Talakhaya Revegetation Project

US Coral Reef Task Force Meeting
September 2016

Outline

- Background/History
- Talakhaya CAP
- Past and Current Work
- Barriers and needs
- Future Work
- Monitoring Summary

Background/History

Rota - Talakhaya Watershed & Conservation Area

Grassland Fire

Visible Soil Runoff Post Rain Event

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Talakhaya Conservation Action Plan Est. 2010

- Targets for management and protection:
  - Wildlife including birds and fish
  - Coral reef ecosystem
  - Endangered and medicinal plants
  - Forest
  - Freshwater
  - Soil
- Major threats:
  - Fire
  - Invasive plants and animals
  - Deforestation
  - Overharvest
  - Soil erosion and runoff
  - Natural disturbances
  - Poaching

"Protehi i rikesan i tano yan i tasi"
Protect the wealth of our land and sea

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Talakhaya Revegetation Project

- First planting season: 2007
- Goal: To control erosion and reduce sedimentation, while building community support and educational outreach efforts as well as preventing fire through field surveillance.
- Total grasses and trees planted to-date: 290,000+
- Total acres covered: 84+

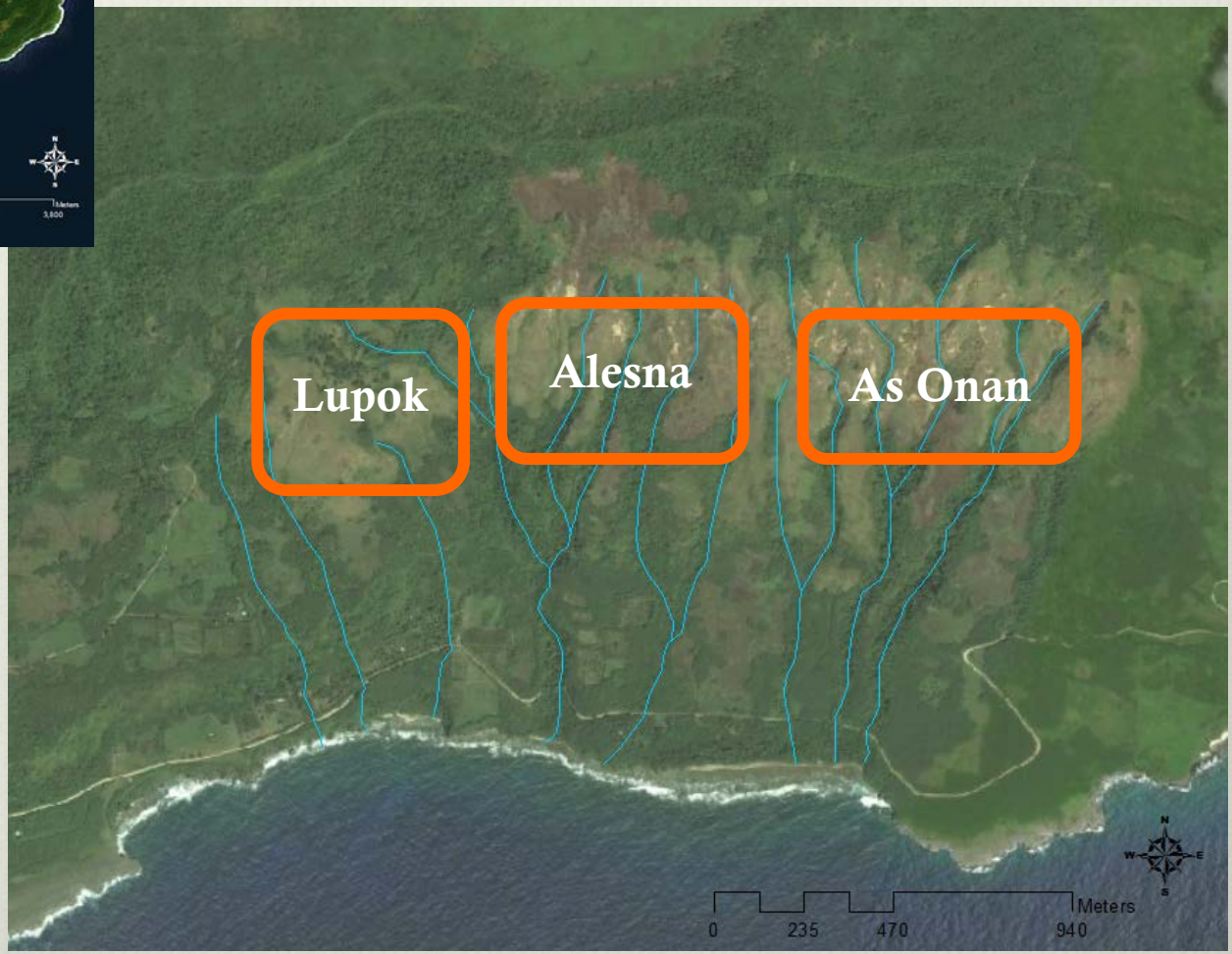
Project Phases

Phase I = As Onan*

Phase II = Alesna*

Phase III = Lupok

*most critical



Wonder grass introduced in 2009

Vetiver Grass - *Vetiveria zizanioides*

Methodologies

- Establish critical areas first
- Species focus:
  - Grasses = Vetiver grass (wonder grass) and Bahia grass
  - Trees = Acacia confusa (non-native)
- Plant grasses on contour/elevation lines - top to bottom to avoid damage
- Plant vetiver in single rows with 1 ft spacing
- Between rows plant:
  - Bahia grass at 1-2 ft spacing
  - Acacia 2-3 ft. above row of vetiver at 6-12 ft spacing
- Plots assigned GPS points


Before


2 Months Later

Community Support

No Burning Campaign

- Inform public of the impact grass fires have on the entire ecosystem.
- Effective, no fires since 2013

Barriers and Needs

- Barriers
  - Steep and often dangerous terrain making site access difficult
  - Limited equipment available to carry up seedlings and other supplies
- Needs
  - 6-9 more years of funding to fully complete required work
  - Proper transportation
  - Improved road conditions

Future Work

- Identify funding opportunities to continue the work in Talakhaya
- Transition to planting native tree species
- Continue monitoring freshwater streams and coastal areas including coral reefs
- Continue involving community in project work
  - Planting volunteers
  - Community outreach events

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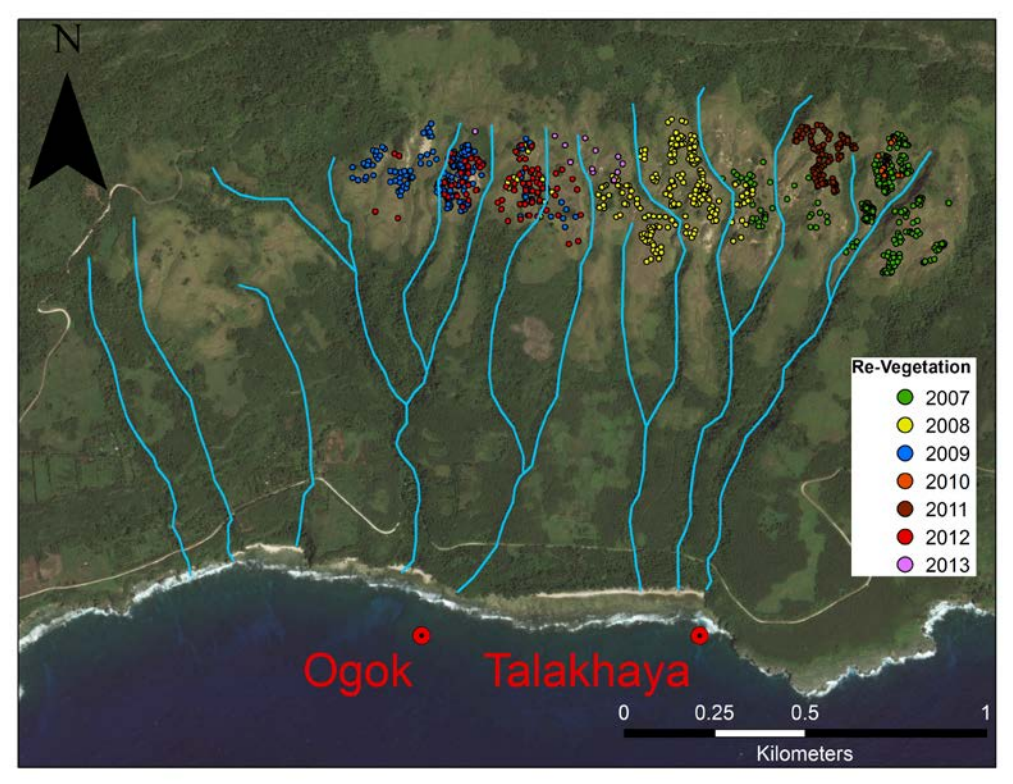
Quantifying Our Efforts: Monitoring

Location	Monitoring Periods	Indicators
Coral Reef Ecosystems	2000 to present, CNMI DEQ	Food fish size and abundance, algal diversity, benthic cover, coral community characteristics and macroinvertebrate abundances
Coastal Marine Water Quality	2016 to present, CNMI BECQ	Total suspended solids and turbidity, pH, dissolved oxygen, temperature, salinity
Stream Water Quality	2013 to 2014, University of Guam 2016 to present, CNMI BECQ	Total suspended solids and turbidity, pH, dissolved oxygen, temperature, salinity

Marine Monitoring Data

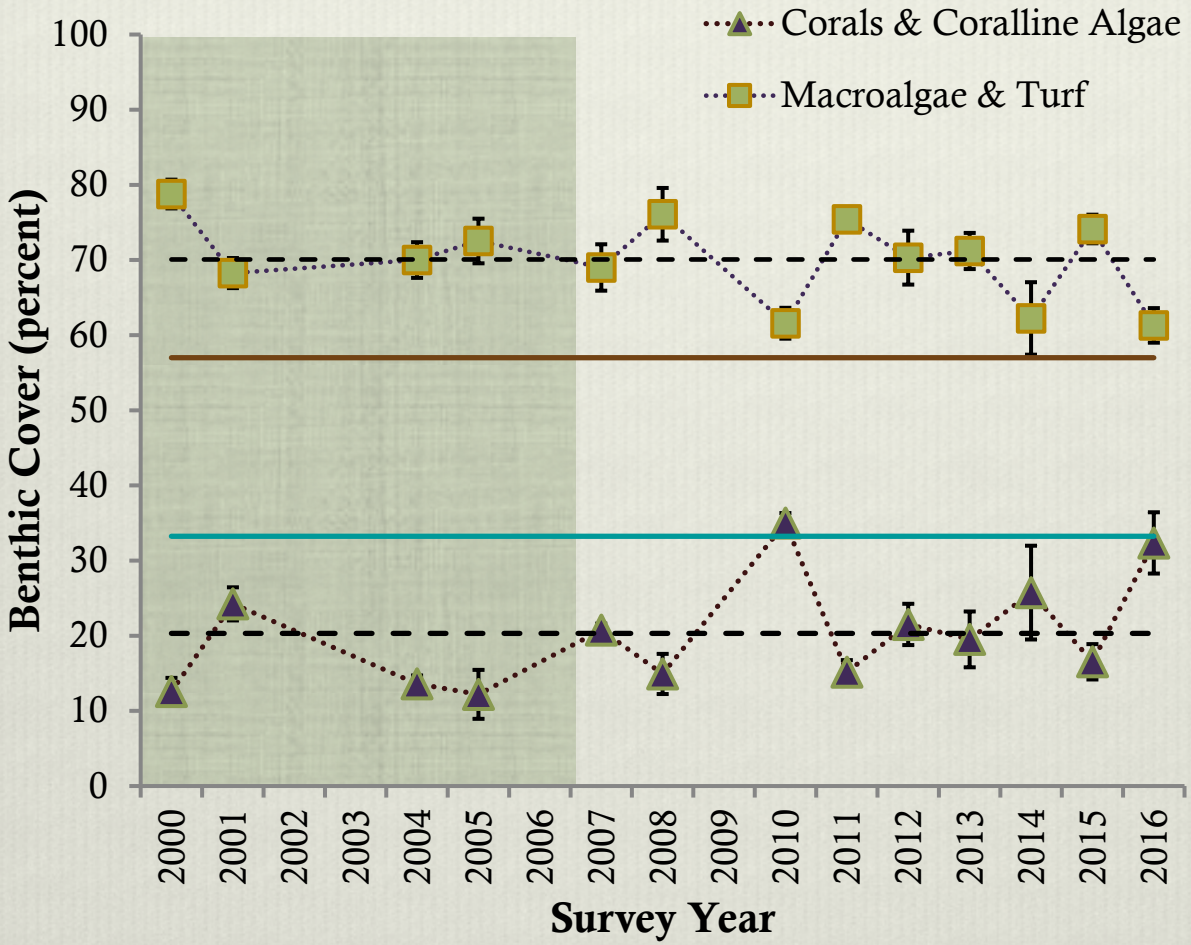
- Survey Sites
  - *Talakhaya*
    - 2000-2016; 13 surveys
  - *Ogok*
    - 2008-2016; 5 surveys



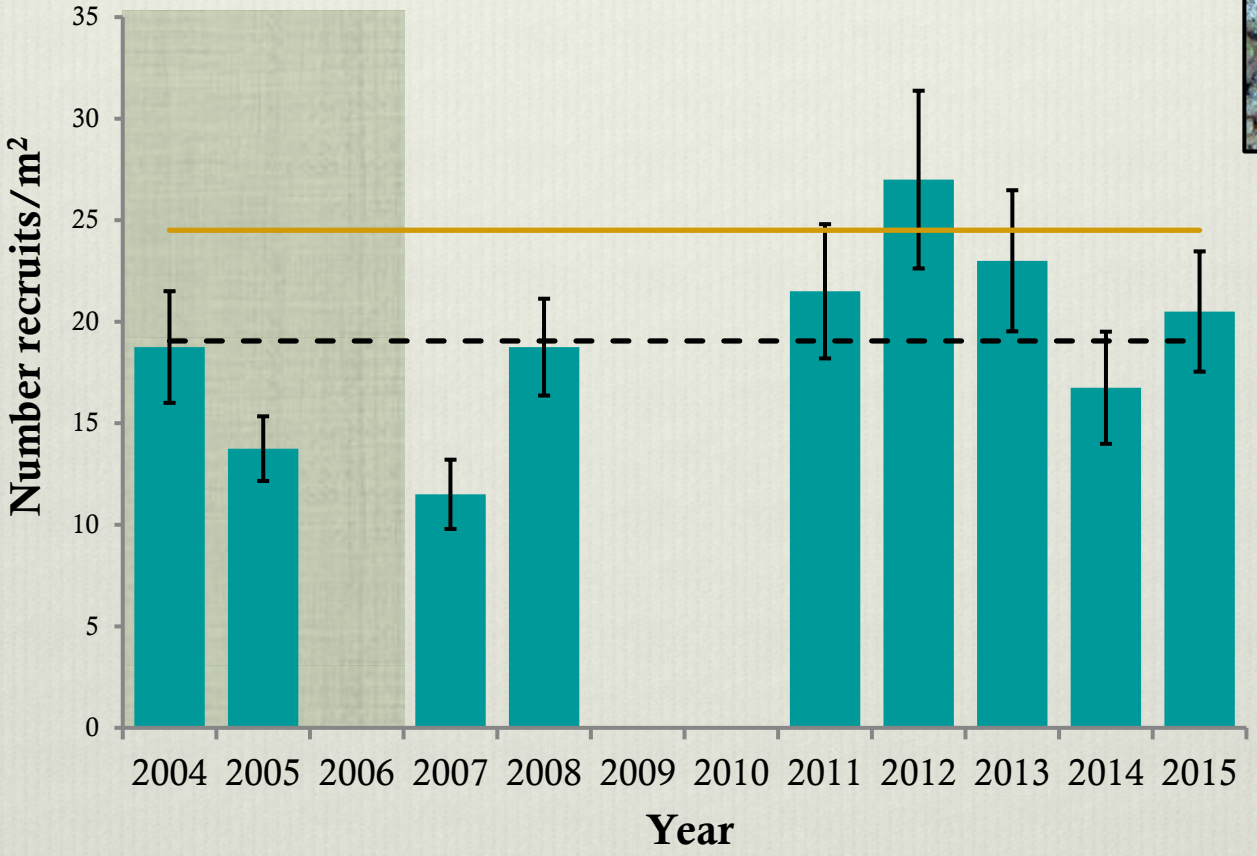
Marine Monitoring Data

- Biological Indicators
  - **Benthic** cover (2000)
  - **Macroinvertebrate** abundance and diversity (2000)
  - **Coral** recruitment, size-class distribution, & diversity (2004)
  - **Food fish** abundance, biomass, size-class distribution, & diversity (2012)
  - **Algal** species richness (2012)

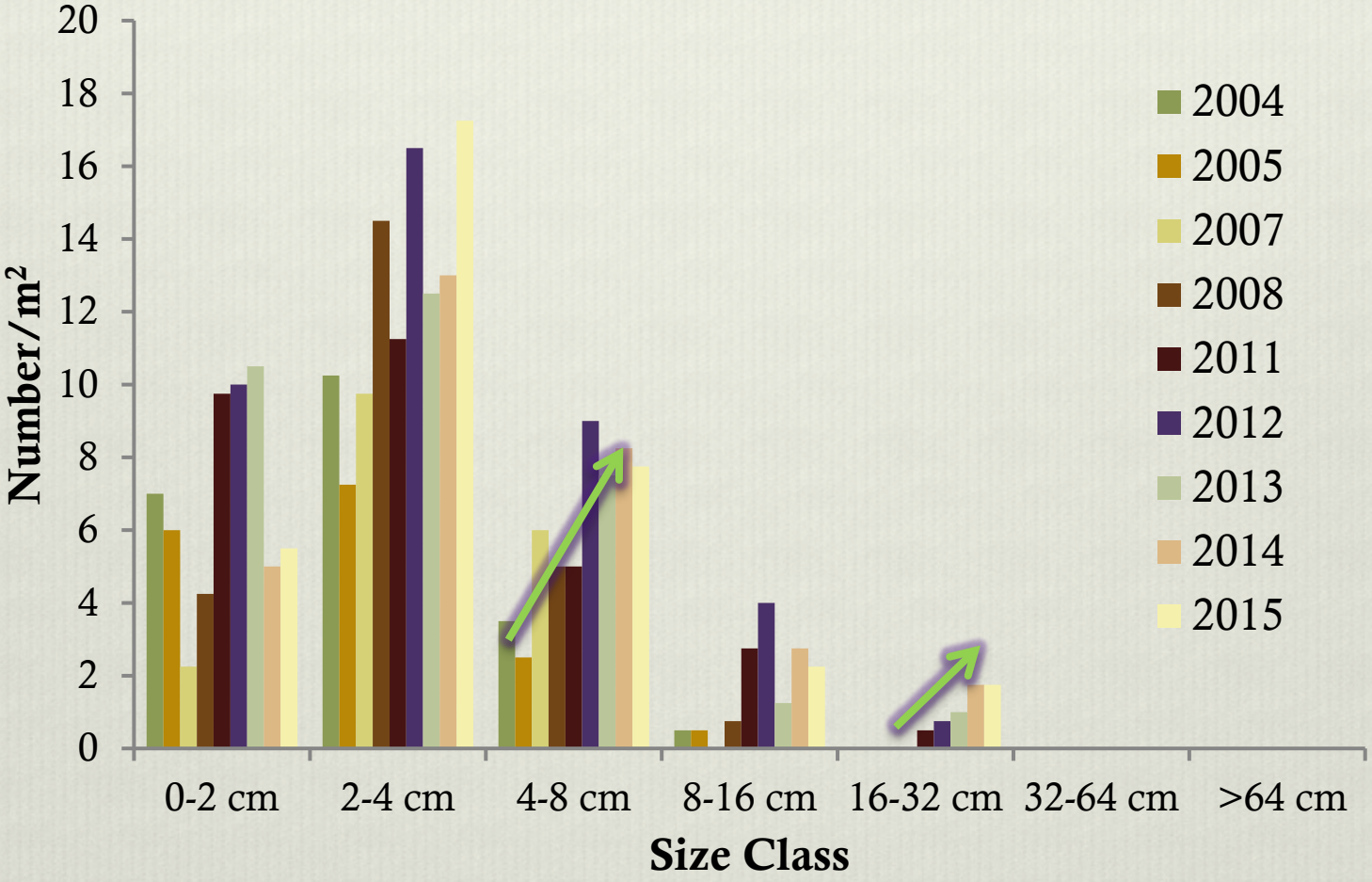
Benthic Cover



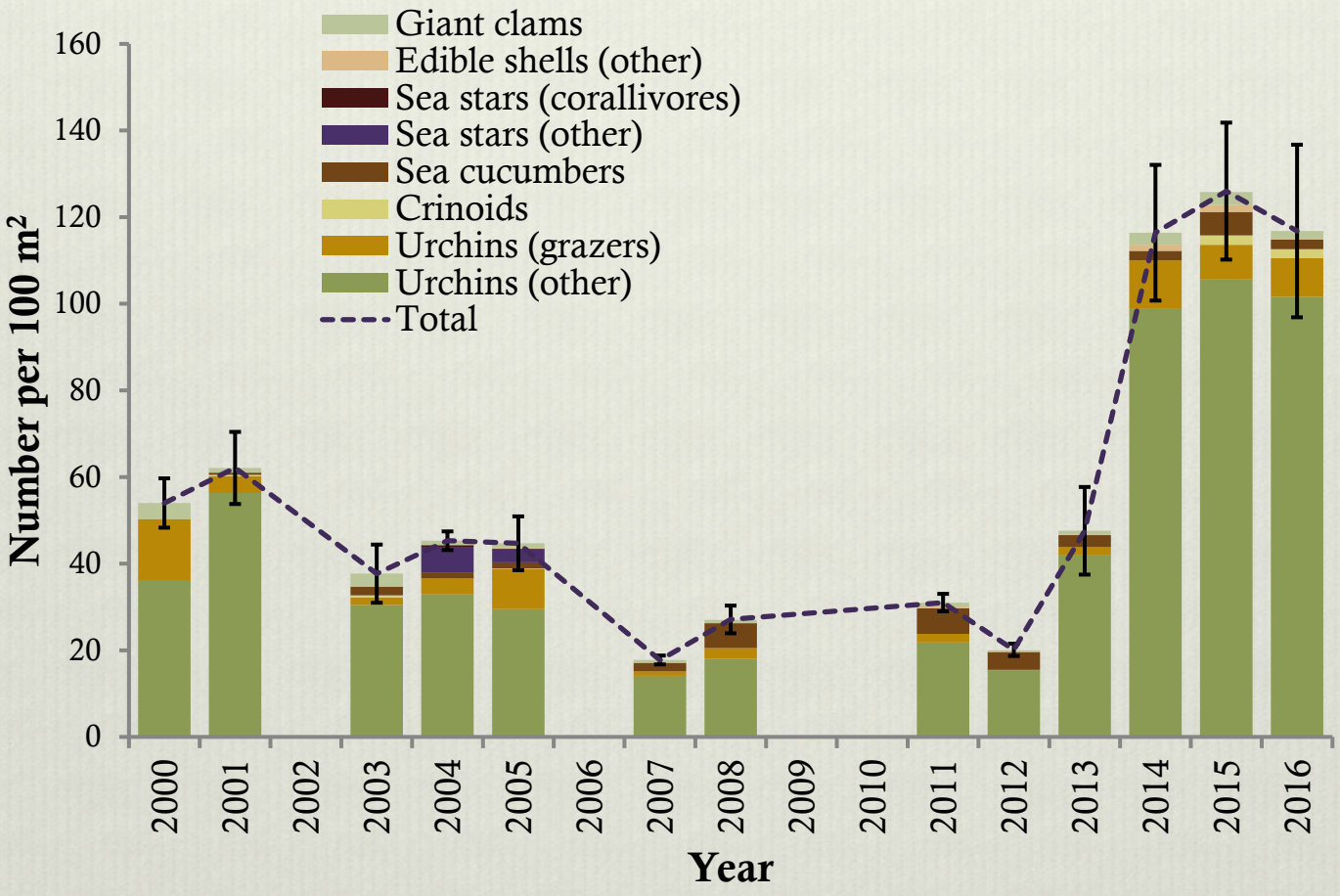
Coral Recruitment



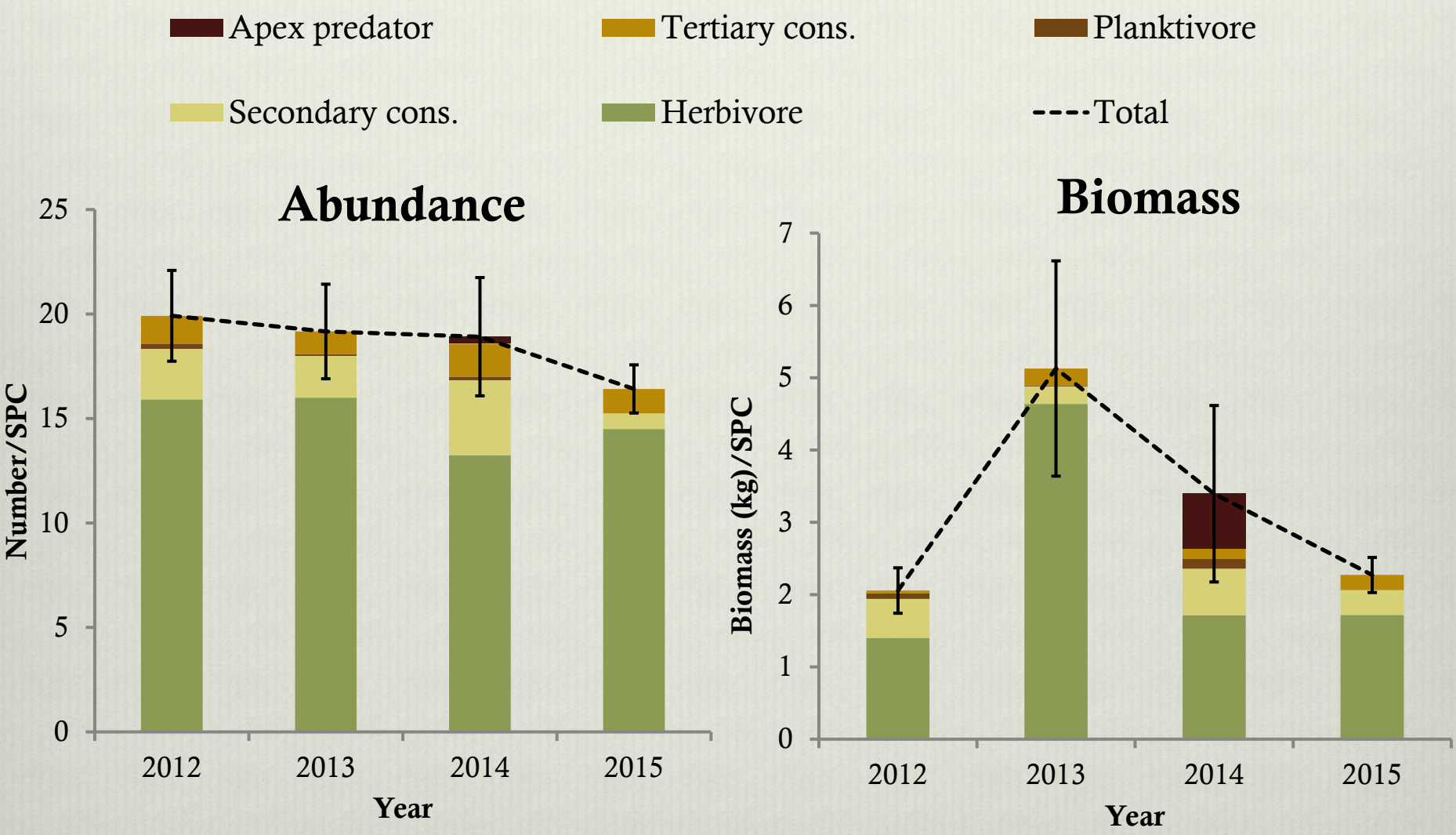
Coral Size-Class Distribution



Macroinvertebrate Abundance

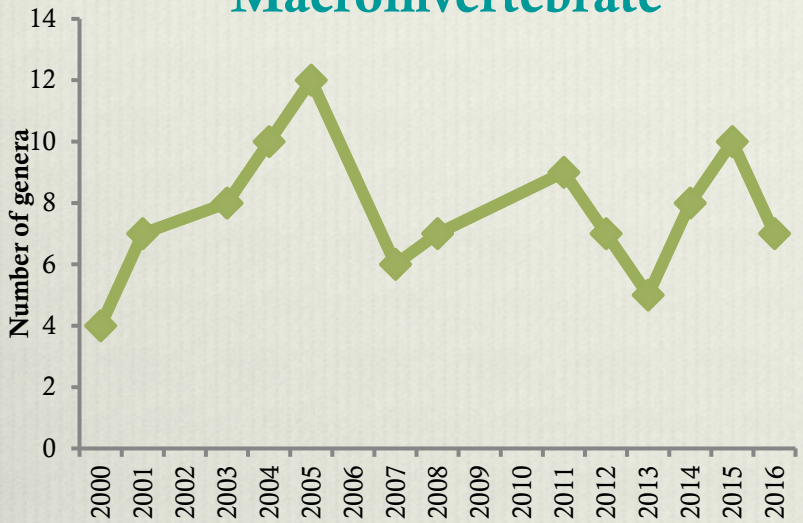


Fish

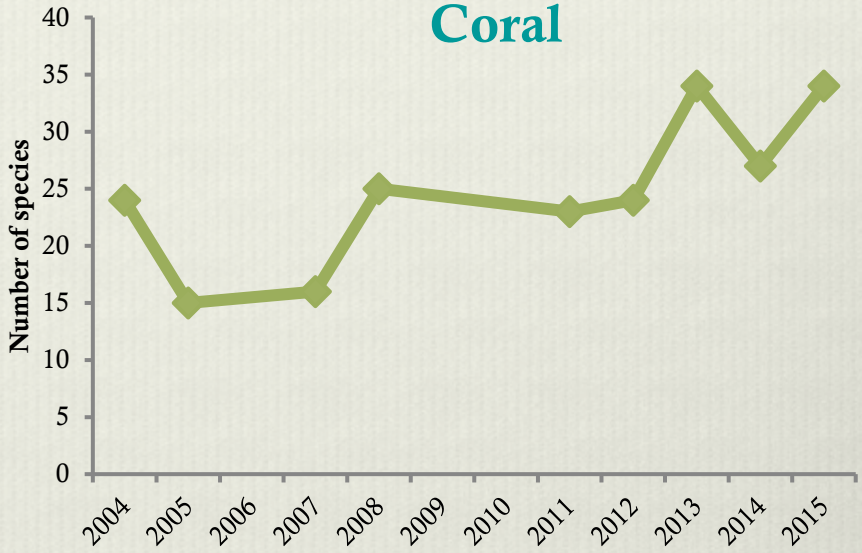

Apex predator
Tertiary cons.
Planktivore
Secondary cons.
Herbivore
Total
Abundance
Number/SPC
25
20
15
10
5
0
2012
2013
2014
2015
Year
Biomass
Biomass (kg)/SPC
7
6
5
4
3
2
1
0
2012
2013
2014
2015
Year

Biodiversity

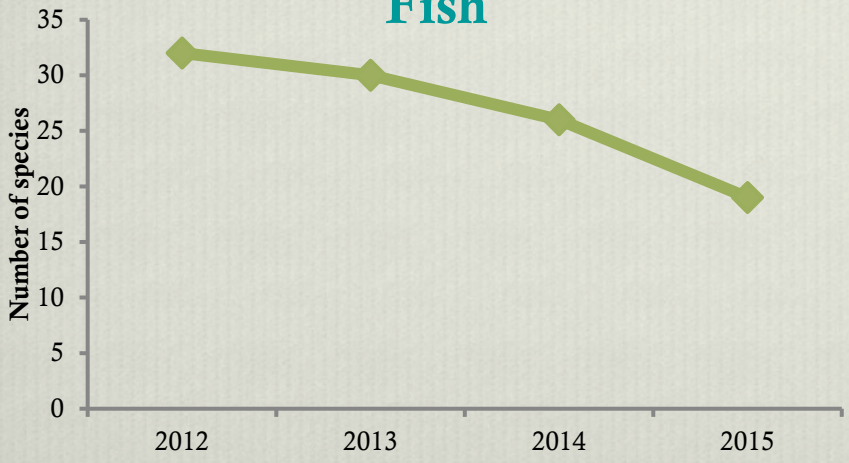
Macroinvertebrate



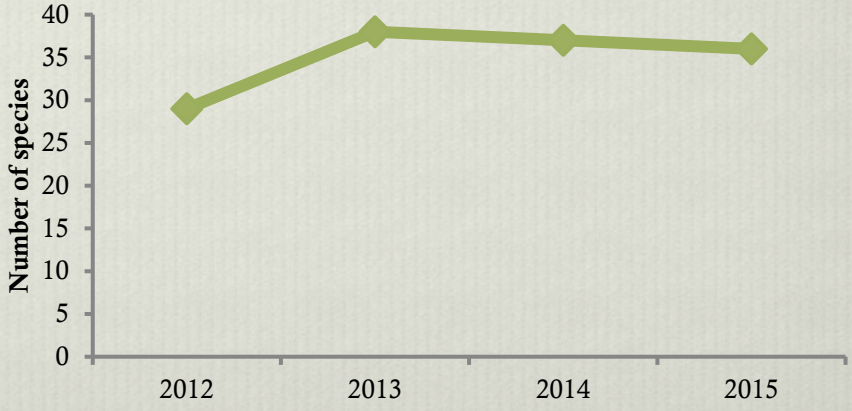
Coral



Fish



Macroalgae



Marine Monitoring Summary

- Long-term monitoring of biological indicators is necessary to assess the effectiveness of upstream management actions and inform management decisions.
- Positive trends in key biological indicators at Talakhaya sites, consistent with island-wide patterns, indicate that watershed management has been effective
  - ↑ Cover of reef accreting substrates
  - ↑ Coral recruitment, size-class distribution, & diversity
  - ↑ Macroinvertebrate abundances
- Improved water quality sampling will help link changes in vegetative cover to downstream biological parameters

Thank You, Questions?

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