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# Scott Islands marine National Wildlife Area Summary of projects fiscal 2012 - 13



**Canadian Wildlife Service  
Environment Canada**

**Port Hardy  
March 27 - 28, 2013**

Common Murre; Scott Islands. © CWS, Greg Jones

# Today's discussion

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- Describe projects underway this fiscal – to end of March 2013.
- Final reports / results available in April or May.

# Background

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- Health of the Oceans (HOTO) funding (fiscal 2012-13) supports projects helpful to the management plan for the proposed Scott Islands marine National Wildlife Area (NWA):
  - Developing awareness of seabirds and marine environment.
  - Understanding the environment supporting the seabirds.
  - Monitoring and managing activities potentially affecting the environment supporting seabirds and their forage species.
  - Understanding cultural values of and history of seabird presence on Lanz and Cox Islands.
- These and new projects to be implemented over time as resources permit.
- Focus is understanding the relationship between the environment, production of forage species, and seabird populations.
- Building collaboration with First Nations; and agencies: DFO, CHS, NRCan, BC.
- Extension of results may benefit environmental and resource management coast-wide.

# Developing awareness of the NWA and seabirds

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- Contract with the Vancouver Aquarium to update existing videos, and produce new short videos:
  - Rhinoceros Auklet / Sand Lance.
  - Underwater nearshore environment.
  - Common Murre.
  - Black Oystercatcher.
- Web page for Scott Islands NWA:
  - Posting of Regulatory Strategy.
  - Frequently Asked Questions.
- Next:
  - Port Hardy Oceans Day.
  - Seabird science talk – Quatse Salmon Stewardship Centre.

# Understanding the environment supporting seabirds and their forage – 2012 breeding season

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- Rhinoceros Auklet provided mostly juvenile salmon (sockeye, pink, chum) for chicks:
  - 1<sup>st</sup> year most of the foraging was salmon.
  - Similar to some other seabird colonies for example in Queen Charlotte Strait.
  - Possibly linked to offspring from the large salmon runs of 2010.
  - Possibly linked to ocean conditions producing low abundance of other forage fish.
  - Generally smaller / poorer condition salmon caught, compared to DFO trawl samples.
  - Genetics work underway.
- Cassin's Auklet had good reproduction year.
- Research on links between environment and Glaucous-winged Gull and Black Oystercatcher continue.
- Comprehensive results will be available later from Wildlife Research Division.

# Seabird field work on breeding island

Much of the work is at night.

Not all nice sunny days!



© CWS, Blair Hammond and Greg Jones



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# Cultural values – Archaeological survey

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- Archaeological survey of shoreline and middens on Lanz and Cox Islands.
- Project co-developed with Tlatlasikwala and Quatsino First Nations.
- Results to be reviewed by Quatsino and Tlatlasikwala First Nations to ensure private information is not made public.
- Results will help identify cultural use of species, and species presence, prior to the current era; and provide recommendations on how to protect cultural sites/values.
- Preliminary: Cassin's Auklet bones found.

# Comprehensive review of Pacific Sand Lance

- One of the key forage species for fish-eating seabirds and other marine species including many large fish.
- Possible to manage & protect habitats, as they depend on specific sandy sea-beds for burying cover, and possibly beaches for spawning.
- Collating existing information on Sand Lance and the environmental variables influencing them.
- Provide recommendations for subsequent inventory and research to understand Sand Lance ecology and inform management strategies.



© Mike Yip, Vancouver Island Birds

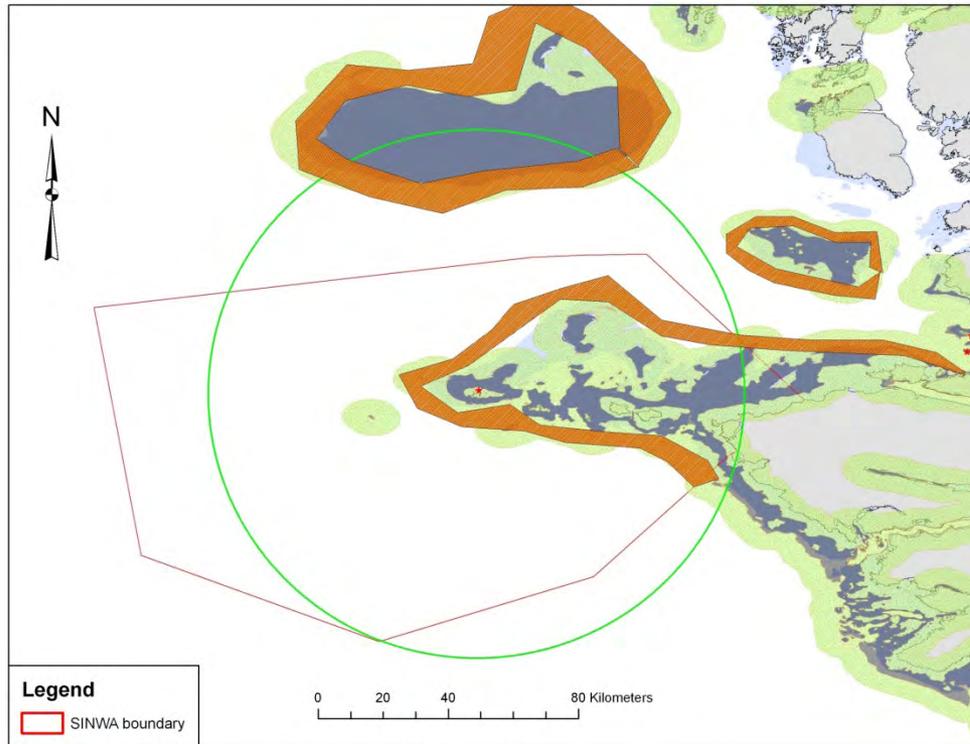


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# Modelled potential foraging range of Pacific Sand Lance Requires field verification



Possible range of foraging Sand Lance, from computer modelling using oceanographic data and Sand Lance general biology.

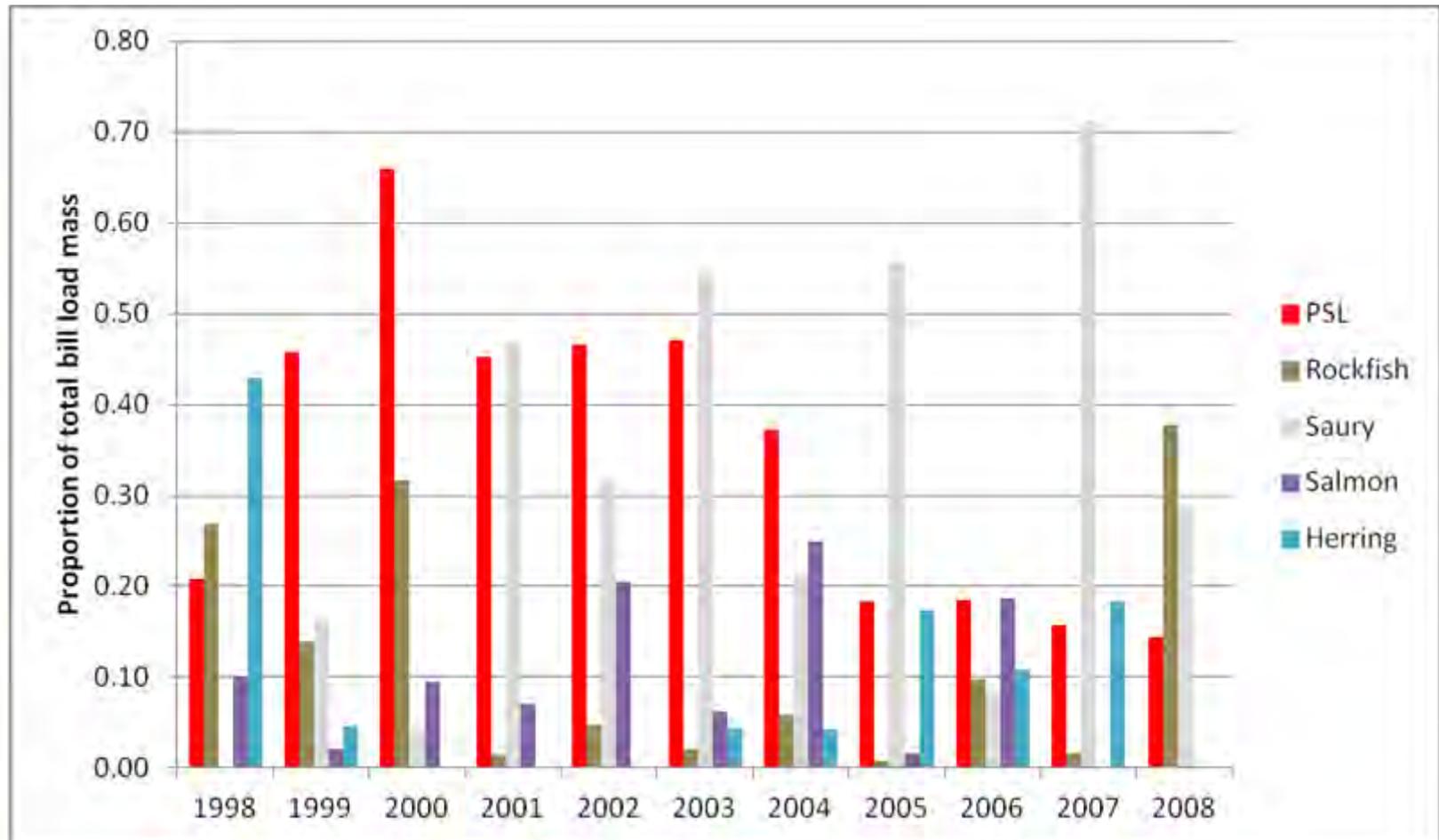
Must be field-verified.

Does not include other forage species important to sea-birds and other marine species.

Radius circle is max known foraging distance of RHAU from Triangle Is.

Analysis and map by Cliff Robinson for CWS.

# Five species / groups of fish commonly occur in bill loads of Rhinoceros auklets (1998 – 2008)



Mark Hipfner, Wildlife Research Division, unpublished data



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# Survey of potential spawning habitat for Pacific Sand Lance

## Beaches surveyed are in Cape Scott Provincial Park

### *Assessment of PSL spawning beaches adjacent to SINWA*

Based on the above review of PSL intertidal spawning habitat requirements, the results from the Harper and Borecky (2003) shorezone model, and the information from the coastal sand ecosystem report, a preliminary PSL intertidal spawn beach survey was conducted 6-8 January 2013 at four beaches with potential as PSL spawning habitat: Guise Bay, Experiment Bight, Nels Bight, and CG Beach (Figure 7 and Table 2).



Figure 7. Location of beaches sampled for sand and PSL eggs in January 2013.

Map by Cliff Robinson for CWS

January 2013 - First ever assessment of beaches in vicinity of NWA for potential spawning of Sand Lance.

2 of 4 beaches surveyed have potential habitat.

Assessments of beaches for Sand Lance spawning habitat will continue in subsequent years.

Survey conducted under Permit from BC Provincial Parks.

Comprehensive report on Pacific Sand Lance under preparation, to be completed in 2013.

# Collecting sand samples and searching for eggs in the lab.



Collecting and sieving sand samples.



Lab and video microscope courtesy of DFO.

© CWS Greg Jones

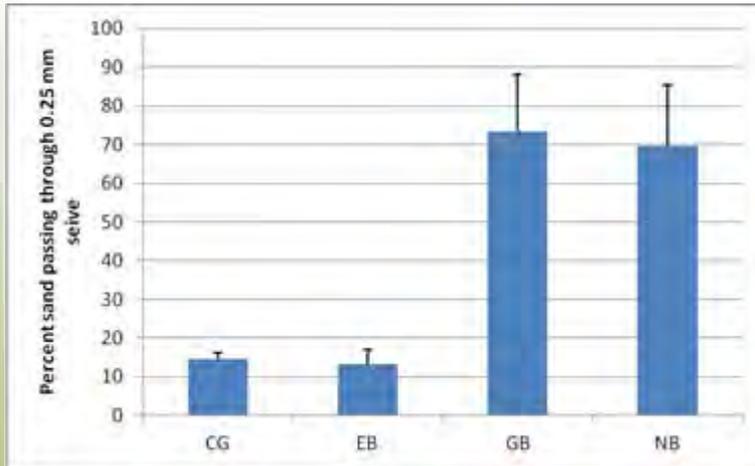


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# Potential for Sand Lance spawning.



Two beaches with 15% of sand under 0.25 mm have potential Sand Lance spawning habitat.

Two beaches with 70 % of small sand are unsuitable.

Sand Lance need burying / spawning habitat with low silt and fine sand.

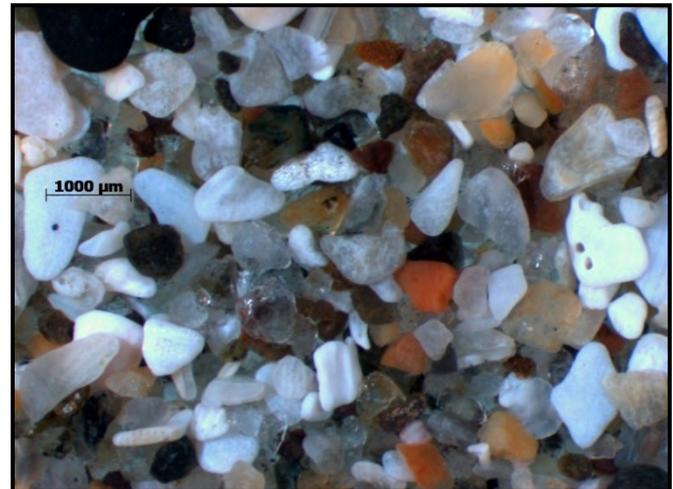
No eggs found, more sampling needed as spawning window is not proven.



Sample sand grain analysis by Thurber Ltd.

# Experiment Bight & Coast Guard Beach

## Clean sand potentially suitable for Sand Lance



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Photos by Cliff Robinson and DFO.

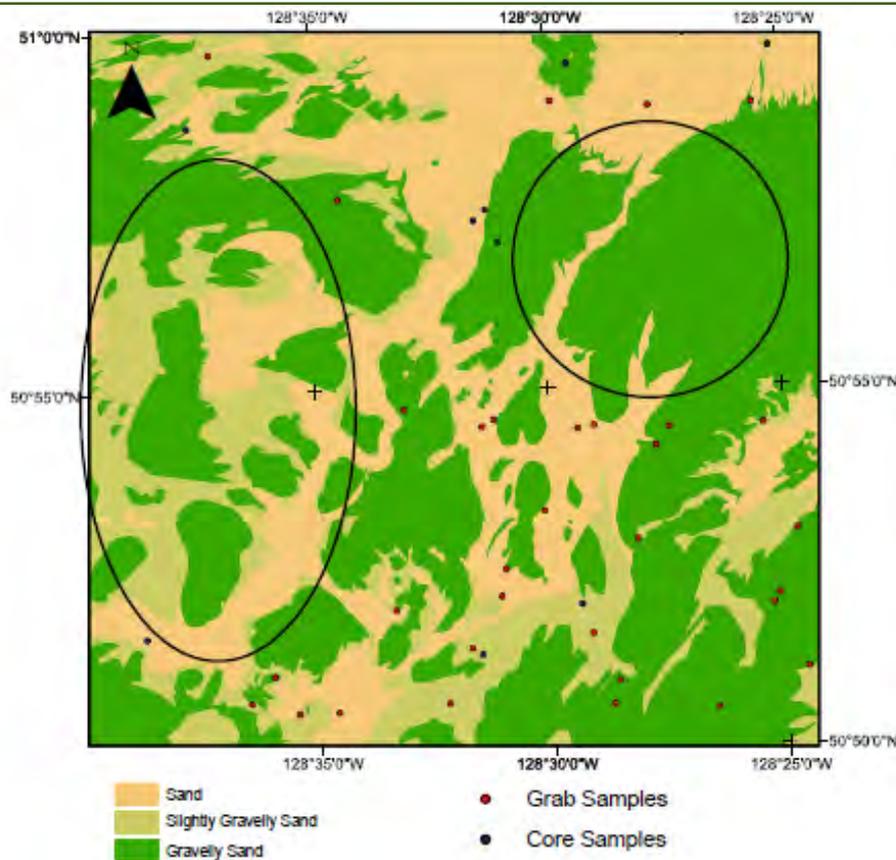
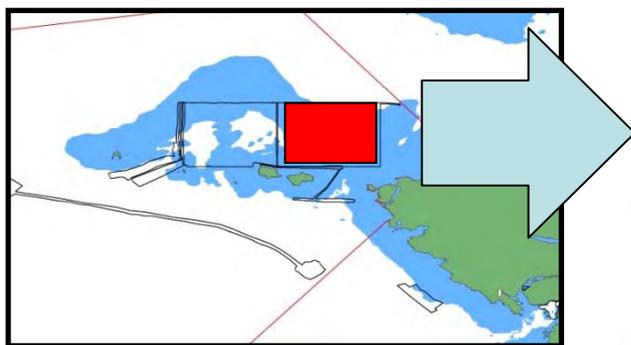
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# Sea-bed habitat mapping

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- Working with Canadian Hydrographic Service, Natural Resources Canada, and Fisheries and Oceans to:
  - Map bottom types in the NWA; for example sand, mud, rock.
  - For first time - collate and analyze all existing bottom classification information from 1911 to current.
  - Develop methods of assessing Sand Lance habitat and other habitats by remote sensing; locally near DFO base Sidney, where it is practical to field-verify the methods before using in the NWA.
  - 2013 plan is to expand bottom mapping in the Rockfish Conservation Area, joint priority with DFO.
  - Priorities for new mapping over 5 – 10 years; results will inform reviews of any current or proposed activities affecting the sea-bed.

# High spatial resolution seabed substrate info is required to map burying habitats (from multi-beam backscatter)



From Finn 2007



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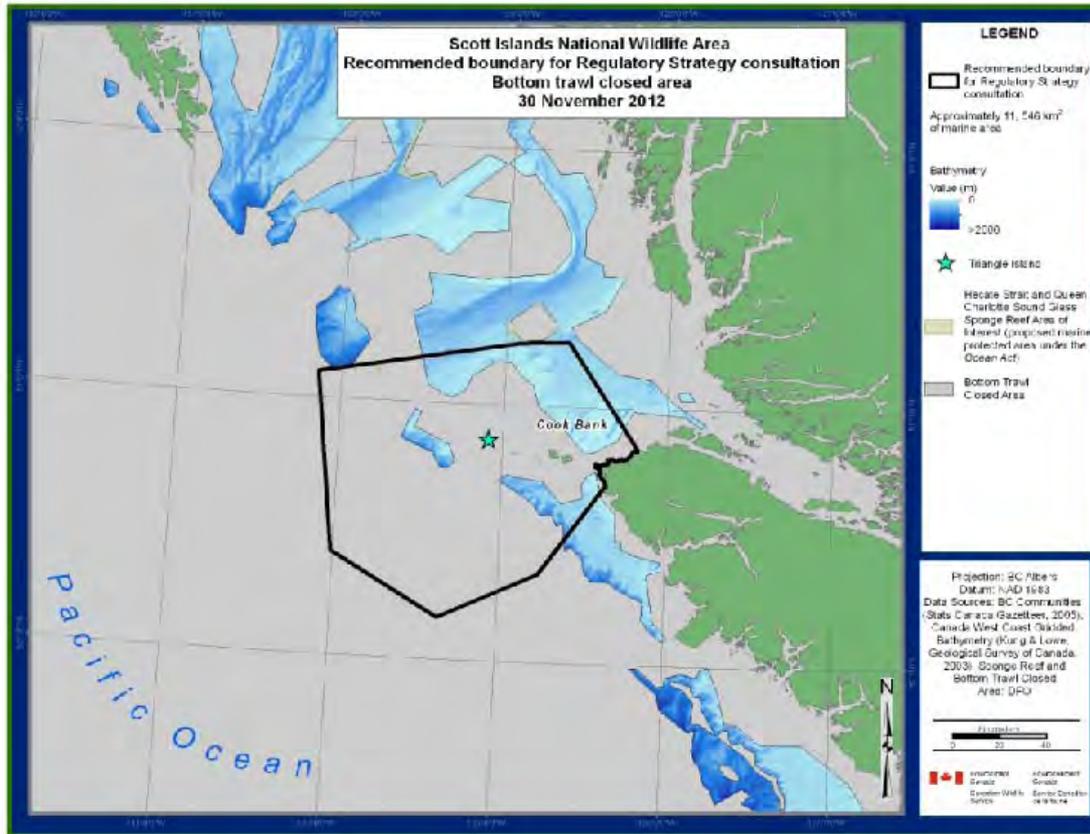
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# Review of effects of bottom activities on conservation values

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- Simon Fraser University contracted to conduct workshop (February 26 / 13) and technical review of potential impacts of sea-bed activities on seabird forage species and other sea-bed habitats.
- Report will:
  - Summarize existing knowledge and data sources.
  - Provide recommendations for further research needed to provide information to review current and future activities potentially affecting sea-bed habitats.

# Existing closure to bottom-trawl fishing



Bottom impact project looking at all potential types of impacts.

Fishing is the only current one, so gets the attention.

Most of the NWA is closed by DFO to bottom-trawl (grey on map).



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# Monitoring and surveillance for pollution

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- Increase number of Transport Canada National Aerial Surveillance Program (NASP) flights over the NWA, for monitoring and enforcement of anti-pollution requirements.
- Similar NASP flights resulted in successful prosecution in 2013 of a foreign ship deliberately discharging fish oil, which in concentrated amounts damages seabirds by oiling their feathers.
- NASP can detect oil and other pollutants such as 'blackwater'.



Photo by Transport Canada

# Reduction in bycatch of seabirds in commercial fisheries

- Continue development of programs joint with DFO and stakeholders to reduce seabird bycatch in commercial fisheries, using DFO data on fishing effort.
- Most seabird bycatch in the NWA is in long-line fisheries. Activities this fiscal:
  - Map fisheries, gear type and effort.
  - Map seabird bycatch by fishery and gear type.
  - Initiate kernel density estimates of fishing effort and bycatch.



Photo public domain

# Debris survey in 2012

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- First ever quantitative survey of debris on beaches on Triangle Island in June 2012.
- Complements long-term monitoring for oiled seabirds – none have been found to date.
- General conclusions:
  - Debris from Asia has reached our coast for decades, for example glass fishing floats.
  - Amount and type of debris in June 2012 had not changed since the 2011 Tsunami, except possible increase in large pieces of styrofoam, likely floats.
  - Debris surveys in subsequent years required to address question of Tsunami debris.

# Examples – variability of debris



Transect South Bay - Center #6

5 total items on this transect.  
Note lack of driftwood, some other South Bay transects had significant driftwood.



Vicinity South Bay - Center transect #3

Note concentration of floats. All floats observed were either foamed or hard plastic. No glass floats were observed.

Photo's © CWS, Greg Jones

# Results – large styrofoam items

- Obvious that many styrofoam (foamed plastic) fragments resulted from breakup of larger pieces.
- 2 large styrofoam items found on transects.
- 29 large styrofoam items, estimated to be at least 75% complete, counted in 600 m covered by the 3 sets of transects (includes the 2 on the transects).
- Some could be tsunami debris.
- Alaska: large styrofoam items predominant suspected tsunami debris item.<sup>6</sup>



Photo's © CWS, Greg Jones

Triangle Island: examples of large styrofoam items, approx 80 – 90 cm long.

Some large styrofoam items wrapped with tarps and tied or taped.

<sup>6</sup> Results of the 2012 MCAF Japanese Tsunami Monitoring program. Marine Conservation Alliance Foundation.

# Results – small plastic fragments



Photo by Greg Jones, CWS

49% of debris items were small fragments of foamed or hard plastic, resulting from breakup of larger pieces.

74% of the fragments were foamed plastics, from larger styrofoam pieces (379 / 512). Most larger pieces were about 80 cm or larger (next slide).

Number of fragments indicates level of pollution. Evaluation of amount of plastic items arriving from the ocean should be based on observations of complete or nearly complete items.

# Driftnet 'banana' floats — Alaska and Triangle Island



Alaska, 2007<sup>7</sup> Photo from report referenced



Triangle Island, 2012

Photo © CWS,  
Greg Jones

Alaska - most numerous debris is 'banana' floats typically used in driftnet fishing. Driftnets banned by UN 1992; beached floats are old or from illegal fishing.<sup>7</sup>

These floats also most numerous item on Triangle Island and likely have similar origin.

<sup>7</sup> High Seas Driftnets in Alaska Marine Debris. 2008. Marine Conservation Alliance Foundation. Prepared for North Pacific Anadromous Fish Commission.