U.S. Fish & Wildlife Service

Alaska Reflections

VOLUME 18 • NUMBER 1 • SPRING 2006

Uncommon Sensing: Using Body Heat to Count Walrus

By Douglas Burn & Suzann Speckman

Although the walrus' huge seal-like body, bristling whiskers, and long ivory tusks make it one of the most recognizable marine mammals in the world today, the size of the Pacific walrus population has never been known with any certainty. Their remote and harsh sea-ice environment has long made accurate population counts impossible. Visual aerial surveys were flown at 5-year intervals between 1975 and 1990 and produced conservative population estimates ranging from 201,039 to 234,020. Marine mammal biologists agree, however, that these estimates were not accurate enough to determine population trend.

USFWS PHOTO

Walrus depend upon sea ice, and face an uncertain future if the arctic icecap continues to shrink.

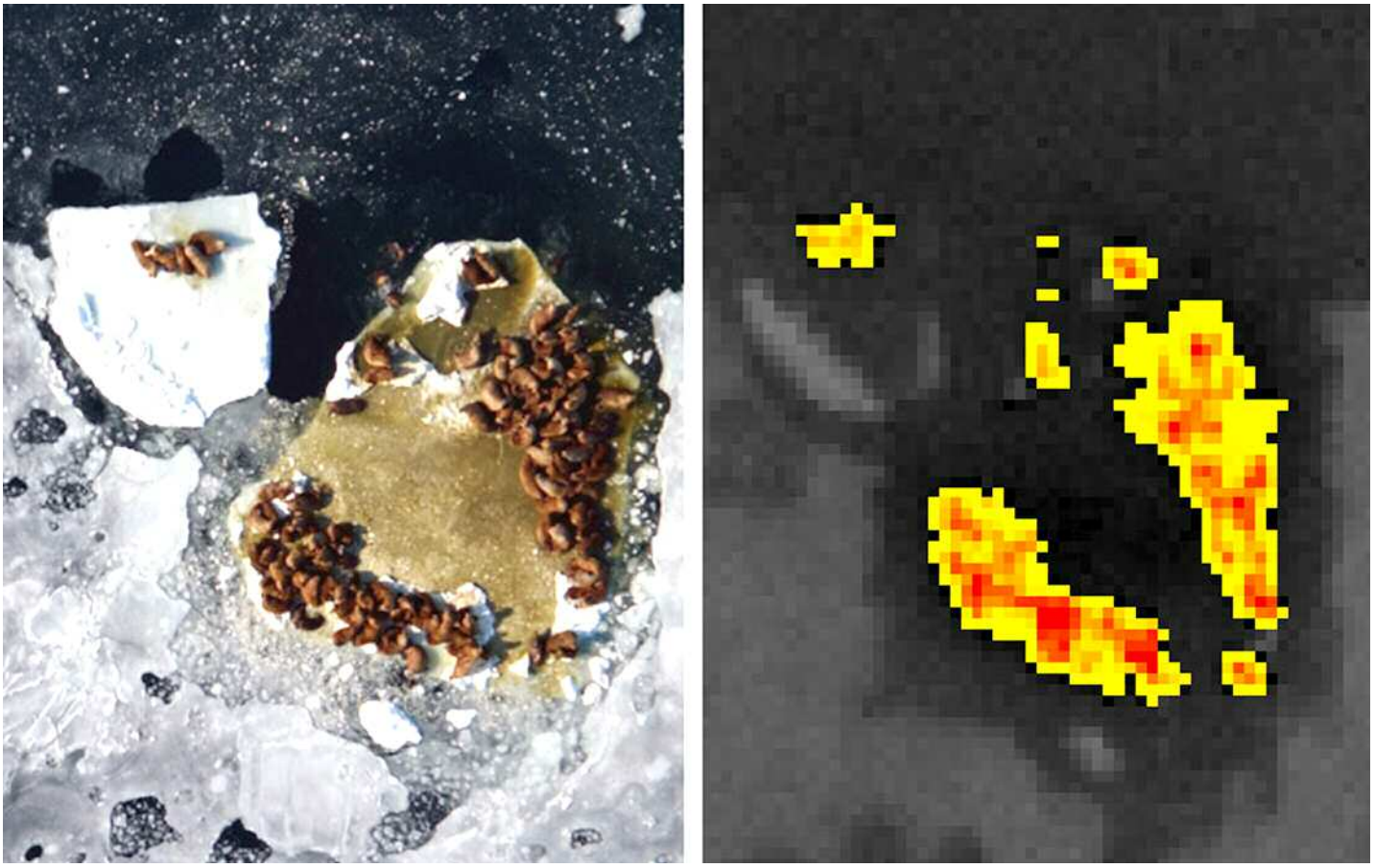
Biologists with the Service's Marine Mammals Management office in Anchorage are currently developing new techniques that will give us a more accurate understanding of the status of Pacific walrus. It is imperative that we do so. Walrus are sea-ice-dependent, and face an uncertain future if the arctic icecap continues to decrease in both extent and duration. They are also an important subsistence species, with total harvests in the U.S. and Russia estimated at about 6,000 animals per year. It is thus more important than ever that we develop a precision technique for monitoring and managing this population.

One promising tool is remote sensing. Remote sensing is the science of obtaining information about an object, area, or phenomenon through the analysis of data acquired by a device that is not in contact with the subject under investigation. For wildlife biologists, the most often used collection tool is sight. Through visual observation we can recognize an individual humpback whale, count the number of birds in a flock, or note changes in animal behavior in response to human disturbance. Although the use of binoculars or spotting scopes can extend the range of such observations, it is our eyes that record the resulting information.

Recent advancements in digital photog-

Continued on page 2

INSIDE



USFWS PHOTO

This photograph of a group of lounging walrus (left) is reproduced with surprising accuracy in the thermal image of the same spot (right).

raphy allow us to capture and instantly review images that can also be analyzed at a later time. Aerial photography has innumerable uses in the natural sciences, ranging from habitat mapping and characterization, to photo-identification of uniquely marked individual animals, to counting the number of nests in a bird colony. However, while the camera typically records things that are visible to the human eye, other technologies have been developed that enable us to see in ways that our eyes alone cannot.

An example of this is the thermal sensor, which can detect heat produced by living animals from miles away, and then create two-dimensional images of the animals' heat set against the environment that forms their background temperature. The Alaska Region Marine Mammals Management Office has turned to this high-tech form of remote sensing, called thermal imagery, to find and count walrus in the Bering Sea pack ice.

Population surveys of Pacific walrus have traditionally been conducted from aircraft, using observers to both detect and count the number of walrus present. Due to the enormous areas occupied by walrus, only a relatively small fraction of their potential habitat can be sampled by such methods. In the past, the limitations posed by these small sample sizes have resulted in population estimates with low precision. Thermal imagery, on the other hand, allows us to survey a 12 kilometer-wide strip at one time, so we can potentially survey enough habitat to provide the basis for a more reliable, and thus useful, walrus population estimate.

The project began in 2002 with a grant from NASA to study remote sensing applications in Alaska. This funding allowed us to demonstrate the feasibility of using airborne thermal imagery to detect walrus groups as they rested on the pack ice in the Bering Sea. Over a two week study period, Marine Mammals Management staff collected thermal imagery and matching aerial digital photography of more than 30 walrus groups ranging in size from one to 256 animals. In order to determine the limits of this technique, we collected thermal imagery at spatial resolutions ranging from one to four meters per pixel. By matching photographs with thermal images, we were able to demonstrate a clear relationship between the number of walrus present in a group and the amount of heat they produce. This relationship existed across all spatial resolutions tested, and demonstrated that we can estimate the number of walrus present using their thermal "signature."

Based on the successful results of the 2002 study, we designed a pilot survey in the area of St. Lawrence Island in the Bering Sea. In April of 2003 we surveyed nearly 30,000 square kilometers of sea ice habitat – an area larger than those covered in any previous visual aerial survey of Pacific walrus. Working with Dr. Mark Udevitz, a biometrician at the U.S. Geological Survey Alaska Science Center, we developed a formula for estimating the number of walrus present on the sea ice within the study area. Results from the pilot survey are being used to design a survey of the entire Pacific walrus population.

To calculate a final population estimate, we also need to know how much time, per day, walrus typically spend resting on the

USFWS PHOTO

Airborne surveillance using new tools is increasing our understanding of the Pacific walrus.

USFWS PHOTO

pack ice. This is because the thermal sensor can detect walrus when they are hauled out on the ice, but not when they're swimming. Knowing the approximate proportion of walrus that can be expected to be in the water and unavailable to the thermal sensor at any given time, we'll be able to correct the population estimate derived from thermal imagery of walrus hauled out on ice. In cooperation with Dr. Chad Jay, a biologist with the U.S. Geological Survey Alaska Science Center, satellite radio transmitter tags will be attached to a number of walrus in the pack ice environment. The tags have conductivity sensors that record wet and dry intervals, and should tell us when the tagged animals are swimming/ diving in seawater and when they're hauled out. Tags will be deployed during an icebreaker research cruise before the aerial surveys take place.

The Pacific walrus population occurs in both U.S. and Russian waters, so any complete survey will require coordination with Russian scientists. Dr. Vladimir Chernook of GiproRybFlot (Research and Engineering Institute for the Development and Operation of Fisheries), St. Petersburg, heads a group of specialists that have been using airborne thermal imagery to survey the harp seal population in the White Sea. In March, 2004, Service biologists accompanied Dr. Chernook and his team on their harp seal survey, and held extensive meetings discussing the use of thermal imagery to survey the Russian portion of the walrus population.

This past April U.S. and Russian survey teams did additional tests in the Bering Sea in preparation for a complete population survey in 2006. The Russian team, operating in the Gulf of Anadyr, successfully located walrus groups using their thermal imaging system, and collected numerous matching digital photographs. The U.S. team, based out of Nome, Alaska, was testing a new, high-resolution detector for their thermal imaging system. Unfortunately, weather conditions in late March and early April were considerably colder than they had been in 2002 and 2003, when previous surveys were conducted. As a result, the surface skin temperature of walrus appeared to be much cooler, which made it more difficult to discriminate them from the background environment. In response to this discovery, we're exploring different ways of analyzing the thermal imagery--to perhaps better detect these smaller variances in temperature between walrus and their surroundings--as well as studying historic weather records to determine the best time to conduct future survey operations.

This is, of course, the kind of unforeseen bump in the road that one often encounters when sophisticated technology comes face to face with the challenges of working in an Arctic climate. Still, the potential of thermal sensing in walrus survey work is undeniable. Each challenge that we encounter and overcome, then, brings us closer to the day when we can, at last, reliably estimate the Pacific walrus population, and thus improve our ability to manage these strange and fascinating animals for future generations.

Douglas Burn and Suzann Speckman are wildlife biologists with the Marine Mammals Management Office.

Reflecting

GREETINGS TO READERS OLD AND NEW

It's somehow fitting that this issue of Reflections, the newsletter of the U.S. Fish and Wildlife Service in Alaska, is being produced as light pours back into the skies and welcome the always dramatic arrival of another northern spring. That's because our publication has been undergoing a change of season, as well, the full extent of which only begins to show its buds with this issue and, we hope, will bear leaf and bloom and fruit in the months ahead.

As some of you already know, last issue marked the first Reflections to be published exclusively online, allowing us to save paper, to use color photographs in the publication (finally doing some sort of justice to the beauty of the Great Land!), and to run longer articles without the constraints of print forms, page counts, and so forth. And now both that issue and this one complete the move from our "trial run" on the Service's internal Alaska website to the internet at large, where we hope many more readers in the Service and out will enjoy learning more about the ongoing adventures to be found in conservation biology here in the 49th state.

And this issue certainly provides a representative sample. You'll read about using thermal sensing to more accurately count walrus on remote pack ice; you'll learn about the amazing 4,000 mile (one way!) migration of a 2-ounce bird; you'll see how removing barriers to passage brought runs of four species of salmon back to a small stream after decades of absence (and how home-security video technology captured these new migrations on tape!). You'll also discover how a flightless gyrfalcon "takes wing" as the star of environmental education programs, and how the introduction of foxes onto islands in the Aleutian chain more than 100 years ago inadvertently laid the groundwork for a scientific experiment that was only recently recognized!

Along the way, you'll meet some of the people responsible for doing "the work of the Service" here in Alaska, and learn a bit about some of the many partners that make that work both possible and successful. I hope that these glimpses into our lives are entertaining and informative, and that they at least give you an inkling of the complexity and grandeur of the Alaska lands that the U.S. Fish and Wildlife Service is privileged to find under its stewardship.

Bruce Woods
Chief of Media Relations
Anchorage, Alaska

AVIAN INFLUENZA INFORMATION ONLINE

A Wing and a Prayer?

Despite the frightening stories that have characterized much of the media coverage of this issue, as of April 2006, the particularly virulent form of avian influenza known as HPAI H5N1 has not been detected in either wild or domestic birds or in humans in North America, including Alaska.

It is not yet clear what role wild migrating birds might play in the movement and distribution of this virus. Only ongoing surveillance will tell us that. Federal and State agencies are working together to detect the virus should it appear in Alaska or elsewhere in North America. There are many federal, state and local agencies as well as non-government entities in Alaska who are working on this complex issue. Wildlife agencies such as the Fish and Wildlife Service, the Alaska Department of Fish and Game and the US Geological Survey's Alaska Science Center are responsible for managing Alaska's wildlife and the surveillance of wild birds. The USGS National Wildlife Health Center is one of many laboratories tasked with testing samples taken from wild birds for the presence of the H5N1 virus. The issue is evolving constantly. To keep up to date on the Service's efforts, follow the story as it develops on our web site: *http://alaska.fws.gov/media/avian_influenza/index.htm*

Phil takes (figurative) flight!

The Yukon Delta National Wildlife Refuges Gyrfalcon Project mixes science, strategies, and a special educational opportunity.

By Charity Haring

USFWS PHOTO

Time spent in camp helped condition Phil to be comfortable in the presence of people.

Few people know that the Yukon Delta National Wildlife Refuge is home to some of the highest nesting densities of gyrfalcons in the world. The species receives relatively little research because most of its populations are widely dispersed across remote Arctic and Sub-arctic areas, making study both logistically and financially challenging. The gyrfalcons that nest in the Ingakslugwat Hills on the Yukon Delta are, however, relatively accessible, and thus provide an unparalleled opportunity for research. The refuge has recently entered into a project designed to study various components of the species' breeding biology in an effort to better monitor and manage this gyrfalcon population. Some of the techniques employed during this research include genetic fingerprinting for individual identification, satellite and conventional telemetry, color banding, contaminant analysis, dietary analysis, and helicopter surveys of raptor occupancy.

Additionally, what has come to be called "the Gyrfalcon Project" is creating and testing survey methodology on the refuge that can later be applied to falcon populations across the state. In this respect, Yukon Delta is supporting a current U.S. Fish and Wildlife Service effort to create a statewide Alaska gyrfalcon monitoring strategy. Service biologist Brian McCaffery oversees the Gyrfalcon Project.

As part of this effort, refuge biologists recently observed a gyrfalcon nest containing young birds which appeared almost ready to fly. Upon examining the nest, Travis Booms and Josh Spice discovered, in addition to two healthy females about 40 days old, a young male gyrfalcon which had not successfully produced wing or tail feathers. The feathers were growing, but for some reason the new growth was simply withering away. All of the chick's body feathers, however, were in great shape. Initially, the plan had been to harness this bird with a transmitter which the refuge would use to follow his movements over the next two years, but since the chick would never fly, the plan had to change.

USFWS PHOTO

Travis Booms contacted Phil Schempf, in the Migratory Bird Management Office, who secured the necessary permits to remove the sick bird from the wild. On the following day, July 14, 2005, Josh Spice and Travis removed the nestling. Had they not done so, it would likely have died when taking a flying leap from its cliff-side nest in an attempt to fly. The bird was 41 days old, and gyrfalcon chicks begin to leave the nest and fly at 47 days old! The chick, which was given the name "Phil," assumed the role of camp mascot until Josh and Travis returned to the refuge headquarters building.

Travis has been studying gyrfalcons for the past five years, and relished the opportunity to watch Phi's physical and mental development at close range. The time spent in camp with Josh and Travis began to condition the bird to be comfortable in the presence of people, and certainly eased its transition from life in the wild to captivity. This condi-

Continued on page 6

Though Phil will never fly, his story has already "taken wing," and helped the Service conduct educational programs on a number of related topics.

tioning has proven particularly valuable, since the bird is now comfortable being handled for educational purposes. Though the cause of the feather problem is still unknown, it's unlikely Phil that will ever be released into the wild breeding populations.

This isn't to say that the unfortunate gyrfalcon hasn't been able to make real contributions to the future of its species, though!

Phil has, for example, been featured in 5 educational presentations to the local community. These programs have summarized the refuge's efforts to study and conserve the species, explained how gyrfalcons can be useful as an indicator species that test the same environments from which local subsistence hunting and fishing occurs, taught some basic biology, and done all of this by introducing the audience to Phil the Gyrfalcon!

Phil's story also appeared in the local newspaper, the Delta Discovery. If you would like to see the article, you can read it on the Delta Discovery website at http://deltadiscovery.com/leadstories/gyrfalcons.html!

In addition to the presentations and the newspaper article, Travis Booms was interviewed by a local public radio station about the gyrfalcon and the U.S. Fish and Wildlife Service project efforts in the local area.

And even that's not all; Phil will now enter the Anchorage Bird Treatment and Learning Center Educational Program. There, he will contribute to the organization's current education program; which includes school visits, public presentations, and appearances at various events in the Anchorage area. Phil will also be sent to the Bethel area this spring so refuge staff can continue to include him in outreach education programs.

Refuge staffers hope that Phil will serve as an ambassador for arctic birds to the general public, and that he will spread awareness and value of remote Arctic places for years to come.

It took the efforts of Donna Hanley, Phil Schempf, Josh Spice, Travis Booms, and Brian McCaffery to rescue Phil from likely death and then help him develop into such a wonderful outreach education tool. Thanks to their hard work and imagination, Phil the flightless gyrfalcon has truly taken wing!

Charity Haring is Alaska's Regional Safety Officer.

A "Chinese" Dunlin in Barrow!

This is no "Dunlins and Dragons" fantasy, but the true story of one shorebird's remarkable 4000+ mile migration.

By Gregory J. Norwood

USFWS PHOTO

Each spring, flocks of dunlin arrive on Alaska's northern coastal plain to breed.

In early June of 2005, amidst dozens of other displaying dunlin (*Calidris alpina*) set against the vastness of the North Slope, one particular individual stood out. Each of these birds had recently crossed numerous national borders, but this one had a bigger story to tell. Like the other dunlin, it had spent the winter in East Asia. At that time, it was just one little part of an immeasurable flock, sprawling across the mudflats like a single organism composed of thousands of tiny individuals.

Dunlin are found in South and East Asia from late October through March, when their North Slope breeding grounds are under ice and snow. They stay in flocks during this period, probing mudflats, flooded pastures, and ponds for small invertebrates. Their departure from Southeast Asia begins in March and continues through mid-May, a great migration that brings all dunlin of the subspecies articola to northern Alaska. As far as we know their route is strictly coastal; taking the birds over the Sea of Okhotsk and the western Bering Sea before they arrive in northern Alaska by late May. During June, with the midnight sun thawing the frozen tundra, these large flocks descend upon the North Slope's coastal plain, where they establish territories, mate, and raise their young.

USFWS PHOTO

During the 2005 breeding season, banding efforts turned up a surprise, in the form of a dunlin that had traveled no less than 4,000 miles!

During the 2005 breeding season, Nathan Coutsoubos and I, working with the United States Fish and Wildlife Service at Barrow, Alaska, had the extraordinary luck of noticing a dunlin with white and black "flags" (these are color bands on the leg with a slight extension of plastic attached). Since dunlin caught and released in the United States, including the birds we study, must be given green colored flags, we knew this bird had been banded outside of the US. What, we both wondered, was its story?

In late May and early June, the North Slope is still almost entirely covered with snow, concentrating shorebirds in the areas of first snowmelt. Thus even small bits of partially exposed tundra can be temporary homes to a frenzy of displaying shorebirds, with dozens of dunlin hovering 30 feet above the ground, giving a series of complex trills and screaming sounds as they fiercely try to establish and defend territories. These concentrations soon spread out, however, as the snow melts and birds are able to re-establish their territories from prior years.

USFWS PHOTO

These shorebirds feed on mudflats and flooded land, seeking small invertebrates.

Our dunlin's frequent movements within its own little patch of snowmelt territory enabled us to positively identify the white-over-black flags that, we soon learned, indicated that this bird had been banded in China, a minimum distance of 4,000 miles (6440 kilometers) away. We later found its nest with four eggs, and were able to band its mate using a trap placed over its nest. The "Chinese" dunlin was part of a much larger study, involving the territories of many birds spaced across six 36-hectare plots. Although extensive fieldwork had been conducted in this area during two prior years, no one had seen a Chinese-tagged bird before.

The larger study required biologists to band individual shorebird adults with unique sets of color bands. By marking these birds, we'll be able to follow them in subsequent years to determine who they mate with, to locate their nests, and to document their success at incubating eggs and hatching chicks.

The additional goals of this larger study were multifold. First we wanted to obtain an accurate assessment of the total number of, and the fates of, shorebird nests on the six tundra plots. This information would be compared to other factors, such as seasonal lemming numbers and weather, to try to determine why nesting density and hatching success varies through time. Next we wanted to determine the survival rate of these highly site-faithful birds, since such information would shed light on the population trends of the species

Of course the Chinese dunlin was already banded, but we were excited to catch it and record its metal band number in order to find out exactly where, when, and who had banded it. "Our" dunlin initiated its nest on June 16th and laid an egg each day from the 16th to the19th, producing a clutch of four. The nest was located on treeless tundra, surrounded by sedges, mosses, and lichens. Although several attempts were made to capture the Chinese dunlin, it was not until July 7, when its young began hatching, that we were able to do so.

And so, as the first of that July's snows was threatening to fall on the tundra, we were finally able to read the code on the bird's metal band and determine that it had been attached at Chongming Island, north of Shanghai, China, on January 15, 2005, some six months earlier. Our bird was one of only 266 dunlin banded at this site that winter! It was also the first recorded Chinese-banded dunlin to be resighted in the United States. We were able to attach color bands to the legs of its chicks that identified them as being banded at a nest in Barrow in 2005. It will be fascinating to see where they are found in future seasons.

Chongming Island, the third largest in China, is at the mouth of the Yangtze River. This is the longest river in Asia, and continually deposits sediment on the east side of the island toward the sea, constantly replenishing the local intertidal areas. However, intensive development has destroyed much of the habitat where one million shorebirds stop to spend the winter each year. Loss of an important wintering site such as this could have strong negative effects on the survival of

USFWS PHOTO

USFWS PHOTO

Lessons learned through bird banding establish a sense of partnership among all of the cultures touched by this species' remarkable migration.

dunlin, and result in declines within the Barrow dunlin population.

After our Chinese dunlin finished raising its brood, it likely headed to the coastal areas around Barrow. From there it will have replaced most of its body and flight feathers and then continued its migration; either flying to the Yukon-Kuskokwim Delta, where it may have stayed until September or October, or heading directly across the Bering Sea to Asia.

Resightings of banded birds such as this enable us to link specific wintering and breeding grounds, and help us understand how environmental alterations in one area may affect the birds in the other. Consequently, it is important that biologists across the annual geographic cycle of a species exchange information so as to better understand the current status and life history of these birds. These observations also establish a greater sense of partnership among the people and cultures touched upon by this bird in the course of its remarkable migration.

Gregory J. Norwood is an undergraduate biology student at the University of Michigan-Dearborn. He is also a researcher at the Rouge River Bird Observatory studying the impact of urban natural areas on neotropical migrants.

USFWS PHOTO

Life's Work

Barbara Armstrong puts her talents to work for Federal and State subsistence programs

By Maureen Clark

USFWS PHOTO

Barbara Armstrong's job gives her opportunities to work with dedicated volunteers from a region she knows well.

For some lucky people, work doesn't feel like work. Their personal interests and beliefs mesh seamlessly with their professional obligations. As a result, their work life has meaning and purpose that go well beyond simply earning a living. Barbara Armstrong is one of those lucky people. As a Regional Advisory Council coordinator with the Office of Subsistence Management, Barbara provides support for Seward Peninsula and North Slope Regional Advisory Councils. Having grown up in the village of Shungnak, she finds, in her job, an opportunity to work with dedicated volunteers from a region she knows well and for a way of life that she knows intimately. Barbara's extensive knowledge of Federal subsistence regulations and processes helps the Councils function effectively and gives rural Alaskans an authoritative and informed voice in Federal subsistence management.

A cultural and linguistic resource

There is, however, another aspect to Barb's work that is especially close to her heart. Barbara has translated Inupiaq hunting terms and names for birds, reviewed documents, and provided extensive cultural and linguistic information to researchers with the Alaska Department of Fish and Game's Subsistence Division. Her dedication to her work with both the State and the Federal Subsistence Management Program is the reason she was nominated for the U.S. Fish and Wildlife Service's regional Customer Service award in 2004.

Most recently, Barbara reviewed place names, fishing terms, and cultural information for the publication "Whitefish: Traditional Ecological Knowledge and Subsistence Fishing in the Kotzebue Sound Region," a report produced by Susan Georgette (who was at the time with ADF&G and has since taken a position as Outreach Specialist at Selawik National Wildlife Refuge) and Attamuk Shiedt of Maniilaq Association. For the past two years Barbara has also collaborated with the state's subsistence researchers on the Kobuk Human-Land Relationships project. This study is intended to help land and resource managers resolve conflicts between local and non-local users, and add to existing knowledge of the history, settlement patterns, social organization, and subsistence activities of the people of the upper Kobuk River.

Poring through the past

During this project, researchers collected more than 25 hours of tape-recorded interviews with elder key respondents. Barbara translated many of these tapes from Inupiaq into English, and reviewed all tapes for consistency and accuracy. Many people mentioned by the elders had long since died. The elders also referred to individuals by a variety of English names, Inupiaq names, and nicknames, making it sometimes difficult to sort out identities. Barbara spent countless hours, many on her own time, resolving this confusion, and researching the names and relationships of the people discussed by the elders. She also helped develop an extensive genealogical database that was extremely useful in writing interview summaries and project reports.

"Barbara is one of those rare people who can truly bridge cultures," said ADF&G's Jim Magdanz, who worked with her on the upper Kobuk project. "It's not hard to find someone who speaks fluent Inupiaq. It is extremely difficult, however, to find someone who can translate fluent Inupiaq into eloquent English, which Barbara can do. Moreover, she's is a self-starter. Barbara is keenly interested in the future of the Inupiaq people. She puts ideas on the table and makes things happen."

"Dynamic people like Barbara are not always a good fit in government jobs," Magdanz continued. "The Office of Subsistence Management deserves credit for finding productive ways to use her strengths."

Subsistence—a family activity

A major focus of the Kobuk Human-Land Relationships project was a small, semi-nomadic society of Inupiaq Eskimo who lived in the vicinity of the Pah River, at the interface between Koyukon Athabaskan and northwest Inupiaq cultures. In contrast with the conventional view that Eskimo-Indian relationships tend to be hostile, these people were frequently in friendly contact with their Indian neighbors. Barbara's ancestors were members of this society, and her insights were invaluable to the study.

"Subsistence is, first and foremost, a family activity. Understanding the adaptations of families and communities to changing circumstances is essential to understanding and providing for subsistence," Armstrong said. "Oral history is good, but in a time when people make decisions based on written data, it is becoming very important that the Alaska Natives document their own communities."

Maureen Clark in a Public Affairs Specialist with the Office of Subsistence Management.

Out-Foxed

Introduced predators have had unforeseen impacts in the Aleutians

By Bruce Woods

USFWS PHOTO

Introduced foxes have had surprisingly complex impacts upon Aleutian Island ecosystems.

It's not surprising when the arrival of a new top predator into an ecosystem has dire consequences for one or more prey species. It's been said, however, that the first law of environmental management is, "you can never do just one thing." So the impacts of a new predator on unprepared prey will likely have less predictable repercussions spreading out from it like ripples from a flung pebble. A *Science* journal study co-authored by Alaska Maritime National Wildlife Refuge Supervisory Biologist Vernon Byrd discussed one such wave of effect. The paper describes how introduced foxes have transformed some of the Aleutian Islands from rich grasslands to less productive dwarf tundra ecosystems.

Here's the story: As the sea otters and other marine mammals that had long fueled the lucrative Aleutian fur trade began to decrease in numbers in the late 19th and early 20th century, foxes were introduced to some 400 islands in southern Alaska to provide a supplemental fur supply. Trappers hoped that these predators, with no enemies of their own on the islands and a ready supply of birdlife to prey upon, would thrive. They did; particularly in the Aleutians, where nearly every island was stocked. However, there were also some islands that either were never stocked with foxes or where stocking failed. These provided the controls in what was essentially a century-long experiment analyzing the impacts of introduced predators on isolated ecosystems.

Before anyone could learn from this accidental experiment, however, somebody had to recognize it for what it was. In his 40-plus years in the Aleutians, first with the Navy and then with the US Fish and Wildlife Service, Vernon noticed that the fox-free islands were thickly grassed; in some cases these meadows were so dense and tall that they were difficult to walk through. On islands that contained foxes, on the other hand, Byrd saw that the tall-grass plant community was restricted, and terrains were dominated by low-growing forbs and dwarf shrubs. His comments to colleagues about these observations sparked interest, and eventually lead to a study.

Between 2001 and 2003, a team of researchers visited the Aleutians each summer, focusing their efforts on 18 islands of approximately the same size; nine fox-free and nine not. Plant and soil samples taken confirmed Byrd's observations. Not only were the fox-free islands far grassier than those that had populations of the introduced predators, but this ecosystem shift was apparently caused by a dramatic reduction in soil fertility on the fox-infested islands.

The reason soon became clear. Foxes have been successful on these islands because there were birds to eat. But as the predators drove down these populations of (mostly) seabirds, the transfer of ocean nutrients to the land by way of the deposition of guano was greatly reduced. Without this fertilizer, the grasses could not survive, and were replaced by less productive forbs and dwarf shrubs.

As Alaska Maritime National Wildlife Refuge continues its fox removal efforts, however, and more and more islands are again free of these non-native predators, there is every reason to believe that such changes will be reversed. As seabirds numbers rebound in the absence of predation, so, too, will the levels of nutrients that they will harvest from the sea, process in their bodies, and deposit on the island soils. Remnant populations of grasses will use this new fertilizer to expand their range, eventually overwhelming the upstart forbs and dwarf shrubs and returning the islands to the emerald lushness that was theirs before the first fox was put ashore.

Vernon Byrd is a Supervisory Biologist at Alaska Maritime National Wildlife Refuge. The article that inspired this piece, "Introduced Predators Transform Subarctic Islands from Grassland to Tundra," appeared in the March 25, 2005 issue of Science, and was co-authored by D.A. Croll, J.L Marion, J.A. Estes, E.M. Danner, and Vernon Byrd. Bruce Woods is with the Service's Alaska Region Office of External Affairs.

Jack Paniyak:
Half a Century of Resource-Management Service

By Christian Dau and Cynthia Wentworth

USFWS PHOTO

Jack was born in 1933, in the heart of America's premier waterbird nesting habitat.

Jack Paniyak, a long-time Service employee from Chevak on the Yukon-Kuskokwim Delta, died on May 30 of this year. He was among the first Yup'ik Eskimos to be hired as permanent employees of the U.S. Fish and Wildlife Service in Alaska. Born in 1933 in a sod hut along the Tutakoke River, in the heart of America's premier waterbird nesting habitat, Jack was raised in the village of Kashunuk, later living in Old Chevak before that village was moved to its present site.

His introduction to the "feather-men," as he called wildlife biologists, probably came in 1940 and 41, when Charlie Gillham of the then U.S. Biological Survey began to conduct studies based out of Old Chevak. In 1949 or 1950, Jack met Dave Spencer, who pioneered the Service's aerial waterfowl surveys on the Yukon-Kuskokwim Delta. Jack was first hired as a biological aide by Sigurd Olson in 1951, who was then studying waterfowl along the lower Kashunuk River.

In 1952, Jack guided Roger Tory Peterson during the famed artist/naturalist's travels in the Old Chevak and Kashunuk River area. Accounts of that expedition are found in the book *Wild America*, by Peterson and his co-author James Fisher.

Two years later, Jack participated in waterfowl production and banding studies headed by Service biologist Russell Hoffman. From 1961-63, he assisted Pete Shepherd of the Alaska Department of Fish and Game in Pacific brant studies. He continued working for the Service as a biological aide, guide, maintenance man and caretaker of the Old Chevak field station until he became a permanent employee of the Clarence Rhode NWR (later renamed Yukon Delta NWR) in 1973, a position he held until his retirement in the 1990's.

Jack's knowledge of the history, geography, vegetation, and fish and wildlife resources of the central coast of the Yukon-Kuskokwim Delta has been invaluable to the Service's research projects and bird banding programs over the years. Notable scientists, coming from around the world to work in the area, have benefited from his insights. He was proud of his work with such biological pioneers as University of Alaska professor David Klein, and Clarence Rhode NWR managers Jim King and Cal Lensink; all of whom valued his contributions to their research projects and surveys. According to Lensink, Jack was an expert bander, and could determine the age and sex of a duck or goose faster than most professional biologists.

In addition to his work with researchers, Jack served as a much-needed cultural liaison between the Service and the villages of Chevak, Hooper Bay, and Scammon Bay. He and his family also helped with goose banding drives in the 1970s, pioneering the involvement of Native youth in banding that has been continued for the past 20 years by USGS biologist Craig Ely.

All told, Jack Paniyak spent more than 50 years providing field support to researchers and furthering resource management on the Yukon-Kuskokwim Delta. His dedication, his knowledge, his kindness, and his generosity will be missed by all who had the pleasure of working with him.

USFWS PHOTO

Researchers from both the public and private sector benefited from Jack's knowledge, skills, and kindness.

Christian Dau is a Pilot/Biologist and Cynthia Wentworth is a Socioeconomic Specialist. Both are with the Alaska Region Migratory Bird Management program.

Submerged Salmon Surveillance at Squaw Creek

Underwater video technology records the recovery of one small watershed after fish passage barriers are removed . . . and then broadcasts that success!

By Charlene Fernandez and Mark J. Lisac

USFWS PHOTO

"Lights! Camera! Salmon!"

Squaw Creek's history as a productive fishery is firmly etched in the memory of Dillingham, Alaska elder Joe Fortune. He recalls that, just 30 years ago, local children used to catch fish for dinner from the little waterway.

In the 1970s, however, Dillingham experienced major growth . . . and this included the construction of several roads across Squaw Creek. A culvert was placed at each creek crossing, but they were undersized and not designed for fish passage. Residents soon noticed fewer fish spawning in the creek, and the culverts resulted in erosion and changes to the stream's hydrology. Before long, this once thriving watershed began to show the visual and ecological scars of human development.

Then, in the 1990s, Togiak National Wildlife Refuge and state biologists established an "integrated fisheries curriculum," with the Dillingham School District, making applied scientific inquiry part of the high school's regular subjects. Another goal of this effort was to evoke more community awareness of the local watershed's species and ecology. Before long, student data-gathering efforts from Squaw Creek helped biologists to determine that the culverts were barriers to juvenile and adult fish passage.

Between 1999 and 2001, the U. S. Fish and Wildlife Service, working through the National Fish Passage and Partners in Fish and Wildlife Programs, cooperated with the City of Dillingham and the State of Alaska to replace three deteriorated culverts on Squaw Creek. In doing so, the partners were able to restore access to 15 miles of anadromous fish habitat in the local Dillingham area.

Within just two years, substantial numbers of sockeye, chum, pink and coho salmon were seen spawning in the creek, after many years when virtually no salmon were found in the little waterway. The return of these fish caught the public's attention. So, in an effort to build on this interest and to provide information on the project's success to the people who had supported it, a new plan took shape.

In the summer of 2005, Togiak National Wildlife Refuge, working with a group of enthusiastic local partners, including the Bristol Bay Economic Development Corporation, Nushagak Cooperative, Bristol Bay Native Association, Dillingham Chamber of Commerce, and Alaska Department of Fish and Game ,installed a lighted video camera in a protective box in the creek. A small weir funnels returning fish close to the camera.

The first fish image was captured on July 12th of last year. (Because the system employs motion-sensitive technology, the video recorder only operates when movement triggers its sensors.) The collected footage was analyzed by students from the Bristol Bay Aquatic Science Academy, which is conducted in partnership with many of the groups mentioned above, as well as the University of Washington School of Fisheries. During its first season the system verified the return of more than 660 pink, chum, sockeye and coho salmon to Squaw Creek. All but the coho were new

Magnificent 7 (region)

The goal of this ongoing feature is to celebrate the uniqueness of Alaska. Each installment of "Magnificent Seven" will take a look at a person, place, critter or thing that reflects the wonderfulness of the state in which we're all lucky enough to be working. In this issue, we profile a fish passage success story from the Dillingham area.

USFWS PHOTO

Undersized and eroded culverts blocked fish passage at Squaw Creek. Replacing them opened up 15 miles of habitat.

USFWS PHOTO

species additions to the Alaska Anadromous Waters Catalog for the creek! Dolly Varden char, sticklebacks, starry flounders, rainbow smelt, sculpin, and even beavers, river otters, and a muskrat also passed the camera!

Live video and recorded highlights are broadcast by the local utility company, Nushagak Cooperative, on two cable TV channels. Community residents are giving rave reviews of the project, and are surprised at how many fish use the stream!

Of course, the "show" captured during that first season is stored on tape and has already been featured in several presentations. Plans are also afoot to make the footage available on the U.S. Fish and Wildlife Service's Alaska Region website.

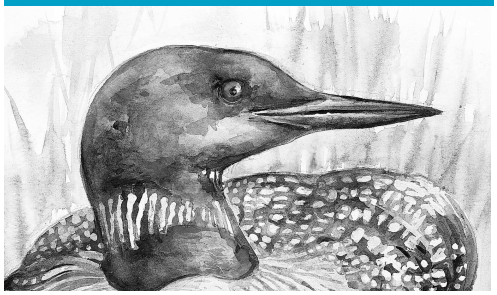
And speaking of the future, it won't be long before this summer's runs of fish begin turning their noses to the sweet scent of fresh water. When that happens, a whole new generation of salmon will find themselves captured—on videotape—and will help to spread the good word about Squaw Creek's fish passage success.

The Squaw Creek "Studio" is prepared for another day of filming.

The stage is set for a local television event!

For more information contact Mark J. Lisac at Togiak National Wildlife Refuge.

U.S. Fish & Wildlife Service



1011 East Tudor Road
Anchorage, Alaska
99503

Alaska Reflections

Alaska Reflections is published for people who are interested in Alaska's lands, fish and wildlife. The U.S. Fish and Wildlife Service manages 77 million acres of lands in Alaska. Alaska Reflections is produced by the USFWS External Affairs staff. Telephone: 907.786.3309

REGIONAL DIRECTOR—**Tom Melius**

ASSISTANT REGIONAL DIRECTOR, EXTERNAL AFFAIRS—**Karen Sullivan**

EDITOR—**Bruce Woods, 907-786-3695, bruce_woods@fws.gov**

The mission of the U.S. Fish and Wildlife Service is to conserve, protect and enhance fish and wildlife and their habitats for the continuing benefit of the American people. In carrying out this mission in Alaska, the Service not only helps Americans enjoy the outdoors, but also helps protect a healthy environment that benefits fish, wildlife and people.

Alaska Reflections welcomes manuscripts on a wide range of topics related to the U.S. Fish and Wildlife Service's mission in Alaska. We are particularly interested in news about research, conservation, and cooperative ventures. Please contact the editor before preparing a manuscript for guidelines. We cannot guarantee publication.

Well-Deserved Awards!

Jerry Stroebele, Merry Maxwell, and Mike Spindler (left to right) proudly display the Service's National Environmental Leadership award in the Environmental Management System category, given to Kanuti National Wildlife Refuge for its efforts in pollution prevention, environmental outreach and partnering, energy initiatives, and sustainable building design. The refuge also was named "Refuge of the Year" for environmental excellence. Having won these awards, Kanuti was nominated and subsequently received the DOI Departmental "Environmental Achievement Award" in October 2005. Merry Maxwell traveled to Washington D.C. and was presented this award by Lynn Scarlett and Gale Norton.

FISH SCHTICKS

by Ron Laubenstein & Bruce Woods

"Is it getting warmer here or is it just me. . . ?"