KIPU KAI

MONK SEAL MONITORING

PROGRESS REPORT

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ATTACHMENT 1

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INTRODUCTION

On August 24, 1998 there was a Bunker C oil spill on the West Coast of Oahu. At some point between one and two weeks later, oil began washing up on the beaches of Kauai. Kipu Kai, an area that covers approximately three and a half miles of coast on the southeastern shore of Kauai, was one of the areas most impacted by this spill. Kipu Kai is also one of the preferred haul-out sights for the Hawaiian monk seal (HMS) in the main Hawaiian Islands. Anecdotal reports have indicated a population of at least seven seals that have frequented Kipu Kai beaches (Don Heacock, DLNR, Bobby Ferriera, pers. comm.). The total size of the population using the Kauai-Niihau Island Area (KNIA) is estimated to be sixteen to thirty seals (Don Heacock, DLNR, pers. comm.). Based on requirements for the natural resource damage assessment (NRDA), the cooperate assessment group (CAG, which included representatives from the local, state, and federal governments as well as the Responsible Party) designed a plan to assess whether or not the seals were exposed to Bunker C oil and if there was injury to this population as a result of the spill.

The HMS is an endangered species. Based on their protected status, studies were limited to "hands-off" (no-take) data collection. For this reason, sampling of blood, urine, skin, blubber, feces, and/or physical parameters, which are usually used to detect sub-clinical levels of impact, were not conducted. Therefore, any level of injury from the oil-spill could only be assessed when signs of a pathologic process became visually detectable.

During nine initial seal sightings by the "SCAT" team only two seals were observed to have been oiled.

DATE	PLACE	OILED/NOT OILED	
9/15/98	KIPU KAI AREA	1	1
9/18/98	KEALIA AREA	0	1
9/22/98	AHUKINI PIER-POINT AREA	0	1
9/19/98	LARSEN'S BEACH AREA	1	0
9/18/98	KIPU KAI AREA	4 seals sighted, oiling status undetermined.	

Additionally, one seal was identified as oiled in Kipu Kai on September 23, 1998 and documented on video by John Cubit of NOAA's NRDA team and Gordon Robilliard of Entrix. The entire island was never observed within a period of one day and observed seals were not identified. Therefore, the actual number of individuals seen is unknown. It is possible that because seals move, some of the same seals may have been observed repeatedly. This means that the percentage of the total population of seals that were oiled can not be accurately represented by this initial sampling. Also, because seals were approached from distances of one hundred feet or greater, assessment of oiling status was not as thorough as possible.

The goal of the study was to determine the visually observable effects of the SPM hose spill on the HMS population at Kipu Kai. It is important to note however, that Hawaiian monk seals are known to move distances of five to twenty-five miles in a single day around Kauai (Don Heacock, DLNR, pers. comm.). Therefore, the SPM hose spill of August 24, 1998, by effecting Kipu Kai waters, may have effected seals that transit through the Kipu Kai area but do not use Kipu Kai as a haul out site. Assessing the Kipu Kai area therefore does not necessarily constitute an assessment of all seals that could have been oiled. As part of the initial proposal, island-wide monitoring was recommended and is currently under discussion. This report presents preliminary findings from the initial three weeks of observation as well as additional information gathered from the results of other oilings that help to assess these findings.

RECENT STATUS OF HMS ON KAUAI & BASIS FOR INJURY ASSESSMENT

The HMS population includes 1150-1250 seals (John Henderson, pers. comm.). The majority reside in the Northwest Hawaiian Islands (NWHI) where most of the conservation-oriented research takes place. It is research in the NWHI that allows population estimates to be made based on beach counts (Tim Gerrodette, NMFS unpublished data). Using this method, the HMS population of the Kauai-Niihau Island area is estimated at sixteen to thirty individuals. HMS's have been known to travel distances of up to 700 miles (authors observation) although travel is normally less than one hundred miles and is primarily for foraging and secondarily for mating or pupping (Mitch Craig, NMFS unpublished data). It is generally accepted that HMS often spend much of their time moving through waters around their natal islands.

HMS on Kauai have been observed to travel from five to twenty-five miles in a single twenty four hour period (Don Heacock, pers.comm.). The Kauai-Niihau population however, has not been extensively studied. There is little information available on sex ratio, foraging areas, individual behavior, or population trends. There has been anecdotal information collected over the past fourteen years by the DLNR. This information while extensive is by no means a thorough account of the HMS in this area. Of the eight to nine individuals that have been identified in the past few years, three males and five females are known, and one may not have been sexed. This year with the advent of the Kauai Monk Seal Watch it may be possible to gather information with more consistency.

There are six to seven individual seals known to haul up frequently on the beaches of Kipu Kai. The area of Kipu Kai was one of the most severely effected by the oil spill. Therefore, based on knowledge of monk seal behavior and hauling patterns, it follows that a large percentage of the local Hawaiian monk seal population (six to seven Kipu Kai "regulars" out of sixteen to thirty in the KNIA, or 20-43%) and possibly the entire Hawaiian monk seal population (other seals that use the waters around Kipu Kai or waters and/or hauling sites in other oiled areas) of the KNIA were potentially exposed to oil during the SPM hose spill. The HMS is an endangered species therefore, it is

important to assess the entire population at risk. In light of their status and the clear possibility of exposure and resulting injury, this study was designed and implemented.

EFFECTS OF OIL ON SEALS

A thorough literature search was conducted by the author and Sandra L. Abbott-Stout the librarian of the National Marine Fisheries Service Honolulu Lab. Aquatic Sciences and Fisheries Abstracts, Zoological Record, Biosis, Medline, and Cambridge Abstracts databases were searched. No records were found which matched the limitations set for our comparison. These limitations were related to the climate, water temperature, and oil type of the SPM Hose Spill. A small number of records were found which presented information on pinnipeds in other areas with other oil types. When appropriate, information was extrapolated from those sources based on common knowledge of oil toxicity dynamics related to water temperature and chemical nature (i.e. Jet fuel vs. Bunker C). Most of the information on oil and its effects on pinnipeds was acquired through consultation with veterinarians around the world. All of these findings are summarized below and sources are cited where appropriate. Information available from unpublished data on a recent oil spill in a similar climate may be available shortly.

When seals have an oil-related injury it is common for them to haul out more frequently than usual (Terry Spraker, pers. comm.). Commonly they will appear lethargic and "reluctant" to move (Elizabeth Vedder, pers. comm.). There can be skin lesions resulting from direct contact with the oil and secondary burns due to the heating of the oil on the skin (Jenny Androukaki, pers. comm.). Mucosal tissues may become inflamed and bleed (Elizabeth Vedder, personal communication). Nausea, vomiting, gastro-intestinal ulceration, inappetance, mal-digestion, mal-absorption, and pneumonia are all examples of secondary problems resulting from inflammation of the mucous membranes (Elizabeth Vedder, Terry Spraker, pers. comm.).With exposure to lighter end fragments, usually through inhalation, there can be central nervous system (CNS) damage as outlined below (Terry Spraker, pers. comm.). Unless seals around Oahu came into contact with the Bunker C shortly after the spill, it's unlikely any HMS's were exposed to these lighter end fractions. The short-term effects of oiling should be evident and direct effects complete between two and sixteen weeks (Marty Haulena, Terry Spraker, pers. comm.) post-exposure. Following that period long term effects or "chronic" effects of exposure may begin to manifest although they will certainly be difficult to perceive (all consultants, pers. comm.).

What follows is the summary of effects acquired through consultation with all consultants listed in the "expert contacts" section.

ACUTE EFFECTS OF OIL ON PINNIPEDS: The effects vary based on type of exposure and type of oil, where relevant these distinctions are made.

Neurologic effects: intramyelinic edema, axonal degeneration, neuronal swelling and neuronal necrosis, in areas of the brain critical to sensory perception, behavior and performance of normal tasks (ie: swimming, feeding, and diving). It is important to note these effects are believed to be due to exposure via inhalation of lighter end fractions. (expert contacts summary)

Respiratory effects: pulmonary changes include and are not limited to alveolar and bronchial damage (at the level of the linings) which can result in acute sequellae such as infection, bronchitis, pneumonia, and emphysema. These effects are believed to be due to contact via inhalation although these same effects can also be seen more chronically, secondary to immune system supression and therefore not limited to exposure through inhalation. (expert contacts summary)

Gastro-Intestinal effects: ulceration is the primary effect reported and can occur anywhere along the tract but is usually found in the esophagus, stomach, and/or duodenum. Accompanying symptoms include but are not limited to; pain, nausea, inappetance, anorexia, and blood in the spewings, vomitus, or stool. Severe ulcerations of any etiology can perforate and lead to death. In addition hepatic changes have been reported acutely and chronically. These changes included hepatocellular swelling and hepatocellular necrosis and were considered mild and reversible. These changes are associated with ingestion and detoxification of toxins. (expert contacts summary)

Superficial tissue effects: conjunctivitis, corneal ulceration, and dermal changes such as ulceration, irritation, rashes, and in warm climates, burns secondary to the heating of tarred areas. These effects are related to contact through external exposure. (expert contacts summary)

CHRONIC EFFECTS OF OIL ON PINNIPEDS: These long-term effects are more difficult to assess and establish in a scientifically valid way. They include but are not limited to decreased immune function, decreased hepatic function, and decreased reproductive success. (expert contacts summary)

Research directs the observer to look for loss in body condition (more chronic and can be due to decreased GI function/appetance or decreased ability to exchange gases or breathhold for example); dullness and lethargy; increased respiratory rates; abnormal discharges from eyes, nares, lungs, mouth, or anus; labored respirations; conjunctivitis; photophobia; or blood from mucous membranes.

PRIOR OILINGS OF HMS IN HAWAII

Prior incidents of oiling on Hawaiian monk seals in Hawaii are rare. There was an episode on March 26th, 1993 when five miles of the seven mile coast line of Laysan Island in the NWHI were dotted with "pea sized" tar balls and "clumps" of oil (0.30 meters wide) (Elepaio, 53:5, May 1993). Clumps occurred at intervals of approximately one every three to five meters. Fifteen Hawaiian monk seals were oiled. The percentage of body surface area oiled was not documented (Brenda Becker, pers. comm.). Follow up resights indicated five of the fifteen seals

missing and presumed dead (one of the remaining ten was translocated to the main Hawaiian Islands and his status is unknown). Of those five, one has not been seen since 1993, three since 1994, and one since 1995 (Brenda Becker, pers.comm.). It is unknown whether their disappearances are related to the 1993 spill. This resight information is current up to the summer 1998 field season (Brenda Becker, pers. comm.).

OBJECTIVE

The only way to know with certainty, whether or not the SPM Hose Spill has caused any injury to seals of this population, is to have prior island-wide seal specific knowledge. The individual and seasonal variability in the hauling and foraging patterns, physical characteristics, and behavior of the HMS in the KNIA has not been characterized. Due to the gross absence of this information, the null hypothesis that no seals have been injured is not applicable as a starting point for this study. Therefore, in light of these limitations, it is possible only to assess current activity, behavior, and physical parameters in an effort to elucidate injury, if present.

The objective of this study therefore, is limited to using visual observations to determine if the SPM Hose Spill has caused injury to the HMS using the oiled areas at the time of the spill.

METHODS

Observations were made for nineteen days. The initial period (phase one observations) occurred from 5 October to 12 October. The second period (phase three initial observations) occurred from 19 October to 30 October, 1998. During these periods observations were made three times each day for a minimum length of two hours each. Daily observations occurred at approximately 0630-0830, 1130-1330, and 1630-1830. During each observation period the entire length of coast was surveyed for seals and any evidence of their recent presence. In some cases due to presence of increased numbers of animals on the beach or questionable health status, observation periods were lengthened.

When seals were encountered they were observed for a minimum of thirty minutes each. During the thirty-minute observation period attempts were made to establish identifying characteristics. Information on size classification, sex, condition, molt status, and presence or absence of perceivable external oil was collected and recorded. Every five minutes during the observation period instantaneous data were also collected and recorded on respiratory rate, behavior, body position, distance from tideline, and relevant weather (sun strength, cloud cover, and wind strength and direction). Observations were made via binoculars or spotting scope. Photos were taken for identification and/or documentation. Additionally when fresh "seal prints" were found in the absence of a seal, haul-out areas were visually inspected for the presence of blood, feces, or oiled substrate.

RESULTS **(see attached tables and scar cards)**

Seal ID____Size____Sex____Condition____Molt____Oil____

Date						
Time						
Resp. Rate						
Behavior						
Distance From Tideline						
Body Position						
Sun						
Clouds						
Wind						
Notes:						

SUMMARY OF FINDINGS

Assessment of phase 1 observations follows; KK01 is not externally oiled, appears relatively normal, and at this time appears unaffected by the oil in any visually observable way. KK02 is possibly oiled up to 1%, possibly affected, and follow up should be made to further assess his condition. There are many etiologies that can result in blood coating the oral mucosa. Oiling can cause damage to mucous membranes in the gastro-intestinal and respiratory tracts, both of which can present as did KK02 (Jonna Mazet, Pam Yochem, pers.comm) Although oiling is not the most likely explanation it can not be ruled out. Exposure to oil and the effects of such exposure can also cause behavioral changes and changes in mental status. Anecdotal reports of KK02 however, indicate his agitated behavior likely existed pre-spill. KW01 appears <10% oiled, relatively normal, and at this time appears unaffected by the oil in any clinically apparent way.

Assessment of phase three follows; KK01 appears relatively normal and at this time appears unaffected by the oil in any visually observable way. KK02 has not been resighted. There are many possibilities to explain this. Due to the recent change in "swell" the south shore of Kauai has been fairly calm. This has enabled many boaters, kayakers, sailors, and divers to use the coastal area of Kipu Kai for recreation. Knowing his behavior through experience and anecdotal reports, it is unlikely that he would choose to haul up on beaches being used by humans. It is also possible that this represents a normal variation in his hauling, using some of the beaches at Kipu Kai some of the time and using other beaches elsewhere on the island at other times. It also must be considered that he may be sick, injured, or dead. In order to determine (to the degree it is possible) which of these is most likely, it is important to resight and observe him for some reasonable period of time. KK03 appears possibly 1-5% oiled and relatively normal at this time. The "gagging" behavior exhibited while on his back needs to be noted, and considered. This type of behavior can be completely normal and has been seen by HMS biologists in the field in un-oiled areas. It is important to note however, as is mentioned above, that exposure to oil can cause gastric, esophageal, and duodenal ulceration. Pain and nausea both can accompany these types of lesions and either may manifest in an animal exhibiting the type of behavior demonstrated by KK03 Although this type of lesion is only one of the possible explanations, follow-up to assess his behavior and possible changes in body condition is recommended. KW01 appeared relatively normal until 27 October. At that time she was noted to have signs and behavioral changes consistent with an upper respiratory tract infection (reddened conjunctivae, increased frequency of sneezing, and unusual behavior of jerking head out of water whenever tidal wash reached head). These signs were seen both on 27 October and 28 October. It is possible that she has developed an upper respiratory infection secondary to some effect of the oil. Direct contact with the oil could damage the mucosal lining of the respiratory tract. This is unlikely however because the light end fractions are likely to have volatilized before seals on/around Kauai could have had contact with them. Another possibility is that exposure to toxins in the oil via ingestion or absorption may suppress immune function and make exposed seals more vulnerable to infection. There is always the possibility that these signs are completely coincidental and unrelated to oiling. This individual was recorded on videotape to document oiling on 23 September. Her haul-out period on 27 October was also approximately three times as long as her haul-outs during other sightings in phases one and three. It is important to note

that during this extended period she was accompanied by KK01 and this may have affected her behavior to some degree. Follow-up and further assessment is recommended. KW02 was seen for a brief time only. However, during that time she appeared possibly oiled <1%, relatively normal, and unaffected by the oil in any visually observable way. Due to the short window of observation it would be helpful to resight her in order to support the conclusion drawn from such a limited observation period.

FUTURE RECOMMENDATIONS

Based on the observation of unusual signs in three individual monk seals in phases one and three of the study, and the pertinent negative finding of KK02's absence, the next step would be to resight these individuals and confirm their survival and health status. The length of the observation period of initial phase three observations has proven to be more appropriate based on the hauling patterns of HMS seen in Kipu Kai. Therefore, a minimum of ten days is the recommended length of a follow up observation period. Dr Bud Antonelis of the NMFS recommends the ten-day resight period for follow up. After attempting to resight these individuals and assessing their health through the means explained in the methods section above, there should be ample information for closure of this phase of the response provided they are seen to be alive and in good health. If all individuals are not seen during that period closure to the response phase could still be possible by shifting the resights into the restoration phase.)

Hawaiian monk seals are known to travel extensively throughout their natal island areas and therefore, as explained in sections one and two above, as an essential part of the response the entire population of HMS of the KNIA should be examined for potential injury. Due to the low probability of accounting for the entire local group as well as the time and expense involved, a decision has been made by the CAG, based on the advice of Dr. Bud Antonelis (Director, NMFS Protected Species Investigations, Honolulu) to make one aerial survey of the KNIA with ground follow up to ensure no seals with an obvious need for care are being missed. In order to have the benefit of this effort as evidence that the monk seals have not been adversely affected it is essential to examine as much of the population as possible. Through island wide observation we should be able to conclude (pending the results) with reasonable probability that, to the limit our observations allow, there is or is not direct evidence of any adverse effect of the SPM Hose Spill on the HMS of the KNIA.

EXPERT CONTACTS

1.Androukaki, Jenny
Hellenic society for the Study and Protection of Monk Seals
Solomou 18, 106 82 Athens, Greece

2.Antonelis, Bud
NMFS, 2570 Dole Street, Honolulu, Hawaii

3.Becker, Brenda
NMFS, 2570 Dole Street, Honolulu, Hawaii

4.Craig, Mitchell
NMFS, 2570 Dole Street, Honolulu, Hawaii

5.Ferriera, Bobby
Kipu Kai Ranch, Kipu, Hawaii

6.Gerrodette, Tim
NMFS, 2570 Dole Street, Honolulu, Hawaii

7.Haulena, Marty
Marine Mammal Center, Sausalito, California

8. Heacock, Don
DLNR, Lihue, Hawaii

9.Henderson, John, R.
NMFS, 2570 Dole Street, Honolulu, Hawaii

10.Mazet, Jonna
Oil Spill Prevention and Response, Davis, CA

11.Reidarson, Tom
Sea World of San Diego, San Diego, California

12.Spraker, Terry
Colorado State College of Veterinary Medicine, Fort Collins, Colorado

13.Vedder, Elizabeth
Seal Rehabilitation and Research Centre, Pieterburen, Netherlands

14.Yochem, Pam
Hubbs-Sea World Institute, San Diego, California

Phase 1

Seal ID KK01 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** no

Date	981005	981005	981005	981005	981005	981005
Time	1724	1729	1734	1739	1744	1749
Resp. Rate	4 bpm	2 bpm	6 bpm	5 bpm	4 bpm	4 bpm
Behavior	resting quietly	resting quietly	resting quietly	resting quietly	resting quetly	resting quietly
Distance From Tideline	15-20m	15-20m	15-20m	15-20m	15-20m	15-20m
Body Position	ventral recumbency (VR)	VR	VR	VR	VR	VR
Sun	0-1/3	0-1/3	0-1/3	0-1/3	0-1/3	0-1/3
Clouds	07/10	07/10	07/10	07/10	07/10	07/10
Wind	1/3 NE	1/3 NE	1/3 NE	1/3 NE	1/3 NE	1/3 NE

Notes:

He has molted since 980923.

Appears to be sleeping

no discharges noted from any orifice

no abnormal areas of pelage observed

Sector 1B

ATTACHMENT 1

Seal ID KK01 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** no

Date	981006	981006	981006	981006	981006	981006
Time	0800	0805	0810	0815	0820	0825
Resp. Rate	6 bpm	8 bpm	6 bpm	6 bpm	8 bpm	8 bpm
Behavior	Sleeping →	→	→	→	→	
Distance From Tideline	20m →	→	→	→	→	
Body Position	VR	VR	VR	VR	VR	VR
Sun	1/2-3	→	→	→	→	→
Clouds	05/10	→	→	→	→	→
Wind	2NE	→	→	→	→	→

Notes:

same as 10/05/98

no discharges noted

pelage not oiled

Sector 1B

Seal ID XXU1 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** NO

Date	981006	981006	981006	981006	981006	981006
Time	1640	1645	1650	1655	1700	1705
Resp. Rate	4 bpm	1 bpm 48 bpm Pink	4 bpm 64 bpm Pink	4 bpm	4 bpm	4 bpm
Behavior	settling down into rest	rolling to side	resting quietly	resting quietly	resting quietly	resting quietly
Distance From Tideline	20m	20m	20m	20m	20m	20m
Body Position	3/4 LLR/VR	LLR	LLR	LLR	LLR	LLR
Sun	0-1/3	0 1/3	0-1/3	0-1/3	0-1/3	0-1/3
Clouds	07/10	07/10	07/10	07/10	07/10	07/10
Wind	2 NE	2 NE	2 NE	2 NE	2 NE	2 NE

Notes: nsf (no significant findings)

Sector 1A

Seal ID XX01 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** NO

Date	981006	981006	981006	981006	981006	981006
Time	1640	1645	1650	1655	1700	1705
Resp. Rate	4 bpm	1 bpm 40 bpm Qint	4 bpm 64 bpm Qint	4 bpm	4 bpm	4 bpm
Behavior	settling down into resg	rolling to side	resting quietly	resting quietly	resting quietly	resting quietly
Distance From Tideline	20m	20m	20m	20m	20m	20m
Body Position	3/4 LLR/VR	LLR	LLR	LLR	LLR	LLR
Sun	0-1/3	0 1/3	0-1/3	0-1/3	01/3	0-1/3
Clouds	07/10	07/10	07/10	07/10	07/10	07/10
Wind	2 NE	2 NE	2 NE	2 NE	2 NE	2 NE

Notes: nsf (no significant findings)

Sector 1A

Seal ID KK01 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** NO

Date	981007	981007	981007	981007	981007	981007
Time	1115	1120	1125	1130	1135	1140
Resp. Rate	66pm	66pm	Not Taken	Not Taken	NT	NT
Behavior	Sleeping	Sleeping	stretching moving	hauling down towards tideline	still hauling down	resting Quietly
Distance From Tideline	20m	20m	15m	10m	5m	0m
Body Position	VR	VR	VR→ DR→ VR	VR	VR	VR
Sun	1/3	1/3	1/3	1/3	1/3	1/3
Clouds	09/10	09/10	09/10	09/10	09/10	09/10
Wind	NE	NE	NE	NE	NE	NE

Notes:

NSF

Sector 1A

Seal ID KK01 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** NO

Date	981007	981007	981007	981007	981007	981007
Time	1722	1727	1732	1737	1742	1747
Resp. Rate	NT	8bpm	6bpm	6bpm	1bpm	1bpm
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping
Distance From Tideline	5m	5m	5m	5m	5m	5m
Body Position	RLR	RLR	RLR	RLR	RLR	RLR
Sun	0/3 (sr)	0/3	0/3	0/3	0/3	0/3
Clouds	05	05	05	05	05	05
Wind	2NE	2NE	2NE	2NE	2NE	2NE

Notes:

nsf

Sector 1A

Seal ID KK01 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** No

Date	981008	981008	981008	98108	981008	981008
Time	0740	0745	0750	0755	0800	0805
Resp. Rate	8bpm	12bpm	6bpm	6bpm	8bpm	6bpm
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Stretching	Rolling
Distance From Tideline	20m	20m	20m	20m	20m	20m
Body Position	VR	VR	VR	VR	VR	RLR
Sun	1/3	1/3	1/3	1/3	0-1/3	1/3
Clouds	03/10	03/10	05/10	06/10	09/10	08/10
Wind	2NE	2NE	2NE	1NE	1NE	2NE

Notes:

nsf

Sector 1A

Seal ID KK01 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** No

Date	981008	981008	981008	981008	981008	981008
Time	1816	1821	1826	1831	1836	1841
Resp. Rate	2bpm	2bpm	2bpm	2bpm	4bpm	4bpm
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping + Hiccuping	Sleeping
Distance From Tideline	5m	5m	5m	5m	5m	5m
Body Position	VR	VR	VR	VR	VR	VR
Sun	0/3 (set)	0/3	0/3	0/3	0/3	0/3
Clouds	03/10	03/10	03/10	03/10	03/10	03/10
Wind	2NE	2NE	2NE	2NE	2NE	2NE

Notes:

- Seems to be getting thinner - subtle difference but perceivable over bony prominences and ribs.
- eyes seem mildly sunken (dehydration?)

Sector 1A

Seal ID KKa **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** No

Date	981009					
Time						
Resp. Rate						
Behavior						
Distance From Tideline						
Body Position						
Sun						
Clouds						
Wind						

Notes:

Not present!
(@ .0620)

Seal ID KW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** not able to assess Available surfaces seem not

Date	981006	981006	981006	981006	981006	981006
Time	0630	0635	0640	0645	0650	0655
Resp. Rate	6	6	6	6	6	6
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping
Distance From Tideline	10m	10m	10m	10m	10m	10m
Body Position	3/4 - Left Lateral Recumbency	3/4 LLR	3/4 LLR	3/4 LLR	3/4 LLR	3/4 LLR
Sun	0 1/3	0 1/3	0 1/3	0 1/3	0 1/3	0 1/3
Clouds	06/10	06/10	06/10	06/10	06/10	06/10
Wind	2/3 NE	2/3 NE	2/3 NE	2/3 NE	2/3 NE	2/3 NE

Notes:

molt is not "fresh"

sleeps with occasional (1/15m.n) sneezes

no discharges noted from any orifice

no oil clearly seen - seemed oiled then rolled to 3/4 position in which ventrum is almost completely unobservable

sector 2

Seal ID KW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** uncertain

Date	981007	981007	981007	981007	981007	981007
Time	1750	1755	1800	1805	1810	1815
Resp. Rate	4 bpm	4 bpm	4 bpm	2 bpm	2 bpm	2 bpm
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping
Distance From Tideline	≤0.5m	≤0.5m	≤0.5m	≤0.5m	≤0.5m	≤0.5m
Body Position	VR	VR	VR	VR	VR	VR
Sun	0/3 (sct)	0/3	0/3	0/3	0/3	0/3
Clouds	05/10	05/10	05/10	05/10	05/10	05/10
Wind	2NE	2NE	2NE	2NE	2NE	2NE

Notes:

- Sleeping wedged in rocks in NE end of s. #1 so much of body not visible
- no discharges noted
- no oil seen on pelage available for inspection

Sector 19

Seal ID KNO1 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** uncertain

Date	981008	981008	981008	981008	981008	981008
Time	0701	0706	0711	0716	0721	0726
Resp. Rate	6bpm	6bpm	6bpm	6bpm	6bpm	6bpm
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping
Distance From Tideline	0m	0m	0m	0m	0m	0m
Body Position	VR	VR	VR	VR	VR	VR
Sun	0-1/3	0-1/3	0-1/3	0-1/3	0-1/3	0-1/3
Clouds	07/10	07/10	07/10	07/10	05/10	05/10
Wind	INE	INE	INE	INE	INE	INE

Notes:
Still have not seen ventrum!
No discharges noted
all visible surfaces (skin + nails) clean

Sector 1A

Seal ID AW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** uncertain

Date	981012	981012	981012	981012	981012	981012
Time	0800	0805	0810	0815	0820	0825
Resp. Rate	6bpm	6bpm	6bpm	6bpm	6bpm	6bpm
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping
Distance From Tideline	0m	0.0m	0.0m	0.0m	0.0m	0.0m
Body Position	LLR	LLR	LLR	LLR	LLR	LLR
Sun	2/3	2/3	2/3	2/3	2/3	2/3
Clouds	02/10	02/10	02/10	02/10	02/10	02/10
Wind	INE	INE	INE	INE	INE	INE

Notes:

Body covered with sand

nsf

in sector 2

Seal ID KK02 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** not assessable

Date	981006	981006	981006	981006	981006	981006
Time	0734	0739	0744	0749	0754	0759
Resp. Rate	not available	not available	not available	not available	not available	8 bpm
Behavior	moving body	moving from veg. line	moving towards tideline	stopped moving	rolling to 3/4 position + LLR	closed eyes
Distance From Tideline	20m	20m	15m	5m	5m	5m
Body Position	Ventral recumbency (VR)	VR	VR	VR	3/4 VR/LLR	3/4 VR/LLR
Sun	1-2/3	1-2/3	1-2/3	1-2/3	1-2/3	1-2/3
Clouds	05/10	05/10	05/10	05/10	05/10	05/10
Wind	2NE	2NE	2NE	2NE	2NE	2NE

Notes:

Tags - Brown (Laysan) 7AP

does not rest quietly even after arriving E tideline seems "agitated"

Missing $\frac{1}{2}$ - $\frac{3}{4}$ of right Front Flipper

no discharges noted however behavior makes complete assessment difficult

Sector 1B

Seal ID KK02 **Size** A **Sex** M **Condition** M **Molt** 10% **Oil** not clear

Date	981006	981006	981006	981006	981006	981006
Time	1649	1654	1659	1704	1709	1714
Resp. Rate	8bpm	8bpm	8bpm	8bpm	8pm	8pm
Behavior	Quiet Alert Responsive	Q A R	Q A R	Q A R	Q A R rolls 5 times	Q A R stops
Distance From Tideline	15m	15m	15m	15m	20m	20m *
Body Position	3/4 VR/LLR	3/4 VR/LLR	3/4 VR/LLR	3/4 VR/LLR	3/4 VR/LLR * VR	VR
Sun	0-1/3	0-1/3	0-1/3	0-1/3	0-1/3	0-1/3
Clouds	07/10	07/10	07/10	07/10	07/10	07/10
Wind	2NE	2NE	2NE	2NE	2NE	2NE

Notes: Sandy body + face - can not assess oiling
white discharge coming from nares

* stops <5m from KK01 & "attends"

Sector 1B

Seal ID KK02 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** uncertain

Date	981009	981009	981009	981009	981009	981009
Time	1733	1738	1743	1448		
Resp. Rate	Not Taken	NT	NT	NT		
Behavior	Alert w/n head facing tideline	rolling	moving to tideline	Swimming		
Distance From Tideline	1.5m	1.5m	~1m	n/a		
Body Position	VR - LLB 3/4	VR	VR	n/a		
Sun	0-1/3	0-1/3	0-1/3	0-1/3		
Clouds	07/10	08/10	07/10	07/10		
Wind	NE	NE	NE	NE		

Notes:
1st look at ventrum today

1743 - red staining around muzzle seen from right side

1746 - opens mouth, entire oral mucosa coated with red, blood like fluid.

Sector 1B

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** M+ **Molt** 100% **Oil** no

Date	981020	981020	981020	981020	981020	981020
Time	1200	1205	1210	1215	1220	1225
Resp. Rate	12 bpm	12 bpm	12 bpm	12 bpm	6 bpm	6 bpm
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping
Distance From Tideline	0.0m	0.0m	0.0.m	0.0m	0.0m	0.0m
Body Position	LLR	LLR	LLR	LLR	LLR	LLR
Sun	02/03	2/3	2/3	2/3	2/3	2/3
Clouds	04/10	04/10	04/10	04/10	03/10	03/10
Wind	INE	INE	INE	INE	INE	INE

Notes:
looks good
NSF

sector 2

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** M+ **Molt** 100% **Oil** No

Date	981022	981022	981022	981022	981022	981022
Time	1200	1205	1210	1215	1220	1225
Resp. Rate	12 bpm	12 bpm	8 bpm	8 bpm	8 bpm	8 bpm
Behavior	Resting Quietly	Looking around	RQ	RQ	RQ	RQ
Distance From Tideline	0m	0.0m	0.0m	0.0m	0.0m	0.0m
Body Position	RLR	RLR	RLR	RLR	RLR	RLR
Sun	2/3	2/3	2/3	2/3	2-3/3	2-3/3
Clouds	1 NE	1 NE	1 NE	1 NE	0-1 NE	1 NE
Wind ↕	06/10	07/10	06/10	05/10	05/10	05/10

Notes:
NSF

Sector 2

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** M1 **Molt** 100% **Oil** no

Date	981022	981022	981022	981022	981022	981022
Time	1645	1650	1655	1700	1705	1710
Resp. Rate	12 bpm	12 bpm	12 bpm	8 bpm	10 bpm	8 bpm
Behavior	Resting Quietly	RQ	Shifting in sand	RQ	RQ - Sleeping	RQ - Sleeping
Distance From Tideline	5m	5m	5m	5m	5m	5m
Body Position	VR	VR	VR	VR	VR	VR
Sun	0/3 (set)	0/3	0/3	0/3	0/3	0/3
Clouds	06/10	06/10	06/10	06/10	09/10	08/10
Wind	ONE	ONE	ONE	ONE	ONE	ONE

Notes:

NSF

Sector 2

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** M **Molt** 100% **Oil** no

Date	981023	981023	981023	981023	981023	981023
Time	0830	0835	0840	0845	0850	0855
Resp. Rate	8 bpm	8 bpm	8 bpm	8 bpm	8 bpm	8 bpm
Behavior	Sleeping	scratching face	Sleeping	Sleeping	Sleeping	Sleeping
Distance From Tideline	15-20m	15-20m	15-20m	15-20m	15-20m	15-20m
Body Position	3/4 LLR/VR	3/4 LLR/VR	3/4 LLR/VR	3/4 LLR/VR	3/4 LLR/VR	3/4 LLR/VR
Sun	0-1/3	0-1/3	0-1/3	0-1/3	0-1/3	0-1/3
Clouds	10/10	10/10	10/10	10/10	10/10	10/10
Wind	ONF	ONE	ONE	ONE	ONE	ONE

Notes:

NSF

-light rain this morning

SECTOR 1B

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** MT **Molt** 100% **Oil** No

Date	981026	981026	981026	981026	981026	981026
Time	1245	1250	1255	1300	1305	1310
Resp. Rate	6bpm	6bpm	6 bpm	8bpm	4bpm	8 bpm
Behavior	RQ or Sleeping	scratching	RQ	Stretching	Resting Quietly or sleeping	Rolling
Distance From Tideline	5m	5m	5m	5m	5m	1-5m
Body Position	RLR	RLR	RLR	RLR	RLR	VR
Sun	02/3	2/3	1/3	1/3	1/3	2/3
Clouds	06/10	07/10	08/10	Dawn Pour 05/10	04/10	03/10
Wind	1NE	1NE	1NE	1NE	1NE	2NE

Notes:

Extremely low tide and light rain

by 1337 was at tideline + getting washed

Sector 1A

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** M³ **Molt** 10% **Oil** No

Date	981026	981026	981026			
Time	1730	1735	1740			
Resp. Rate	Not Taken	not taken	not taken			
Behavior	Resting Quietly	RQ	moving to deeper water			
Distance From Tideline	IN tidal pool	in tidal pool	swims in water			
Body Position	LLR	LLR	n/a			
Sun						
Clouds						
Wind						

Notes:

- Left by 1745

Sector 1A

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** M+ **Molt** 100% **Oil** No

Date	981027	981027	981027	981027	981027	981027
Time	0830	0835	0840	0845	0850	0855
Resp. Rate	8bpm	8bpm	8bpm	8bpm	8bpm	8bpm
Behavior	Resting Quietly	Sneezing	RQ	RQ	RQ	RQ
Distance From Tideline	3m	3m	3m	3m	3m	3m
Body Position	LLR/VR 3/4	LLR/VR 3/4	LLR/VR 3/4	LLR/VR 3/4	LLR/VR 3/4	LLR/VR 3/4
Sun	0/3	0/3	0/3	0/3	0/3	1/3
Clouds	10/10	10/10	10/10	10/10	10/10	09/10
Wind	INE	INE	INE	INE	INE	INE

Notes:

'Torrential' downpour this morning 95/100" 6-8am

NSF

Sector 2

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** M+ **Molt** 100% **Oil** No

Date	981027	981027	981027	981027	981027	981027
Time	1315	1320	1325	1330	1335	1340
Resp. Rate	4bpm	4bpm	4bpm	4bpm	4bpm	4bpm
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping
Distance From Tideline	5m	5m	5m	5m	5m	5m
Body Position	RLR	RLR	RLR	RLR	RLR	RLR
Sun	1/3	2/3	1/3	2/3	2/3	2/3
Clouds	10/10	08/10	08/10	07/10	07/10	06/10
Wind	INE	INE	INE	INE	INE	INE
Notes: NSF						

Sector 2

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** M' **Molt** 100% **Oil** NO

Date	981027	981027	981027	981027	981027	981027
Time	1730	1735	1740	1745	1750	1755
Resp. Rate	4 bpm	6 bpm	6 bpm	6 bpm	4 bpm	4 bpm
Behavior	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping	Sleeping
Distance From Tideline	10m	10m	10m	10m	10m	10m
Body Position	RLR	RLR	RLR	RLR	RLR	RLR
Sun	0/3 (Sc1)	0/3	0/3	0/3	0/3	0/3
Clouds	07/10	07/10	08/10	06/10	06/10	06/10
Wind	INE	INE	INE	INE	INE	INE

Notes:
NSF

Sector 2

Phase 3

Seal ID KK01 **Size** A **Sex** M **Condition** M+ **Molt** 100% **Oil** No

Date	981029	981029	981029	981029	981029	981029
Time	1210	1215	1220	1225	1230	1235
Resp. Rate	8 bpm	8 bpm	8 bpm	8 bpm	10 bpm	10 bpm
Behavior	Resting Quietly	Resting Quietly	RQ	RQ	RQ	Stretches & Rolls
Distance From Tideline	5m	5m	5m	5m	5m	5m
Body Position	LLR/DR	LLR/DR	LLR/DR	LLR/DR	LLR/DR	DR
Sun	2/3	2/3	2/3	2/3	2/3	2/3
Clouds	05/10	05/10	05/10	05/10	05/10	05/10
Wind	INE	INE	INE	INE	INE	INE

Notes: - after the observational period resp slowed to 4-6/min with cardiac rate of 40 bpm

Sector 1B NSF

Phase 3

Seal ID KW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** <1% possible

Date	981025	981025	981025	981025	981025	981025
Time	0845	0850	0855	0900	0905	0910
Resp. Rate	6 bpm	6 bpm	4 bpm	6 bpm	6 bpm	6 bpm
Behavior	Scratching	Sneezing	Resting Quietly	Scratching	RQ	RQ
Distance From Tideline	1-5m	1-5m	0-5m	0-5m	0-5m	0-5m
Body Position	VR	VR	VR	LLR	LLR	LLR
Sun	2/3	2/3	2/3	2/3	2/3	2/3
Clouds	01/10	01/10	01/10	02/10	02/10	02/10
Wind	NE	NE	NE	NE	NE	NE

Notes:

NSF

Sector 1A

Phase 3

Seal ID KW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** <1% possible

Date	981025	981025	981025	981025		
Time	1745	1750	1755	1800		
Resp. Rate	Not Taken	NT	NT	NT		
Behavior	Bright Alert Responsive	Looking + moving	at Tideline	Swimming		
Distance From Tideline	<1m	<1m	0m	n/a		
Body Position	VR	VR	VR	n/a		
Sun	0/3 (set)	0/3	0/3	0/3		
Clouds	01/10	01/10	01/10	01/10		
Wind	2 NE	2 NE	2 NE	2 NE		

Notes:

1805 sample not taken - seal swimming away

NSF

Sector 1A

Phase 3

Seal ID KW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** ~~No~~ 1-10%

Date	981027	981027	981027	981027	981027	981027
Time	0900	0905	0910	0915	0920	0925
Resp. Rate	8bpm	8bpm	8bpm	8bpm	8bpm	6bpm
Behavior	Sneezing	RQ (sneezed)	RQ (sneezed)	RQ	RQ (sneezed)	RQ
Distance From Tideline	1m	1m	1m	1m	1m	1m
Body Position	LLR/VR	LLR/VR	LLR/VR	LLR/VR	LLR/VR	LLR/VR
Sun	0/3	0/3	0/3	0/3	0/3	1/3
Clouds	10/10	10/10	10/10	10/10	10/10	09/10
Wind	INE	INE	INE	INE	INE	INE

Notes: 'Torrential Down Pour' this am 0600-0800
- conjunctivae appear reddened
- area on rt lat. hip 2/0cm x 5cm of dark/oiled? fur
Sector 2

Phax 3

Seal ID KW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** 1-10%

Date	981027	981027	981027	981027	981027	981027
Time	1245	1250	1255	1300	1305	1310
Resp. Rate	6 bpm	6 bpm	4 bpm	4 bpm	4 bpm	6 bpm
Behavior	Sneezing	Sleeping	Sleeping	Sneezing	Sneezing	Sneezing
Distance From Tideline	1m	1m	1m	1m	1m	1m
Body Position	VR	VR	RLR	RLR	RLR	RLR
Sun	01/03	1/3	2/3	2/3	2/3	2/3
Clouds	10/10	10/10	08/10	08/10	07/10	06/10
Wind	INE	INE	INE	INE	INE	INE

Notes: Today she is not normal, different than usual
Eyes are reddened (conj.), Sneezing is frequent
* Jerks head out of water when tide washes head
appears to have URT infection sector 2

Phase 3

Seal ID KW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** 1-10%

Date	981027	981027	981027	981027	981027	981027
Time	1700	1705	1710	1715	1720	1725
Resp. Rate	6	6	8	8	6	8
Behavior	Resting Quietly	RQ	RQ	RQ	RQ	RQ
Distance From Tideline	5m	5m	5m	5m	5m	5m
Body Position	VR	VR	VR	VR	VR	VR
Sun	0/3 (set)	0/3	0/3	0/3	0/3	0/3
Clouds	07/10	07/10	08/10	06/10	06/10	06/10
Wind	NE	NE	NE	NE	NE	NE

Notes:
Still Sneezing more than 1X/5minutes
not quite right (ADR?) should watch her.

Sector 2

Phax 3

Seal ID KW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** 1-10%

Date	981028	981028	981028	981028	981028	981028
Time	0900	0905	0910	0915	0920	0925
Resp. Rate	0bpm	6bpm	6bpm	0bpm	6 bpm	6 bpm
Behavior	Resting Quietly + looking	Sneezing + RQ	holding head out of tidal wash	RQ	RQ	RQ
Distance From Tideline	0-1m	0-1m	0-1m	0-0.5m	0-0.5m	0-0.5m
Body Position	LLR/VR	LLR/VR	LLR/VR	LLR/VR	LLR/VR	LLR/VR
Sun	02/03	2/3	2/3	2/3	2/3	2/3
Clouds	06/10	06/10	07/10	05/10	05/10	04/10
Wind	INE	INE	INE	ONE	ONE	ONE

Notes: 2 more spots of possibly oiled fur on Rt side ≈ 3" cranial to anklets, size of spots is ≈ quarter sized also possibly 2 areas on muzzle possibly oiled (eye) usually not visible due to sandy covering from head shuffling.

Sector 2, sneezing less today
Rained again this morning 7-8am

Phase 3

Seal ID KW01 **Size** A **Sex** F **Condition** F **Molt** 100% **Oil** 1-10%

Date	981028	981028	981028	981028	981028	981028
Time	1240	1245	1250	1255	1300	1305
Resp. Rate	8 bpm	8 bpm	8 bpm	8 bpm	8 bpm	6 bpm
Behavior	Resting Quietly	Resting Quetly	Scratching	Scratching	Rolling 180°	180° Rolling & looking
Distance From Tideline	3-5m	3-5m	0-3m	0-3m	0-3m	0-3m
Body Position	DR/RLR	DR/RLR	DR/RLR	DR/RLR	VR	RLR
Sun	2/3	2/3	2/3	2/3	2/3	2/3
Clouds	03/10	04/10	04/10	04/10	04/10	04/10
Wind	INE	INE	INE	INE	INE	INE

Notes: moves around more than usual seems to be uncomfortable

sector 2

Phase 3

Seal ID KW02 **Size** A **Sex** F **Condition** M **Molt** 100% **Oil** <1% possible

Date	981020	981020	981020	981020	981020	981020
Time	1600	1605	1610	1615	1620	1625
Resp. Rate	12bpm	12bpm	6bpm	6bpm	6bpm	6bpm
Behavior	moving	resting quietly	RQ	RQ	RQ	"Jolted" by crab
Distance From Tideline	10m	10m	10m	10m	10m	10m
Body Position	VR	VR	VR	VR	VR	VR
Sun	0/3 (set)	0/3	0/3	0/3	0/3	0/3
Clouds	07/10	08/10	08/10	08/10	08/10	08/10
Wind	ONE	ONE	ONE	ONE	ONE	ONE

Notes:

NSF

Sector 1B

Phase 3

Seal ID KW02 **Size** A **Sex** F **Condition** M **Molt** 100% **Oil** <1% possible

Date	981023	981023	981023	981023	981023	981023
Time	0855	0900	0905	0910	0915	0920
Resp. Rate	12	8	8	4	4	12
Behavior	Looking Around	Resting Quietly	RQ	Sleeping	Sleeping	Looking Around
Distance From Tideline	5m	5m	5m	5m	5m	5m
Body Position	VR	VR	VR	VR	VR	VR
Sun	~~4~~ 0-1/3	0-1/3	0-1/3	0-1/3	0-1/3	0-1/3
Clouds	10/10	10/10	10/10	10/10	10/10	10/10
Wind	ONE	ONE	ONE	ONE	ONE	ONE

Notes:

- Right Fastlipper fingertips are clean
- see 2 streaks of oil tinged fur Right side caudal mid-body a 2" x 0.5" and 3" x 0.5"
- Just Hauled Out
- Light rain

Sector 1B

Phase 3

Seal ID KW02 **Size** A **Sex** F **Condition** M **Molt** 100% **Oil** <1% possible

Date	981020	981020	981020	981020	981020	981020
Time	0915	0920	0925	0930	0935	0940
Resp. Rate	12 bpm	12 bpm	8 bpm	8 bpm	8 bpm	8 bpm
Behavior	resting Quietly (RQ)	looking around	RQ	RQ	RQ	RQ
Distance From Tideline	5m	5m	5m	5m	5m	5m
Body Position	RLR	RLR	RLR	RLR	RLR	RLR
Sun	02/3	2/3	2/3	2/3	2/3	2/3
Clouds	03/10	03/10	03/10	02/10	02/10	01/10
Wind	ONE	ONE	ONE	INE	INE	INE

Notes:

oiling possible under left side of "neck" cranial to Left front flipper.

no discharges noted

no other significant findings

Sector 1B

Phase 3

Seal ID KNO2 **Size** A **Sex** F **Condition** M **Molt** 100% **Oil** <1% possible

Date	981020	981020	981020	981020	981020	981020
Time	1235	1240	1245	1250	1255	1300
Resp. Rate	8 bpm	8 bpm	6 bpm	6 bpm	6 bpm	6 bpm
Behavior	Resting Quietly	Scratching head	RQ	Looking around	RQ	RQ
Distance From Tideline	5m	5m	5m	5m	5m	5m
Body Position	RLR	RLR	RLR	RLR	RLR	RLR
Sun	02/03	2/3	2/3	2/3	2/3	2/3
Clouds	04/10	04/10	04/10	04/10	03/10	03/10
Wind	INE	INE	INE	INE	INE	INE

Notes:
- possible additional oil on left side of muzzle
- fully wet and sandy

Phase 3

Seal ID KK03 **Size** A **Sex** M **Condition** MF **Molt** 100% **Oil** not clear

Date	981029	981029	981029	981029	981029	981029
Time	1315	1320	1325	1330	1335	1340
Resp. Rate	not taken	6 bpm	6 bpm	4 bpm	6 bpm	6 bpm
Behavior	Just hauled out	resting	resting	resting quietly	resting quietly	scratching & rolling
Distance From Tideline	0.0 m	3m	1-3m	1-3m	1-3m	1-3m
Body Position	VR	LLR/DR	LLR/DR	LLR	LLR	RLR
Sun	2-3/3	2-3/3	2-3/3	2-3/3	2-3/3	2-3/3
Clouds	04/10	04/10	04/10	04/10	05/10	05/10
Wind	INE	INE	INE	INE	INE	INE

Notes: - no discharges noted
- covered in sand - can't tell if oiled
- gagging type behavior noted area by opihi rocks in sector 4

Phase 3

Seal ID KK03 **Size** A **Sex** M **Condition** MF **Molt** 100% **Oil** possible (<1%)

Date	981029	981029	981029	981029	981029	981029
Time	1800	1805	1810	1815	1820	1825
Resp. Rate	6 bpm	6 bpm	8 bpm	8 bpm	6 bpm	6 bpm
Behavior	Resting Quietly	RQ	moving/ settling	RQ then responds to cues	RQ	RQ
Distance From Tideline	10m	10m	10m	10m	10m	10m
Body Position	VR	VR	VR	VR	VR	VR
Sun	0/3 (ext)	0/3	0/3	0/3	0/3	0/3
Clouds	05/10	06/10	06/10	05/10	05/10	05/10
Wind	NE	NE	NE	NE	NE	NE

Notes:
- gagging behavior exhibited
- no discharges noted
- areas of dark fur seen (unusually dark)

phase 3

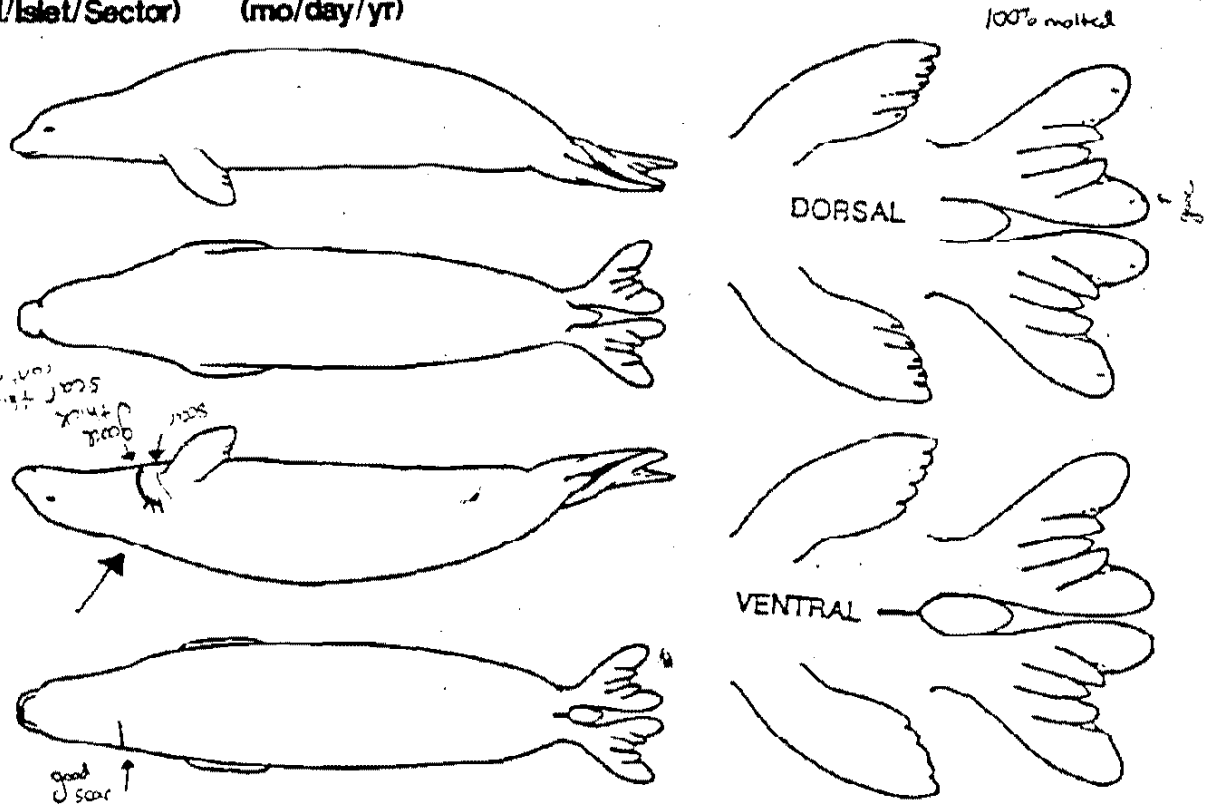
Seal ID KK03 **Size** A **Sex** M **Condition** MF **Molt** 100% **Oil** 1-5% possible

Date	981030	981030	981030	981030	981030	981030
Time	0805	0810	0815	0820	0825	0830
Resp. Rate	8bpm	8 bpm	6 bpm	8 bpm	6bpm	6bpm
Behavior	'gagging'	'gagging'	Resting Quietly	Moving/ Settling	RQ	RQ
Distance From Tideline	3-5m	1-3m	1-3m	1-3m	0-3m	0-3m
Body Position	DR	DR	DR	DR	DR	DR
Sun	2/3	2/3	2/3	2/3	2/3	2/3
Clouds	01/10	01/10	01/10	01/10	01/10	01/10
Wind	INE	INE	INE	INE	INE	INE

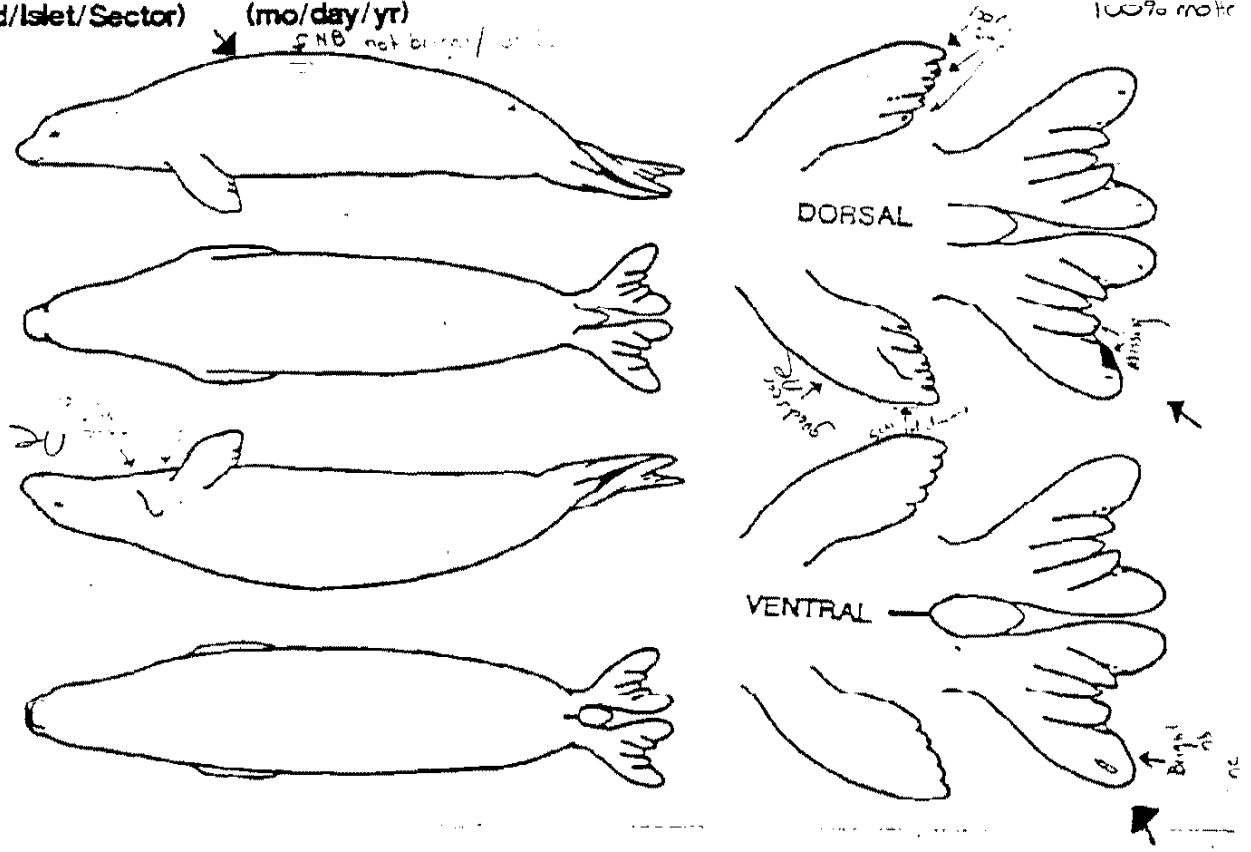
Notes:
- gagging behavior exhibited
- no other significant findings

area by opihi rocks in Sector 4

Sighting Location (Island/Islet/Sector)	Date (mo/day/yr)	Size	Sex	Bleach/Temp. No.	ID No.
K. oJ Ka. /1	10/8/98	A	M	KK01	

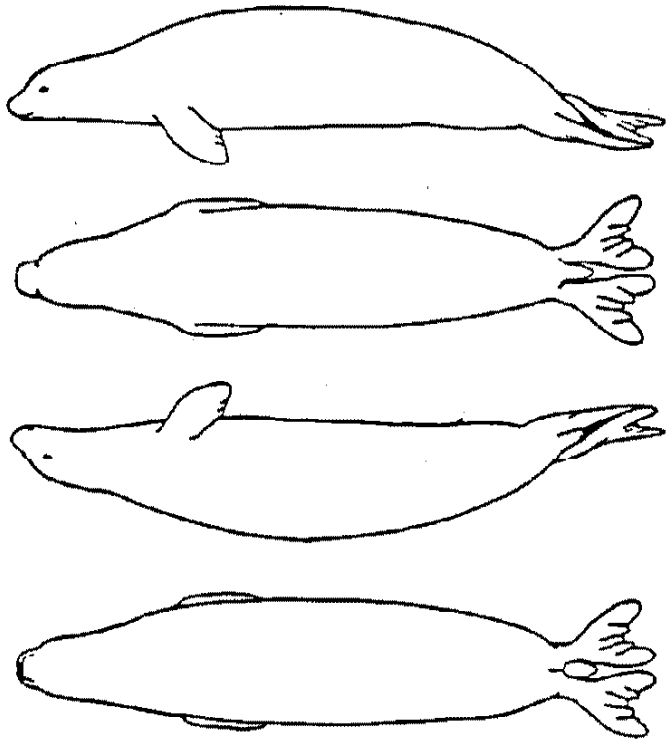


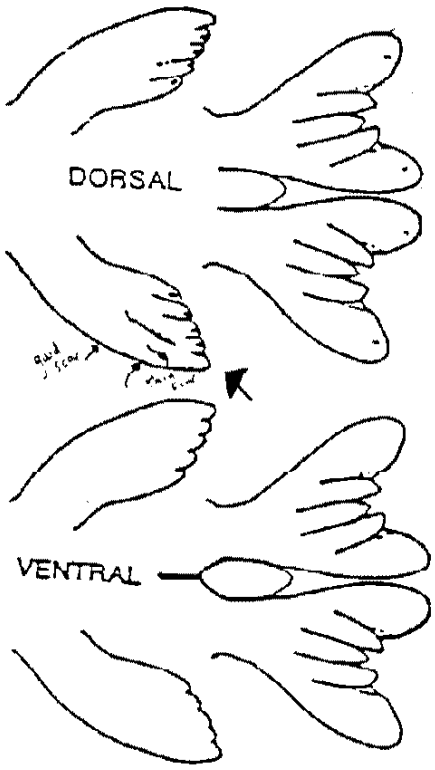
Sighting Location (Island/Islet/Sector)	Date (mo/day/yr)	Size	Sex	Bleach/Temp. No.	ID No.
K. oJ Ka.	10/05/98	A	(M)	KK01	100% molt



Kiou Kai	12/7/98	A	M	KK01	
Sighting Location (Island/Islet/Sector)	Date (mo/day/yr)	Size	Sex	Bleach/Temp. No.	ID No.

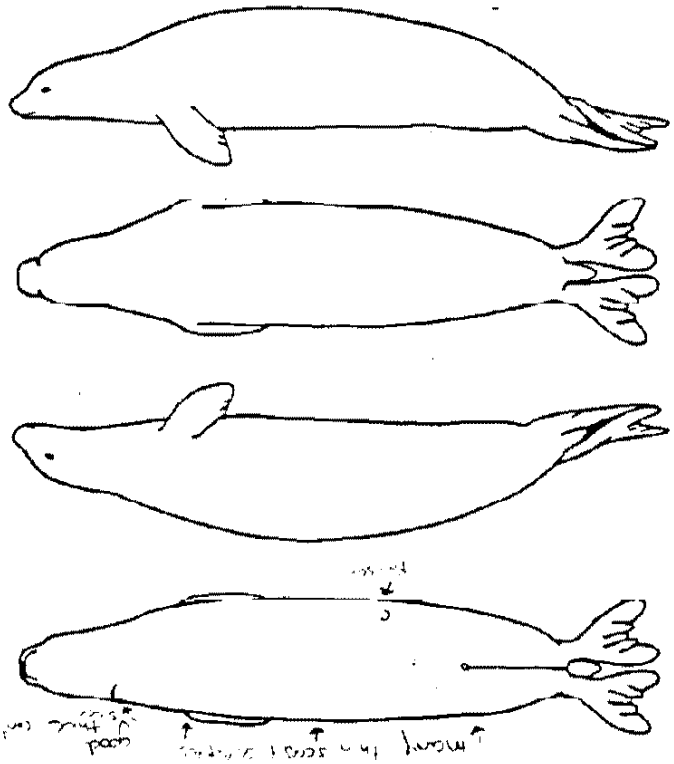
100% molted

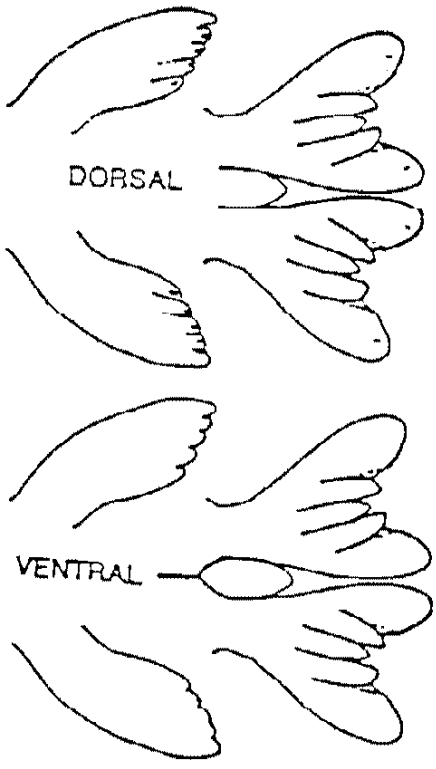




Kiou Kai 102	10/06/98	A	M	KK01	
Sighting Location (Island/Islet/Sector)	Date (mo/day/yr)	Size	Sex	Bleach/Temp. No.	ID No.

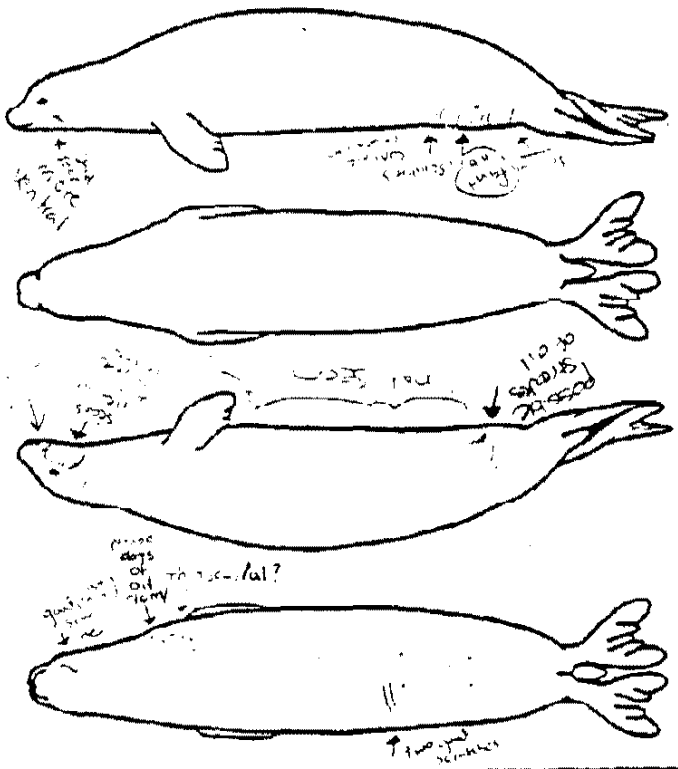
100% molted

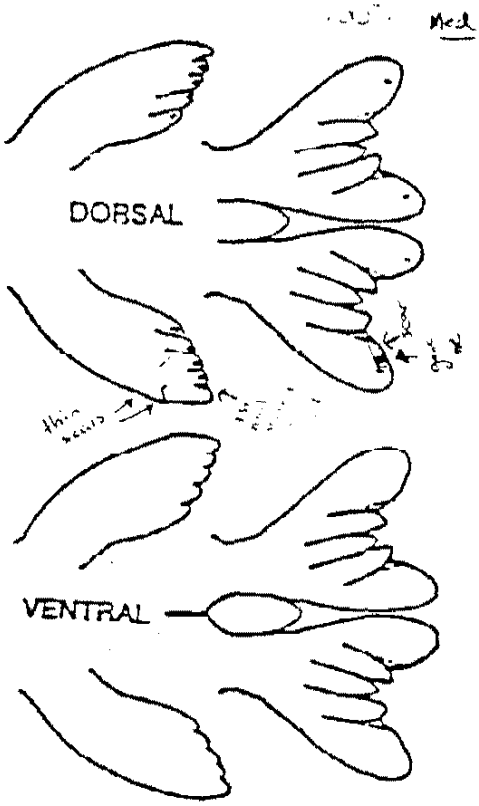




& composite-all dates

Kaoka/01B	10/20/98	A	F	KW02	
Sighting Location (Island/Islet/Sector)	Date (mo/day/yr)	Size	Sex	Bleach/Temp. No.	ID No.



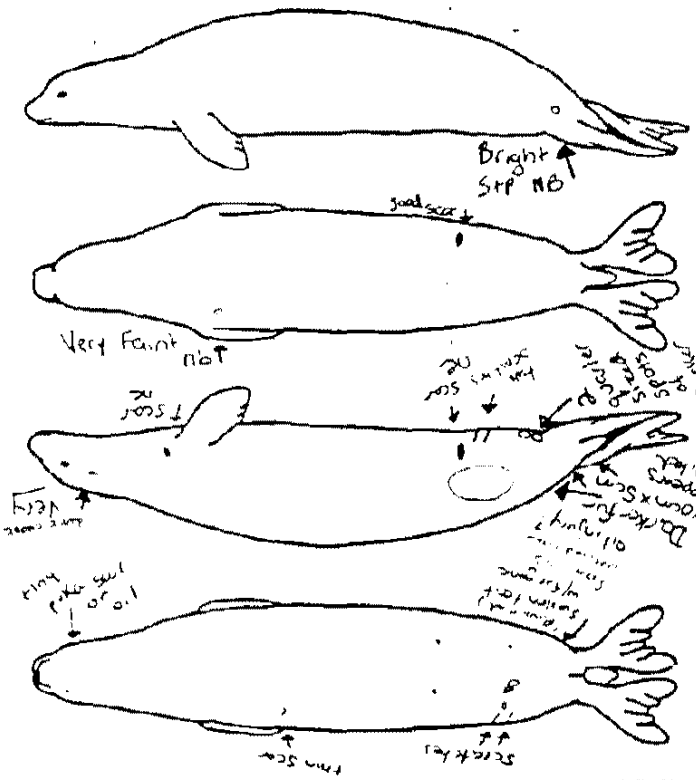


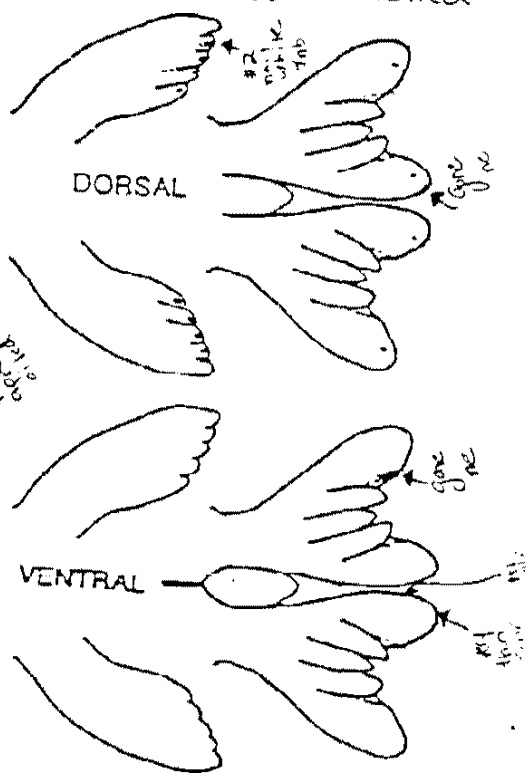
3/9

& composite-all dates

Kaoka/02	10/07/98	A	F	KW01	
Sighting Location (Island/Islet/Sector)	Date (mo/day/yr)	Size	Sex	Bleach/Temp. No.	ID No.

100% mottled

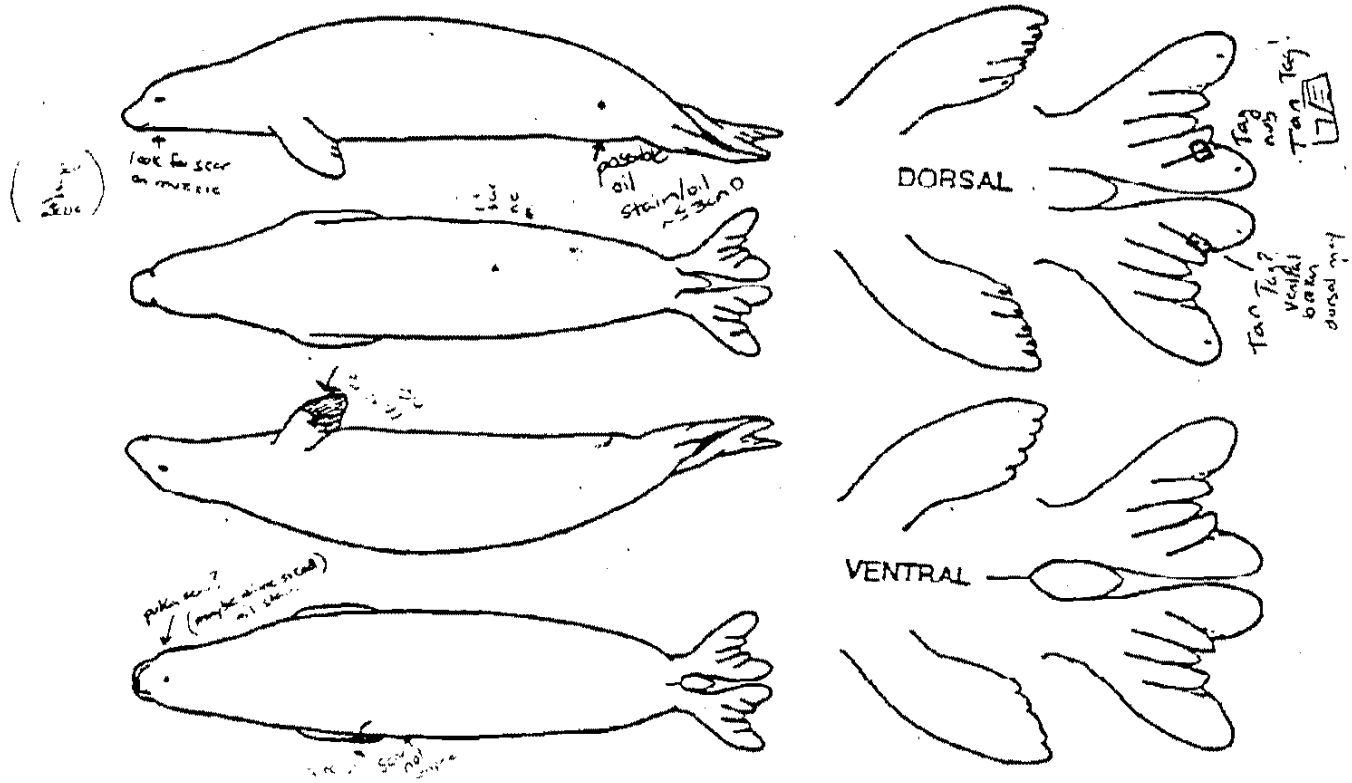




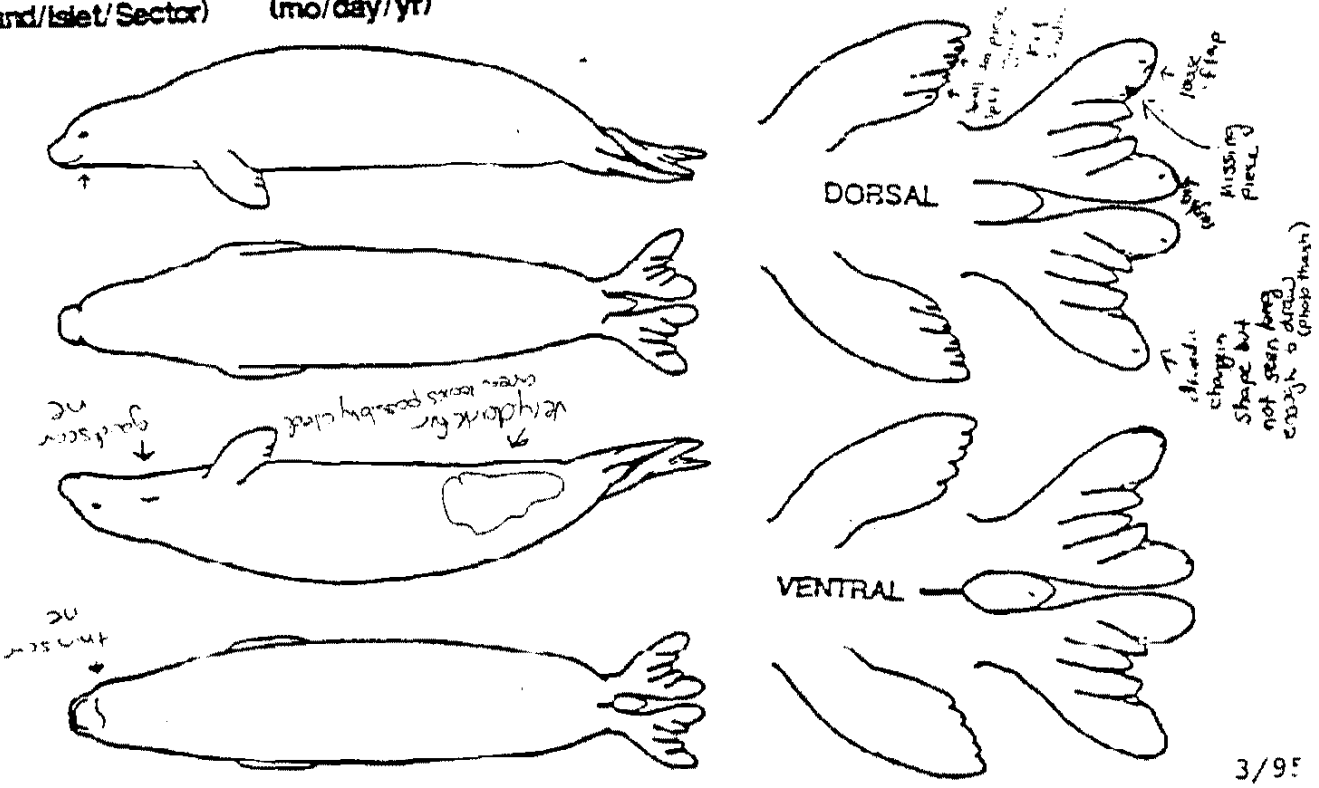
& composite - all dates

Sighting Location (Island/Islet/Sector)	Date (mo/day/yr)	Size	Sex	Bleach/Temp. No.	ID No.
Kiwi Kai / O1a	01-7-98	A	M	KK02	

100% molted



Sighting Location (Island/Islet/Sector)	Date (mo/day/yr)	Size	Sex	Bleach/Temp. No.	ID No.
Kiwi Kai / O4 channel	composite w/ 10/30/98 10/29/98	A	M	KK03	



3/95