

N3619

Memorandum

Date: August 5, 1988

From: Biological Technician

Subject: NMFS survey of plastic debris on the Malaspina Forelands
beaches on July 27 & 29, 1988

To: The file

G. Synder, Lab Director of the National Marine Fisheries Service (NMFS) in Auke Bay, Alaska, contacted D. Martin and C. Summers in April, 1988 about the possibility of conducting beach surveys for plastic debris along the Malaspina Forelands from Pt. Manby to Sudden Stream during July, 1988.

NMFS has conducted plastic debris surveys on coastal beaches in Alaska since 1972 and has conducted surveys near Yakutat since 1984. There is concern about the amount of plastic debris found on these beaches and at sea. Plastic debris entangle and endanger marine animals and affect the scenic quality of beaches. NMFS felt that data from the Malaspina Forelands beaches would provide valuable information on plastics pollution in the Gulf of Alaska and that Wrangell-St. Elias National Park & Preserve (WRST) could use this data to assess the quality of the Malaspina Forelands beaches and to determine the need and frequency of monitoring studies by the park in the future.

S. Johnson, fisheries biologist from NMFS Auk Bay lab, and B. Connery, WRST resource management specialist, made arrangements for a park representative to assist with the plastics survey in late July. It was also agreed that WRST would share flight time expenses with NMFS. The park representative was to document the survey techniques so that the park could continue the monitoring surveys if necessary.

S. Johnson, K. Koshi (NMFS fisheries biologist) and A. Yannota (NMFS technician) were assisted by M. Cook (WRST biological technician) in the Malaspina Forelands survey. S. Johnson will prepare a summary report with recommendations for WRST. Observations and an account of the survey methodology follow. Additional information on the survey techniques used in the plastic pollution surveys can be obtained from: Johnson, S.W. and T.R. Merrell. 1988. Entanglement Debris on Alaskan Beaches. NOAA Technical Memorandum NMFS F/NWC-126. This is in the plastics pollution survey folder filed in the resource management office.

Methods

27 July 1988, S. Johnson and K. Koshi completed a plastics debris survey from Sudden Stream north 10 km. Little debris was found. After consulting with local residents and pilots, S. Johnson decided that the section of beach from Fountain Stream to Yana Stream might have a greater incidence of debris. Foul weather prevented survey work the following day, 28 July.

29 July 1988, the beaches from Fountain Stream to Yana Stream were surveyed. First, an aerial survey was attempted. Flying parallel to the shoreline at an altitude of 150 - 200 ft., the crew tallied gill nets, trawl nets and rope that were observed from Fountain Stream to Yana Stream. At this altitude, objects were passed very quickly and it was difficult to obtain accurate tallies. At the completion of the aerial survey, emergency gear was unloaded at Yana Stream and the crew was set down at Fountain Stream.

10 km were surveyed from Fountain Stream to Yana Stream. A hip meter with biodegradable string was used to measure the distance and to mark off 1 km sections. Every 30 - 50 m, the string was tied around a piece of driftwood or rock to prevent bowing of the string and a false measurement. The person wearing the hip meter walked parallel to the shoreline, between the shoreline and the beginning of the terrestrial vegetation. This person called out the distance at a set increment (e.g. 100 m) so that the other crew members could monitor the distances surveyed.

Plastics were tallied in all odd numbered km sections (km 1, 3, 5, 7 and 9). Debris was not tallied in even numbered km sections (km 2, 4, 6 and 10). Notes were taken on debris of interest within these even numbered sections. Plastics were collected and disposed of (in the terrestrial vegetation above the high tide line) in every other km section in which plastics were tallied (km 1, 5 and 9). Km sections in which plastics were tallied were referred to as "beaches" and were numbered sequentially (km 1 = beach 1; km 3 = beach 2; km 5 = beach 3; km 7 = beach 4 and km 9 = beach 5).

The beginning and end of each beach was marked with flagging and a cardboard tag covered with weather resistant aluminum. Beach number, km, date and crew initials were inscribed on the tag. A permanent structure (a tree or an embedded log) above the high tide line, was used to secure the tag and flagging. A written description of the marker and location was made. Photographs were taken of the marker and a crew member holding up the number of fingers equal to the km number and the direction of the surveyed km. (Usually, the beach number is indicated in the photos, but at beach two, three fingers were photographed, so it was decided to indicate km number instead of beach number in this survey).

The crew walked the transect, one person near the shoreline, the person with the hip meter near the middle and usually the recorder and the fourth person at the high tide line where most debris are likely to be found. Plastics in the terrestrial vegetation above the high tide line were not counted. Plastic debris visible from walking height, ≥ 5 mm and net fragments with five or more complete meshes were counted. Fragments of larger pieces were not counted if they were less than one-half their original size. As debris was found, the type and any applicable qualitative characters and measurements were called out to the recorder. Weights up to 20 kg were measured with PESOLA scales. Weights greater than 20 kg were estimated. If the debris was being removed, it was put in a large plastic bag or placed in the terrestrial vegetation above the high tide line.

Two separate data sheets were completed for each beach surveyed (see attached). Debris was tallied by type on the first data sheet. The total tallies for each debris type were entered in the coded boxes when the transect was completed. Measurements and qualitative characters of netting, rope, fishing line, closed packing straps, floats and dead animals were recorded on the second data sheet. Data will be entered into a dBase III Plus file.

Samples of debris collected during this survey are on file in the WRST resource management office. Photographs of debris and the survey procedures accompany this report.

Discussion

S. Peterson was very surprised at the scarcity of debris on the beaches of the Malaspina Forelands. The aspect and ocean currents of the Forelands are similar to the Yakutat beaches which have been surveyed since 1984. Yet Yakutat beaches have a very high incidence of plastics. The low incidence of plastics on the Forelands may be due to the outwash of the many streams on the Forelands (Yana, Fountain, Alder, Manby, Osar, Kame, Sudden and Esker), the severity of winter storms here or differences in ocean currents. S. Peterson may have a more complete explanation in his report to WRST. Considering the low incidence of debris on the Malaspina Forelands beaches, Peterson recommended that WRST monitor the beaches for plastics every three to five years.

The most common debris found in this survey were packing straps, trawl web floats, trawl webs and gill nets. These are the debris types that entangle and entrap seabirds, marine mammals and fish. Plastic pellets, which block the digestive tracts of seabirds and sea turtles when ingested, were not sampled in this survey but are a common debris on Alaskan beaches. Although ~~WRST has~~ relatively "clean" Malaspina Forelands beaches, the occurrence of the entanglement debris here verify that there is a debris disposal problem at sea which will need to be monitored by NMFS.

NMFS-PLASTIC MEASUREMENT FORM



Surveyors _____ Location ☐ 1 ☐ 2 Beach No. ☐ 3 ☐ 4 Length (m) ☐ 5 ☐ 6 ☐ 7 8 Month ☐ 9 ☐ 1

Netting																		Rope																		Fishing line																		Clo																																																																																																																																																																																																																																																																													
Type																		Weight (kg)																		Weight																		Stretch mesh (mm)																		Twine Dia (mm)																		Color																		Position																		Construction																		Tag No.																		Recap																		Entangled animals																		Transect																		Color																		Dia (mm)																		Length (m)																		LB-Test																		Length (m)																		Stretch																	
1	1920	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																																																																																																																																																																																																		

Location	Position	Netting Type	Transect (m)	Cleared	Rope (D)
1 Yakutat	1 Buried	1 Trawl web	1 = 0-100	1 Yes	1 1/8"
2 Middleton Is.	2 Snarled on logs	2 Monofilament gillnet	2 = 1-200	2 No	2 1/4"
3 Amchitka Is.	3 Loose	3 Multifilament gillnet	3 = 2-300	3 Trawl web only	3 3/8"
4 Krusen Is.	4 Buried and snarled	4 Cargo net	4 = 3-400	4 Trawl web, gillnet, closed strap, rope	4 1/2"
5 Kulu Is.			5 = 4-500		5 5/8"
6 Noyes Is.			6 = 5-600		6 3/4"
7 Suemez Is.			7 = 6-700		7 1"
8 Admiralty Is.			8 = 7-300		8 1-1/4"
9 Lincoln Is.			9 = 8-900		9 1-1/2"
10 Ralston Is.			10 = 9-1000		10 1-3/4"
11 Kayak Is.			11 = 1000-1100		11 2"
12			12 = 1100-1200		
13			13 = 1200-1300		
14					
15					

Beach No. 1-99

Recap 1 Yes 2 No

Weight 1 Actual 2 Estimated

