

Alaska Region Marine Mammal Stranding Network

Spring/Summer 2011 NEWSLETTER

Stranding Photo of the Winter: This killer whale necropsy team races against the surging tide in Sitka Sound.



Photo credit: Paul Norwood (Sitka Sound Science Center). Sitka, March 2011.

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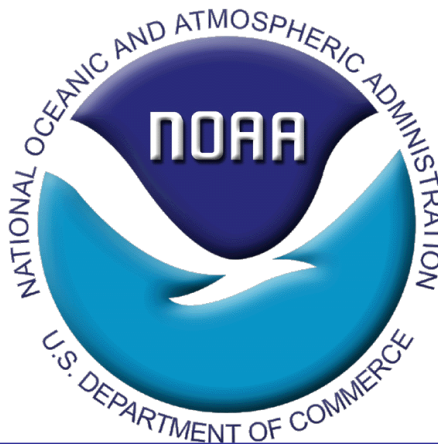
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Greetings from the Coordinator...

Greetings Alaska Stranding Network,

It's spring—or is it? Still snow on the trails here in Juneau. Hope that the season finds you all well—and ready for the phone to ring. ☺

It's already been a busy year for the stranding program, including several high profile necropsy events that you'll find detailed in this issue (see pg. 4). Both Sitka and Skagway have been hotspots, with multiple events since the beginning of the year.

With stranding season officially upon us, here are a few things to be aware of from the Regional Office:

- Dr. Kate Savage, who has been on detail in Silver Spring backfilling for the National Stranding Coordinator position, will be back in the Regional Office on May 16. See page 3 for her report on a recent health workshop held in Seattle examining the role of *Coxiella* in marine mammals and the marine environment.
- This season we have a number of special requests for parts from stranded animals in Alaska (see pgs 7-10). The researchers we've profiled in this issue are all permitted to possess the parts described. To the extent that it does not become burdensome, we ask you to keep these requests in mind as you collect tissue samples throughout the season.
- Given ongoing interest and concern over Naval activities, you may want to read the Final Rule for the Gulf of Alaska (GOA) Temporary Maritime Activities Area (TMAA) which published on May 4. The rule issues regulations to govern the unintentional taking of marine mammals incidental to training activities conducted in the GoA TMAA for the period April 2011 through April 2016. It includes a final Stranding Response Protocol developed jointly by NMFS and the Navy. We can send pdf copies to those interested, or you can access a copy at the following url: <http://www.gpo.gov/fdsys/pkg/FR-2011-05-04/pdf/2011-10440.pdf>
- Public comment period is open through July 5, 2011, for NMFS notice of proposed information collection via a specimen banking information sheet for the National Marine Mammal Tissue Bank, the Marine Mammal Health and Stranding Response Program and the Alaska Marine Mammal Tissue Archival Project. Federal register notice at: <http://alaskafisheries.noaa.gov/notice/76fr24862.pdf>
- Finally, don't forget **Endangered Species Day** on May 20! Passed by Congress in 2008, this day celebrates endangered species around the country. In Juneau, NMFS and the Alaska Wildlife Alliance are hosting an evening of art and science showcasing Alaska's endangered species. Since many of the species we respond to in the stranding network are ESA-listed, think about celebrating the event in your own community as an opportunity to raise awareness about the stranding program. For more information, visit www.endangeredspecies.org.

Thank you for all your efforts on behalf of marine mammals in Alaska. Have a great summer!

Aleria Jensen
Stranding Coordinator, NOAA Fisheries Alaska Region



Coxiella in Marine Mammals

By Kate Savage, NMFS

Coxiella burnetii is a globally distributed, highly infectious bacterium which has been detected in humans, domestic animals and a wide array of wildlife species. In the United States, *Coxiella* has been found to be fairly ubiquitous, both in domestic and wild animals as well as in the environment.

Although *Coxiella* has been documented in many species, sheep, cattle and goats have traditionally been considered the primary reservoirs. Infected mammals are typically asymptomatic, but reproductive pathology such as placental inflammation and abortion is also possible. Transmission of *Coxiella* is thought to occur via the inhalation of aerosolized urine, feces, milk, and birth products of infected animals. Once in the environment, the organism is highly resistant to environmental degradation and the potential for windborne transfer of infected particles, which has been documented up to 11 miles, remains (1).

The first reported case of *Coxiella* in a marine mammal was in 1999 when an adult female Pacific harbor seal, with a full-term fetus and evidence of placental infection, was found in Marin County, CA (2). In 2008, a pregnant adult Steller sea lion in Washington was also found to be infected (3). The presence of *Coxiella* has since been confirmed in tissues from other marine mammal species, including California sea lion, harbor porpoise and Northern fur seal. The strain of *Coxiella* in marine mammals has not yet been fully characterized. However, based on genetic sequencing techniques, the *Coxiella* strain(s) found in marine mammal species are very similar, although they do appear to be quite different from strains found in terrestrial species.

The significance of *Coxiella* in marine mammals is uncertain. In April of 2011, NMFS convened a workshop to discuss strategies to develop a better understanding of *Coxiella* in the marine environment. A principal outcome was the development of an 18 month Strategic Plan. Some of the questions addressed in the Strategic Plan include:

- Is *Coxiella* emerging or endemic? How established is the organism in marine mammal populations, both temporally and spatially?
- How pathogenic is *Coxiella* to marine mammal species and what are the implications on a population level?
- What are the potential reservoirs of exposure?
- What is the zoonotic potential of marine mammal *Coxiella*?

Although no human cases of Q fever have been linked to marine mammal exposure, the ability of the marine mammal strain to infect people is unknown. Once the Strategic Plan is formalized, activities that address these questions will be initiated. We will continue to provide updates as more information becomes available.

References:

1. ISU Center for Food Security and Public Health: Q fever, query fever, coxiellosis, abattoir fever. http://www.cfsph.iastate.edu/Factsheets/pdfs/q_fever.pdf [accessed 3/2/11].
2. LaPointe, J., F.M. Gulland, D.M. Haines, B.C. Barr and P.J. Duignan. 1999. Placentitis due to *Coxiella burnetii* in a Pacific harbor seal (*Phoca vitulina richardsi*). J Vet Diagn Invest 11:541-543.
3. Kersh, G.J., D.M. Lambourn, J.S. Self, A.M. Akmajian, J.B. Stanton, T.V. Baszler, S.A. Raverty and R.F. Massung. 2010. *Coxiella burnetii* infection of a Steller sea lion (*Eumetopias jubatus*) found in Washington State. J. Clin. Microbiol. 48(9):3428-3431.



Dr. Kate Savage

Winter/Spring Strandings

by Kaili Jackson, NMFS

With twelve marine mammals strandings reported statewide through April, the 2011 stranding season is off to a busy start. Ten of the twelve reports have involved dead animals. Trained teams have responded and necropsied eight of the ten carcasses. Both live events involved Steller sea lions- one sick and one entangled in active fishing gear, which was successfully released. Thank you to everybody whose efforts have made these high response rates possible.

Of particular interest, while Skagway has not historically been an area of frequent marine mammal stranding reports, four pinniped carcasses (two Steller sea lions and two harbor seals) have been reported in 2011. All four carcasses were successfully secured and/or collected for necropsy. No clear connections are apparent at this time, but we will continue to monitor the situation. Also, Sitka has had a busy start to the year with three reports of large whale carcasses- one killer whale, one gray whale, and an unidentified whale carcass. Both the killer whale and the gray whale have been necropsied and cause of deaths remain indefinite.

We look forward to a busy and successful 2011 season!



This sick and emaciated Steller sea lion hauled out near Tenakee on the 3rd day of the year and became our first stranding of 2011. The animal was monitored by responders for almost a week before the animal left the area and was never relocated.



MAP Agent and network responder, Reid Brewer, leads a necropsy on this northern elephant seal in Dutch Harbor while local students watch.

(Right) This pregnant Steller sea lion was found floating near Skagway in January. (Below) Dr. Kate Savage and Casey Brewer examine the same sea lion during the necropsy, which revealed trauma to be the most probable cause of death.



(Left) Originally observed thrashing in the surf near Homer, this harbor porpoise died shortly thereafter and was transported to Dr. Kathy Burek's lab for necropsy.



(Left) Volunteer, Ellen Chenoweth, pauses for only a moment while examining the head of the gray whale that was found floating near Sitka in April. Cause of death was likely trauma.



Stranding Agreement holders, Dr. Rachel Dzuiba and Jan Straley examine the head of this juvenile killer whale carcass that washed ashore in Sitka Sound during March, while volunteers Pat Swedeen, Kaili Jackson (NMFS), and Ellen Chenoweth flense the blubber from the animal.

2009-2010 Steller Sea Lion Mortalities in Northern Southeast Alaska- UPDATE

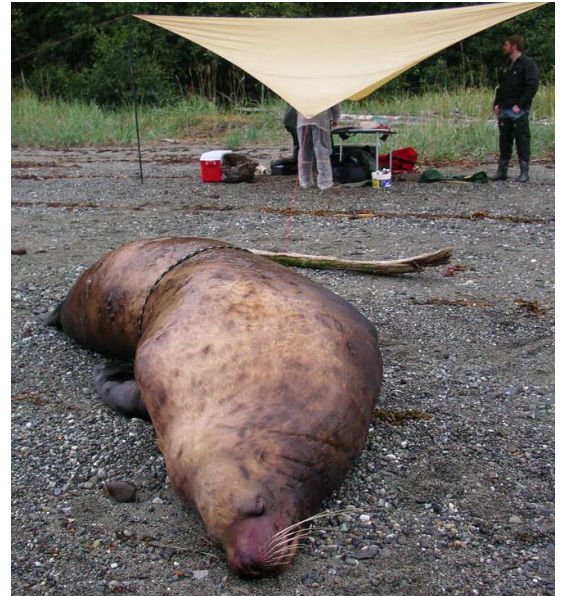
Aleria Jensen, Kaitli Jackson, and Kate Savage
NOAA Fisheries Alaska Region

NMFS previously reported on elevated numbers of Steller sea lion (*Eumatopias jubatus*) mortalities in Southeast Alaska in 2009 and 2010. An assessment by the Working Group on Marine Mammal Unusual Mortality Events last fall concluded that the situation does not currently qualify as an Unusual Mortality Event (UME), in part based on a lack of information to thoroughly evaluate the situation in accordance with the seven criteria used for declaring an UME. The Working Group remains concerned about these strandings, and would like to receive frequent updates to monitor the situation. As new information is received, the current recommendation may change.

An adult Steller sea lion carcass that was observed near Gustavus in January, 2010.



A Bald Eagle takes advantage of a secured Steller sea lion carcass near Juneau in May of 2010.



This Steller sea lion waits to be necropsied in Glacier Bay National Park on a rainy day in September, 2009.

Necropsy team hard at work in Glacier Bay National Park while transportation waits nearby, May 2010.



To learn more about marine mammal Unusual Mortality Events, visit NOAA Fisheries UME site at

<http://www.nmfs.noaa.gov/pr/health/mmume/>

Updates from the Alaska SeaLife Center

by Tim Lebling, ASLC

The 2011 AK Stranding Network Meeting is in the books. Over 70 people attended the meeting from all corners of the state. New representatives included tribal members from Port Heiden, Tenakee, and Sitka, US Coast Guard, and our State Veterinarian. The network continues to grow, and each year we are amazed at the number of stranding events that take place around the state. Some notable events include the walrus and polar bear adaptations in the north, human interaction scars and entanglements recorded on harvested bowhead whales, branded sea lions from Lowrie Island in Southeast AK in Nome on Christmas, a green turtle stranding in Ketchikan, and tracking an entangled beluga.



Network members look on during presentations at the 2011 AK Stranding Network Meeting in February.

Our guest speaker was Mike Ziccardi from Oiled Wildlife Care Network in CA and the lead animal response representative on Deep Water Horizon (DWH). He spoke on lessons learned during DWH, and offered consultation to our AK network about preparedness in the event of an oil spill.

A meeting highlight always seems to be the necropsy wetlabs. This year we necropsied an adult sea otter from Homer, a sea lion from Skagway and a sick seal which was hunted just days previously. Many thanks to all those whose participation produced a successful meeting.



(Above) Guest speaker, Mike Ziccardi, and Southwest Region Stranding Coordinator, Sarah Wilkin.

(Left) Deb Tobin reports out on stranding response in 2010 by the Homer Stranding Network.



The Alaska Stranding Network says goodbye to NOAA Enforcement Officer Scott Adams, whose career will continue outside of Alaska. Thank you, Scott, for all you've done here in Alaska!

Dr. Murali Pai,
North Slope
Borough,
provides a
lesson in "The
Life of Pai."



Seeking Where the Barnacles Roam

by Dr. John Zardus

Barnacles don't usually spring to mind as animals that traverse great distances during their lifetime but those living on whales travel as far as their hosts! Six species of barnacles world-wide live attached only to cetaceans. Closely allied with a dozen or so species that live on sea turtles, they share a similar lifestyle of filter-feeding and a developmental mode with planktonic larvae. Despite these similarities, they are remarkably diverse in how they attach to their living substratum. Barnacles on cetaceans in particular have to cope with a living, growing surface that continuously tries to repel



them. Some, like *Xenobalanus globicipitis* that lives on dolphins, anchor with a skin penetrating shell (Fig. 1a & 1b). *Coronula diadema*, on the other hand, clamps host skin within openings in its shell (Fig. 2); while *Tubicinella major* seems to dissolve its way down into host epidermis (Fig. 3).

A multi-objective study is underway to learn how these crustaceans are optimized for their epizootic life. Samples of intact barnacles from cetaceans are being sought for detailed morphological comparison of attachment mechanisms of the shells. DNA will also be extracted from the tissues to reconstruct phylogenetic relationships and, where possible, to test for regional genetic signatures within species. And finally, if live barnacles can be collected, they can be readily shipped in moist paper towels and the larval stages reared in the laboratory for developmental studies.



Persons dealing with stranded cetaceans who are willing and able to obtain fresh barnacle specimens, are asked to contact Professor John Zardus at the address below about procedures for collecting, preserving and shipping specimens. Rare taxa, such as the barnacle *Cetopirus complanatus*, not seen for decades, are especially desired and are most likely to be obtained from cetacean species that strand infrequently. Another, *Coronula reginae*, not often collected but likely not rare, is found well embedded in the lips and other thin skin of humpbacks. The relatively common species *X. globicipitis* is wanted in quantity from many localities for population studies.

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Study Exploring the Development of Diving Capacity in Baleen Whales Seeks Muscle Tissue Samples

by Dr. Rachel Cartwright

A research team at California State University Channel Islands, currently conducting a study of the development of diving capacity in baleen whales, is seeking muscle tissue samples from any age cohort or species of baleen whales.

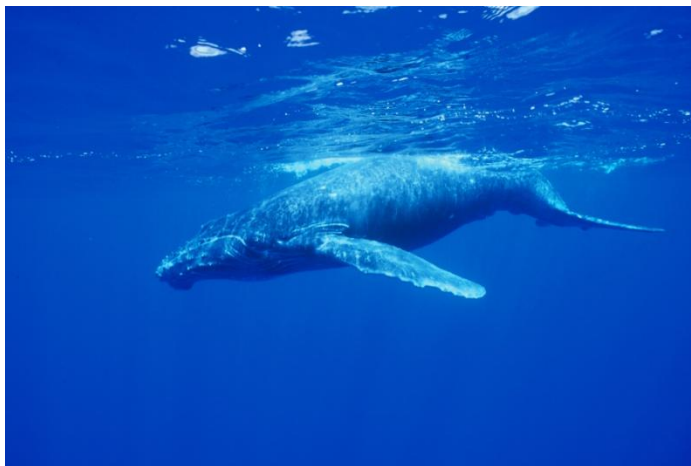
The study, underway at CSU – Channel Islands and led by Dr. Rachel Cartwright, a Hawaii-based humpback whale researcher, looks to tie in behavioral observations of the youngest humpback whales while in Hawaiian waters with their essential physiological development during their first natal season. As reported for many other marine mammals, the team previously documented very

constrained breath holding capacity in the youngest humpback whales calves in Hawaiian waters. Typically, the youngest humpback calves in this region make short dives of less than 2 minutes and frequently surface intermittently for single breathes. However, these calves are also the most active, engaging in bouts of breaching, rolling and pectoral fin slapping at the surface and typically traveling for around 90% of their time. Such high levels of activity are somewhat surprising, considering that calves are completely reliant on maternal lactation and their mothers, like all humpback whales, fast throughout their time in Hawaii.



Humpback calf breaching in Hawaiian waters. Researchers believe that high levels of surface activity, such as breaching, may up-regulate myoglobin levels in young animals. Photo taken under NMFS permit # 10018

However, converging lines of evidence now suggest that all this exercise serves a crucial function, in the development of diving capacity during these early months. The ability to make extended dives is a key, essential attribute in marine mammals, enabling foraging, avoidance of predation and more efficient swimming. A wide -ranging suite of behavioral and morphological attributes, from



Humpback calf underwater. Breath-holding capacity is extremely limited in young humpback whale calves during their first natal season. Photo taken under NMFS permit # 10018

ultra-streamlined body shape and highly efficient swimming techniques to voluntary bradycardia facilitate extended diving in marine mammals. Additionally, marine mammals display many key physiological attributes, including high levels of myoglobin in the muscle cells. Myoglobin acts as an oxygen store, easily grabbing oxygen from circulating blood, then storing the oxygen until required at the cellular level. Myoglobin levels in many young marine mammals may be very low, however high levels of activity under hypoxic conditions are emerging as a key trigger that up-regulates the expression of myoglobin within the cell.

Continued on next page...

Study Exploring the Development of Diving Capacity in Baleen Whales Seeks Muscle Samples- Continued

The dynamics of the development of muscular myoglobin stores in maturing marine mammals has now been reported for several species of seals, in sea lions and in small odontocetes. However, to date, such data has not been available for baleen whales. The team at CSU-Channel Islands is aiming to address this. Using muscle tissue samples from strandings of humpback and other baleen whale calves, generously provided by Dr. Kristi West, Hawaii Pacific University and Dr. Jim Rice, Oregon State University and standards provided by Michelle Berman, of Santa Barbara Natural History Museum, they are now building up a database detailing how myoglobin and other respiratory features of muscle tissue, such as buffering capacity and tissue type, change as baleen whales mature. Early results indicate that myoglobin levels are extremely low in young humpback and gray whale calves. Samples from juvenile minke and humpback whales demonstrate a slow, but significant rise in myoglobin levels with age, however, as yet, adult levels of myoglobin in most baleen whales, including humpback and minke whales remain undocumented. Consequently, the team is eager to receive samples of muscle tissue from any baleen whales that may become available this season.



Processed samples of muscle tissue suspended in phosphate buffer. Color differences are indicative of differences in myoglobin levels. Left – Harbor porpoise, Middle – common dolphin calf and right – Humpback whale calf.

The sampling protocol is really straight forward; full details can be obtained on request from Rachel, at rachel.cartwright@csuci.edu. Essentially, samples of between 250-500 g would be ideal. The first choice sampling site would be directly below the dorsal fin in humpback and minke whales, or from mid caudal region in gray whales, and from the innermost portion of the main swimming muscle (*longissimus dorsi*) if possible. Where feasible, samples from both the outer and inner portions of the muscle would be useful, and in these cases, leaving a small amount of blubber attached to the outer portion ensures accurate identification of sampling locations. Samples should be wrapped in foil and frozen as soon as possible, at -80°C where available, alternatively – 20 °C, or just as cold as possible depending on field location will suffice.

Samples can then be shipped in dry ice, where available, or between ice-packs. Our shipping address is:

c/o Rachel Cartwright, Dept of Biology, Aliso Hall,
California State University Channel Islands,
One University Drive, Camarillo, CA 93012.

All contributions will be fully acknowledged in up-coming publications and funds are available to cover or re-imburse costs of shipping.

Tissue samples from any life stage, age cohort or gender of baleen whales will be especially useful to the current study. Additionally, tissue samples from larger toothed whales, such as Orca and Sperm whale would serve provide very useful comparative data, and would be used in associated work at the University, studying the ways in which mechanisms of up-regulation may vary across the wider range of cetaceans. For more details on the project visit www.caringforcalves.org

The Case of the Bumpy Humpies – the puzzle of skin lesions in Alaska humpback whales

Christine Gabriele, Glacier Bay National Park
Kate Savage, NOAA Fisheries Alaska Region

This article is an updated reprint from the fall/winter 2010 AK Marine Mammal Stranding Newsletter

In recent years, researchers have increasingly noticed blister-like lesions or “bumps” on the skin of several species of cetaceans around the world. Having also noticed similar lesions in southeastern Alaska humpback whales, Chris Gabriele and Janet Neilson (Glacier Bay National Park) and other stranding network members are keenly interested in collecting samples of these “bumps” from stranded whales to determine what may be causing them.

It appears that a growing number of humpbacks in southeastern Alaska and Hawaii have bumps on their flanks, but, admittedly, no quantitative analysis has been done to investigate this assertion. However, we can say that many whales have a few bumps and a few whales have been documented with severe cases. Bumps can occur anywhere on the body, but mild cases tend to be visible on the whale's flanks (Figure 1). They seem to be less common in yearling and juvenile whales. In American Samoa humpback whales, bumps are more prevalent on the ventral flanks and toward the tail end of the whale (Mattila and Robbins 2008). In turbid Alaskan waters, it would be difficult to see any bumps occurring below the water line. Bumpy skin appears to be less prevalent in Gulf of Maine humpbacks, and photo-documentation has shown that individual whales may retain a specific bump in the same location over periods of up to 29 years (Mattila and Robbins 2008). Many different types of skin lesions have been documented in cetaceans (Van Bressemer et al. 2008) and it is not clear whether the concave skin lesions that are fairly common in humpback whales indicate places where a bump has come and gone.



Figure 1. Many whales have a few bumps scattered along their flanks. Photo by Janet Neilson, Glacier Bay National Park.

In Hawaii (Figure 2), Suzanne Yin (Hawaii Marine Mammal Consortium) collected a biopsy sample of a bump that was histologically analyzed by pathologist David Rotstein (University of Tennessee). His analysis was limited by having just a small frozen sample of part of a bump (see recommended sampling protocol below) but revealed similarities with an allergic reaction. Similar results were found for biopsy samples from the Gulf of Maine and American Samoa (Jooke Robbins, Center for Coastal Studies, pers. comm.). High quality samples obtained from stranded whales will be needed to further investigate this phenomenon.

“Bumps” is a generic term for blister-like or vesicular lesions (Flach et al. 2008). These lesions have been previously reported from North Atlantic right whales (Pettis et al. 2004) and blue whales off Chile (Brownell et al. 2008). However, nothing is known about the origin of these lesions, but they are likely present in other species as well. A number of etiologies have been suggested. In a bottlenose dolphin observed off Chile, vesicles were thought to possibly be viral in origin (Flach et al. 2008). A recent study (Marinez-Levassuer et al. 2010) using biopsy samples and observations of blue, fin and sperm whales in Mexican waters suggests that blister-like lesions are correlated with sun-related skin damage.

This summer, a NOAA necropsy team working on a stranded juvenile humpback whale in Tenakee Inlet collected a few different blister-like lesions. Some lesions were solid while others were fluid-filled. Interestingly, the fluid-filled lesions were documented to have formed post-mortem (GBNP photos of this whale alive in Icy Strait earlier in the summer showed no bumps on the dorsal fin) and it is a mystery how they may fit into the picture. The “bumps” from this animal as well as another humpback stranded near Hyدابurg are currently being analyzed by Kathy Burek, DVM (Alaska Veterinary Pathology Services). Determining whether the lesions in southeastern Alaska whales are of the same origin as what is seen in large whales elsewhere will involve reconciling several sources of observations and collecting more samples. And that's where the Alaska Stranding Network can help.

Next time you are at a whale stranding, we hope you will be on the lookout for bumpy skin, be observant and take lots of photos, especially of any bumps you collect, and use the sample storage methods provided below. With your help, the Alaska Stranding Network might help to solve the case of the bumpy humpies. Thanks to everyone who has helped with this effort already.



Figure 2. Biopsy dart sampling a whale with severely bumpy skin, and head of same whale. Photos courtesy of the Hawaii Marine Mammal Consortium.

Sampling Cetacean Skin Lesions :

Photograph and collect samples of the bumps themselves and the adjacent unaffected tissue (sometimes the best information about lesions is learned from the interface).

Samples should include the full thickness of the skin and the entire blubber layer.

The tissue should be stored in four ways: 1. Tissue in formalin. 2. Tissue for freezing -80° F. 3. Fresh samples could be submitted for viral isolation, but cell lines and where to send for analysis would have to be planned in advance. 4. A small amount of tissue in electron microscopy solution. This protocol was provided by David Rotstein, DVM, MPVM, Dipl. ACVP.

Announcements

Congratulations!

Gay Sheffield, a long time marine mammal stranding responder with ADF&G, will continue her stranding response through University of Alaska Fairbanks as a Marine Advisory Program (MAP) Agent. Here is a summary of her new position provided by UAF:



In Nome, Gay Sheffield, formerly a marine mammal biologist with the Alaska Department of Fish and Game, began work March 1, 2011 as the MAP agent for Bering Strait coastal communities. Sheffield is based at the UAF Northwest Campus in Nome. Her emphasis will be on marine safety, subsistence, marine mammals, fisheries, and community economic development for the region's residents. Sheffield holds a master's degree in marine biology from UAF, and is a UAF affiliate research associate. She can be reached in Nome at 907.443.2397 or at gay.sheffield@alaska.edu.

Coming Soon

Our new AK Marine Mammal Stranding network website will be available soon. More information to follow...

THANK YOU in advance for your hard work during this upcoming stranding season.

Please submit any 2011 level As, photos, and necropsy reports to NMFS (Kaili.Jackson@noaa.gov) to maintain good standing in the program and to allow us to stay up to date on events.

Hope you enjoyed this issue...

We continue to plan on releasing AK stranding network news twice a year in this newsletter format. You can expect to see one again following the 2011 summer season. We would like to solicit network input in the form of articles, photos, updates, or any other news for distribution. Please contact Kaili Jackson at Kaili.Jackson@noaa.gov or 907-586-7209 with your ideas or submissions.

Thanks!!