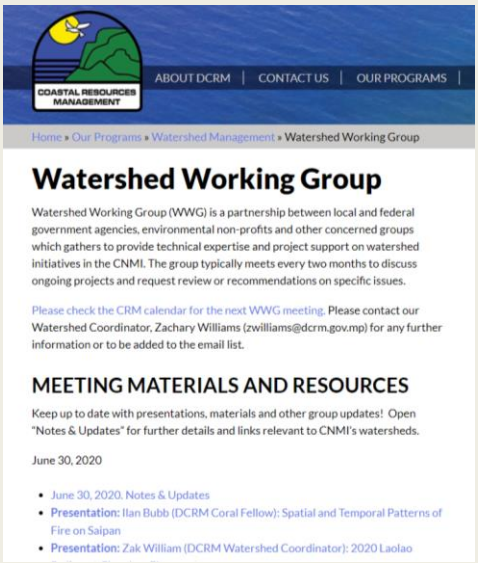
Watershed Working Group (WWG)

May 6, 2021 Quarterly Meeting

The Watershed Working Group is a network of partners involved in watersheds planning, project implementation, research, and education.

Includes members from local and federal government agencies, NGOs, community groups, and other interested parties.

Typically meets quarterly to discuss issues relating to watersheds, in order to pool knowledge and networks towards better management and collaboration.



https://dcrm.gov.mp/our-programs/water-quality-and-watershed-management/watershed-working-group/

Meeting Agenda

Anne Kitchell (Horsley Witten)
- *Achugao and Laolao Watershed Management Plans (WMP) updates*

Zak Williams BECQ-DCRM)
- *DOI Grant Updates*
- *Tanapeg Raingarden*

Ilan Bubb BECQ-DCRM)
- *Fire Management Plan*

Roundtable Discussion
- *Member updates, concerns, opportunities, etc.*
- *Larry Maurin (BECQ-DEQ)*
  - Triennial Review Water Quality Standards update
- *Marry (BECQ-DCRM*
  - Nature-Based Solutions Virtual Workshop
- *Pedro Tudela (Forestry)*
  - Watershed Updates

Closing

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NMIWATERSHEDS/

LAOLAO WMP

MAY 6, 2021 UPDATE

Purpose: Update CAP as part of comprehensive watershed management plan

PROJECT TIMELINE

FIELD ASSESSMENTS & WORKSHOP
COVID what?

Jan-Feb 2020

Dec 2020

INTERIM REPORT
Existing Conditions & Opportunities; CAP evaluation

BMP CONCEPTS & ACTION PLAN
Concepts for priority projects, Education and Outreach Plan

Feb-April 2021

May-June

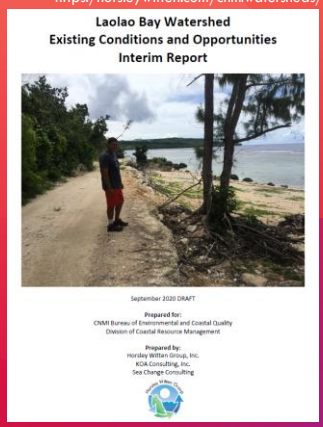
DRAFT WMP
Management approach and implementation strategy

FINAL WMP
Final plan

July 2021?

INTERIM REPORT

https://horsleywitten.com/cnmiwatersheds/



- **Characterization** – land use, hydrology, geology, infrastructure, ecology, vulnerability, water quality
- **CAP Evaluation**
- **Pollutant load modeling** – existing loads for 3 subsheds, TSS, TN, bacteria
- **Stakeholder engagement**
- **Potential watershed restoration projects** – structural, non-structural, conservation, education
- **Field Sketches**

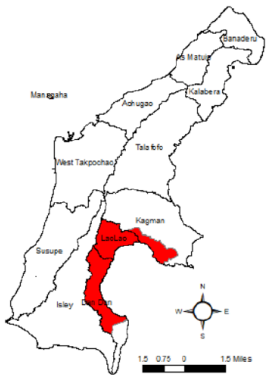


Figure 2. Laolao Bay Watershed (2020)

OBSERVATIONS

- Great history of watershed restoration and monitoring efforts
- Coral reefs not doing well
- Not high priority for climate or social vulnerability (compared to west coast), but Yutu damaged shoreline
- High priority for recreation, but lots of issues (overuse, no facilities, lack of maintenance)
- Land conservation is critical but policies on how to protect undeveloped areas are unclear
- Nitrogen and bacteria reduction challenging. New info on groundwater sources pending, not much info on wastewater contributions. There is a bacteria TMDL
- A lot we still don't know about Dan Dan and Kagman subwatershed conditions and opportunities

2009-2012 CAP ASSESSMENT

1. Since 2009 CAP there have been many accomplishments
   - Achieved burn reduction target
   - Established canopy species with revegetation project
   - Social marketing/education campaigns and signage
   - Completion of road improvements
2. Some actions in progress (monitoring)
3. Some actions not completed (reduce failing septics, gap gap rd., expand tasi-watch)
4. New priorities (invasives, land-owner stewardship, birds)

Table 14. Summary of progress on achieving objectives and completing strategic actions from 2009-2012 Laolao Bay CAP

Objective/Action	Attainment Status (2012 and 2020)	Status of Specific Implementation Actions (as of 2020)
Habitat and Wildlife Related Objectives and Actions		
Objectives 09-1/4/5: Statistically significant positive trends in the abundance of a) carnivorous fish, surgeon fish and adult parrot fish; b) sea urchins and sea cucumbers; and c) the coral density per unit area and mean colony size by FY2015 compared to baseline.	*IN PROGRESS (in 2012 and 2020)* Have not done full benthic surveys, trends not complete. Reduction in sedimentation and illegal beach/fishing activities may lead toward completion by the target date. Monitoring is taking place so information can be evaluated in 2015	COMPLETE • Maintain and improve fisheries regulations --maintaining • Continue the sea cucumber moratorium beyond 2010. ONGOING • Work with community to form a Volunteer Tasi-watch Team IN PROGRESS • Hire a charismatic community leader to work with local fisherman to create a locally managed marine area (LMMA). *The reduction of sea urchins and sea cucumbers during the 1980's through the 1990's was a result of the influx of Chinese garment workers. It would be better to choose a Chinese community leader to work with tourist and local Chinese residents about avoiding the harvesting these animals.* • Provide non-destructive diver access from shore to both reef cuts. *Toshi-President of NMDOA. They do underwater cleanups as well and are mostly responsible for installing all the ropes at all the dive sites*
Objective 09-7: Under normal weather conditions the acreage burned by fires in the Laolao Bay Watershed has been reduced by 50% by the end	*ACHIEVED (in 2012).* No wildfires have been reported since 2008 (per 2012	
Objective 09-8: Using the N Planting Plan, at least 4 car are established in the Laola Revegetation Site by the de of a 50% total survival rate (24 acres) by the end of FY2009.	showed 67% survival	
Objective 12-7: Continue recent record of "no fires" through 2014	ACHIEVED (presumably, 2020)	
Objective 12-8: Maintain >50% survival of plants in revegetation sites.	ACHIEVED (presumably, 2020)	GAP/NOT COMPLETED • Weed/fertilize upland revegetation sites twice a year for the next two years until the plants grow above the level of the grass • Partner with NRCS to create an invasive plant monitoring plan for upland and lowland areas (by 2014) • Plant native vegetation on beach and road edges • Partner with NRCS to create a revegetation plan for beach and road edges
Water Quality & Engineering Related Objectives and Actions		
Objective 09-2: By the end of FY2015 water turbidity is reduced below 1997 ambient levels by 10%, and by 50% by the end of FY2018, at both Laolao water quality sample sites.	IN PROGRESS (in 2012 and 2020?) Reduction in sedimentation should lead toward completion by the target date. Monitoring data indicates turbidity reduction >10% in Laolao N site between 2012 and 2016. 2018 and 1997 values not provided. Laolao S site did not show same level of improvement	COMPLETE • Implement road improvement plan --Done but needs maintenance, especially hardened stream crossings. damaged by Yutu? • Revegetate badlands using student and community volunteers-- *Done/ongoing, but needs better maintenance. Monitor growth (check against old GIS layers.)* This project was led by Ryan O'Kano but left when he moved back to Hawaii. DCRM provided the plants, garden tools, and fertilizers. Worked with MINA, NMC CREES/NR Program and clubs; and hotel guests (Ritz-Carlton Give Back Get-Away Tour Package). GAP/NOT COMPLETED • Reduce the number of failing septic systems- No progress. Expand watershed area to encompass Dandan /residential area upstream (source of water pollutants). • Gap Gap Road improvements- two proposed designs, none implemented • Dive site parking lot drainage improvements and shoreline setback revegetation—designs completed, no implementation due to ownership issues
		COMPLETE

NEED ONE MORE MEETING WITH DCRM TO COMPLETE THIS EVALUATION

OUTSTANDING DATA NEEDS

1. Confirm TMDL bacteria reduction targets for laolao

2. Locate the Appendix 2 technical report in the 2012 CAP establishing the baseline from which WQ targets were established

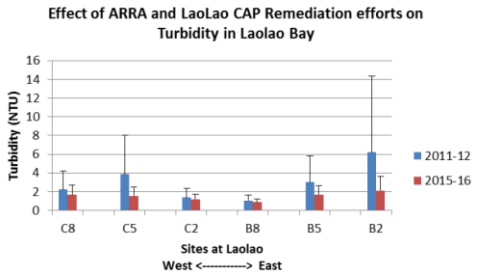
3. Compile data collected since 2016 to update the trends graphics (turbidity)

4) Sea turtle, urchin, fish, and coral density monitoring data to compare to baseline.

4. Check back in with Kiho Kim on Laolao results from Nitrogen studies.

Table 9. Summary of *Enterococcus* load reductions in the 2017 TMDL for Laolao (Segment 15)

	Count	Exceedances	WQS	% Reduction				
				Duration Curve Zone				
				Dry (0 - 10%)	Low - Mid (10 - 40 %)	Mid (40 - 60 %)	Mid - High (60 - 90 %)	High (90 - 100%)
DRY SEASON								
STV	184	6	130	0%	0%	0%	0%	70%
Geomean	184	19	35	0%	0%	0%	0%	0%
WET SEASON								
STV	84	14	130	0%	27%	0%	44%	57%
Geomean	84	33	35	0%	0%	0%	41%	55%



- Inlets and catch basins, culverts, manholes, BMPs, outfalls, other
- The condition, dimensions, elevations, photos were documented for each
- 30% require maintenance, repair, or other attention due to clogging, high sediment accumulation, visible damage, associated erosion, or other observations.

ID	Description/Notes	Sediment[1]	Damage[2]	Flow[2]	Erosion[1]	Needs Attention[3]
LL346	24" HDPE with ~ 3.5 ft invert.2 inlets curb and one open inlet	○			○	
LL347	24" HDPE with ~ 4 ft invert. Goes to detention basin	○			◖	
LL353	36" pipe along ISA Dr. and goes into 18" HDPE into forested area; structure at 4 ft invert	◖			◖	
LL354	Found catch basin in vegetated area next to other catch basin; 2.5 ft invert					
LL355	concrete, 36" with ~2.0 invert. Slopes into manhole adjacent	●			◖	●
LL357	9" deep; Grate 2x2	●			◖	●
LL358	Filled completely. Saw construction up the road					●
LL359	12" concrete; 4 ft invert; dry weather flow	◖		●		●
LL360	24" RCP at 4 ft invert from road. Runs along Isa Dr.	◖				
LL361	48" RCP at 5 ft invert. Sump 9' down; 24" coming from inlet across the street. Outlet is box 2'Hx4'W into ponding basin. 24" pipe coming in from Isa Dr.					
LL364	24" HDPE with 4 ft invert. Goes to ponding basin	○			◖	
LL365	24" RCP. Goes toward CB to ponding basin	○				

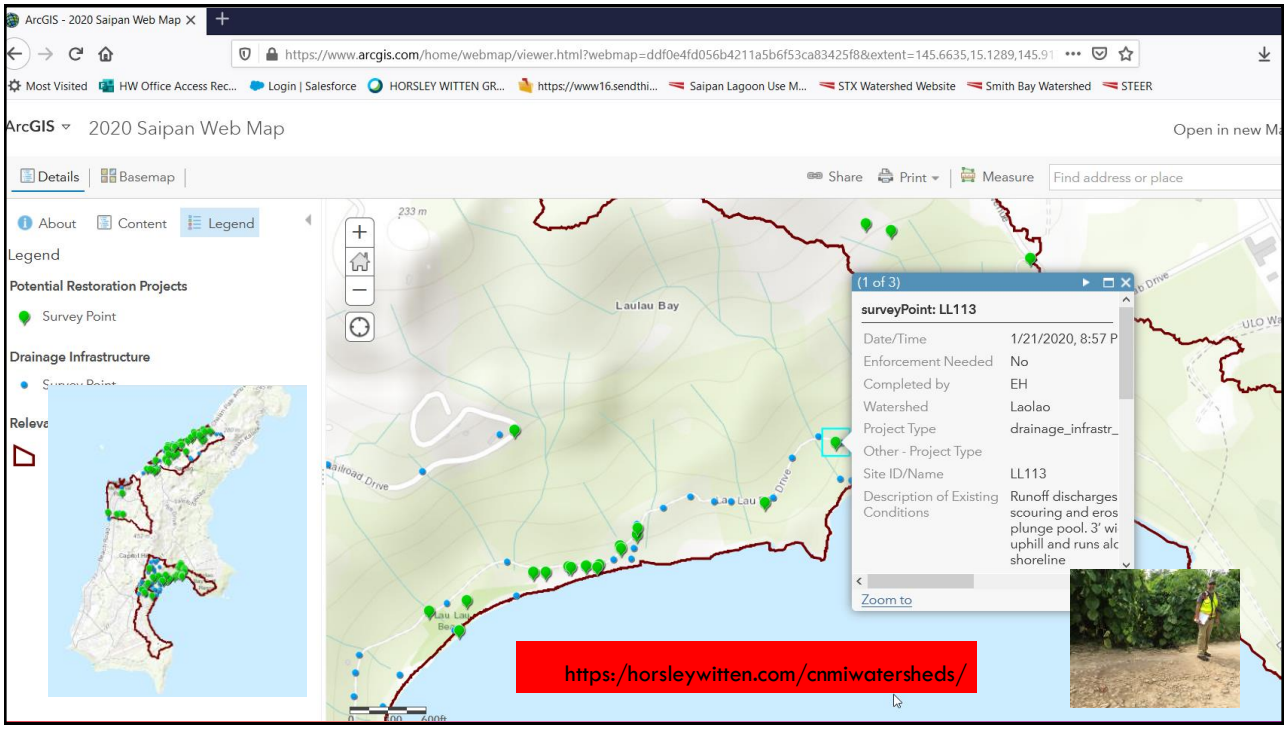
>140 DRAINAGE STRUCTURES MAPPING AND ASSESSMENT

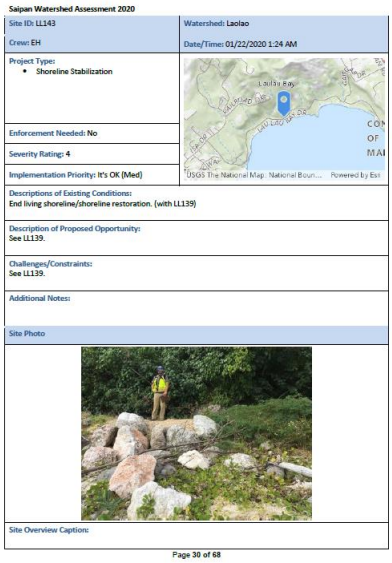
- Type- Stormwater retrofits, road stabilization, upland habitat, shoreline or streambank stabilization, non-structural (enforcement, trash cleanup, land conservation), & education
- Description
- Priority and level of importance
- Relative cost
- Field notes and sketches

Table 15 Potential Project Opportunities in Laolao

ID	Description of Condition & *Potential Solution*	Relative Severity[1]	Priority[2]	Cost[3]	Stormwater Retrofit/ Unpaved Road	Upland Veg.	Shoreline/Bank Stabilization	Non-Structural	Education
LL100/ 101	Ongoing revegetation efforts by MINA. Currently maintained and monitored by MINA	0/0	?	$		●			
Dive Site LL103/ 104/ 108/ 109	Uncontrolled pedestrian circulation eroding shoreline at multiple access points to beach. Parking lot runoff eroding shoreline along pedestrian path. *Organize circulation and limit access points to 2 paths/boardwalk. Part of dive site improvement & parking lot reorganization. Educational opportunity with signage etc.* Uncontrolled runoff from Laolao Bay Rd eroding entrance to parking area and shoreline. *Intercept runoff before entering dive site. Water bars with stormwater infiltration. Improve drainage along the road. See concept from PIWI. Remove trash from gully.*	3/4/3/3	H	$$$	●		●	●	●
Lau Lau Bay Dr. LL112	Culvert concentrates flow into narrow channel. Road grading is rough mounds and dips. *Replace and widen culvert (convert to a large box culvert). Construct broad dip or other diversion at low point to direct road runoff into ditch.*	4	H	$$	●				
Lau Lau Bay Dr. LL113	Runoff discharges off road at uncontrolled location causing scouring and erosion down to very deep pool. 9' down to 3' wide plunge pool. Inflow to east comes onto road ~100 ft uphill and runs along road contributing to runoff at shoreline. *Create broad dip and formalize overflow. Upstream drainage: pitch discharges to road. Runs along eastern edge to informal drainage overflow.*	5	H	$	●		●		
Gap Gap Rd. LL124/ 125/ 126	Washout and erosion of steep, unpaved road surface. *See PIWI conceptual plans. Proposed improvements to drainage were confirmed and remain valid.*	5	H	$$	●				

26 POTENTIAL PROJECTS





Saipan Watershed Assessment 2020

Site ID: LL143	Watershed: Laolao
Crew: EH	Date/Time: 01/22/2020 1:24 AM
Project Type: • Shoreline Stabilization	
Enforcement Needed: No	
Severity Rating: 4	
Implementation Priority: It's OK (Med)	

Descriptions of Existing Conditions:
End living shoreline/shoreline restoration. (with LL139)

Description of Proposed Opportunity:
See LL139.

Challenges/Constraints:
See LL139.

Additional Notes:

Site Photo

Site Overview Caption:

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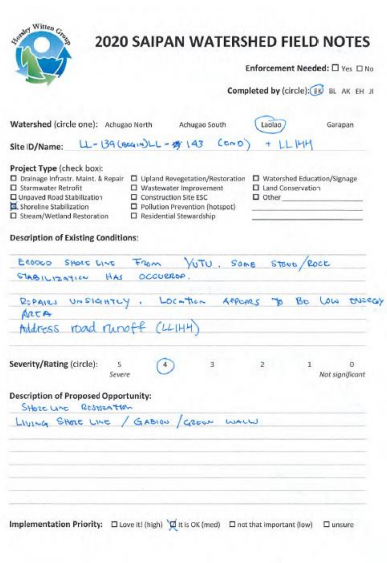


2020 SAIPAN WATERSHED FIELD NOTES

Enforcement Needed: ☐ Yes ☐ No

Completed by (circle): (EH) BL AK EH JI

Watershed (circle one): Achugao North Achugao South (Laolao) Garapan

Site ID/Name: LL-139 (LL-143 CONT) + LLHH

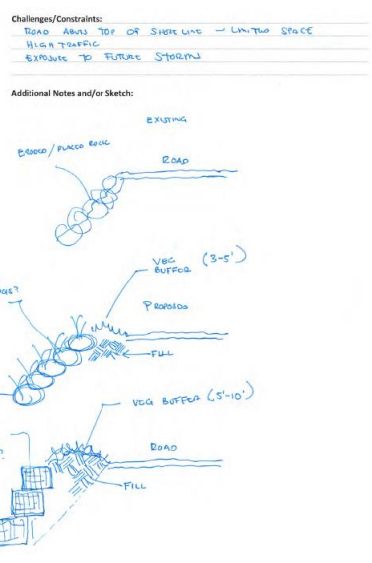
Project Type (check box):
☐ Drainage Infrastr. Maint. & Repair ☐ Upland Revegetation/Restoration ☐ Watershed Education/Signage
☐ Stormwater Retrofit ☐ Wastewater Improvement ☐ Land Conservation
☐ Unpaved Road Stabilization ☐ Construction Site ESC ☐ Other
☒ Shoreline Stabilization ☐ Pollution Prevention (hotspot)
☐ Stream/Wetland Restoration ☐ Residential Stewardship

Description of Existing Conditions:
ERODED SHORE LINE FROM YUTU. SOME STONE/ROCK STABILIZATION HAS OCCURRED.
REPAIRS UNSIGHTLY. LOCATION APPEARS TO BE LOW ENERGY AREA
Address road runoff (LLHH)

Severity/Rating (circle): 5 Severe (4) 3 2 1 0 Not significant

Description of Proposed Opportunity:
SHORE LINE RECREATION
LIVING SHORE LINE / GABION / GREEN WALL

Implementation Priority: ☐ Love it! (high) ☑ It is OK (med) ☐ not that important (low) ☐ unsure



Challenges/Constraints:
ROAD ABUT TOP OF SHORE LINE – LIMITED SPACE
HIGH TRAFFIC
EXPOSURE TO FUTURE STORMS

Additional Notes and/or Sketch:

STAKEHOLDER INPUT

Jan 20th Workshop

- Sustainable eco-tourism
- Water quality- meet DU standards for recreation and creatures via BMPs
- Improved ecosystem function/services
- Education for residents and tourists

Public

- COVID issues
- Survey Monkey
  - Awareness of watershed issues
  - Vision for laolao
  - Perception of road projects impact on water quality improvements
  - Ranking of watershed priorities

ACTION PLAN

1. Drainage improvements
   - Unpaved roads
   - Stormwater retrofits
   - Maintenance program
2. Shoreline stabilization and infrastructure protection
3. Carry over actions from CAP
4. Watershed forestry- invasives management, revegetation, native trees, habitat quality
5. Additional assessments in Dan Dan and Kagman subwatersheds, septic surveys, and research into policies and alternatives for local land conservation
6. Watershed education and outreach plan- residential stewardship, tour industry, school projects
7. Monitoring plan
   - Stream flow and sediment loads
   - Integration with existing marine monitoring program
   - Nutrient source tracking

CONCEPT DESIGNS

1. Lau Lau Bay Dr.—package of parking, road realignment, living shoreline options
2. Gap Gap Rd.—options for stabilization and flow diversion
3. Residential road examples
   a. Lau Lau Bay Dr Extension—short unpaved residential road west of Isa Dr.
   b. Benata Dr.—driveways and steep residential road drainage improvements
4. San Vicente Elementary—field drainage and slope stabilization improvements

NEXT STEPS

- Finalize CAP evaluation
- Survey Monkey for LaoLao Watershed Awareness
- Draft Action Plan
- Draft Education and Outreach Plan
- Submit advanced concepts for review
- Model potential load reductions achieved
- Draft Management Plan

ACHUGAO WATERSHED MANAGEMENT PLAN

HTTPS://HORSLEYWITTEN.COM/CNMIWATERSHEDS

SINCE WE LAST MET

- NOAA extended project timeframe through Feb 2022
- Received comments on Interim Report
- Drafted priority concept designs for
  - Kensington
  - Aqua Resort
  - Tanapag Middle School
  - Tanapag Beach Park
  - Culvert/wetland on middle road @ old garmet factory—Agatan
  - Green streets on middle road in san roque , near Latte Stone Café
- Prepared for 2 public meetings in Tanapag and San Roque

ACHUGAO DATA NEEDS

- Location of priority reforestation areas (previously burned)
- Kensington hotel site plans/drainage plans
- Stream walk data- new stream GIS layer as well as findings/sites for stream restoration or other projects
- Wetland assessment data
- Priority habitats in the watershed
- Status of OPD comprehensive plan for Achugao

Zak Williams – Watershed Project updates

Reef tips

MARIANAS VARIETY NEWS AND VIEWS FRIDAY, JULY 8, 2016 21

Be a Watershed Warrior!

This spring, almost 50 students from the 4th grade at Garapan Elementary School gained the title of 'Watershed Warrior,' for their hard work to protect the land and sea of the CNMI. Students from Ms. Megan Nevitt-Loken's and Mr. John Aldrich's classes learned about watersheds, the water cycle, coral reefs, pollution and environmental stewardship as part of an educational program run by the Bureau of Environmental and Coastal Quality. For the final field trip, students trekked to a restoration site in the watershed above Lao Lao Bay, where they planted trees that will reduce erosion and benefit healthy coral reefs in the waters below.

Learn more about watersheds, land based sources of pollution, and ways to protect watersheds so that you too can be a Watershed Warrior for the CNMI!

Watershed Warriors

Hands-on and experiential learning aimed towards 4th-grade students in PSS.

- Previously held at Garapan Elem. School, now moved to **GTC Elem. School** to educate residents of Achugao watershed.
- Funded by DOI OIA Coral Reef & Natural Resources (CRNR) Program.
  - 3-year grant project
- **April 13 – May 26**
- Programming includes Achugao geography, biodiversity, pollution sources and solutions.

Going well so far!

Tanapag Raingarden Maintenance

Workday in cooperation with DEQ to renovate and replant existing raingarden locate on Tanapag Middle School grounds.

- Raingarden was in poor shape due to lack of maintenance, weeds, litter, etc.
- Wetland plants purchased by DEQ, tools and landscape planning by DCRM.
- April 22, part of Environmental Awareness Month (EAM) activities.
- More maintenance planned in coming months, for Tanapag, San Vicente, and WSR schools. Stay tuned!

Thank you volunteers!

Ilan Bubb– Fire Management Plan

Mt. Tapochao - 2020

Coral Ocean Point- 2020

Goal 1

Goal: Increased institutional understanding of fires on Saipan

- **a. Objective:** By 2025, baseline fire data and understanding established and published in formal report.
  - **i. Activity:** Survey agencies to collect already available fire data/info while determining data gaps.
- **b. Objective:** By 2022, establish multi-agency protocol for wildfire monitoring
  - **i. Activity:** Establish agency roles in the Fire Monitoring protocol.

Goal 2

Goal: Reduction in Fire vulnerable lands

- **a. Objective:** By 2022, outreach incorporating multi-stakeholder messaging targeting fire prone areas/villages
  - **i. Activity:** Determine and develop village specific fire concerns through talks with DFEMS and BECQ.
- **b. Objective:** By 2022, reforestation at rate of 1 acre planted per year on identified vulnerable lands
  - **i. Activity:** Identify sustainable funding source for nursery outside of current Achugao grant.

Goal 3

Goal: Establish Municipal Trash Collection

- **a. Objective:** By 2030, municipal trash collection service for green and household waste is accessible to 100% of Saipan's population
  - **i. Activity:** Have FMP Representative on Governors Economical Council of Advisors.
- **b. Objective:** By 2030, 50% of waste is diverted from landfill through zero waste initiatives
  - **i. Activity:** Develop and distributable brochure on how to compost in your backyard

Goal 4

Goal: Formalize coordination of relevant stakeholder groups

- a. By 2030, an open access database containing spatial data, management plans, and other pertinent statistics relevant to fire management is created
  - **i. Activity:** Determine which department is capable of hosting and creating the database
- **b. Objective:** By 2023, Expand Saipan Fire Management plan to include Tinian and Rota creating the CNMI Comprehensive Fire Management Plan.
- **c. Objective:** By 2023, an MOU is effectuated between BECQ, OPD, DFEMS, DLNR, DPW, CUC, CHCC, DCCA, MOS and other community partners to implement fire management plans

Roundtable

Updates, concerns, opportunities?

- Larry Murrin
  - *Triennial Review Water Quality Standards update*
- Mary Fem Urena
  - *Nature-Based Solutions Virtual Workshop*
- Pedro Tuela
  - *Watershed Updates*
- Others, thoughts, questions, concerns?

Larry Murrin (BECQ-DEQ)

- Water Quality Standards Triennial Review
  - *Every three years the Division of Environmental Quality (DEQ) is required by the US EPA to review it's Water Quality Standards for surface and groundwater and incorporate any changes necessary to protect public health and the environment, as well as to keep our waters swimmable and fishable.*
  - *In 2021, DEQ will be engaged in this process to review and update standards, and ask the public to comment on the proposed standards revisions. DEQ expects to have the proposed revisions available for public comment and to hold a public hearing to receive questions for the public in June. Stay tuned for more details.*

Roundtable

Updates, concerns, opportunities?

- Larry Murrin
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- Mary Fem Urena
  - *Nature-Based Solutions Virtual Workshop*
- Pedro Tuela
  - *Watershed Updates*
- Others, thoughts, questions, concerns?

Thank you!

Ilan Bubb - NOAA Coral Fellow
ibubb@dcrm.gov.mp
(670) 664-8303

Zachary Williams-Watershed Coordinator
zwilliams@dcrm.gov.mp
(670) 664-8303