SWAN Nearshore Monitoring: Status and Trends

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SWAN Southwest Alaska Network

NATIONAL PARK SERVICE

Outline

- Tasks completed in 2008
- Modified SOPs
- 2009 Sampling

Tasks completed

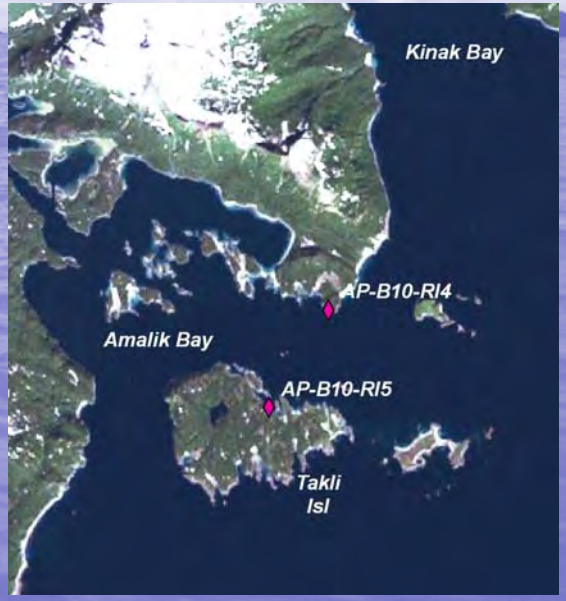
Vital Sign	KEFJ 2008	KATM 2008
Winter marine bird and mammal survey	X	Scheduled for 2009
Rocky intertidal sampling	X	X
Water chemistry	-Hobo temp. loggers collected & deployed -salinity device placed at Aialik Bay site	-Hobo temp. loggers collected & deployed -salinity device placed at Takli Isl. site
Mussel bed SOP testing	X	X
Black oystercatcher nest density and diet	X	X
Sea otter foraging	X	X
Sea otter aerial survey	Completed in 2007	X
Summer marine bird and mammal survey	X	X
Eelgrass SOP testing	X	X
Carcass collection	X	X

Modified SOPs

- Rocky Intertidal
- Mussel Bed Sampling
- Eelgrass Bed Sampling
- Winter Marine Bird and Mammal Surveys

Rocky Intertidal

- Placed salinity recording devices at 2 sites
  - Should consider deploying one at each rocky intertidal site to determine variation of salinity between sites



Rocky Intertidal

- Placed permanent markers along both 50m transect lines to:
  - Mark permanent quads for annual photos to possibly estimate percent cover
  - Ensure transect tape is placed along the same horizontal line every sampling season

*Will be marking permanent transects for both limpet and mussel sampling at each intensive rocky site

Rocky Intertidal

- Conceptualization of “rocky lite” sampling
  - To begin in 2009
    - Occurs during soft sediment sampling years
    - “Lite” sampling will only include: star counts, photo quads, hobo download, limpet and mussel counts and size distribution
    - Should only require 2 – 3 people for 2 hours

Mussel Bed Sampling – Why??

- Mussels are a dominant invertebrate in the intertidal, particularly at KEFJ

Mussel Bed Sampling – Why??

- Important prey item for several organisms including black oystercatchers and sea otters

2007

Sea otter KEFJ	Sea otter KATM	Oystercatcher KEFJ	Oystercatcher KATM
53%	<10%	37%	19%

Mussel Bed Sampling – Why??

- Realized our rocky site sampling methods were inadequate to sample the larger size classes that are being utilized by black oystercatchers and sea otters

KATM – rocky mussel sampling

KATM – black oystercatcher mussel collection

Mussel Bed Sampling - Purpose

- To assess changes in:
  - Mussel bed size (area) of a selected portion of the bed
  - Density of large mussels (>20mm) within these beds
  - Size distribution of larger mussels (>20mm) within the beds
  - Density of mussels regardless of size (core samples)

Mussel Bed Sampling - Methods

- Beds at least 50 m in length and in close proximity to each of the rocky intertidal sites were selected
- To delineate the perimeter of the bed (area)
  - A horizontal transect line was placed at the top edge of the bed section
  - Ten vertical transects were used to determine width of bed to the zero tidal height

Mussel Bed Sampling - Methods

- Random quads were selected for sampling along the vertical transects
- Core samples were taken – all mussels within the core were counted to calculate density regardless of mussel size
- Quadrats of various sizes were used to determine the area needed to collect a minimum of 20, 20 mm or greater sized mussels
- Once an area was selected, ALL 20 mm or greater sized mussels were collected for density calculations of large mussels as well as size distribution of large mussels

Mussel Bed Sampling - Revisions for 2009

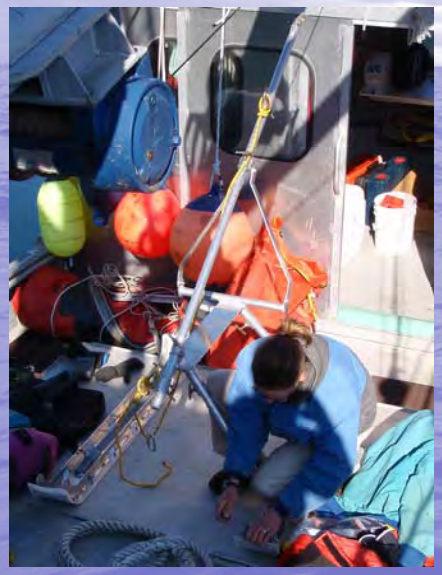
- Use of sub-meter GPS devices to accurately delineate bed (or portion) to be re-sampled
- Decide on maximum quad size to sample for large mussels – 1^{2m}

Eelgrass Bed Sampling - Problems

- Relied on keeping track of waypoints manually and recording positions of waypoints in the GPS
- In many cases, this proved inadequate and errors in recording positions made mapping and making reasonable estimates of relative density difficult in most cases

Eelgrass Bed Sampling - Problems

- Tried a towing mechanism to have constant height above bed for possible density calculations, but that didn’t work either….

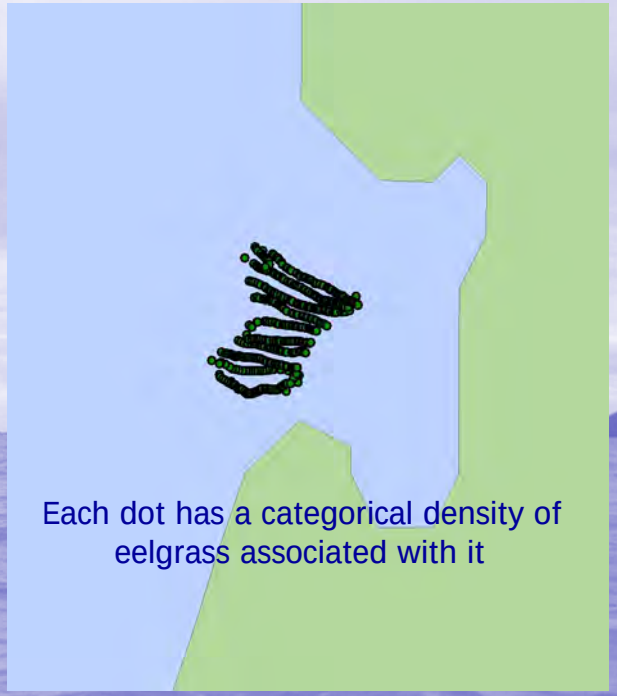


Eelgrass Bed Sampling

- We utilized an underwater video camera to detect the presence or absence of eelgrass beds as well as determine the boundaries of the eelgrass bed area to be sampled
- Once an area of a bed was determined
  - Temporary buoys were deployed to mark four edges (2 inshore, 2 offshore) of a 200 m long (parallel to the shoreline) section of an eelgrass bed

Eelgrass Bed Sampling

- Several transects were created perpendicular to shore by deploying buoys to mark the beginning and end points within the designated sample area
- Dlog2 (GPS linked mapping software) was used to record the transect line as well as points along the transect where eelgrass bed density was recorded
- The underwater video camera was used to categorically estimate the density of eelgrass along each transect



Winter Marine Bird and Mammal Surveys

- To characterize the density, distribution and species composition of marine birds within the SWAN parks during the winter
- Initially sampled transects that were completed during the summer months
- Future winter surveys
  - emphasis will be given to areas within the Parks that may have habitat characteristics suitable to support marine ducks in the winter such as protected bays and lagoons

Winter Marine Bird and Mammal Surveys - Revisions for subsequent surveys

- KATM: Add lagoons as potential habitat for over-wintering sea ducks:
  - Swikshak Lagoon
  - North end of Hallo Bay
  - Head of Kukak Bay
  - Other areas?
- KEFJ: Add
  - Pederson Lagoon
  - McCarty Lagoon
  - James Lagoon
  - Other areas?

Tasks for 2009 - 2010

Vital Sign	LACL 2009	LACL 2010	KEFJ 2009	KEFJ 2010	KATM 2009	KATM 2010
Winter marine bird and mammal survey				X	X	
Rocky intertidal sampling				X		X
Rocky “lite” sampling			X		X	
Soft intertidal sampling	X		X		X	
Water chemistry			X	X	X	X
Mussel bed sampling			X	X	X	X
Black oystercatcher nest density and diet			X	X	X	X
Sea otter foraging			X	X	X	X
Sea otter aerial survey				X		2011
Summer marine bird and mammal survey	X		X	X	X	X
Eelgrass bed sampling			X	X	X	X
Carcass collection			X	X	X	X

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