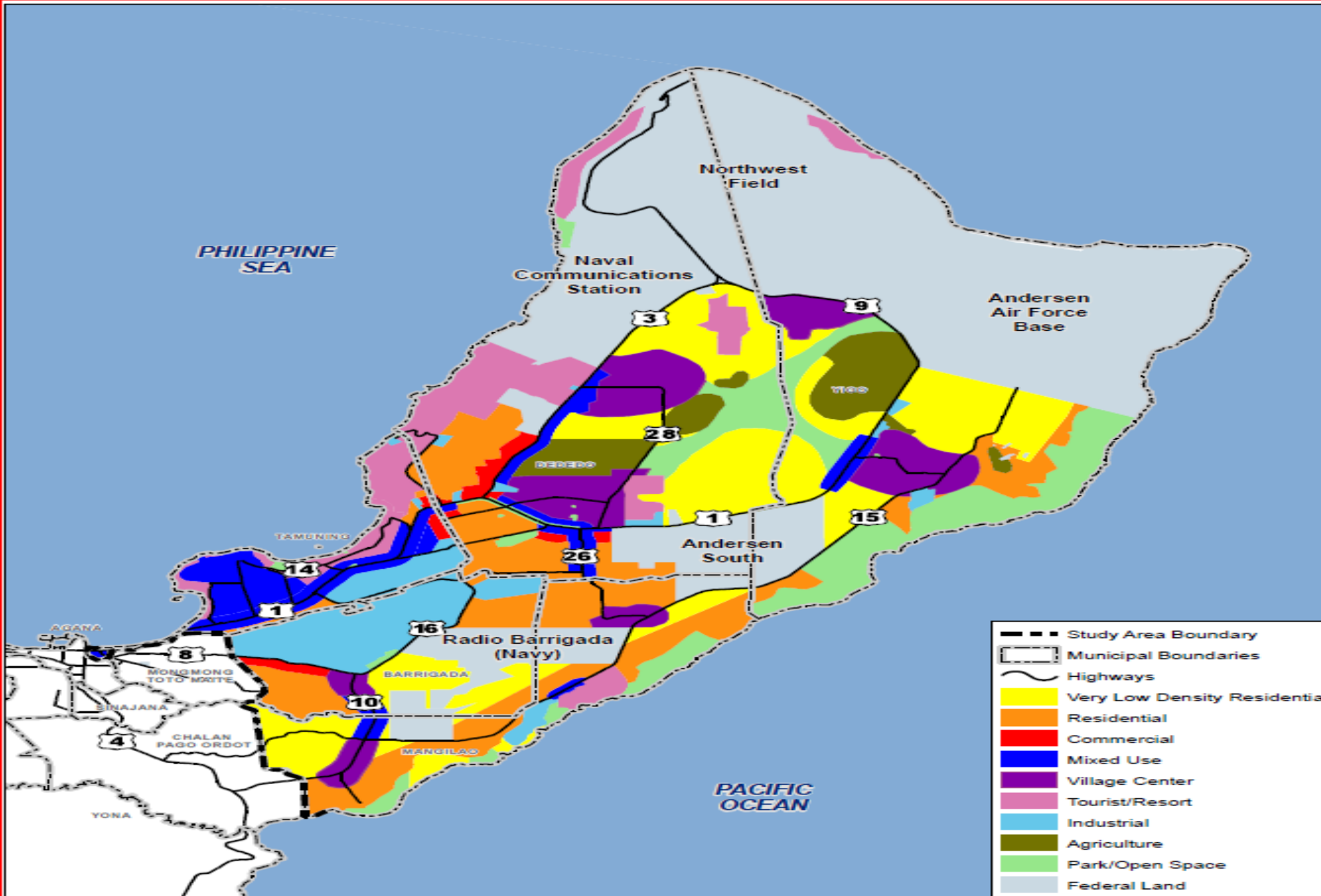


ICF
INTERNATIONAL

PLAN RITE

SEi Sablan Environmental, Inc.

16



Vision

Guam is a sustainable tropical paradise that is safe, walkable, family and community-oriented, and protective of natural resources.

The N&CGLUP is divided into 5 separate visions:

Land Use

Environmental

Community

Economic

Infrastructure

6 Components of the Plan

1. Land Use
2. Housing
3. Economic Development
4. Natural Systems
5. Transportation
6. Infrastructure

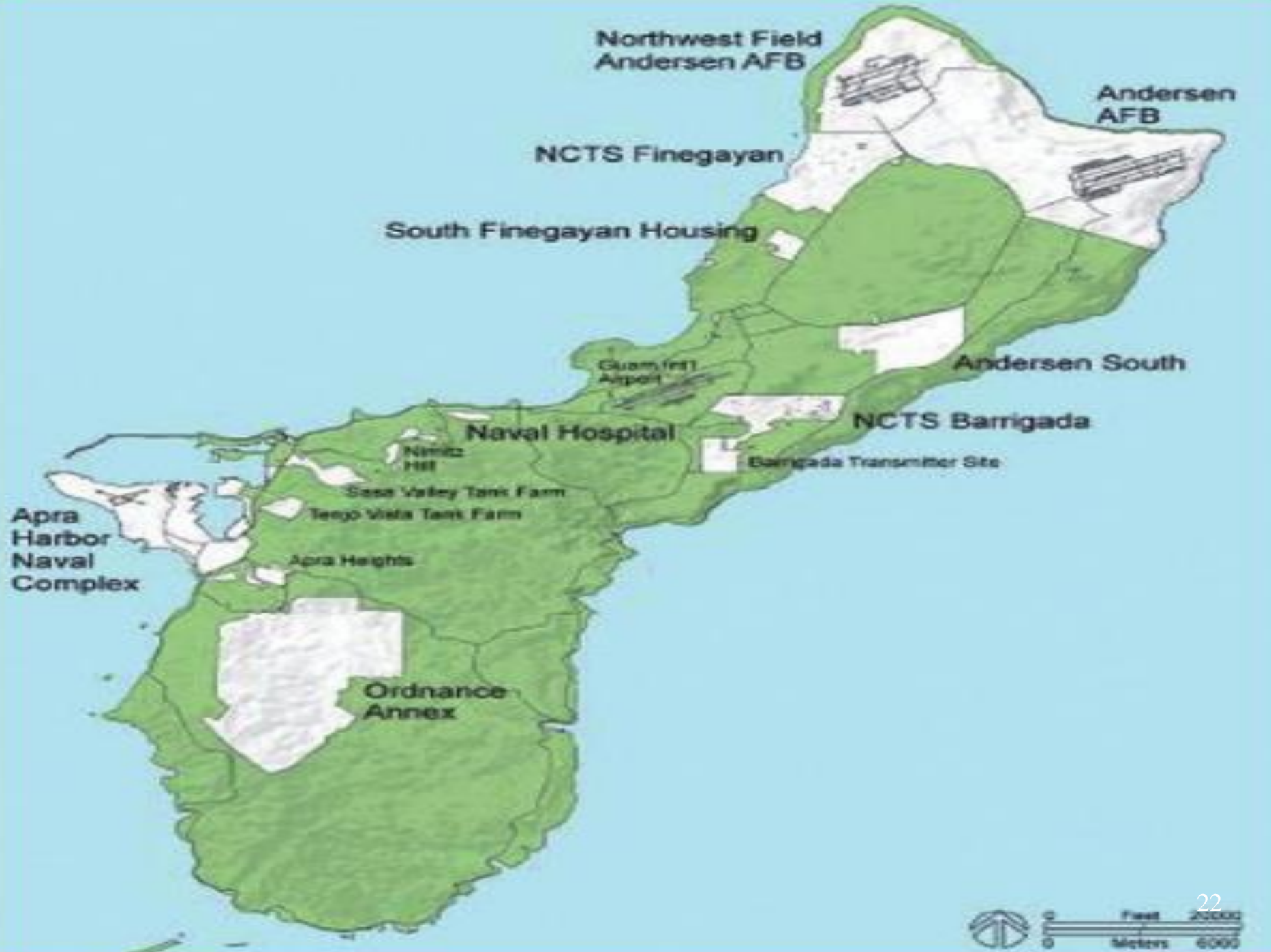




The North & Central Guam Land Use Master Plan

The following are 11 identified designated LAND USE Goals and Policies areas:

- A. Very Low Density
- B. General Residential
- C. Commercial
- D. Mixed Use
- E. Village Center
- F. Tourist Resort
- G. Industrial
- H. Agriculture
- I. Dos Amantes Planning Area
- J. Park, Open Space, & Conservation Lands
- K. Federal Land



Northwest Field
Andersen AFB

Andersen
AFB

NCTS Finegayan

South Finegayan Housing

Andersen South

Guam Intl
Airport

Naval Hospital

NCTS Barrigada

Barrigada Transmitter Site

Nimitz
Hill

Sase Valley Tank Farm

Tongo Vista Tank Farm

Apra Heights

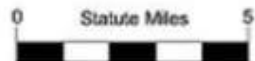
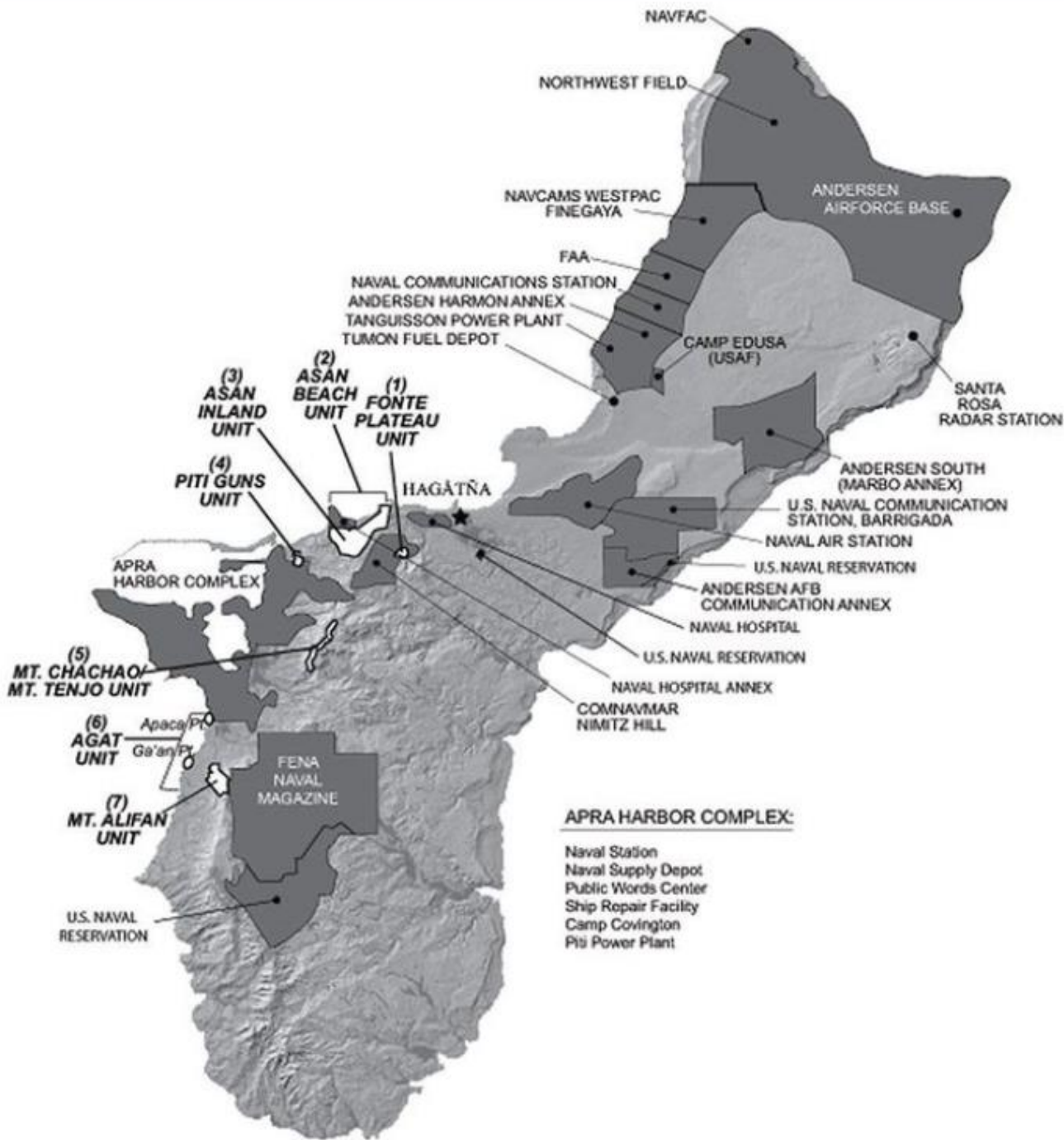
Apra
Harbor
Naval
Complex

Ordnance
Annex





Map of Guam showing the seven units of the Park and lands held by the U.S. military. After Rogers, 1995.



HOUSING

The following are 4 identified Goals and Policies identified types:

- A. Residential Land Use Categories
- B. Affordable Housing
- C. Housing Choices
- D. Housing Maintenance – Senior housing, assisted living facilities,



ECONOMIC DEVELOPMENT

The following are 3 identified policies that deal with a economic development and a diverse economic base:

- A. Tourism
- B. Construction
- C. Real Estate



Guam Visitors Bureau
グアム訪問観光局

Pacific Islands Club

Guam Marriott Resort

Beach Access
ビーチアクセス

The Plaza

Underwater World
DFS Galleria

Sand Castle

Gameworks

ROYAL ORCHID HOTEL
-GUAM USA-

Tumon Sands Plaza

GS
Airport 10 Minutes driving
空港まで車で10分

GS
Micronesia Mall 10 minutes
マイクロナেশア・モールまで車で10分
GS
K-Mart



NATURAL SYSTEMS

The following are identified policies that deal with a viable and valuable forest, coastal, and marine ecosystems:

- A. Coral Resources
- B. Fisheries Resources
- C. Marine Water Quality
- D. Terrestrial Wildlife
- E. Introduced and Invasive Species
- F. Terrestrial Habitats
- G. Freshwater Habitats and Water Quality
- H. Parks & Open Space

144°40'

144°50'



Guam

Philippine Sea

Extent of Northern Guam Lens Aquifer



13°30'



Guam

Pacific Ocean

13°20'

-  Northern Guam Lens Aquifer
-  Areas of potential additional military development

0 2 MILES
0 2 KILOMETERS

EXTENT OF THE NORTHERN GUAM LENS AQUIFER

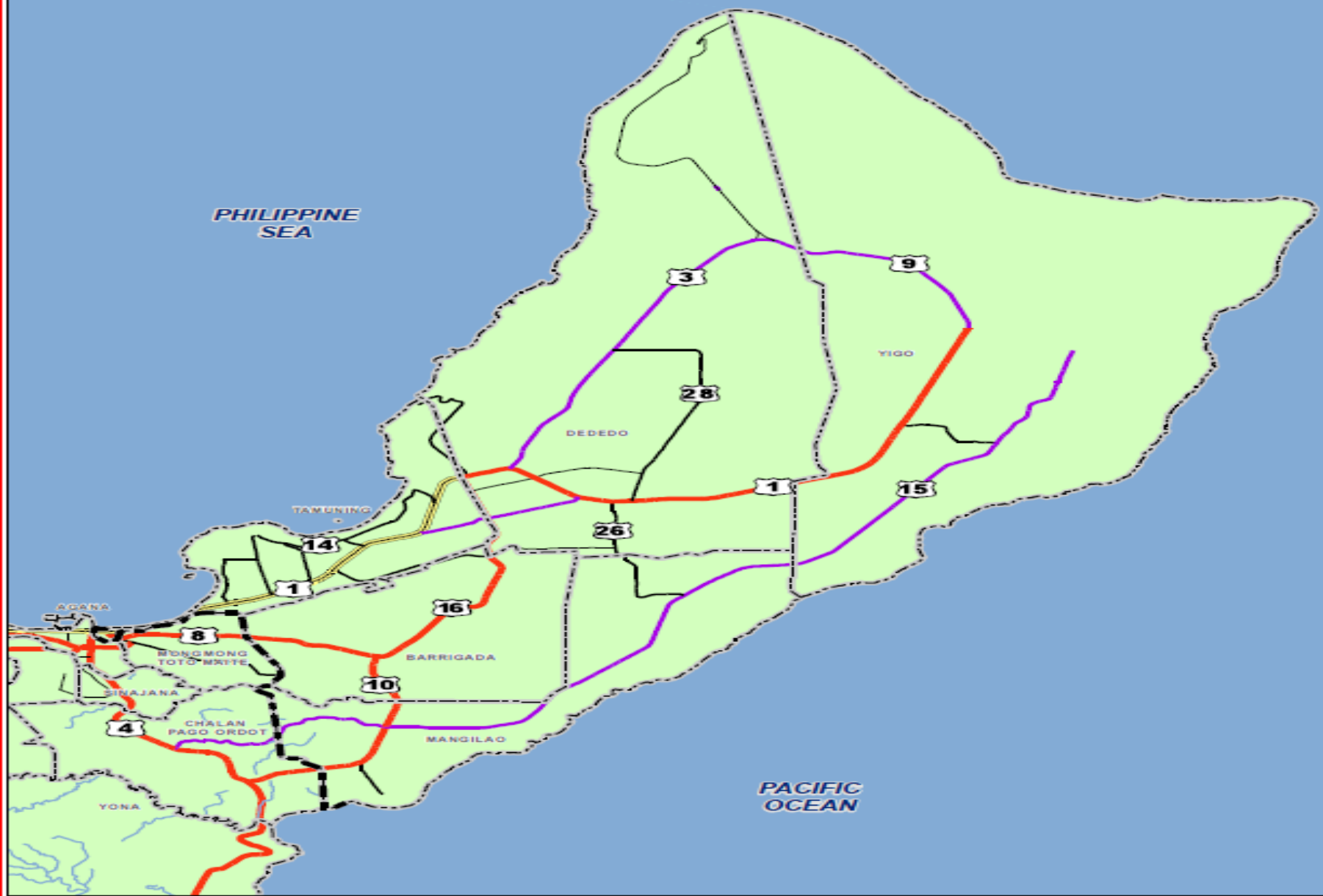
- Entire northern Guam
- Southern boundary is the Pago-Adelup fault
- All limestone and volcanic terrains in northern Guam act as catchment for the aquifer



TRANSPORTATION

The following are identified routes that serve the island community and focuses on the impacts and efficient growth well into the future:

- A. Trunk Highways
- B. Major Highways
- C. Minor Highways
- D. Collector Roads
- E. Transit Services



- | | |
|----------------------|---------------------|
| Study Area Boundary | Road Network |
| Municipal Boundaries | Trunk Highway |
| Rivers | Major Highway |
| | Minor Highway |
| | Collector Road |

Figure 3 - Functional Classifications
North & Central Guam
Land Use Plan
September 2009









AGAT
VILLAGE



INFRASTRUCTURE

There are 3 major components that have been identified within Guam's master plan that detail our valuable and much needed utilities:

A. Water

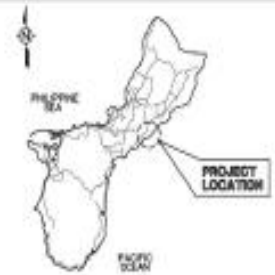
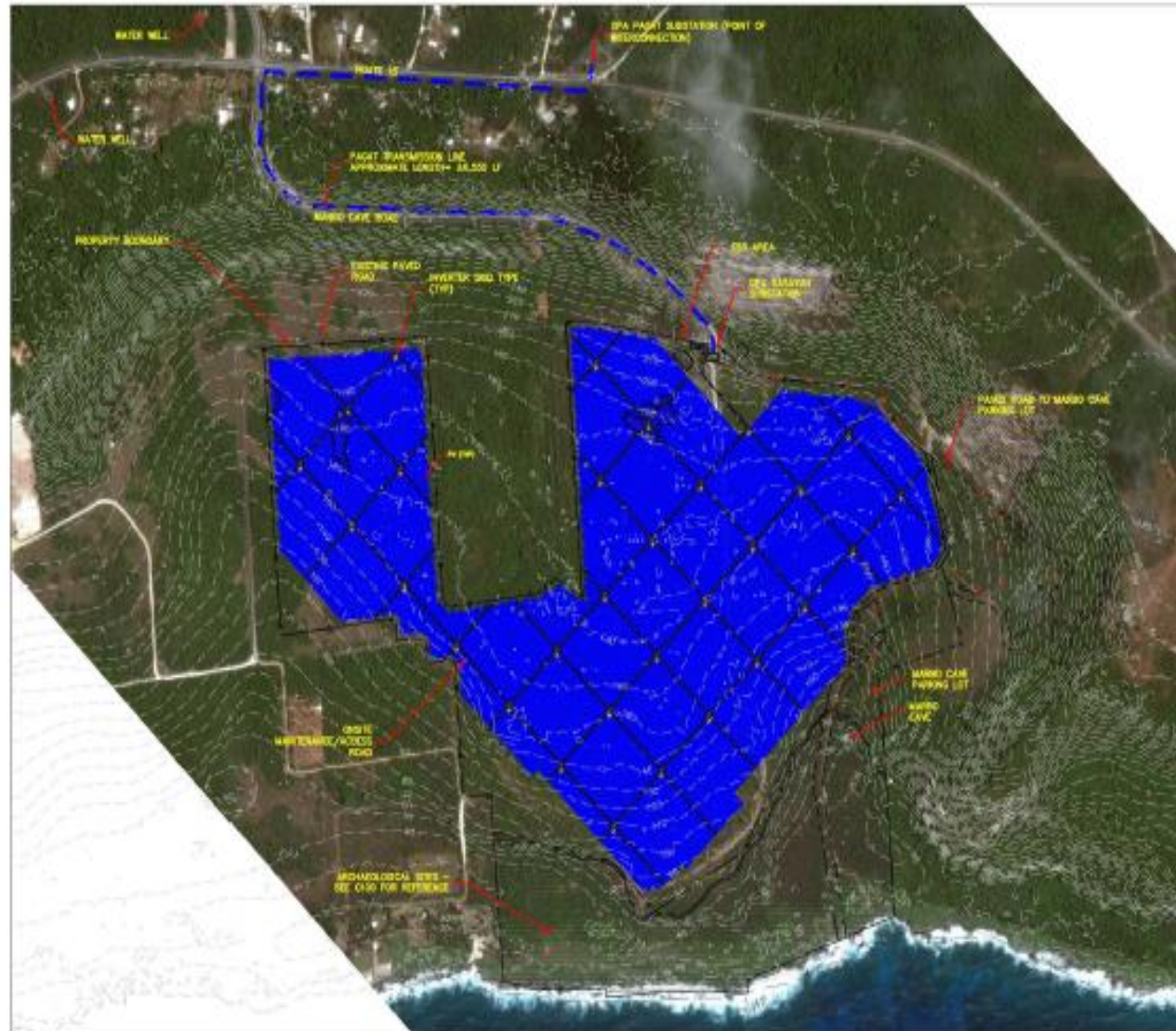
B. Sewer

C. Power









ISLAND OF GUAM

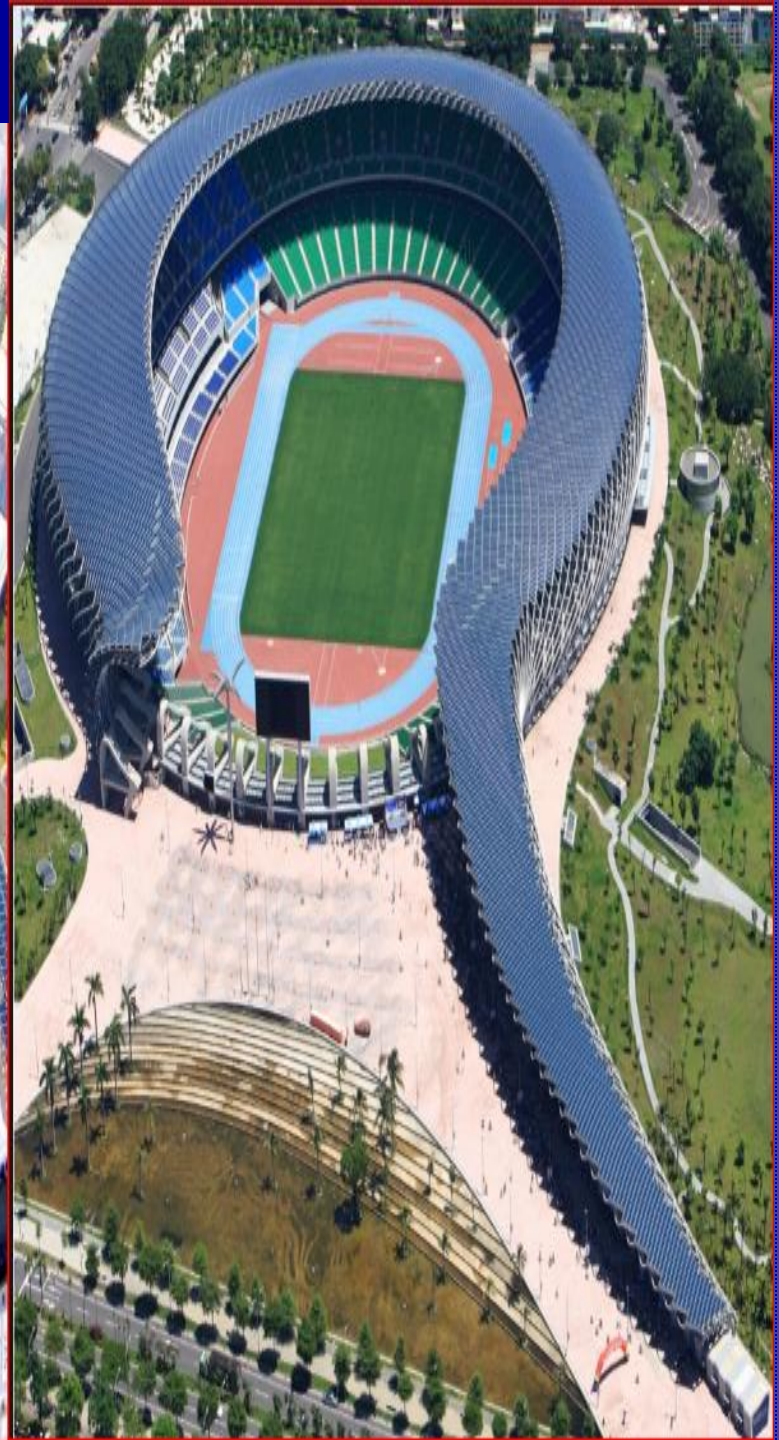
SYSTEM PARAMETERS:

- 300V CAPACITY: 80,400W (DC) / 60MW (AC)
- INVERTER: 2,000MW (300 TIPS)
- PV MODULE: 350W ON TING TILES PLANE
- TILES: 13 SQUARE
- 20 MODULES PER TABLE
- PARALLEL TRAILS: 13 STRINGS



FIGURE 2 – OVERALL SITE PLAN

THE FUTURE OF SOLAR PANELS



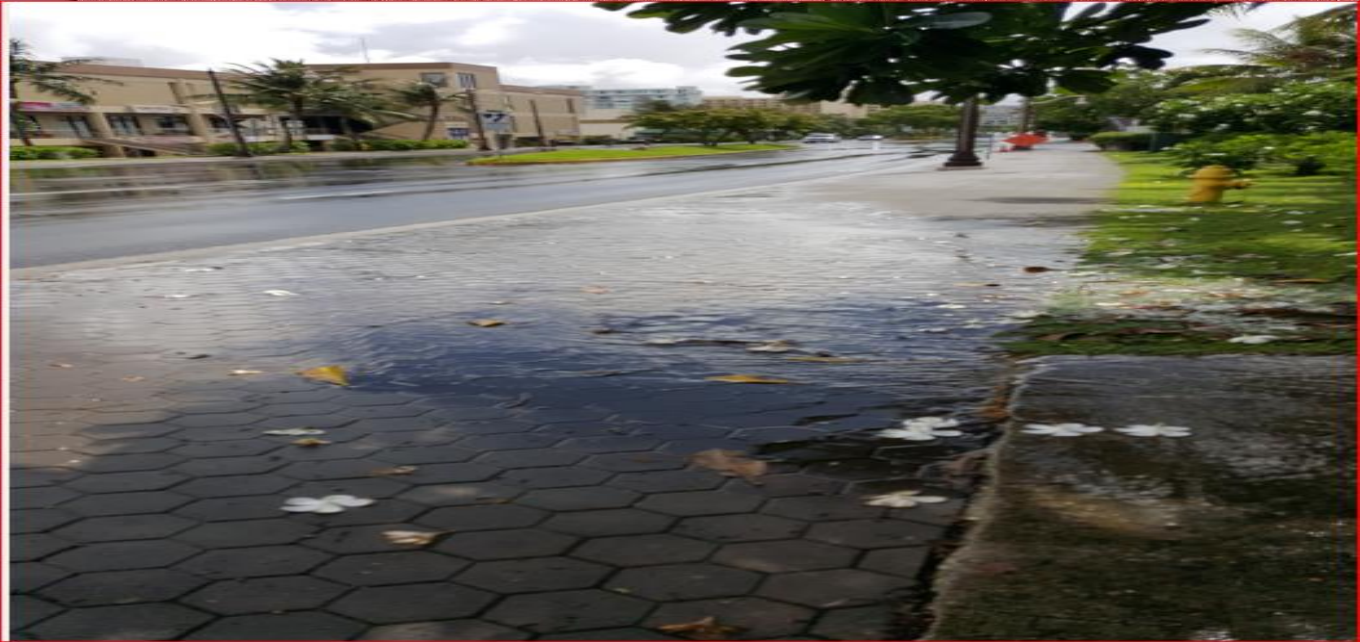






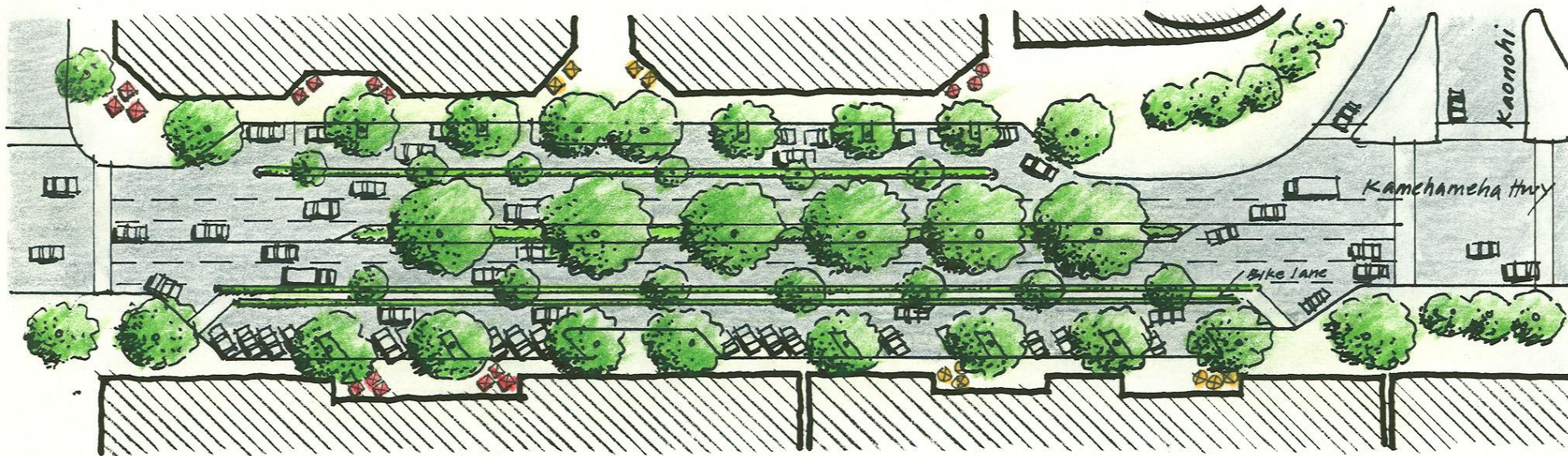
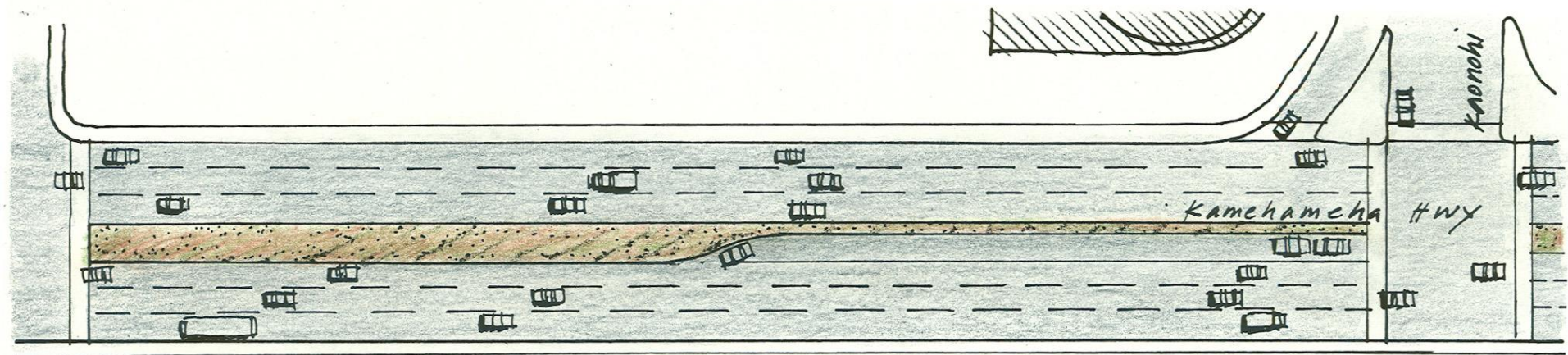
VERONA HOTEL







Kamehameha Highway



Kamehameha Highway



Kamehameha Highway



Kamehameha Highway



Kamehameha Highway



Kamehameha Highway





SOUTHERN GUAM







Tumon Beach - 1954



For more information on the Guam Land Use Master Plan I can be contacted at the Guam Coastal Management Program Phone No. 671-475-9666 or email at francis.damian@bsp.guam.gov
- www.bsp.guam.gov -

