



United States
Environmental Protection
Agency

OPPTS Tribal News

Spring 2008

Alaska

Volume II



Exposing its Ancient Ice



Environmental
voices

Office of Prevention, Pesticides,
and Toxic Substances and
Tribal Environmental News Exchange

www.epa.gov/opptintr/tribal

Table of Contents

Table of Contents

News & Events	3
Environmental Concerns & Issues	7
Climate Change	11
Wildlife & Endangered Species.....	15
Coal Mining & Industry	19
Oil Exploration & Industry	27
Solid Waste & Open Dumps	30
Toxic Contaminants	37
Programs & Initiatives	43
Success Stories	46
Alaska Faces Spruce Bark Beetle Infestation	54
Kid's Page	56
Elders	58



The Office of Prevention, Pesticides, and Toxic Substances is pleased to include the comments and opinions of contributors. Byline articles and interviews represent the opinions and views of contributors and not necessarily those of the U.S. Environmental Protection Agency. All web sites and URL's were true and current at the time of publication. *OPPTS Tribal News* is a publication of the U.S. Environmental Protection Agency and is intended for noncommercial, scientific, and educational purposes. As a federal governmental agency, neither the U.S. Environmental Protection Agency, its programs, nor the producers of this publication can endorse any products or services. Also note, unless otherwise stated, the EPA does not represent that featured science articles have been scientifically peer-reviewed.

This publication may contain materials that may be subject to U.S. and foreign copyright laws. For an explanation of page number icon, please see page 54.

Photograph of polar bears on cover courtesy of Scott Schliebe, U.S. Fish and Wildlife Service, Digital Library System.

OPPTS Tribal News, Volume 5, Number 2
EPA 745-N-00-001
ISSN: 1555-3175 (on line) 1555-3183 (in print)

LIST OF CONTRIBUTORS

Toby Anungazuk, Jr.
Roger Burnside
Pete Christich
Patricia Cochran
La'ona Dewilde
Rhea DoBosh
Brian H. Hirsch
Secody Hubbard
Janice King Jensen
Janice Johnson
Steve Johnson
Mary Lauterbach
A. J. Matthews
Hailey McKenzie
Howard Norman
Doug O'Harra
Evon Peter
Joe Sarcone
Bill Stokes
Colleen E. Swan
Jennifer Sweigart
D. Warden
Lynn Zender
Chris Zimmer

OPPTS Tribal News requests interesting, relevant stories about pesticide and pollution prevention programs and projects in Indian country from our readers. If you want to share your experience with our readers, please write or send an email message to Mary Lauterbach, EPA Office of Pollution Prevention and Toxics, 1200 Pennsylvania Avenue (MC7408M), Washington, DC 20460, lauterbach.mary@epa.gov.

To be placed on our mailing list, write to:

OPPTS Tribal News, U.S. EPA, OPPT
1200 Pennsylvania Avenue (MC7408M), Washington, DC
20460, or send an e-mail to lauterbach.mary@epa.gov.

OPPTS Tribal News can be viewed on the Internet at
www.epa.gov/opptintr/tribal

Mary Lauterbach, OPPTS Editor
Danielle Gritz, Assistant Editor
Shanita Brackett, Writer
Hailey McKenzie, Intern
Michelle Humphrey, Photographer
Brian Adams, Graphic Design

Transition to Sustainable Energy Sources

Adapted from "Traditional Wisdom and the Dilemma of Fossil Fuels in Alaska," Evon Peter, Chairman, Native Movement

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Elders have said that there will come a time when we will have to live from the land once again. Although most of our peoples have never been fully separated from life on the land, we have become comfortable with some western ways that are not sustainable for the future generations. The environment that we live in, the waters we drink, the air we breathe, and the animals that give themselves to us, are either being depleted and/or contaminated. The time has come for us to heal ourselves and in that process begin to apply the traditional wisdom of our peoples to the challenges we face.

We have time to make wise decisions for future generations and ourselves that will ease the suffering our people encounter. We must prepare for a time of transition or risk facing a crisis situation later. One of the more pressing issues is the use of fuels in Alaska (gas, propane, diesel, coal, etc.).

The way of life most of us have become comfortable with in the last 50 or so years is based on the use of fossil fuels. We rely on gas, diesel, or coal for our snow-machines, four wheelers, cars, boats, planes, electric generators, home heating, refrigerators, water pumping, and shipping of supplies. The reality we face is that fossil fuels are a limited resource that will be running out at the current rates of global consumption within a generation

or two. This is a very serious issue for communities around the world. We must discuss the impacts of this reality as well as the possible solutions within each of our communities.

The burning of fossil fuels is also linked to global warming, which is beginning to have a major impact on our way of life as well. There is melting of sea ice, drying of the tundra that leads to out-of-control wildfires, land erosion, and possible extinction of some animal species. We cannot ignore the climatic impacts of fossil fuel use.

Things to Consider

Our elders teach us that we need to think of the future generations and that we need to respect our relationships with the land, animals, and spirits. A part of our spirituality is how we maintain our relationships, not only with one another, but also with all of creation, all our relations. There is wisdom in this approach to life.

We depend on water, air, food, and shelter for our survival. So it makes sense that we should consider those things being available for future generations a necessity in the decisions we make today. Unfortunately, availability is not the only issue. We also need to consider accessibility and contamination. In parts of the continental United States, pollution has resulted in water sources being unsuitable for human consumption. In other areas, people are advised to restrict their fish consumption due to contamination levels.

Strategy for the Transition to Sustainability

We have to transition to a sustainable way of life once again. We have many opportunities to use tools that will make life much easier than the lives our ancestors had. It is a transition into a healthy and sustainable way of life for us and for many future generations. It is our responsibility to our children, grandchildren, and to their grandchildren to make the transition in our lifetime.

The transition to a healthy and sustainable way of life will most likely take a number of years. Each community has a unique situation and therefore a unique set of challenges they will need to address. There is no one solution for all communities, but there are some initial steps and actions that are universally applicable:

- ▶ **Conserve energy and minimize the use of fossil fuels.** One approach might be to run diesel generators for a minimal number of hours each day, maybe between 3-12 hours a day when it is most useful, such as during business hours. We should also only use snow-machines, four wheelers, and boats when necessary. This will significantly reduce the amount of money villages have to raise for fuel expenses.

News & Events

- ▶ **Invest in renewable energy sources such as solar, wind, and mini-hydro.** While renewable energy sources will not be able to power villages with 24-hour electricity, they can provide energy during times of sun, wind, and/or flowing currents. Perhaps funding saved in fossil fuel conservation efforts could be used to invest in renewable energy infrastructure.
- ▶ **Re-learn traditional ways of life and new sustainable practices.** It would be wise to re-learn traditional ways for hunting, water harvesting, food storage, and shelter construc-

tion. Also, depending on the environment and what types of foods people desire, it might be desirable to farm the land.

- ▶ **Use available resources to support the transition to health and sustainability.** We have resources available to us from the federal government, native corporations, foundations, and individual donors that can be used for this transition. For example, rather than pay out individual dividends from the corporations we could choose (vote) to invest in renewable energy sources for the villages.

The purpose of this piece is to encourage deeper dialogue about the realities we face in Alaska and around the world. It is a time sensitive manner.

Our elders teach us that we need to think of the future generations and that we need to respect our relationships with the land and animals. We should listen. We need to actively transition into a healthy and sustainable lifestyle or be forced into it later under much more difficult circumstances.



Alaska Forum on the Environment 2006

The eighth annual Alaska Forum on the Environment (AFE) was held February 6-10, 2006 at the Egan Convention Center in Anchorage, Alaska.

AFE is a statewide gathering of environmental professionals from government agencies, non-profit and for-profit businesses, community leaders, Alaskan youth, conservationists, biologists and community elders. Each year, over 1,200 people attend AFE to learn more about the environment and meet other Alaskans that work in the environmental field.

The forum includes special keynote speakers and more focused, break-out sessions to discuss topics of interest to AFE participants. AFE offered over 80 breakout sessions which were organized by subject tracks including: climate change, emergency response, environmental regulations, fish and wildlife

AFE Mission Statement - Alaskans working together to promote a clean, healthy environment through communication and education.

populations, rural issues, energy, military issues, business issues, pollution prevention, and contaminants.

The Forum also included presentations, panels, a session on environmental career opportunities, organizational meetings, training classes, social events, vendor displays/information booths, and a "Talking Circle" with community leaders and tribal elders.

The Forum provides an oppor-

tunity for state, local, federal, military, private, and Native leaders and professionals to come together and discuss the latest projects, processes, and issues that affect the people of Alaska.

The AFE was originally called the Federal Facility Environmental Roundtable. It was an annual conference focused on contaminants, hazardous waste cleanup, hazardous materials management, and pollution prevention at federal facilities. It was expanded pursuant to an agreement, called the Statement of Cooperation, with environmental regulators, military departments, and federal agencies. Since then, to operate and finance an event the size of the AFE, Alaska Forum, Inc. was formed as a registered 501(c)(3) non-profit organization to support the annual event and its extended mission to promote effective cooperation, communication, and education in Alaska.

The Planning Committee includes representatives from the Environmental Protection Agency, Alaska Department of Environmental Conservation, U.S. Army, U.S. Air Force, Federal Aviation Administration, U.S. Navy, Mineral Management Service, Department of the Interior, Alaska Native Science Commission, Conoco Phillips, Ecology & Environment, Federal Emergency Management Agency, Alaska Department of Homeland Security, and many others.

In the past five years, AFE has offered technical sessions on environmental issues such as; alternative energy sources for rural villages, subsistence hunting, fishing

and gathering on federal lands, biological studies, bioterrorism, cruise ship initiatives, effects of climate change, the Alaska Native Claims Settlement Act, military environmental restoration, and tribal and federal government-to-government policies.

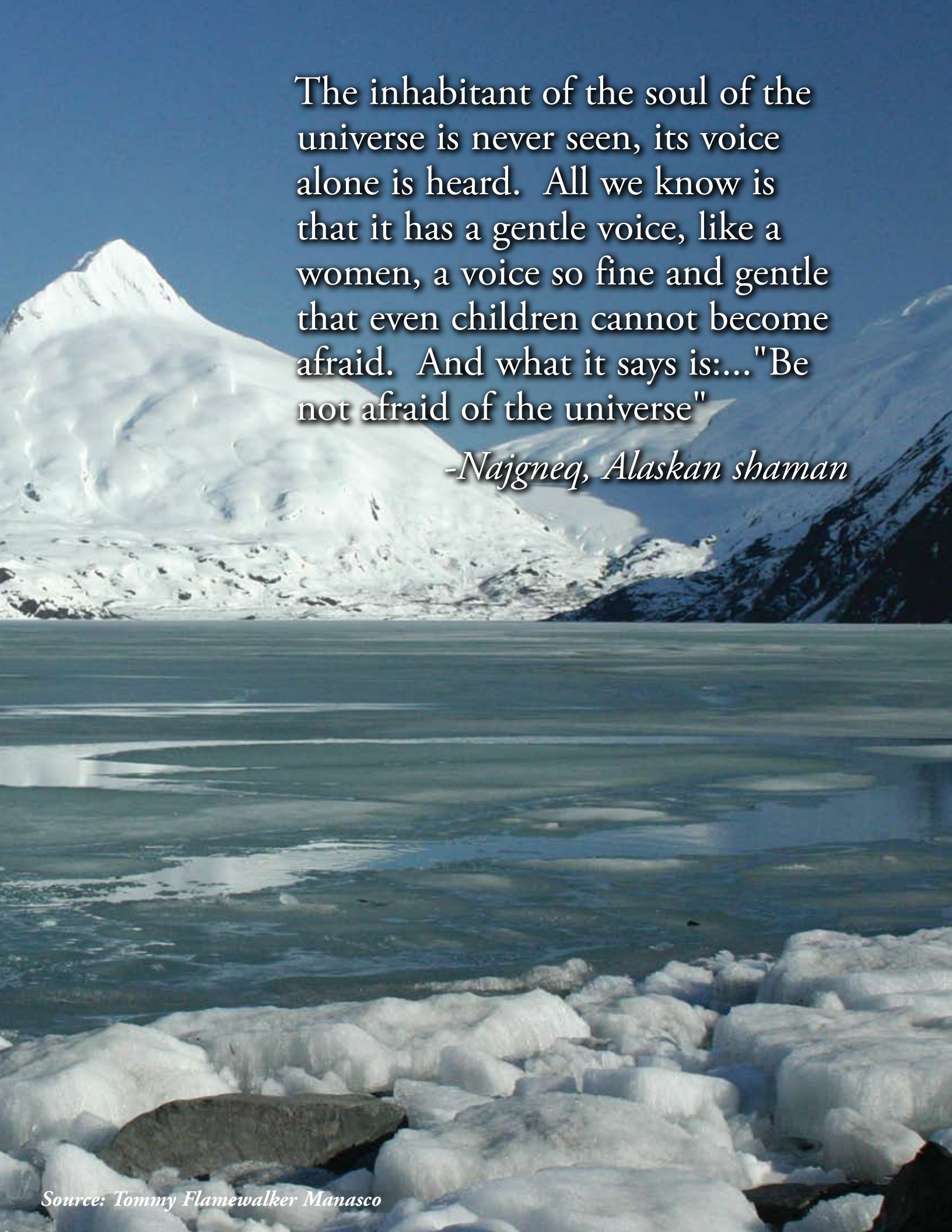
For more information on the event, please visit www.akforum.com or contact AFE staff at 888-301-0185 or info@akforum.com.

The following keynote speakers have participated in the Alaska Forum on the Environment:

2008-
Senator Lisa Murkowski (R-AK)
Jill Fredston, Author
Lynn Scarlett, Deputy Secretary, DOI
Sandra Cointreau, World Bank

2007-
Clarence Alexander, Buffett Award Winner
Paul Rose, Explorer & BBC TV Presenter
N. Scott Momaday, Author, Scholar, Poet

2006-
Wade Davis, National Geographic
Sheila Watt-Cloutier, Inuit Circumpolar Conference
John Francis, Planetwalker
Edwin Piñero, U.S. Federal Environmental Executive

A scenic view of a frozen body of water, likely a lake or fjord, with snow-capped mountains in the background. The foreground is filled with large, white ice chunks and dark rocks. The sky is a clear, deep blue.

The inhabitant of the soul of the universe is never seen, its voice alone is heard. All we know is that it has a gentle voice, like a woman, a voice so fine and gentle that even children cannot become afraid. And what it says is:..."Be not afraid of the universe"

-Najgneq, Alaskan shaman

My Earth

Hailey McKenzie, Cherokee Nation (Deer Clan), Talequah, Oklahoma

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Earth is the one place that we all have in common. It is a home shared by living and non-living things; it is a complex system made up of homogeneous and heterogeneous components that constantly interact with each other. As a caring citizen of this planet, I am fully aware of the many challenges that we and the future citizens must face to ensure the sustainability of our planet. One such issue that is of special importance to me is the mining and oil drilling near tribal land. To me, this issue has at least three equally important components of harm: the cultural threat, health concerns, and the environmental impact.

Reservations and tribal lands are scarce in space and limited in number. They are the few places where native culture still thrives and hopes to stay alive. With the invasion of mining and drilling on this sacred land, many tribes are facing a cultural turmoil that leaves them feeling stripped of their one last place that they can call home.

Many native cultures still practice traditional ways of living where there is direct contact with the environment. One such trade that I have personal experience with is the practice of basket weaving. When weaving baskets, one must put the plant in the mouth to hold one end and then pull the bark down. If such plants come from land that is contaminated with pollutants, whether from mining

or drilling, it poses serious health risks to the children, women, and men making baskets. This is just one example where health can be seriously jeopardized as a result of environmental negligence.

Environmental impacts due to mining and drilling are just as significant. It is not exploitation of land alone, but the aftermath left behind. Many times companies are very effective at hiding their environmental crimes until it's too late. Drinking water becomes undrinkable, land becomes unable to support crop growth, and the air emissions spread throughout



the region for many miles before they settle. Instead of preventing the release of the toxic chemicals in the first place, companies often resort to settlements for remediation. But no matter how effective the clean-up, the dump will always leave a dark mark on the environment.

Many of these projects are promoted in the name of economic progress. It is said that they will benefit not only the companies pursuing the drilling, but the inhabitants of the land and country as a whole. However, we know very well that the revenues are not always used in the best interests of citizens, especially in the states and countries where the ruling parties might not be as concerned about the citizens and environment as they are about the economy. One cannot deny the fact that economic drives have a mighty force that even the most democratic systems cannot hold back. However, it is not the political system alone that should be fighting the human and environmental injustices; it is the duty of all citizens to stand up for their interests. It is this concern for the environment and for the people that drives my desire to join the EPA, where I hope to become an effective contributor to protecting our home and all its inhabitants.

Environmental Concerns & Issues

International Cooperation, Challenges, and Goals

Pete Christich and Rashida Shivers, EPA Office of International Affairs

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Alaska is a unique U.S. state. It shares border regions with Canada and Russia, including shared ecosystem regions with British Columbia and the Yukon Territory, and is part of ecosystems of the North Pacific and Arctic Oceans.

Since 1909, the United States and Canada have cooperated under the 1909 Boundary Waters Treaty to prevent and control water pollution. Article IV of the 1909 Treaty states: "...It is further agreed that the waters herein defined as boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other." Under the 1909 Treaty, the two countries are increasingly taking steps in shared watersheds to ensure that water use, levels, flows, and quality are addressed as part of an integrated whole, and not on a "piece meal" or conflicting basis.

In 1988, the US-Canada International Joint Commission's (IJC) Report on the US-Canada Flathead River Basin reads "there are far reaching implications of this Article IV principle as applied to an important migratory fishery that moves in both directions to spend part of its life cycle in each country. In such cases, there is a mutual obligation to protect that fishery by a range of management practices in both countries which will ensure that the provisions of the Treaty will be jointly honoured."

The 1909 Treaty is an impor-

tant framework for Alaska's inland water ecosystems shared with British Columbia and the Yukon Territory. Over many centuries, indigenous people in this region have lived in harmony with nature by following life ways passed down through many generations, which has helped protect human health and the diversity of wildlife and ecosystems. In Canada and the United States, indigenous people are also recognized as aboriginal people. Their governments are referred to as First Nations in Canada and as Tribes or Native Villages in the US. The extensive United States-Canada border includes a number of indigenous/ aboriginal people's governments or alliances, some of which span the US-Canada border.

In 1998, the Canadian and United States governments asked the IJC to help explore and develop new and improved watershed ecosystem approaches along the entire US-Canada border. The goals of this long-term initiative include, for example, improvement of consultation and partnering with Tribes/ Native Village and First Nation governments to help better fulfill requirements of the 1909 Treaty.

The international region, which includes Alaska, is affected by trends in the larger Northern Hemisphere and worldwide trends. Some of the issues of shared concern among the United States Government, Alaska Tribes, State of Alaska, Canada, and others include long-range transport of persistent toxic air and water pollutants, bio-accumulation of toxics in food chains, environment and development challenges within US-Canada

watersheds, and climate change.

The following three sections highlight international issues, challenges, and goals affecting Alaskan lands and waters.

Alaska -British Columbia Region: Since 1998, the United States and Canada have engaged in consultations about how to fulfill the 1909 Treaty for the Alsek, Stikine, and Taku River watersheds. Since the mid-1990s, the two countries have consulted and coordinated on a Canadian-led multi-year review and assessment of the proposed re-opening of the Tulsequah Chief mine and new mine access road. Issues of concern include ambient levels of certain heavy metals in Taku River water, as it flows from British Columbia into Alaska, the Tulsequah Chief mine's surface tailings impoundment proposed to be in a flood plain, and the mine's proposed access road, which could catalyze additional development and cause adverse environmental impacts. A historical and cultural goal includes ensuring protection of the Taku River Tlingits' traditional hunting and trading trail, which has existed over many centuries, and has end points on both sides of the Alaska -British Columbia border. As part of their joint review and assessment of the Tulsequah Chief mine project, the two countries have stated that the 1909 Treaty, US-Canada Pacific Salmon Treaty, and the UN Espoo Convention, are important agreements regarding Tulsequah Chief mine project issues.

Alaska -Yukon Region: The US/ Alaska border with Canada/Yukon Territory includes shared rivers and streams such as the Yukon-



Environmental Concerns & Issues

Porcupine Rivers system, and smaller bi-national waters, such as Old Crow and Firth Rivers, and Joe and Aspen Creeks. The 1909 Treaty is an important framework for these surface waters which flow across the US-Canada border. Additional international frameworks, applicable to migratory animal species such as salmon and caribou, also apply to transboundary watershed ecosystems. Some of these additional agreements include the Pacific Salmon Treaty and Porcupine Caribou Herd Conservation Agreement.

The Yukon River Inter-Tribal Watershed Council (YRITWC) was launched at a summit in Galena, Alaska in 1997 when Tribes and Canadian First Nations came together to form a coalition to address common concerns along the Yukon River. Today, the signatories of the YRITWC number 64 Tribes and First Nations. This binational initiative helps the two countries fulfill the 1909 Treaty, and it also serves as a model for consideration for other international watersheds.

Arctic Region: Cooperation among Arctic territorial nations since the 1970s, including their long-term cooperation under the UN Convention on Long Range Transport of Air Pollution and international work of the Arctic Monitoring and Assessment Program (AMAP), led to the creation of the Arctic Council in 1996. The Arctic Council is a regional model effort on sustainable development. The Council helps member countries develop and advance regional approaches on social, economic, health, and environmental issues. It includes, in addition to government members of the eight Arctic nations, these indigenous peoples' representatives as Permanent Participants: the Aleut

International Association, Arctic Athabaskan Council, Gwich'in Council International, Inuit Circumpolar Conference, Russian Association of Indigenous Peoples of the North (RAIPON), and the Saami Council.

Ensuring the protection of people, wildlife, and ecosystems in the international region, which includes Alaska, requires a diverse array of international frameworks and cooperation, both binational and multinational. Since the 1990's, national governments, indigenous people's governments, and others have steadily strengthened international cooperation to include important goals of human health and environmental protection in this important and unique region. The Yukon River Inter-Tribal Watershed Council demonstrates that no Tribe or First Nation is an "island." The Arctic Council demonstrates that no country is an island. Issues such as the long range transport of persistent toxic air pollutants and global climate change highlight that no international region is an island. International cooperation, which

includes Alaska, has resulted in development and advancement of approaches and shared visions of the future that will help achieve sustainable development.

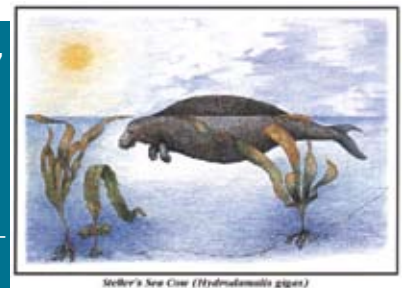
Information, Internet Sites, References

- ▶ US-Canada International Joint Commission: www.ijc.org
- ▶ Persistent Organic Pollutants, A Global Issue, A Global Response, EPA report, 2001, available from EPA OIA.
- ▶ EPA Tribal News, Fall 2003/ Spring 2004 issue, pp. 30-32
- ▶ Yukon River Inter Tribal Watershed Council: www.yritwc.com
- ▶ Arctic Council: www.arctic-council.org
- ▶ International Union for Conservation of Nature: www.iucn.org
- ▶ Pete Christich: 202.564.6404, or Christich.Pete@epa.gov

Case Study: Steller's Sea Cow of the Bering Sea

The Steller's sea cow, a marine mammal that in length averaged 20 - 25 feet lived alongside indigenous people in the US - Russia Bering Sea region for many generations. The sea cow grazed on plants such as kelp. After the arrival of Europeans in the 1700s, in less than 30 years, these large, gentle, herding animals became extinct.

Over the past century, the United States, Canada, other countries, international organizations, indigenous people's governments, and others have learned and are demonstrating that international cooperation is needed to ensure that other animals do not suffer the same fate as Steller's sea cows. Countries are aligned internationally in their focus, work, and goals in the Alaska international region to protect wildlife, people, and ecosystems.



Susanne Swibold

Environmental Concerns & Issues

Tribes Benefit from GIS Software

*A J Matthews, Little Traverse Bay Band of Odawa Indians,
Environmental Services*

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

A geographic information system (GIS) is a combination of computer software, hardware, and data designed to support the collection, analysis, and display of geographic-related data. GIS is extremely beneficial to Tribes and can easily be obtained. The Bureau of Indian Affairs (BIA) has an Enterprise License Agreement with ESRI, the company that produces the commonly used ArcGIS software. The Geographic Data Service Center (GDSC) was established by the BIA in order to maintain the license agreement. Under this agreement, federally recognized Indian Tribes can obtain ArcGIS software and support at no cost. Licenses are available for a variety of software options from the baseline entry level package (ArcView) to the more complicated analysis software (ArcInfo). Free training opportunities are also provided through the GDSC in both instructor-led and online course formats. The courses cover a variety of topics varying from GIS introduction to more specific issues including geoprocessing and spatial analysis. The enterprise license agreement provides an avenue for the acquisition of software and the qualification of users through training and support. With these benefits, Tribal organizations can easily establish a successful GIS program.



Data acquisition is another key aspect in the success of a GIS program. Data can be acquired through many channels including free downloads, data sharing agreements, and by purchase from consultants or GIS companies. GIS data can also be created using GPS information or by manipulating pre-existing data. It is important that GIS data be updated and maintained in an organized, central location. Relevant and readily available data is a key factor in the optimization of a Tribal GIS program.

The combination of state of the art software, qualified users, and a solid foundation of data will allow any Tribe to maximize the potential of a GIS to meet the many needs of Tribal operations.

Key Sites

- ▶ ESRI Main Page
www.esri.com
- ▶ Geographic Data Service Center
www.esri.com/industries/federal/bia
- ▶ ESRI Virtual Campus
campus.esri.com
- ▶ Data Depot (Free Downloads)
data.geocomm.com

Attention Science and Engineering Students: The EPA Can Help You Pay Tuition!

If we are going to meet the complex environmental challenges of tomorrow, we need to start planning today. That's why the U.S. Environmental Protection Agency (EPA) is helping future scientists and engineers get the training they need. Each year, EPA awards fellowships to the nation's top undergraduate and graduate students to help them complete their degrees.

What is STAR and GRO?

Two fellowship programs are available to students pursuing degrees in environmental fields. The Science to Achieve Results (STAR) fellowship supports graduate research in environmental science and engineering disciplines. The Greater Research Opportunities (GRO) fellowship program is primarily designed to support students attending colleges and universities that traditionally have limited funds for research and development. In 2005, 168 STAR and GRO research fellowships were awarded to students from more than 110 universities in 43 states and the District of Columbia. All applicants for STAR and GRO fellowships undergo a rigorous peer-review process, ensuring that some of the best students in the country are chosen.

Who is Eligible?

Applicants must be U.S. citizens or lawfully admitted into the country for permanent residence. In addition, fellows must be attending a college or university within the United States. For more information and applications, please visit www.epa.gov/ncer/fellow.





Signs of a Warming Planet

Adapted from "Hot summer a sign of warming planet," Anchorage Daily News, Doug O'Harra, February 22, 2005

The opinions and views expressed in this chapter are from the article from which it was adapted, and are not necessarily those of the Environmental Protection Agency.

Alaska's long, hot summers are a great indication of a warming planet. Last year, temperatures in Alaska averaged five degrees Fahrenheit above normal during the months of May, June, July, and August. According to Doug O'Harra, the warmer temperatures were driven by the warmest ocean temperatures ever measured in the Northern Hemisphere, matched globally by the fourth-warmest year on record. Episodes of lightening and the state's decrease in rainfall resulted in nearly 6.5 million acres of Alaskan land burned.

"Throw in melting glaciers, disintegrating permafrost, diminishing sea ice, coastal erosion, changes in vegetation and wildlife, insect infestations, rising sea level, and increasing exposure to contaminants brought on air and sea currents, and Alaskans know firsthand about the potential damage and cost caused by the shifting climate. The Climate is really warming now, and you Alaskans know that," said Robert Corell, chairperson of the Arctic Climate Impact Assessment Steering Committee for the international Arctic Council, "Because this really is the bellwether, the canary in the mine: What we see over the next decade here and in the Arctic, the rest of the world will see in the next 25 years."

Dr. Corell is a senior fellow of the American Meteorological Society. As a participant in several

panel discussions at the Alaska Forum on the Environment in February 2005, Dr. Corell outlined the devastating impact of a warming climate and melting ice across the North. These impacts were summarized by an international scientific committee commissioned to evaluate and synthesize knowledge on climate variability, climate change, and increased ultraviolet radiation and their consequences. Dr. Corell served as chairperson of the committee. The committee also studied how contaminants reach the Arctic through air and water currents and then enter the food chain.

Sheila Watt-Cloutier, chairperson of the Inuit Circumpolar Conference, also participated in panel discussions on contaminants and climate change at the Alaska Forum, and suggested that excessive greenhouse gas emissions by the United States directly threaten the human rights of Arctic residents. Other effects of Alaska's warm summer resulted in lower surface water levels in the Yukon Flats region. According to Craig Fleener, Council of Athabaskan Tribal Governments, there was only a half-inch of rain in certain parts of the Yukon Flats region, and the waters could not be navigated. "The community of Birch Creek was nearly landlocked," reported Fleener.

Doug O'Harra concluded his article with a summary of findings presented by Dr. Robert Corell during other meetings and speeches. Dr. Corell reports the following:

- Analysis of air sampled from ice cores in Antarctica shows a close match between greenhouse gas concentrations and average

global temperatures over the past 400,000 years.

- The difference between a full ice age and the sort of warm interglacial period now occurring on Earth appears to be only about 10 degrees Fahrenheit.
- Similar studies of ice cores, tree rings, and sediment show that global temperatures spiked beginning with rapid industrialization in the 1700's to 1800's, when greenhouse gases like carbon dioxide began to rise.
- Climate shifts are changing the ecosystem faster than plants and animals can respond and are stressing trees in Alaska's interior, triggering insect outbreaks like the spruce bark beetle in the Southcentral region, and threatening to push Arctic species like the polar bear toward extinction.
- There is a need for a national "climate aware" campaign to reduce energy consumption. People can begin by putting up storm windows, deciding to walk instead of drive, lowering thermostats, and buying products from companies that also reduce emissions.

Impact of Climate Change on Alaska Native Communities

Patricia Cochran, Alaska Native Science Commission

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

What are the environmental concerns of some Alaska Natives?

- ▶ Global warming
- ▶ Abnormalities in subsistence foods
- ▶ Human health

- ▶ Impacts of commercial and sports fishing
- ▶ Local and foreign sources of contaminants
- ▶ Changes in the ecosystem
- ▶ Perpetuation of culture.

It is known that climate change affects a community's way of life. Alaska Natives have always expected fluctuations from year-to-year in weather, hunting conditions, ice patterns, and animal populations. However, since the 1970's, some

Alaska Natives have noticed many indications of major changes in climate.

What climate changes have been observed during the last 30 years?

- ▶ Temperatures in parts of Alaska average more than four degrees warmer during the last 30 years
- ▶ Permafrost is becoming impermanent

Observations from Alaska Natives

Erosion, Ice, and Wind Patterns

"There have been a lot of changes in the sea ice currents and the weather. Solid ice has disappeared, and there are no huge icebergs during the fall and winter. The ice now comes later and goes out earlier, and it is getting thinner. The current is stronger and it is windier on the island. We had a bad hunting season with lots of high winds. Our elders tell us that our earth is getting old and needs to be replaced by a new one."

— Jerry Wongittilin, Sr., Savoonga

"[In] Copper River, we've noticed that in the last 10 years, it doesn't freeze across like it used to. The temperatures are warmer. The lakes are drying up. Over the last two years, the water has been low in June affecting the fish run. Sockeyes are much smaller and so are hatchery fish."

— Gloria Stickwan, Cooper Center

"This year our ice didn't last long because it was so thin. It made it dangerous to go out. There was open water between Wales and Brevig at Lost River. The ice at Wales, when it forms, goes out a quarter of a mile and forms a pressure ridge. The ice was very thin [last year] and rotted very early between the pressure ridge and the village."

— Ellen Richards, Wales



Temperatures

[Regarding] the temperatures, it used to get warm, but now it gets hot. There are droughts in some places. There are trees where there never used to be trees. The tree line is moving out where it didn't used to be. If contaminants are in the snow, then they are everywhere.

They will contaminate fish. We're not going to walk around with a gas mask on; we're going to have to figure out how to live.

— Orville Huntington, Husila

Seasonal Characteristics and Weather

"Last spring we got only six walrus because of the weather and ice moving out too quickly. A long time ago, it used to be really nice for weeks and even sometimes for months. Now, we only have a day or two of good weather, and this impacts our hunting. The hunters talk about the ice getting a lot thinner. It is going out too quick.

— William Takak, Shaktoolik

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.



Environmental Concerns & Issues

Climate Change

- ▶ Glaciers are retreating by 15 percent every decade
- ▶ More incidents reported of hunters and travelers falling through thin sea ice
- ▶ Spruce beetles are decimating forest areas
- ▶ The Iditarod (dog sled race) has moved north due to lack of snow.

Climate change affects shore erosion and wind patterns, ice conditions, seasonal characteristics, and human populations. In studying shore erosion at Shishmaref, Alaska, scientists have observed that the sea is almost ice-free well into December instead of October, and that there are more frequent storms in the area in the summer and fall. Also, the sea is gnawing away at the local airstrip and has “relocated” 18 homes.

Climate change also impacts food resources. Water temperatures



affect phytoplankton and zooplankton growth, which indirectly affect fish, marine mammals, and human harvests due to lifecycle dependencies.

Researchers investigating these climate observations believe that changes in solar activity, positioning of the moon, variations in the Aleutian low (the low pressure center located near the Aleutian Islands), and atmospheric pressure “regime” shifts are the cause.

When considering the broad impacts of climate change, Alaska Natives are already seeing the effects on cultural and traditional ways of acquiring and storing food. The observations of Alaska Natives

not only mirror scientists’ predictions, but provide first-hand evidence of the effects of climate change. For more information, contact Patricia Cochran, Alaska Native Science Commission, at pcochran@aknsc.org or visit www.native-science.org or www.nativeknowledge.org.



Alaska Inter-Tribal Council (AITC) has developed a website for Villages on non-local source contaminant issues. “Nunat” will be about climate change, resource development (mining etc.), and contaminants, and how these events might impact subsistence. The website became “live” in February 2008. www.nunat.net

Planned features of the site include:

- ▶ Village-to-village message board for mining, climate change, contaminants, subsistence changes, etc.
- ▶ Fish database for villages to share “unusual” fish observations with other Villages, and pictures/video of fish caught that look different
- ▶ “Climate change” gallery – video and photo uploads of people’s climate and subsistence change observations

- ▶ Sample template on how to keep a climate change observation journal
- ▶ Materials (presentations, handouts, etc.) from recent conferences
- ▶ Calendar of events and grant deadlines
- ▶ Introduction tutorials/information on main and sub topics
- ▶ Personal stories of how climate change is impacting villages and lives
- ▶ Email listserves to keep informed, and a list of groups that meet about climate change, mining, etc.
- ▶ “Where is my mine at?” Links to status of mining permitting process with contact information etc.

Impacts of Climate Change in Golovin Alaska

*Toby Anungazuk Jr., Environmental Coordinator
Chinik Eskimo Community Tribal Environmental Program*

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

The community of Golovin is in the Norton Sound. Cape Darby and Rocky Point, on the Golovin Bay, act as a buffer zone to almost all severe storms. In previous decades, occurrences of high water in Golovin were infrequent. From the mid-1960's to 1992, the lower part of Golovin was inundated only twice with a potentially damaging storm surge. However, such storms are now occurring more frequently. In 2003, a storm surge hit Golovin that lasted for approximately one day before the high water receded. In late October 2004, Northwesterly winds of less than 40 knots, coupled with severe high water conditions and an extremely high tide, caused water to breach the roads and the beach ridge at an unprecedented speed.

In Golovin, we are experiencing a much earlier spring thaw. The snow is melting over a month earlier than it did in the late 1980's, and it doesn't start freezing until later in the fall. Snow does not accumulate on the ground until after the Thanksgiving holiday. Ice is melting on the water bodies approximately one month earlier and freezing over a month later than in the past.

In the beginning of July, Agnes Amarok, Golovin's Eldest, noted that the grass, willows, and edible greens had already changed to



August colors. This summer, the first salmon berries ripened a week earlier than ever before. In addition to early vegetative maturation, many small birds and ducks have begun to lay eggs earlier. What will happen if most of the birds hatch eggs early and we have a late spring freeze after the eggs hatch? Our concern is that the food sources needed for raising young may not be at their optimum levels, and the birds and ducks may not try to lay a new batch of eggs. Another concern is that sea mammals rely on stable ice conditions to raise their pups. Will these sea mammals, which remain an important part of the Golovin diet, be more difficult to harvest because they are following the northward receding ice earlier in the season than usual?

These climate changes also make it more difficult to "predict" the weather. Weather prediction is essential for hunting, fishing, harvesting, and protecting human and animal habitats. Because

hunting regulations do not always keep up with the changing weather patterns, hunters may be forced to hunt in more adverse weather conditions. Salmon and herring fishing harvests could decline if most of the fish arrive early before the nets are set. Clouds arriving at the coast have lost most of the moisture necessary for the different types of berries to ripen. When there is less rain, the tundra has desert like conditions, which seriously raises the threat level for a tundra fire. Such a fire could be disastrous to the community and animal habitats.

We believe that contaminants in "Arctic Haze," including airborne dust, absorb heat and, therefore, contribute to early snow melts. Once the dust melts some of the snow accumulated on the ground and exposes patches of earth, the ground temperature begins to rise, speeding up the melting process.



The Basics of the 1973 Endangered Species Act (ESA)

Secody Hubbard, EPA Office of Civil Rights

Congress passed the Endangered Species Preservation Act of 1966 and the Endangered Species Conservation Act of 1969.

Although the laws allowed for a listing of endangered species for protection, they were limited in their protective scope. Finally, in 1973, Congress passed the Endangered Species Act (ESA), which is considered to be one of the most comprehensive conservation laws for wildlife in the world. The law is administered by the Interior Department's Fish and Wildlife Service (US FWS) and the National Oceanic and Atmospheric Administration (NOAA). US FWS has primary responsibility for terrestrial and freshwater organisms, while NOAA-Fisheries has marine species responsibility.

The ESA is intended to conserve ecosystems that endangered and threatened species depend on. Federal agencies are required to ensure that the actions taken by an agency do not jeopardize a listed species and/or destroy or modify critical habitat. In protecting plant and wildlife, all species are eligible for listing as endangered or threatened, with the exception of pest insects. Currently, the list of threaten or endangered species contains mammals, birds, fish, snails, clams/mussels, reptiles, insects, plants, etc. The most listed species under the law are plants, mammals, birds, fish, reptiles, and clam/mussels.

Generally, the determination of endangered and threatened species is based on the following factors: (A) the present or threatened destruction, modification, or

curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or, (E) other natural or manmade factors affecting its continued existence.

ESA and Tribal Governments

American Indian lands in the lower 48 States comprise over 45 million acres of reserved lands, and another 40 million acres of traditional Native lands in Alaska with over 200 Federally recognized tribes. Much of the acreage in native Alaska remains untouched and unspoiled. The protection of native lands is vital to tribes as human welfare is tied closely to the land. The reservation environment including land, natural resources, and wildlife species not only provides economic self-sufficiency, but they are an intricate part of native spirituality and physical sustenance in the interconnected web of the American Indian way of life. Sustaining the overall reservation and native land's environmental integrity is not only essential to preserving the reservations themselves, but also satisfies Tribal Government's priority to keep native lands healthy and viable environments for future generations.

In working with Tribal Governments, the US FWS recognizes that the unique legal posture of the tribes in relation to the federal government is deeply rooted in American history. These unique

enclaves are independent entities with inherent powers of self-government based on treaties, statutes, judicial decisions, executive orders, or agreements. The US FWS, as a representative of the Federal government, has responsibilities to observe several key elements of Federal-Indian relations in protecting native natural resources. They are:

- The Federal trust responsibility toward Indian tribes
- Respect for tribal rights
- Acknowledgement of treaty obligations of the United States toward tribes
- The government-to-government relationship in working with tribes
- Protection of natural resources that the Federal government holds in trust for tribes.

Implementing the ESA in relation to Indian tribes, the Departments of Interior and Commerce issued Secretarial Order #3206 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act) in June, 1997, that clarified roles, responsibilities, and guidance in working with tribal Governments. Essentially, the Order acknowledges the trust responsibility and treaty obligations, and sets principles for Agency coordination with tribal governments. The Order, however, excluded Alaska Natives. ESA Section 10(e) provides that the Act's prohibition on takings of species generally does not

Environmental Concerns & Issues

Wildlife & Endangered Species

apply to Alaska Natives if the taking is primarily for subsistence purposes. In January of 2001, the Secretary of Interior issued Order No. 3225 (Endangered Species Act and Subsistence Uses in Alaska, Supplement to Order No. 3206) which established a consultation framework relative to the subsistence exemption in Sec.10(e) of the ESA. The consultation framework addresses conservation concerns relative to a species that is listed as endangered or threatened under the ESA and also used for subsistence by Alaska Natives, tribes and other Native organizations.

Today, the Department of Interior collaborates with Alaska Natives when subsistence take negatively impacts certain listed species. In devising cooperative agreements, they not only form conservation partnerships and conserve listed species, but the agreements also meet the subsistence needs.

Management of subsistence species by FWS and Alaska Natives share a common goal of conserving sensitive species including candidate, proposed, and listed species. Other collaborative management efforts include: forming recom-

mendations for management actions, plans, or regulations; population and harvest monitoring projects; law enforcement activities; education programs; research design, data collection and use of traditional knowledge; habitat protection programs; and recovery projects that minimize the cultural and economic impact on Alaska Native communities. Working in a conservation-partnership and government-to-government manner will benefit both the endangered resources and will exercise treaty rights of tribal governments.

Alaska is served by the US Fish and Wildlife located in Anchorage, Alaska. Alaska is Region 7.

For further information regarding specific species, issues, and regulations, consult the following organizations and documents:

- ▶ Office of the Native American Liaison, U.S. Fish and Wildlife Service
- ▶ Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000)
- ▶ Final Recommendations of the Working Group on the ESA and Indian Water Rights (Federal Register Notice of

Availability and Request for Comment, 65 FR 41709, July 6, 2000)

- ▶ Secretarial Order #3206: American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act (June 5, 1997)
- ▶ Questions & Answers— American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act
- ▶ U.S. Department of Interior, Bureau of Indian Affairs
- ▶ Department of the Interior, Responsibilities for Indian Trust Resources
- ▶ List of Federally Recognized American Indian Tribes and Alaska Natives (Federal Register: December 5, 2003 [Volume 68, Number 234]).

Or contact:
Native American Liaison
U.S. Fish and Wildlife Service
1011 East Tudor Road
Anchorage, Alaska 99503-6199
T-LIP Contact: Tony DeGange
(907) 786-3492



Endangered Species List of Alaska

On December 27, 2006, the Secretary of Interior announced a proposal to have the Polar Bear listed as threatened under the Endangered Species Act and to conduct a twelve month study before making a final decision to list the species. The proposal cites concerns about the effect of receding sea ice on the habits of polar bears, which use the ice as a platform to hunt for prey, and intends to investigate other factors that may have an adverse effect on the polar bear populations. The proposed rule and other information about the proposal is available on the Marine Mammal website at: alaska.fws.gov/fisheries/mmm/polarbear/issues.htm

The species listed below have been identified as endangered in Alaska by the Commissioner of Fish and Game. This information was gathered from the Alaska Department of Fish and Game, Division of Wildlife Conservation. For more information, please visit www.adfg.state.ak.us or contact the Office of the Commissioner at ADF&G Headquarters, P.O. Box 25526, Juneau, Alaska 99802-5526, (907) 465-4100.

Eskimo curlew, *Numenius borealis*
Short-tailed albatross, *Diomedea albatrus*
Humpback whale, *Megaptera novaeangliae*
Right whale, *Eubalaena glacialis*
Blue whale, *Balaenoptera musculus*
Steller's sea lion, *Eumetopias jubatus*



Eskimo curlew, *Numenius borealis*

The Eskimo curlew, *Numenius borealis*, is currently listed as an Alaska endangered species and a federal endangered species. Eskimo curlews are medium-sized shorebirds and are related to the whimbrel. They are about 12-inches long and have a slightly down-curved bill. Their coloring is dark cinnamon, and they have solid primary feathers.

In the mid-1800's, huge flocks of the Eskimo curlew migrated from South America to their nesting areas in the Alaska and Canadian arctic. According to researchers, unrestricted market hunting led to the decline of the species between 1870 and 1890. The last documented sighting of the Eskimo curlew was in Texas in 1962.

Source Author: Skip Ambrose.



U.S. Fish & Wildlife Service, Alaska Image Library

Short-tailed albatross, *Diomedea albatrus*

The Short-tailed albatross, *Diomedea albatrus*, is currently listed as an Alaska endangered species and a federal endangered species. Mostly seen in the North Pacific, the Short-tailed albatross is a large seabird with narrow, seven-foot-long wings for soaring low over the ocean. The young birds are chocolate brown and turn white as they grow older. The adult short-tailed albatross have an entirely white back, white or pale yellow head and back of neck, and black and white wings. Their bill is large, pink, and hooked at the end with a blue tip.

During the late 1800's and early 1900's, feather hunters killed an estimated five million short-tailed albatrosses, resulting in much of their decline. The species then further declined after volcanic eruptions in Japan in the 1930's. From the late 1940's to 1993, the species numbers have dramatically grown from fewer than 50 to over 600.

Source Author: Jean Fitts Cochrane.

Environmental Concerns & Issues

Wildlife & Endangered Species

Humpback whale, *Megaptera novaeangliae*

The Humpback whale, *Megaptera novaeangliae*, is currently listed as an Alaska endangered species and a federal endangered species. Humpback whales have stocky bodies and flat, broad heads. Their upper bodies are black or blue-black, and their flippers, grooved undersides, flanks, and underside of the flukes can be white or black.

Humpback whales can be found in a wide range of ocean habitats from the waters surrounding tropical islands to shallow waters off continental coasts. They are seasonal feeders and build up body fat reserves in the summer and then migrate to warmer subtropical areas during the winter breeding season. In Alaska, humpbacks feed mostly on krill and small fish. Currently, there are approximately 1,000 to 1,200 humpback whales compared to the estimated 15,000 whales that existed in the North Pacific prior to mechanized commercial whaling.

Source Author: Tamra Faris.

Right whale, *Eubalaena glacialis*

The Right whale, *Eubalaena glacialis*, is currently listed as an Alaska endangered species and a federal endangered species. Northern right whales are found in the northern and southern hemispheres, including both the Atlantic and Pacific oceans. Alaska right whales feed in the northern waters of the Pacific Ocean during the summer and migrate to lower latitudes to breed during the winter. Northern right whales grow up to 56 feet in length and are mostly black with some white patches on their bellies.

Northern right whales were over-hunted from 1835 to the 1850's. They were sought after because of their thick blubber, long baleen, and slow swim speed. Currently, there are approximately 100 to 500 Northern right whales.

Source Author: Linda Shaw.



Alaska Department of Fish and Game,
Division of Wildlife Conservation

Blue whale, *Balaenoptera musculus*

The Blue whale, *Balaenoptera musculus*, is currently listed as an Alaska endangered species and a federal endangered species. The blue whale is the largest living animal in the world, with an estimated average length of 75 to 80 feet and weight of 200,000 pounds. Their coloring is mottled bluish-gray, and their heads are wide and flat. Blue whales migrate long distances between equatorial wintering grounds and high latitude feeding areas. Blue whales spend most of their time along the edges of the continental shelves and are seldom seen in coastal Alaska waters.

An estimated 4,900 to 6,000 blue whales inhabited the northern Pacific Ocean prior to whaling. During the whaling seasons of 1910 to 1966, however, an estimated 8,200 blue whales were killed in the North Pacific. Currently, there are approximately 1,200 to 1,700 blue whales in the North Pacific.

Source Author: Steve Zimmerman.

Steller's sea lion, *Eumetopias jubatus*

The Steller's sea lion, *Eumetopias jubatus*, is listed as endangered for the segment of the population located west of 144 deg. W. longitude (a line near Cape Suckling, AK). The population of this western stock declined 75% between 1976 and 1990. The decline was believed to be caused by direct takings, reduced prey abundance, or certain diseases and contaminants. Other stocks of the Steller's sea lion are listed as threatened.

Source: Alaska Department of Fish & Game.



Mining in Alaska, A Tribal Member's Perspective

Hailey McKenzie, Cherokee Nation (Deer Clan), Talequah, Oklahoma

Hailey was EPA's summer tribal intern to the "OPPTS Tribal News, in 2004. A part of this intern experience is for each intern to develop an article for the publication that features their own environmental interest area or shares their own unique tribally affiliated issues related to the environment.

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Mining is essential for harvesting the resources needed to fuel our high-tech world. However, it is important to consider the associated hazards to the people that live around the mining sites and to the land and water that surround these areas.

The mining sector is made up of establishments that extract natural resources from the earth such as crude petroleum, mineral solids, ores, coal, and natural gas. Mining also refers to practices such as well operations, crushing, screening, washing, flotation, and other preparation customarily performed at the mine site or as part of mining activity.¹

Alaska is known for having an abundance of gold and rich deposits of lead, silver, zinc, and copper. The Kennecott Copper Mine (now a National Park) in the Wrangell Mountains was one of the richest copper deposits ever found. Teck-Cominco's Red Dog Mine, located in the DeLong Mountains 50 miles northeast of the Native Village of Kivalina, is currently the world's largest lead-zinc mine. It is estimated that the mine holds 25 million tons of zinc. Platinum has also been mined in Alaska. In addition to metal mining, prospectors are conducting explorations for precious gems, such as diamonds and sapphires, in stream gravels.²

Placer gold mining, the process

by which free gold is washed from stream gravels, dominated Alaskan mining from the early 1900's through the late 1950's. However, the practice has been eclipsed by large, industrial hardrock mines operated by multinational companies.²

The Interior and Arctic regions are the primary targets for future mining in Alaska. The latest mining boom began with the development of the Red Dog Mine in the 1980's, and was compounded by the discovery of gold deposits near Fairbanks (Fort Knox Mine) and Delta (Pogo Mine). These mineral deposit discoveries have resulted in rapid, aggressive claim staking and exploration by mining companies.²

Metal mining is one of the largest producers of toxics in the United States, generating up to two billion tons of solid waste annually. According to the U.S. Environmental Protection Agency's (US EPA) Toxics Release Inventory (TRI), metal mining produces over 50 percent of toxics reported through the TRI. In 2003, Alaska's only operational metal mines, Red Dog, Greens Creek, and Fort Knox, were ranked as the top three toxic producers within the state.³

Douglas Dobyns, of the Sitka Tribe of Alaska, provided his personal opinion on the impacts of mining in Alaska. The following is a summary of his comments.

A number of Tribes from Alaska have voiced concerns over mining impacts. The impacts can be far-reaching and long lasting. Transfers and run off from water, wind, roads,

and ore transfer facilities can result in impacts hundreds of miles away from the mine sites.

In some cases, the regulatory process is complex. For example, there are mines in transboundary areas that have impacts in Canada. Other factors contributing to regulatory complexity include: the location of mines on corporation lands that can be native, or nested in a variety of ways so that the ownership cannot easily be determined; the fact that some mines are enclaves in parks or other types of Federal land; and, the fact that some mines have legacy property rights and deeds, often in special status.

In addition to the aforementioned problems, there has been a lack of proper consultation with tribes in many of these cases. It is not easy to properly examine the records. In one case I have worked on for many years, there has been consultation with one selected tribe, but not with other tribes who also have felt impacts in their communities. It should not be the responsibility of one tribe to inform another. Furthermore, one tribe should certainly not speak for, or in any other way be responsible for, the tribal citizens of the other tribe(s), unless there are protocols and resolutions between the tribal governments that provide the basis for that to occur.⁴

There is a need to raise awareness of the nearby and far-off impacts of mining, the current problems, and potential future problems.

¹ US Census Bureau. Data Tools Catalog Census 2000.

² Northern Alaska Environmental Center website. www.northern.org/artman/publish/mining.shtml.

³ Metal Mining and the Toxics Release Inventory – Fact Sheet. www.northern.org/artman/publish/metalmining.pdf.

⁴ Direct communication with Douglas Dobyns, member of the Sitka Tribe of Alaska.

Cooperating Tribes, A Tribal Perspective

Colleen E. Swan, Kivalina, Alaska

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Tribes acting as cooperating agencies when a federal project falls within their geographic area or reservation makes more sense than project proponents care to admit. Native people have an intimate knowledge of their surroundings and are more aware of the dynamics of the natural environment they live in. The road that led me to this conclusion was not an easy one to travel. It was an uphill road that was riddled with manmade obstacles and jagged rocks, not traveled by many others. It saddens me to know that there still is much disrespect for Native People. There still is a sense among many, including our own people, that rural Alaska native people are not equipped with advanced knowledge and technical skills like people of other races. The Indigenous people's knowledge comes from centuries of observations made as they experienced life in the wild, untamed lands.

My experience began a little more than 10 years ago while working as Tribal Administrator for the Native Village of Kivalina. I began with little knowledge about politics, but learned quickly after considering what was at stake. Our village was almost immediately impacted by pollution from the newly-constructed Red Dog Mine. Contaminated run-off from the waste rock pile flowed into our fresh water source, the Wulik River and killed thousands of wild trout fish, one of our people's main sources of food. The run-off was eventu-

ally contained and diverted to the tailings containment pond. However, I never felt peace of mind after that and, therefore, began my campaign to protect our environment against contamination from the largest lead and zinc mine in the world.

In an effort to reach this goal, our tribal government requested designation as a cooperating agency (or stake holder) on a project that would expand the Red Dog Mine operations. This project was headed by the Army Corps of Engineers (Alaska District) (ACoE). The purpose of the project was to expand the Delong Mountain Transportation Terminal System to improve efficiency and safety. But how would this project benefit the public and be of national benefit as required by the National Environmental Policy Act of 1969 when it served only the Red Dog Mine? Red Dog Mine is a private company owned by TeckCominco, whose parent company is located in Canada. Public funds were to be used to finance the project. It was stated that the improvements would include reducing the cost of fuel to the villages in the Northwest Arctic Borough by turning the Red Dog Mine Port into a centralized fuel distribution point. However, in order to accomplish these goals, they would have to buy fuel from Singapore or other foreign countries at drastically reduced costs. But wouldn't we then reduce fuel sales in the United States? Also, an environmental impact statement reported that the project would have a devastating impact on our way of life, based on a preliminary study of the possible environmental and human health effects resulting from the project.



“Any scientist would tell you that what grows in certain environments grows there for a reason...Anything that grows in Northwest Alaska in our geographic area is what we eat, [and] what we eat...thrives and survives in the Arctic. What we eat is who we are, and it is so important to us to be able to protect our tribal resources. We need to be able to protect ourselves and our way of life. Colleen Swan, Native Village of Kivalina

Our request for designation as a cooperating agency was initially denied based on the fact that we were a tribe without reservation status and didn't have “special expertise.” However, our opposition to this decision drove our case to Washington D.C., where we explained that we were a federally-recognized tribe serving its members and have certain responsibilities to those members as approved by the Secretary of Interior in our constitution and by-laws.

In the end, the decision made by the ACoE was overturned and it became possible for all tribes in Alaska to be designated Cooperating Agencies. However, the designation was not granted to our tribe because we were not able to reach an agreement with the ACoE as to what our tribe's responsibilities would be for the Cooperating Agency Agreement. That is a consequence that we will have to deal with if the Delong Mountain Transportation Terminal Improvement Project is approved.



Canadian Mine Threatens Alaskan Interests in Taku: Review Process Leaves Many Questions Unanswered

Chris Zimmer, *Rivers Without Borders*

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Update:

Since this article was written in October 2006 Redcorp Ventures has placed its road access plans on hold and is now proposing to use a new and untested combination of a hoverbarge and several types of tug vessels (including a new “amphitrac” tug) to service the Tulsequah Chief mine via the Taku River and Juneau, Alaska. While this proposal would eliminate the road and its numerous impacts on the Taku, this new plan raises serious concerns for Taku salmon, wildlife and their habitats. Redcorp now requires permits from the State of Alaska (but no US

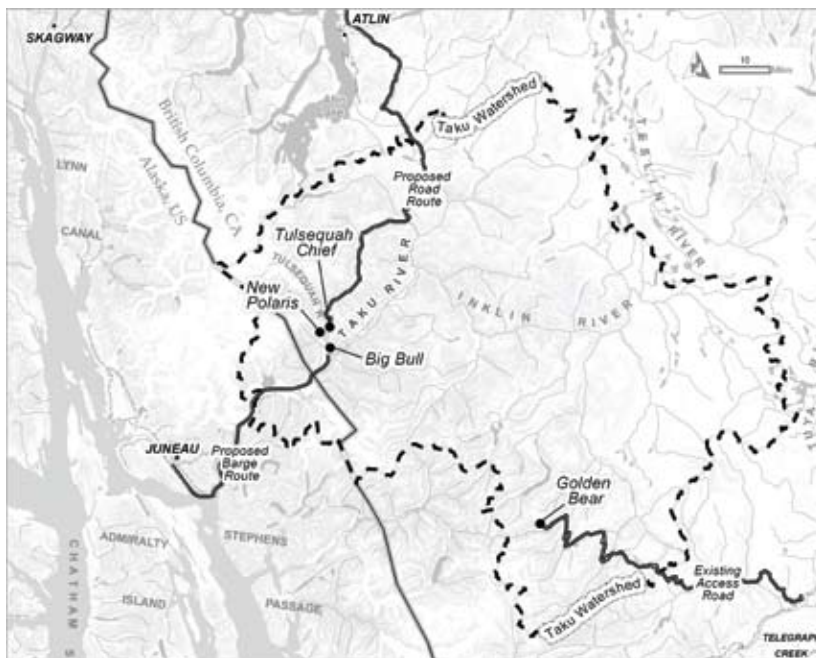
federal permits) and the permitting process began in December 2007. The Alaska Department of Fish and Game (ADFG), fishermen, local businesses, Alaska Natives and numerous others have raised strong concerns about the potential for the hoverbarge and tug vessels to harm spawning adult salmon, incubating eggs and embryos and rearing juvenile salmon, to degrade salmon habitat, to erode river banks and increase sedimentation and to disrupt the annual ice freezeup and breakup regime. The Alaska permitting process has now been suspended because Redcorp has twice failed to supply adequate information to Alaska permitting agencies. The British Columbia (BC) permitting process is also underway, but the Canadian federal process has not yet been scoped. For more information on the

hoverbarge, the permitting processes and concerns raised to date see www.riverswithoutborders.org.

The Acid Mine Drainage (AMD) problem continues at both Tulsequah Chief and Big Bull sites. Redcorp claims it can't clean up this pollution until it re-opens the Tulsequah Chief mine because they lack access to the site. However, this past Summer Redcorp conducted several conventional barging and helicopter operations to bring in supplies, heavy equipment and other materials for mine development so the claim of no access is questionable.

The Taku River Tlingit First Nation (TRTFN) is continuing Land Use Planning negotiations with the BC government. The negotiations should move from framing to substantial negotiations by early summer 2008. This planning process could provide long-term environmental and ecosystem protection supported by sustainable development, but such outcomes are far from guaranteed. British Columbia has always been clear that these negotiations have no bearing on their approval of road access to the Tulsequah Chief site, and there are strong indications that BC may require a legislated road access corridor reserve into the lower Taku whether or not the current mine proponent requires or builds such a road.

The Taku Watershed is now



Graphic courtesy of Rivers Without Borders

Environmental Concerns & Issues

Mining & Industry

more than ever at an important crossroads: will it become a new mining district with the river serving as an industrial highway and without proper environmental review and long term land use planning or will the State of Alaska conduct a more rigorous review of the hoverbarge proposal and seize the opportunity presented by the BC/TRTFN planning talks? The way this is resolved will set precedents, for better or worse, as to how transboundary industrial projects are reviewed and how fish and wildlife protections will be provided.

Original Article (October, 2006)

Crossroads for World Class Watershed

The transboundary Taku River is one of the top five salmon rivers in Alaska and usually the top producer of salmon in Southeast Alaska. Up to 2 million salmon return annually.¹ Twice the size of Yellowstone Park, it is the largest unprotected, undeveloped watershed on the west coast of North America.

As I write this in October 2006

from my cabin in Juneau, eight miles from the Taku, the commercial salmon fleet is wrapping up a lucrative fishing season. Sport fishermen also benefit from the Taku's rich fisheries, with almost half of the Juneau sport fish catch dependent on the Taku.² The Taku fishery is worth at least \$7.5 million to Southeast Alaska, while tourism brings in over \$18 million³. The Taku is the traditional home of the Tlingit native people.

The future of this watershed is in doubt. A junior Canadian mining company, Redcorp Ventures (and its subsidiary Redfern Resources), plans to re-open the Tulsequah Chief mine, and probably the nearby Big Bull mine, and construct a 100 mile access road through the heart of the watershed to Atlin, British Columbia (BC). Other mining companies are interested in using this road to open mines, with mineral stakings and exploration on the increase (see maps).⁴

The Taku is at a crossroads. Will it suffer from piecemeal development without long term land planning and without regard to the obligations of the Boundary Waters Treaty and the Pacific Salmon

Treaty?⁵ Or will the United States and Canada take this opportunity to develop a long term stewardship plan that allows for economic development, respects native rights, and protects the Taku's clean water and healthy salmon runs?

Wrong Mine, Wrong Place

Many Alaskans think this is the wrong mine in the wrong place: an acid-generating mine, mixing zone and tailings dump upstream from some of the most important spawning and rearing habitats in the watershed. The Alaska Department of Fish and Game is worried about Flannigan Slough, just downstream from the confluence of the Tulsequah and Taku Rivers, and wrote in 2001 that "this area is extremely important for rearing juvenile and staging and spawning adult salmon... Degradation of spawning or rearing habitat or water quality in this area, from mining or other development activity, could have substantial adverse effects on the health of anadromous fish stocks throughout the river⁶."

The US EPA "is particularly concerned with the operator's ability to maintain in perpetuity the tailings impoundment, proposed to be located in the active floodplain of Shazah Creek, the project's ability to meet water quality objectives, and the potential for cumulative long-term water quality impacts."⁷

Cleanup Failures

The track record is not encouraging. The Tulsequah Chief and Big Bull mines were abandoned by Cominco in the late 1950's without being cleaned up, and acid mine drainage has since been polluting the Tulsequah River, the main tributary to the Taku. Redfern



Photograph courtesy of Paul Morrison

Aerial view of Tulsequah Chief mine site, 2005



Photograph courtesy of Paul Morrison



Aerial view of Taku River, 2005”

has been violating the Canadian Fisheries Act for 10 years and is the subject of a federal cleanup order. In 1990, Canadian regulators found “considerable acid generation” and “acutely toxic” water samples at the Tulsequah Chief. Subsequent inspections through October 2003 found that “none of the measures undertaken by [Redfern] had significantly reduced the acutely lethal toxicity” of the discharges from the two sites.⁸ In July 2005, Redfern installed a treatment plant at the Tulsequah Chief as a temporary measure. Although we have been denied access to monitoring reports and other information on the cleanup by both Redfern and Canadian agencies, it appears that this plant is receiving mixed reviews. No apparent efforts are being made to clean up Big Bull.

Although the mine and its tailings dump pose serious risks to Taku water quality and salmon, the access road is the larger threat. The access road is the “foot in the door” to major industrial development in the Taku watershed.

Canadians Ignore Road Issues

The US EPA’s comments to the Canadian federal environmental assessment in February 2005 stated, “An associated concern is the potential for other mines such as the Polaris and Big Bull, and possibly others, to be re-opened as well. The potential cumulative water quality impacts of multiple mines operating in this highly productive and sensitive watershed will require much more additional analysis...”⁹

The lead Canadian federal agency, Department of Fisheries and Oceans (DFO), ignored comments such as these by adopting the completely unfounded assumption that the Tulsequah Chief access road would be closed when the mine closed. In its July 2005 environmental assessment approval, DFO asserted that the road would be decommissioned with the mine, blatantly ignoring the advice of its own minister who said in 2004 that “DFO understands that its Fisheries Act and CEAA [Canadian Environmental Assessment Act] reviews would

be best served by considering potential environmental effects of extended use of the road after mine site closure.”¹⁰ Statements by BC and Redfern about restricting access and closing the road are contradicted by BC law, which allows any company with a timber license or mining claim use of the road—a reality that BC was well aware of at the start of this project. According to a September 20, 1999 cable from the US Consulate in Vancouver, “BC officials acknowledged that under their law it would be virtually impossible to refuse access to the mine road to any legitimate third party.”

The parties are stepping forward. In January 2005, the president of Canarc said, “Our re-activation of the New Polaris project coincides not only with higher gold prices but also with the pending development of the large Tulsequah Chief copper-zinc-gold-silver mine and road access of Redcorp Ventures, immediately adjacent to the New Polaris property.”¹¹ Mineral exploration and staking is also dramatically increasing in the Taku, especially along the road route (see maps).¹²

BC and Redfern are promoting widespread development of the Taku based on the Tulsequah Chief access road and are, at the same time, making promises to close the road. A 1993 news article said, “John Greig of Redfern Resources says that Taku River corridor road access is critical to development of the northwestern British Columbia mining industry.”¹³ In its reasons for approving the

Environmental Concerns & Issues

Mining & Industry

Tulsequah Chief in 2002, the BC Ministry of Energy and Mines committed to “require that Redfern close the access road as a means of ensuring that any impacts to wildlife that result from the use of the access road stop, when the mine closes.” Yet, three months earlier on September 13, 2002, the Ministry issued a press release promoting their Geological Survey Branch’s “Joss’alun Discovery” in the Taku watershed. The release included a website link showing the as yet unbuilt Tulsequah Chief mine road and including a note that “The occurrence is about 22 km from the proposed Tulsequah road route.”

In a validation of the old saying of “give ‘em an inch and they’ll take a mile,” Redfern is now stating that the Tulsequah Chief “project” includes both the Tulsequah Chief and Big Bull.¹⁴ A mine of this size, and specifically reopening Big Bull, was never assessed by Canadian agencies and requires additional environmental assessment and new approvals.

Alaskan and Other Concerns Ignored

Alaskans have been worried about this project for years, and believe that these concerns have never really been addressed by the Canadian federal or BC government.

In December 2001, Alaska governor Tony Knowles wrote: “The State of Alaska has been working on issues related to the Tulsequah mine project for over 7 years, but nothing to date gives us confidence that our concerns for protecting Taku River salmon and their habitat have been addressed.”¹⁵ The situation hasn’t gotten any better since then. In March 2003, the United Southeast Alaska Gillnetters wrote, in a letter to the DFO minister, “we have never been satisfied that our concerns have been addressed in a serious manner.”¹⁶ In July 2004, Juneau Mayor Bruce Botelho wrote to the Canadian federal government, “There is no evidence



Taku River sand flats and glacier on lower river, Oct. 2007

*Photograph courtesy of Chris Zimmer,
Rivers Without Borders*

that the views of Alaskans were integrated into the BC assessment or even seen by Ministers making the decisions.”¹⁷

After a February 8, 2005 Taku Public Forum, convened by the City of Juneau after Canadian agencies refused to host a public hearing in Alaska, Mayor Botelho told Canadian radio, “The overwhelming majority of people testifying are either opposed to the mine development or very concerned that there has been insufficient demonstration that the watershed would be adequately protected.”¹⁸

What Next?

During the federal assessment, DFO brushed aside substantive concerns and questions with a promise that the issues would be addressed in a detailed permitting process. However, it appears that this process is stalled. In fact, DFO is now claiming that no further review is needed before the issuance of permits for the access road.¹⁹

DFO is facing a lawsuit filed by Rivers Without Borders that seeks to



Acid mine drainage into Tulsequah River, Oct. 2007

*Photograph courtesy of Chris Zimmer,
Rivers Without Borders*



halt the issuance of any permits until serious flaws in the DFO environmental assessment are addressed, including the clearly wrong assumption that the road will be closed, and until a detailed permitting process is completed as promised. A decision from the Federal Court of Canada is expected sometime in mid to late 2007.

The company must soon demonstrate that it has an economical project. On May 17, 2005, Redcorp Ventures Ltd. halted its feasibility study and announced that the project is now on hold due to a “combination of increased capital and operating expenditure estimates and a reduced resource estimate,” and that more work will be needed to make the project “financeable.”²⁰ They are now conducting new drilling at the Tulsequah Chief and Big Bull in a desperate attempt to find an

economical ore deposit, and plan on issuing a new feasibility study by early 2007.

Now is an excellent opportunity to take a step back from the focus on this one flawed project and develop a long term management plan for this watershed. In contrast to BC’s rush to develop the Taku watershed, the Taku River Tlingit First Nation (TRTFN) has developed a conservation-based land plan that allows for economic development while ensuring that the Taku will remain healthy and productive.²¹ The Tlingit are now in formal government-to-government talks with BC regarding land planning and the future of the Taku. The Tlingit are asking that no development occur prior to the finalization of a detailed land management plan, but BC has refused this request. An International Joint Commission

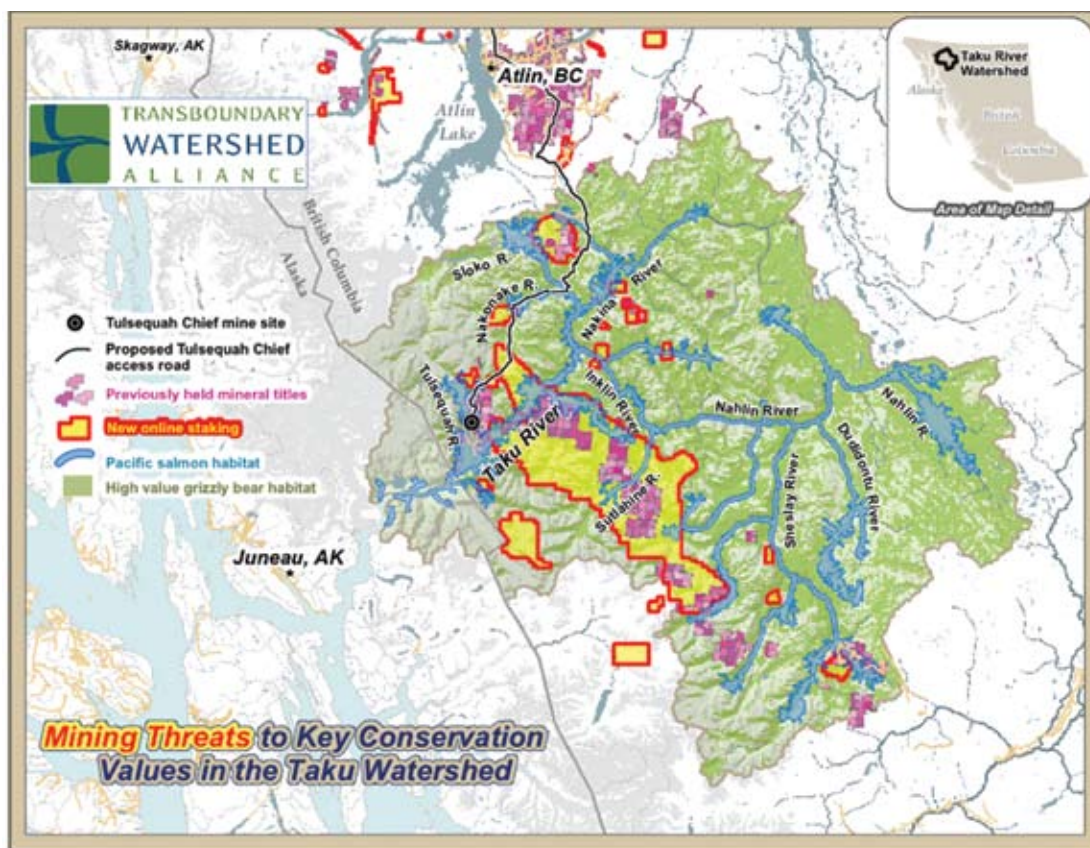
convened under the authority of the Boundary Waters Treaty is another vehicle to resolve the disputes in the Taku, but Canada and BC oppose this option.

“The Tlingit people on both sides of the border have a long-term commitment to the land, while the mining company has only a short-term interest in this land,” said John Ward of the TRTFN in February 2005.²² The question at hand is whether governments and industries will take this long term view.

For more information, please contact:

Chris Zimmer
US Field Coordinator
Rivers Without Borders
(907) 586-4905
Zimmer@riverswithoutborders.org
www.riverswithoutborders.org

Graphic courtesy of Rivers Without Borders



Environmental Concerns & Issues

Mining & Industry

References:

1. Undated factsheet, Alaska Department of Fish and Game; Comments to DFO, US EPA Region 10, February 18, 2005.

2. Personal communication with Ed Jones, fisheries biologist, Alaska Department of Fish and Game, December 2004.

3. The Taku River Economy: An Economic Profile Of The Taku River Area, The McDowell Group, September 2004.

4. See BC Mineral Titles Online site at www.mtonline.gov.bc.ca/ and attached maps.

5. Article IV of the Boundary Waters Treaty says “waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other.” In the Habitat and Restoration portion (Attachment E) of Annex 4 of the 1985 Pacific Salmon Treaty Canada and the other signatories agreed to: “protect ... habitat so as to promote safe passage of adult and juvenile salmon and achieve

high levels of natural production”, “maintain ... safe passage of salmon to and from their natal streams”, and “maintain adequate water quality and quantity.”

7. Comments to DFO, US EPA Region 10, February 18, 2005.

6. State of Alaska White Paper, October 2001.

8. Letter from Environment Canada Minister David Anderson to Nicole Lischewski, February 12, 2004.

9. Comments to DFO, US EPA Region 10, February 18, 2005.

10. Letter from DFO Minister Geoff Regan, in response to Petition 95A from the Society for Atlin’s Sustainable Economic Initiatives, February 11, 2004

11. Press release, Canarc Resource Corporation, January 12, 2005.

12. See BC Mineral Titles Online site at www.mtonline.gov.bc.ca/ and attached maps.

13. Mineral exploration over the border, Rishel, John, Alaska Business Monthly. November 1993.

Vol.9, Iss. 11; Sec. 1. pg. 45.

14. Redcorp Ventures, Second Quarter Interim Report for the Period Ending June 30, 2006, page 4.

15. Press release, Governor Tony Knowles, December 5, 2001.

16. Letter from United Southeast Alaska Gillnetters to DFO Minister Thibault, March 17, 2003.

17. Letter from Juneau Mayor Botelho to Canadian Department of Foreign Affairs, July 6, 2004.

18. CBC Radio transcript, February 9, 2005.

19. Email from Herb Klassen (DFO) to Nola Poirier (Transboundary Watershed Alliance), April 18, 2006.

20. Press release, Redcorp Ventures, May 17, 2005.

21. See www.roundriver.org/trt_conservation_main.html.

22. Joint press release, Douglas Indian Association and Taku River Tlingit First Nation, February 9, 2005.



Maintaining The Environmental Stewardship of the Trans-Alaska Pipeline

Reviewed by: Rhea DoBosh, Information Officer, Joint Pipeline Office in Anchorage, Alaska

The Trans-Alaska Pipeline System (TAPS) is known the world over as one of the most significant achievements in engineering during the last thirty years. Since its inception, the pipeline has influenced and altered the physical, social, political, and economic landscape of Alaska. Nowhere has this impact been felt more greatly than with its indigenous peoples.

When oil was discovered in Prudhoe Bay in 1968, the concept of a pipeline carrying oil down to a marine terminal in Valdez was born. There were major challenges facing the construction of such a pipeline beginning with the location. The pipeline begins in Prudhoe Bay which is located north of the Arctic Circle with temperatures ranging from -115°F (including the wind chill factor) in the winter up to 70°F in the summer. Other major construction challenges included diverse terrain in a highly active seismic region, major river crossings, and permafrost (i.e., frozen ground).

There were Alaska Natives who filed protests with the Department of the Interior to the transfer of lands along the proposed pipeline corridor, effectively blocking construction of the pipeline. The pipeline owners negotiated with Alaska Natives living along the corridor route, promising jobs and contracting opportunities throughout the life of the pipeline in exchange for lifting the protests they had filed with the Department. The Alaska Claims Settlement Act of 1971 resolved many land issues along the proposed pipeline



Gene Ferguson

corridor. The settlement terms included Alaska Natives receiving 40 million acres and approximately one billion dollars.

By 2004, the TAPS Federal Grant and State Lease had been renewed. The environmental impact statement that was required in the renewal process contained pipeline historical data. Since 1977, the pipeline has been in continuous operation. Under regulatory control, the pipeline effects on the physical environment, the land, air quality, and water quality are familiar. Much of the environmental data that was considered was extrapolated from prior experience. The pipeline was basically expected to continue without significant change, and any changes that did occur were estimated to be limited and manageable. Some of the biological resources evaluated included vegetation, wetlands, fish, birds, terrestrials, and marine mammals. Social and economic

impacts were equally evaluated. Unique considerations included subsistence harvest areas. Some areas of Alaska, notably the interior and western areas where subsistence activities provide more than 50 percent of the residents' daily nutritional requirement were examined for potential impact.

The Bureau of Land Management and State of Alaska, through the Joint Pipeline Office (JPO), were both required to work through the government-to-government relationship with the Alaska Native Tribes. The JPO developed a government-to-government relationship protocol, identified affected tribes, and laid out a process and communication plan. Public meetings were conducted through the Alaska Administrative Order

Environmental Concerns & Issues

Oil Exploration & Industry

No. 186 and Executive Order 13175.

After a lengthy renewal and approval process, the State Lease of Right-of-Way and Federal Agreement and Grant were renewed for another 30 years until 2034 to the owners of the TAPS.

Recent events including disruption of oil production in the Gulf of Mexico and world competition for energy have once again raised the need to examine domestic sources of energy and alternate sources of energy. TAPS' importance is underscored as it transports approximately 15 percent of the nation's crude oil production.

In order to continue with the pipeline's relative success for the next 30 years, it is in everyone's interest that the operation of the pipeline continues to protect the environment and safeguards public health. Only then can economic vitality be ensured for all of Alaska's inhabitants. As we continue to explore and develop new energy sources, it is prudent to prevent pollution in the first place. In the long term, this will be the most cost effective route.



Quick facts about the pipeline:

- The pipeline covers over 800 miles.
- The pipeline measures 48 inches wide, is elevated above ground for 420 miles, and is buried for the next 380 miles.
- The pipeline crosses three mountain ranges and more than 800 rivers and streams.
- Construction was completed in just over two years (March 1975 - May 1977).
- More than 14 billion barrels of oil have moved through the pipeline.
- There are approximately 579 animal crossings along the pipeline.

Strategic Reconfiguration (SR)

The SR project represents the single biggest pipeline investment since construction of the TAPS. The upgrade will replace 30-year-old pump and control systems with state-of-the-art modern systems that are easier and less expensive to operate and maintain.

The overall effect of reconfiguration is expected to benefit the environment. According to the most recent environmental assessment released by the Bureau of Land Management, pump station electrification will reduce air emissions by two-thirds, eliminate pump station fuel hauling and storage risks, and reduce the environmental impact of day-to-day Alyeska Pipeline Service Company (TAPS management company) operations, such as noise and wastewater handling.

The following are some of the major environmental concerns involving the pipeline.

Spills

Spills are a major concern as they can cover large areas and can, in some cases, cause extensive irreparable damage to the ecosystem. Spills are difficult to clean-up and the impact to all the inhabitants may not be known until years later. Clean-up costs can be staggering. One of the most famous spills not directly associated with the pipeline was the famous 1989 Valdez Spill,



Photo used under permission by Dave Perez, JPO.



which was caused by a supertanker. The spill resulted in 11 million gallons of oil being dumped into Prince William Sound. The legal settlement in 1991 exceeded \$800 million. Because certain wildlife species have not recovered since the spill, additional claims may still be forthcoming.

Leaks

Leaks are a concern because, depending upon their size, they can go undetected and over time can evolve into larger problems. Timely response is critical to detect and correct a leak. There have been several spills through the pipeline's history and vigilance needs to continue to assure that leaks are detected quickly.

Fires

6.7 million acres of interior Alaska land burned in the summer of 2004, the result of 736 fires. JPO monitored TAPS closely in those areas affected by fire. Pipeline throughput was not affected and only very minor repairs, which were performed during regular maintenance activities, were needed. TAPS original design considered the inevitability of fires in many locations. Several steps were taken to protect

the pipeline and sensitive equipment and pump stations. The right-of-way is regularly monitored and brushing is performed to keep foliage away from the pipeline and valves. Special wrapping and insulation resistant to fire was applied to the pipeline and equipment. TAPS has been "in the line of fire" many times over the years with minimal damage.

Aging/Maintenance

The pipeline is now over 25 years old and there are concerns regarding corrosion and the increased need for maintenance and repairs. Corrosion can cause leaks throughout the system.

Sabotage

Adverse actions can damage the integrity of the pipeline and result in environmental damage. A recent example of this was in 2001, when a person shot a bullet into the pipeline causing a major oil spill. More than 277,000 gallons of oil were spilled over 36 hours in the spruce forest that surrounded the pipeline.

Natural Events (Earthquakes)

The unique zig zag pattern of the pipeline was designed to

withstand seismic activity. TAPS has experienced many earthquakes, including one with a magnitude of 7.9. During all earthquake events, the system acted as designed with minimal damage.

All of these concerns underscore the need to ensure the environmental stewardship of the pipeline. This will require, among other things, effective governmental oversight through proper monitoring, compliance with current environmental requirements, and following state-of-the-art technical requirements and guidelines. Oversight performed by the Federal/State Joint Pipeline Office also can greatly assist compliance and demonstrate governmental cooperation. Only then can many of the environmental concerns and risks be significantly reduced over the next 30 years. For more information on the Joint Pipeline Office, please visit www.jpo.doi.gov.

The Challenge

This article has been reprinted with permission from Janice Johnson, EPA Tribal Waste Journal Creative Director. "The Challenge" originally was published in the EPA Tribal Waste Journal, Issue 3, February 2004 (EPA530-N-03-0005).

The word "Alaska" conjures images of tundra, rugged terrain, and harsh conditions. This stereotype, however, doesn't pay tribute to the state's diversity. Alaska is one-third the size of the continental United States and is divided into five unique climate zones. Alaska Natives are as diverse as the climate and topography of the state, from the Sugpiaq Aleuts of the Alaskan peninsula to the Inupiat, Yup'ik, and Siberian Eskimos of the Bering Sea and Arctic Ocean coasts to the Athabascan people of the interior to the Tlingits, Haidas, and Tsimshians of the southeast coast.

Although there are hundreds of Alaska Native villages, and each village has a unique culture and history, Alaska Natives are united in their quest for funding, recognition, and social justice. Raven Sheldon of Selawik Village believes, "Everyone is entitled to basic services. The tribes up here are 3, 4, or even 5 years behind tribes in the lower 48 states when it comes to being able to provide basic services for members." Tribal

leaders throughout Alaska are working to secure services that are critical to the health and safety of their people. Proper solid waste management ranks near the top of the list.

Many Alaska Native villages do not have the funding, technical expertise, staff, or equipment required to close open dumps, or ensure safe disposal of solid wastes. Common difficulties associated with solid waste management in Alaska Native villages include:

- ▶ Residents dispose of plastic, metal, and paper waste.

- ▶ A remote location makes shipping (back-hauling) waste difficult and expensive.
- ▶ Permitted land-fills are more expensive to build and maintain than open dumps.
- ▶ Burning waste reduces waste volume, but concentrates toxic materials and produces harmful smoke.

The villages featured in this issue of the Tribal Waste Journal have overcome some of these common obstacles through creativity, persistence, and partnerships.

"I want the people who read this issue of the Tribal Waste Journal to understand the big picture. I want to open peoples' eyes and focus more attention on Alaska. Federal agencies should send representatives to visit Alaska villages to gain a better understanding of our situation. Tribes up here are being overlooked."

—Raven Sheldon, Selawik Village



Environmental trainers gave villagers the tools to tap into the leadership and creative potential of the community. Partnerships enabled them to leverage private, state, and federal resources to achieve community goals.

Considering Culture and Climate

Villages interviewed are working to implement solid waste management practices that are compatible with the local environment and culture. For thousands of years, Alaska Natives lived subsistence lifestyles, hunting and gathering to survive and producing very little waste. Rosalie Kalistook, environmental planner for the Association of Village Council Presidents explains, “In the past, people did not generate a lot of trash. Any garbage they produced came from the land. They used to bury bones from terrestrial animals under the ground, giving them back to Mother Nature.” The biodegradable nature of the waste stream changed as nomadic tribes assumed a sedentary lifestyle, and Alaska Natives began to consume outside goods. Villages are inundated with plastic, metal, and paper goods and packaging, but most of them do not export waste. This change in lifestyle has created waste management problems that did not exist in the past.

Some Alaska Natives, such as the Athabascans, were traditionally highly mobile. According to Roy Andrew of Kokhanok, “Between 1955 and 1963, our people gave up the nomadic life style and settled in Kokhanok permanently.” As a result, community members became

more dependent on durable goods such as snowmobiles and appliances.

There are five distinct climate zones in Alaska—arctic, interior, west coast, south-central, and maritime (which is further subdivided into western maritime and eastern maritime). Each climate zone has specific temperature and precipitation patterns. These patterns, along with differences in underlying bedrock, produce characteristic soils and vegetation patterns, from grassland tundra in the arctic to temperate rainforest in the southeast. Solid waste management solutions must be compatible with, among other factors, the distinct climate and soils of each village.

Tundra dominates the west coast and arctic regions of Alaska, where a thin layer of soil rests on top of permafrost, a permanently frozen layer of ground. Open dumps and landfills can exert pressure on the permafrost and cause it to melt. As the permafrost melts, the ground begins to sink. Some villages have discovered disposal options that preserve the tundra, which is not resilient once damaged. For example, Selawik is planning to build above ground disposal areas surrounded by berms and fill them with special storage bags to prevent waste and leachate from disturbing the tundra.

Solid waste management planners for St. Paul Island must take into consideration sandy shorelines in addition to a treeless tundra interior. Residents are working to open a new landfill and close an old one, which is located in a sand dune. Landfill leachate perco-

lates quickly through sandy soils and ocean winds blow plastic bags and other waste onto the tundra.

Unlike Selawik and St. Paul Island, Chilkat Indian Village is located in southeast Alaska on permeable silt soil rather than tundra or sand. While Chilkat’s environmental planner does not need to worry about protecting permafrost, she must consider the impacts of the village landfill on a nearby river. Leachate from the landfill could potentially move through the silt soil into Chilkat River.

“Alaska has five distinct regions with different cultures and climates. You can’t develop a single solid waste management plan for every community in Alaska because each community is unique.”

—Patricia Warren, environmental planner, Chilkat Indian Village

For more information or to obtain a copy of the EPA Tribal Waste Journal, please contact Janice Johnson, EPA Tribal Waste Journal Creative Director, at 703.308.7280 or johnson.janice@epa.gov or visit www.epa.gov/tribalmsw.

The Tundra Bag Concept

Bill Stokes, 7 Generations Environmental Consultants

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Village dumps have long been a serious environmental problem for all of Alaska's rural villages, especially tundra villages. The very nature of permafrost soil makes conventional landfill cell design all but impossible for these villages. As there is no reasonable alternative, the solid waste generated by the villages is dumped onto the tundra or open burned in place.

Some villages are using polypropylene "super sacks" as an alternative to open dumping with limited success. The super sack very successfully serves as a solid waste collection and transportation method. Unfortunately, the polypropylene bags degrade in UV (ultraviolet) light, and the solid waste is again exposed to the environment.

After more than 10 years of research and development, a unique woven fiberglass fabric was fashioned called Tundra Teck. This woven fiberglass fabric is UV immune and will withstand the rigors of Alaska's harsh climate. For the first time, a village-based solid waste collection and transportation system, and creation of an above-ground landfill cell is possible.

The Tundra Bag is designed around three main concepts: creating an above-ground landfill cell technology; providing a viable alternative to open burning of solid waste; and, creating a cottage industry for the villages (the Tundra Bags could be made in the

villages). There are two Tundra Bag sizes and both bags use the same basic technology. The solid waste is placed in the top of the Tundra Bag and, when full, the top is pulled together and tied with a knot. A plastic clip allows the loops on the corners of the Tundra Bag to be connected together so the Tundra Bags can form a berm and do not roll in the wind.

The open dump "Cleanup" bag is a four foot cube bag that will contain almost two cubic yards of solid waste and is designed to be filled "in place" during a village dump cleanup. The premiere design would be to use the "Cleanup" bags to build a berm around the perimeter of the old dump, thus creating a landfill cell.

The "Dump Truck" bag is a smaller tundra bag that is designed to be transported from the village to the landfill cell. This Tundra Bag hangs on a steel pipe frame that is bolted to the floor of an ATV trailer or snow machine sled. The "Dump Truck" bag is three feet square, four feet high, and will contain a little more than one cubic yard of solid waste. The "Dump Truck" Tundra Bag is designed so that the village solid waste technician can fill the bag in the village, transport it to the landfill, unhook the bag from the frame, tie the top closed, pull it from the frame, and drag it into place in the landfill cell.

During the summer, the boardwalk would be used to access the



landfill, and during the winter, the snow machine sled would allow the Tundra Bag to be transported to the landfill. Additional frames and "Dump Truck" Tundra Bags can be placed at the village landfill for those that want to transport their own solid waste. As no site preparation is necessary, the landfill can be placed wherever the village decides is the best location and meets Alaska Department of Environmental Conservation regulations for Class III landfills.

There will need to be some solid waste source separation at the villages for this technology to work. Best practices would encourage that all of the solid waste be placed in garbage sacks before being placed in the Tundra Bag. Hazardous waste and medical wastes should never be taken to the landfill. Heavy, sharp metal and broken glass may create problems during dragging of the Tundra Bag at the landfill.

As Tundra Bags are at the cutting edge of village solid waste technology, there will be a learning curve to develop "best practices" for their use. However, this is much preferred to the open dump technology that the villages use now.



Awareness and Action: Village Based Solid Waste Management Solutions and EPA

*Joe Sarcone, Rural Sanitation Coordinator
U.S. EPA Region 10, Alaska Operations Office*

Through the years, rural sanitation conditions in Alaska villages have often been compared to conditions in third world countries. Today, approximately 15-20 percent of the households in rural Alaska remain unserved by piped water and sewer systems or an equivalent technology. In the majority of villages, the solid waste disposal site is an uncontrolled, intermittently burning, open dump site, in many instances located close to the village, and often in an area of free standing water or flooding.

The context in which these conditions persist is complex. Variables that influence a village's capability to address issues of health and the environment are many and include socio-economic, political, cultural, and environmental considerations. There is positive change in protecting human health and the environment where there is village-level awareness and action.

In the past decade, environmental awareness among residents of villages in Alaska has dramatically increased in large part due to two programs, the EPA-Indian General Assistance Program (IGAP) and the RuralCAP, Raven Ameri-Corps program. The village environmental program supervisors and staff supported by these programs translate newly acquired knowledge and skills into actions that not only protect the environment but also empower Tribal governance. These resources are leveraged by a number of other projects and programs including: the 7 Generations Environmental Assessment Tribal Training, the Alaska Native Tribal

Health Consortium (ANTHC), Solid Waste Management Demonstration Projects, the annual ANTHC Tribal Environmental Management Conference, programs offered through the Yukon River Inter-Tribal Watershed Council (YRITWC), and Central Council Tlingit and Haida Indian Tribes of Alaska (including the much utilized Solid Waste Alaska Network, www.CCTHITA-SWAN.org). These programs continue to be funded, in large part, by EPA, but the work of getting things done with these resources happens in the villages.

Solid waste management efforts in the village have primarily focused on two areas: the separation and proper disposal of hazardous and potentially hazardous waste, and reductions in the volume of waste going to the dump site. In the village waste stream, the two commonly disposed of wastes identified as potentially hazardous to human health and the environment are used oil and lead acid batteries. More than a dozen villages have purchased and now operate used-oil heat recovery units resulting in considerable power costs savings in remote locations where energy costs are extraordinarily high. Many village environmental programs have organized lead-acid battery collection and back haul through barge companies and air carriers. In the past 10 years, Raven Ameri-Corps members successfully removed more than 300,000 pounds of lead-acid batteries from villages to battery recycling destinations. Other programs have experienced similar

success with such efforts.

The opportunities for reaching recycling markets from rural Alaska are very limited with few exceptions including aluminum can recycling. Village environmental program staff work with the Alaskans for Litter Prevention and Recycling (ALPAR) Flying Cans Program to back haul aluminum to recycling centers in larger cities. In 10 years, Raven Ameri-Corps members successfully removed more than 200,000 pounds of aluminum from villages to recycling destinations.

Appropriate technologies for reducing waste volume have been difficult to identify due in large part to limited revenue within the village to support the operations. The most commonly used low-cost technology is the burn box. Burn box designs vary, but they are generally regarded as low-efficiency incinerators that can provide more control of the burning process than open burning. Burn boxes offer an incremental improvement in protection to human health and the environment in relation to open burning, but remain an intermediate solution for solid waste management in villages. Other technologies that are being introduced to villages include more efficient burn box designs, moderately sized proper incineration units, and baler facilities.

Health Risks Associated with Waste Practices in Alaska Native Villages

Lynn Zender, Ph.D., Zender Engineering

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Rural Alaska tribes face unique and challenging circumstances on many fronts, including their waste management situation. Of the nearly 200 rural tribes not accessible by road, about ninety-five percent have unlined open dumps that are typically unmanaged, unfenced, and unconsolidated. Due to the extreme transportation and weather logistics, backhauling wastes to regional facilities is not possible, and would cost households in these small villages several hundred dollars each month.

What is in these dumps? The dumps contain every waste that is generated in the village, including hazardous wastes of all types, vehicles, and construction wastes. In at least 30 percent of the villages, some to all honeybucket wastes (i.e., undiluted feces and urine typically in tied-up plastic bags) are discarded at the site. Alternatively, garbage is discarded at the adjacent honeybucket disposal site, creating an expanded problem area.

These open dumps are often located in low-lying tundra areas, with direct hydrological connection to adjacent rivers and ponds. Fifty-six percent of dumps are seasonally flooded. Some contamination of land and water from dump leachate or runoff is expected. Such a situation is problematic because Alaska tribes retain a subsistence lifestyle. Hunting, fishing, and gathering from the local environment provide the dietary mainstays. Subsistence

activities and their associated values and traditions are a dominant facet of Alaska Native life. As an indication of scale, in a survey of over 100 villages, hunting or fishing was reported to take place in the vicinity of the dump in 45 percent of the villages.

It is well documented that subsistence food intake is vital to maintaining individual rural Alaska Native health, as well as community socio-cultural health. In tribal communities, perhaps of greater concern than physical exposure to dump site contaminants is the residents' concern that the dump sites are impacting their subsistence activities. In 2000-2001, the Central Council of Tlingit and Haida Indian Tribes of Alaska sponsored a state-wide solid waste management project which included a 110 village survey. In this survey (discussed in more detail below), 64 percent of residents from disparate village situations reported altering their subsistence activities due to their fears of off-site contamination.

Contaminated water is another concern because of the common, if not predominant, rural Alaska practice of using untreated water sources for drinking and other household uses. Alaska Natives' heavy use of untreated water and local subsistence foods strongly indicates a proportionately higher overall contaminant exposure from open dumps than would be expected for virtually any other U.S. population group.

Exposure to dump site contaminants is possible via a number of routes. Due to lack of staff and/or



lack of soil, a mere 6 percent of villages apply cover material to control vectors and minimize human-waste contact. At about 55 percent of dumps, users must walk on top of garbage to unload wastes. Additionally, with the absence of hardware stores, dumpsites are used by some residents in about half of the villages to salvage parts.

Beyond exposure via the use of the dumpsite, other unsanitary practices that are prevalent include; tracking contaminants or pathogens in town, eating or touching contaminated foods, hunting in contaminated areas, and inhalation or other exposure to smoke or ash from open burning wastes at the dump or in home burn barrels. Seventy-two percent of dumps were self-reported to be within one mile of homes, and at least 30 percent within one-quarter mile. Yet, burnboxes or dump fires are used in up to 73 percent of Alaska villages. Over 61 percent of residents in the 2001 health study reported being regularly bothered by dump odors or smoke during the course of

everyday activities. Open burning for waste management is permitted in rural Alaska. However, it would occur regardless of permission because many villages, if not most, lack heavy equipment, cover material, dry land, and/or operational monies. Without burning, their dump would expand into the river or town within a matter of months to a few years. Note, in the absence of roads, sites cannot be simply relocated.

Historically, it has been difficult to quantitatively identify physical health risks posed to native villages because the population size is too small for statistically significant results. However, two recent epidemiological studies have specifically addressed Alaska village open dumps. Both studies generated significant associations between health and poor waste conditions.

The previously mentioned 2000-2001 solid waste management project included a 110 village comprehensive self-report survey, from which the descriptive statistics described in this article are taken. In conjunction, increases in health symptoms associated with a number of surrogate exposure factors (such as dumpsite use and home distance from the dump), were evaluated in four pilot villages. The household surveys, which were based on other dump site health effect studies, included questions related to general immune function (e.g., headache, nausea, eye irritation, etc.), and household solid waste management and subsistence practices.

Remarkably, people who visited their dump were 2 to 3.7 times more likely to experience faintness, fever, vomiting, stomach pain, ear and eye irritation, headache, and numbness. Those who visited more often were more likely to experi-



ence symptoms. Residents did not need to visit the dump to be at increased risk. People living closer than one mile to their dump were 19 times more likely to have eye irritation and three to four times more likely to have headaches and/or faintness.

To avoid visiting the dump, residents in at least 66 percent of villages burn waste just outside their home, typically in 55-gallon drums. For a proxy measure of exposure to this smoke, residents' waste burning habits were examined. Residents who burned were five to 17 times more likely to feel faint, and almost five to ten times more likely to develop numbness. The risks increased the more often people burned. Home barrel burners were much more likely than other residents to have developed rashes, and were at a significantly increased risk for a variety of other symptoms including fever, sore throat, and cough.

In contaminated areas, one of the first negative effects can be reproductive system problems. Studies have found increases in negative birth outcomes near contaminated areas. Thus, as a follow-up to the 2001 study, a

2004 study examined over 10,000 records for babies born during 1997-2001 in 197 rural Alaska Native villages, along with village dump rankings for overall dump hazard condition and hazardous content. A number of other risk factors including age of mother, cigarette use, prenatal care, village plumbing, and economic status, were accounted for.

- Differences were not found in the number of pre-term births, stillbirths, babies who were classified as very-low birth weight, or babies who were considered small for their gestational age.
- However, babies registered to mothers from villages with high hazard dumps were about two to four times more likely to be low-birth weight (about 55 grams less) than babies from villages with lower hazard rankings, with pregnancies lasting on average 1.2 days less.
- Babies registered from villages that had

Environmental Concerns & Issues

Solid Waste & Open Dumps

dumps with highly hazardous contents were about 4.3 times more likely to have certain birth defects. Additionally, a statistical indication for all birth defect categories was found, with the estimates similar to significant associations found in other studies on maternal populations living near open dump sites in developing countries.

The issue of risks to rural Alaska Natives from waste management facilities and practices is complex, and a solution is being sought by a wide variety of agencies, tribal groups, and non-profits. With the complex weave of road-less village transportation and weather logistics, the paramount importance and intransigence of a subsistence lifestyle, diverse governmental relationships, policy trends, local capacity, and funding availability, whatever the solution is, it is at least a decade off. In communi-

ties where expansion of the town footprint or relocation of the dump is not possible (as there are no roads), these are not straightforward questions, and stricter regulations without appropriately formed and funded assistance would be, at best, fruitless. For example, the tradeoff between unhealthy smoke exposure versus degradation of subsistence grounds, or versus expansion of the dump onto the last usable dry land for homes, is a decision that only the tribe can make. In the case of smoke exposure, community short-term health can suffer. In the other cases, community integrity can suffer. Losing traditions can divide the generations. Without their own home, youth may move away, and the community could lose its future.

It is now possible to define the health risks faced by villages in such a way that the definitions can be used in making waste manage-

ment decisions: Which practices specific to Alaska villages are most hazardous? How hazardous are they compared to alternatives? What wastes would make a true difference separated from the wastestream? How close can homes be built to a dump site? How close can berries be picked? Are there significant differences in health risks between the various open burning units being used? With this information, tribes are empowered to best protect the community, while searching for resources that will provide improved protection from waste risks in the future.

For more information on waste management conditions and studies discussed here, contact Dr. Lynn Zender at lzender@zender-engr.net or visit the Solid Waste Alaska Network at www.ccthita-swan.org. Dr. Zender also may provide full references for the materials presented in this article upon request.



Snake in the Sand

Steve Johnson, DoD Lands Investigator for Sitka Tribe of Alaska

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Standing up on the deck of the 24-foot boat, it's hard to picture 30,000 military personnel in the Northwest coast rainforest of Sitka, Alaska. My dive buddy, Jeromy Campbell and I

add a little air to our dry suits, don our fins, check our tanks and prepare for the journey below. It is a beautiful winter day, azure skies and turquoise waters meet on the island-studded canvas. The 41-degree water is warmer than the 24-degree air. With a large splash we roll off the side of the boat into the frigid waters, and after a moment of adjustment we descend into the deep. Light surges of the



ocean tidal currents sway us about as we sink to the bottom. Tiny bubbles flow out of the breathing apparatus shimmering to the surface. As we approach the 60-foot bottom, the white bottom sands



Environmental Concerns & Issues

Toxic Contaminants

of Abalone Island come into focus, through the darkness of the deep a dark line appears on the sea floor, where it has rested for more than 60 years. The cable once connected area military sites during WWII. Firing Coordinates from radar positions above once raced through it to the heavy artillery at the other end.

Bringing the cable back to the surface has its own set of challenges. With a lift bag in hand, Campbell lassos around the cable and snaps the bag on. With a shot of air in the bag the cable lifts off the bottom, dancing in the current. We give a few tugs on the control line and the surface crew hauls the cable in. Miles of the lead, copper, creosote, and hemp cable run from island to island, connecting more than 30 defense sites in the Sitka area. The cable which lies across critical marine habitat, is poised to release thousands of pounds of lead into the environment.

To the Tlingit people of southeastern Alaska, hunting, fishing and gathering is a way of life. Clams, abalone seaweed, and chitons of the low tide are important food sources for the people. For thousands of years the bounty of the waters and the woods have sustained the Tlingit. Today tribal elders are concerned about the extra chemicals and metals creeping into the food chain. At the north end of town, a popular shotgun shooting range recently passed a policy prohibiting lead shot. Previously, the fall out from this range peppered the clam beaches with lead. Through the years, the lead has spread. The same concern exists with the lead cable. Over the years, a number of private individuals have salvaged sections of the cable, hoping to get rich from metals recycling.

“We dug up a couple hundred yards on Kruzof Island. We burned the outer layers off and put the metal in a 17 gallon drum, the fire stunk really bad. We figured we’d better sell what we had. The price per pound was too low so, we quit” – a quote from the late Al Perkins Jr.

Back on the boat, deck hand Jim Nielsen and skipper Ben Johnson stack the cable as Campbell and I shimmy over the stern of the boat onto the back deck. Climbing out of the water in a dry suit and fins takes a certain finesse that resembles a seal sliding up on the rocks. The lead cable is cut into 30-foot sections and tied to the gunnel rails of the boat.

The condition of the cable varies greatly depending on the bottom composition and depth. Shallower objects tend to break down quicker while the sections lying deeper remained largely intact. The deeper you go, the less oxygen is in the water. The amount of sand and gravel also play a role. Water sand blasting whittles the 1-1/2 inch thick coating into small threads while other areas bury it in silt. Once the creosote coating is peeled off, the salt water goes to work on the steel armor and exposes the lead and copper.

With the sand and wave action, the cable has the potential to release massive amounts of lead into the pristine waters.

The tribe is taking cleanup in its own hands. Sitka Tribe of Alaska, the federally recognized tribal entity for Sitka, is in the process of removing the lead cable. The cable will be shipped to Seattle for recycling. The tribe works cooperatively with the US Army Corps of Engineers and receives funding from the Native American Land Environmental Mitigation Program

(NALEMP), a US Department of Defense (DoD) program, to carry out the clean up effort. Pat Roth, the Corps’ Project Manager, while not diving with them, is also excited about the project. “This work the Sitka Tribe of Alaska is completing is a shining example of what can happen when the Department of Defense and Tribes work together.” Under NALEMP, much of the control and management of the project funds are turned over to the tribe that is being impacted by remnants of past military activity. The tribe wins by managing the clean up that is in its own back yard; the DoD wins by having the material removed. Both parties enjoy a new relationship of cooperation and trust that hopefully will last for many, many years.

Back in the boat, Campbell and I switch air tanks and head back to the bottom for more salvage work. As we sink to the bottom, the clicks and thumps of ocean creatures flow across our eardrum through the static of exhaling bubbles. I can’t help but be proud to know the waters will be better off with each section we pull.

The author, Steve Johnson is the DoD Lands Investigator for Sitka Tribe of Alaska. For more information, please contact Steve Johnson at sjohnson@sitkatribes.org.



Regional Efforts to Reduce Risks from the Insecticide Lindane

Janice King Jensen, EPA Office of Pesticide Programs and Chair of the Lindane Task Force

What is lindane?

Lindane is an organochlorine insecticide that has been widely used for decades. Over the last several years, however, countries around the world have been working to limit or phase out uses of lindane due to its persistent, toxic, and bioaccumulative nature.

Lindane is the gamma isomer in a mixture of isomers of hexachlorocyclohexane (HCH). Lindane is the only isomer with insecticidal properties.

How is lindane used in North America?

In agriculture, lindane is used on ornamental plants and as a soil and seed treatment to protect seeds and seedlings. However, these uses are in the process of being phased out. In December 2004, Canada deregistered all agricultural uses. In August 2006, the U.S. Environmental Protection Agency (EPA) announced the voluntary cancellation of the six remaining seed treatment uses of lindane, effective July 2007. Mexico has agreed to phase out all agricultural uses of lindane using a prioritized approach.

For veterinary purposes, lindane is used to protect livestock from ticks, fleas, and other insects. It is no longer registered for these uses in Canada or the United States. Mexico has agreed to phase out these uses.

In the public health sector, lindane is regulated as a pharmaceutical drug and is used in shampoos and creams to treat head lice and scabies. It is currently registered for these uses in all three countries,



although Mexico has agreed to phase out this use. The Food and Drug Administration (FDA) is responsible for the public health uses of lindane in the United States.

What are the current concerns?

Lindane and other HCH isomers are mobile in the environment, and through long-range atmospheric transport, are deposited in the Arctic, where they have been detected in the air, surface water, groundwater, sediment, soil, ice, snowpack, fish, wildlife, and humans.

Studies in test animals show that lindane and other HCH isomers have a wide variety of toxicological effects, including reproductive and neurotoxic impairments.

In February 2006, EPA published a risk assessment that indicated potential risks from dietary exposure to two HCH isomers in Alaska and others in

the circumpolar Arctic region who depend on subsistence foods, such as caribou, seal, and whale.

What is being done to mitigate risks?

To reduce exposure on a regional basis, Canada, Mexico, and the United States, through the Commission for Environmental Cooperation (CEC), developed a North American Regional Action Plan (NARAP) on lindane and other HCH isomers. The action plan was signed in November 2006.

The Lindane NARAP was developed by the lindane task force, with representatives from governments and public stakeholders, including indigenous groups, the pesticide industry, academia, and the environmental public interest sector.

Environmental Concerns & Issues

Toxic Contaminants

A unique aspect of the task force was that it included an indigenous representative from each country. The Alaskan Inter-Tribal Council represented indigenous interests for the United States. The Alaskan Community Action on Toxics represented the U.S. environmental sector.

To solicit additional perspectives, the lindane task force convened two public meetings. The first was held in Guadalajara, Mexico, in September 2003. The second was held in Anchorage, Alaska, in February 2004.

What further steps are North American countries taking?

In Canada, Health Canada will continue to monitor the pharmaceutical use of lindane and will explore measures for addressing potential health and environmental risks.

In Mexico, following a stakeholder process, the government announced its commitment to phase out all uses of lindane, with timeframes under discussion. In July 2005, Mexico nominated

lindane to the Stockholm Convention on Persistent Organic Pollutants.

In the United States, EPA is in the process of cancelling the remaining agricultural uses of lindane. FDA will work with pharmaceutical companies to facilitate the development of alternatives to lindane for the treatment of lice and scabies. The Indian Health Service (IHS) reports that the use of lindane for lice and scabies treatments has been reduced from 2.6 percent in 2004 to less than 0.1 percent in 2006, and that lindane is only used as a second or third line agent when other treatments have failed. IHS will review lindane orders and follow up with facilities that ordered a substantial amount of lindane to determine if use was warranted.

Building on each country's individual regulatory activities, the three countries will:

- ▶ Collect and share information
- ▶ Focus on the development and use of sustainable alternatives
- ▶ Address waste management, trade, and science and research needs

- ▶ Strengthen outreach and education efforts
- ▶ Improve compliance and enforcement measures
- ▶ Leverage additional resources
- ▶ Engage the international community in risk reduction activities.

As an example of regional collaboration, the CEC sponsored an international workshop on alternatives to lindane in Mexico City, Mexico in October 2005.

Conclusion

Regional cooperation is a powerful means for reducing and eliminating environmental contamination. Bringing together expertise and resources throughout North America enables Canada, Mexico, and the United States to generate actions that strengthen protection beyond borders.

Where to find additional information?

On the Lindane NARAP:
www.cec.org/

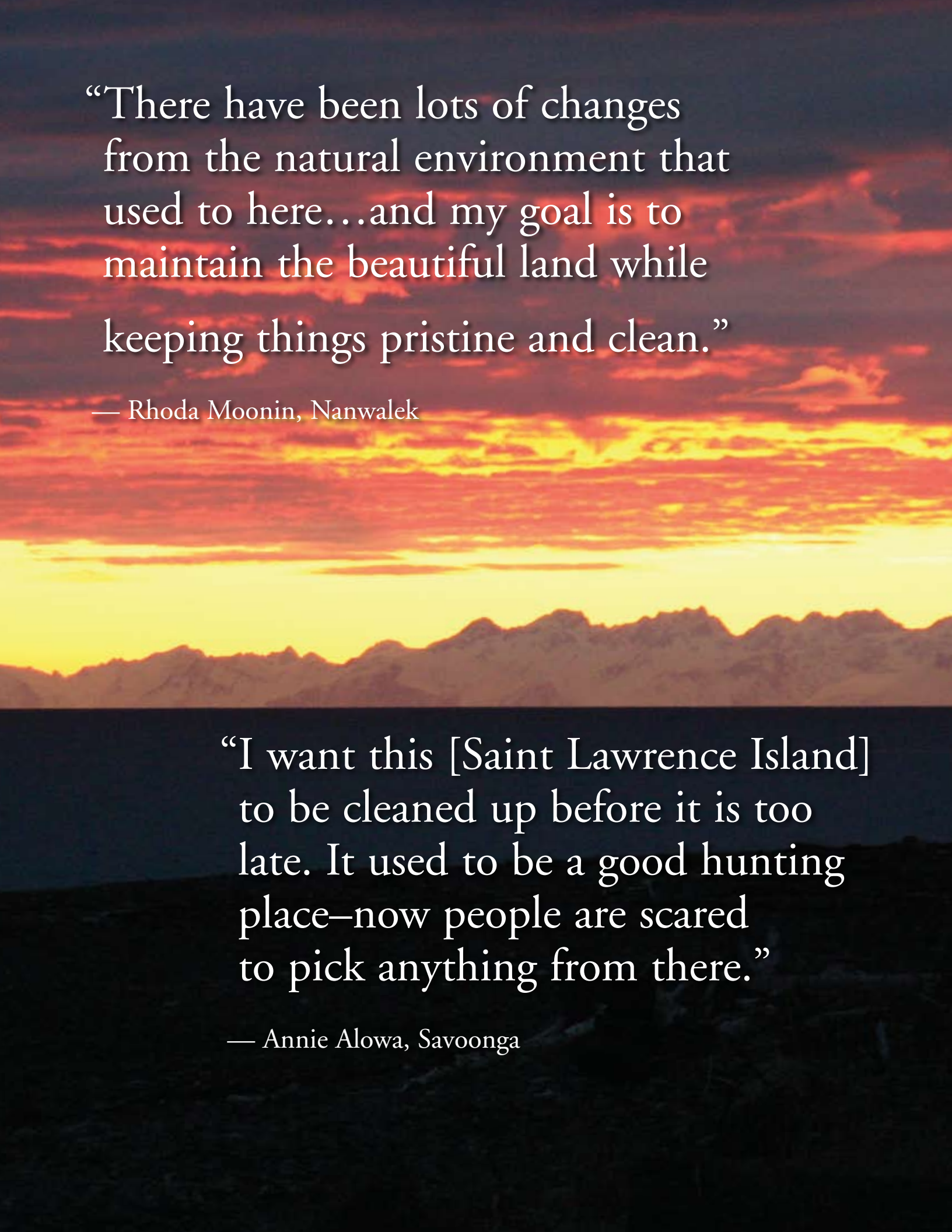
On the Stockholm Convention on POPs: www.pops.int

EPA's TRI Provides Outlook on Toxic Chemicals in Alaska

EPA's Toxics Release Inventory (TRI) program allows EPA, states, and Tribes to annually collect data on releases, transfers, waste management, and source reduction activities of certain toxic chemicals from industrial facilities and to make these data publicly available. EPA compiles TRI data each year and makes it available through several data access tools, including the TRI Public Data Release and State Fact Sheets publications and the TRI Explorer web-based tool. When

using these data access tools, communities have more power to hold companies accountable and make informed decisions about how toxic chemicals are to be managed. For more information about EPA's TRI program, visit www.epa.gov/tri or contact TRI User Support Service at 202-566-0250.



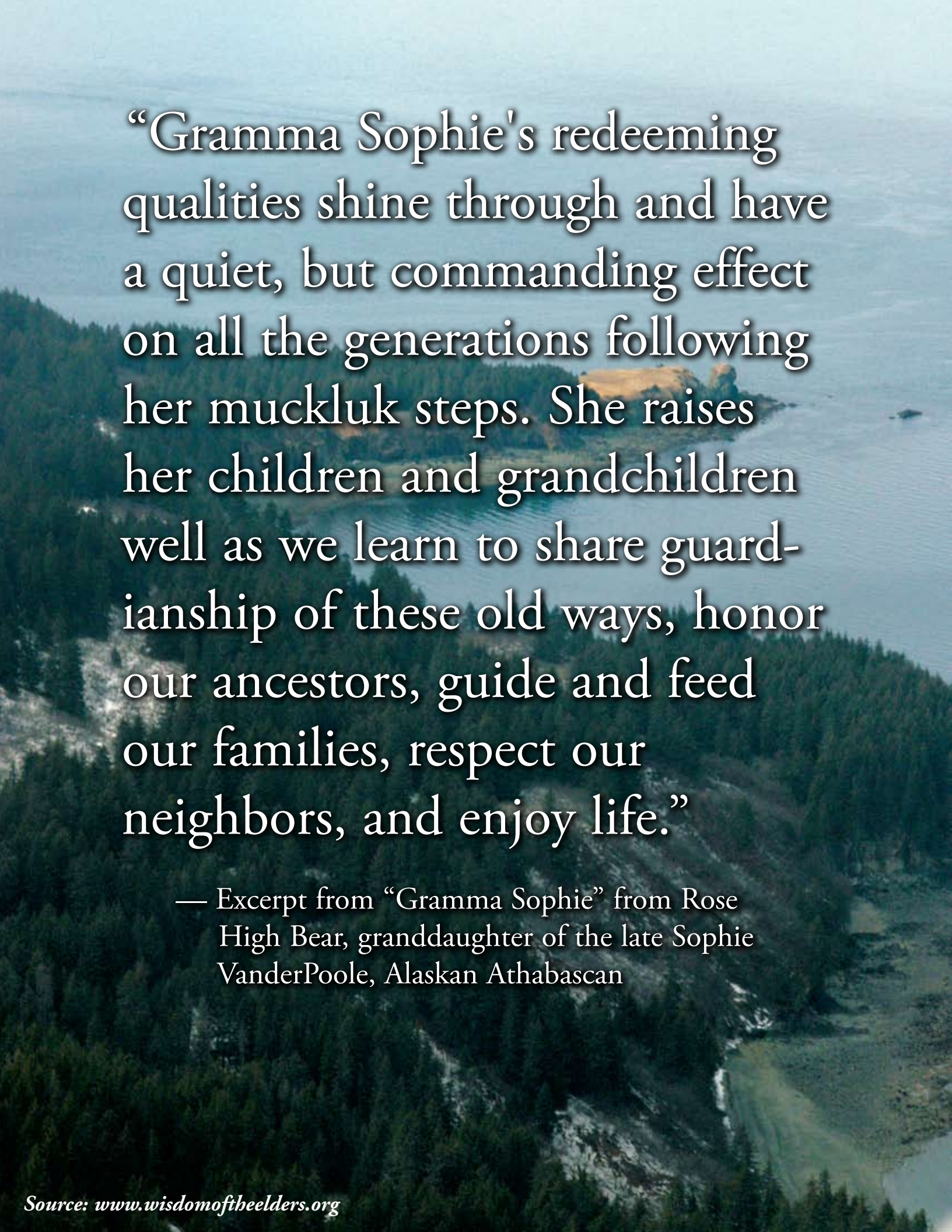
A sunset over a mountain range. The sky is filled with vibrant orange and red clouds, transitioning to a bright yellow glow near the horizon. The mountains are silhouetted against the bright light. The foreground is dark and mostly obscured by the text.

“There have been lots of changes from the natural environment that used to be here...and my goal is to maintain the beautiful land while keeping things pristine and clean.”

— Rhoda Moonin, Nanwalek

“I want this [Saint Lawrence Island] to be cleaned up before it is too late. It used to be a good hunting place—now people are scared to pick anything from there.”

— Annie Alowa, Savoonga



“Gramma Sophie's redeeming qualities shine through and have a quiet, but commanding effect on all the generations following her muckluk steps. She raises her children and grandchildren well as we learn to share guardianship of these old ways, honor our ancestors, guide and feed our families, respect our neighbors, and enjoy life.”

— Excerpt from “Gramma Sophie” from Rose High Bear, granddaughter of the late Sophie VanderPoole, Alaskan Athabascan

The Yukon River Contaminant Database

La'ona Dewilde and D. Warden, the Yukon River Inter-Tribal Watershed Council

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

The Yukon River Watershed is the fourth largest watershed in North America. It encompasses over 330,000 square miles and contains The Yukon River, which at 1,980 miles long is the third longest river in North America. This northern treasure is home to 72 tribes in Alaska and the Yukon Territory, Canada. Twenty-five percent of the tribes in Alaska depend upon the Yukon River for their survival. Even though Alaska is the Last Frontier with a seemingly pristine environment, contaminants are found in many places throughout the watershed. Sources of contamination include oil spills, military operations, mining operations, leaking sewage lagoons, and nuclear waste.

In 1997, tribal leaders held a meeting in Galena to discuss the concerns of the area's inhabitants who noticed changes and anomalies in their food. During that meeting, the Yukon River Inter-Tribal Watershed Council (hereafter referred to as the watershed council) was formed with the mission: "to be able to drink from the river in 50 years." One of the ways we are working to reach that goal is to implement the Contaminants Identification and Tracking Program.

The watershed council contaminant mapping program is now underway. To date, we have mapped contaminated sites in 27 villages. Our goal is to continue updating the database until we have site

locations for areas of concern in villages such as: dumps, junk yards, military waste sites, sewage lagoons, oil spills, and fuel storage sites. We hope to have site locations for as many of the 72 communities in the Yukon River Watershed as possible.

The watershed council is in the process of developing an interactive mapping website. People along the river will be able to submit water quality monitoring data and information regarding contaminated and land use sites to the watershed council, and view the detailed maps we have created on line. To facilitate participation in this program, watershed council staff will meet with environmental tribal technicians, students, and volunteers in the villages to train them in data collection and submission

techniques and reading the on line maps. Volunteer participation in this program is integral to making this database a powerful tool for management, monitoring, development, remediation, and grant writing activities.

Anyone with internet access will be able to view the contaminants mapping project. Through this program, we hope to give the public an up-to-date snapshot of the contaminants in the Yukon River Watershed. If you have questions or comments regarding this program, please contact La'ona DeWilde at (907) 456-1568 or e-mail: ldewilde@yritwc.com. For more information, please visit the YRITWC website at www.yritwc.com.



Programs and Initiatives

Resources and Tools

Living in a rural Alaska native village poses unique environmental problems not encountered in other communities. Some of these problems include: the necessity of honey buckets, the lack of roads to remote locations, extreme weather conditions, and landfills on frozen ground, just to name a few. Numerous resource documents and tools have been developed to aide communities in identifying and prioritizing their environmental issues. Two such resources are discussed below.

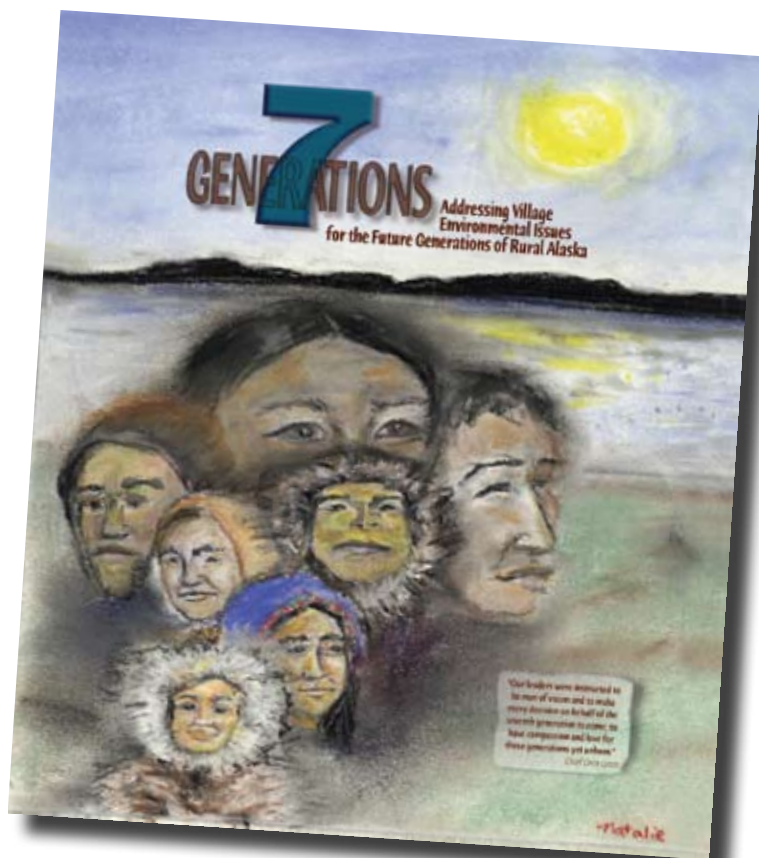
A resource manual entitled *The Seven Generations- Addressing Village Environmental Issues for the Future Generations of Rural Alaska* was developed to help the people in rural Alaska improve the environmental health conditions within their communities. The manual is divided into three separate sections. Section 1 covers aspects of the environmental assessment and planning processes. Section 2 covers environmental assessment surveys. Some of the issues covered in the villager planning survey are: safe drinking water, abandoned vehicles and drums, beach or river bank erosion, village dump/landfill, construction materials left by contractors, raw sewage spills/sewage disposal, annual clean-up, indoor air pollution, outdoor air pollution, fuel oil contaminated soils, fish and animal carcasses left in villages, trash left out in open village space, contaminated subsistence foods, old military sites, and hazardous/toxic materials. Section 3 of the manual contains resources, such as examples of environmental planning surveys, environmental workplans, and

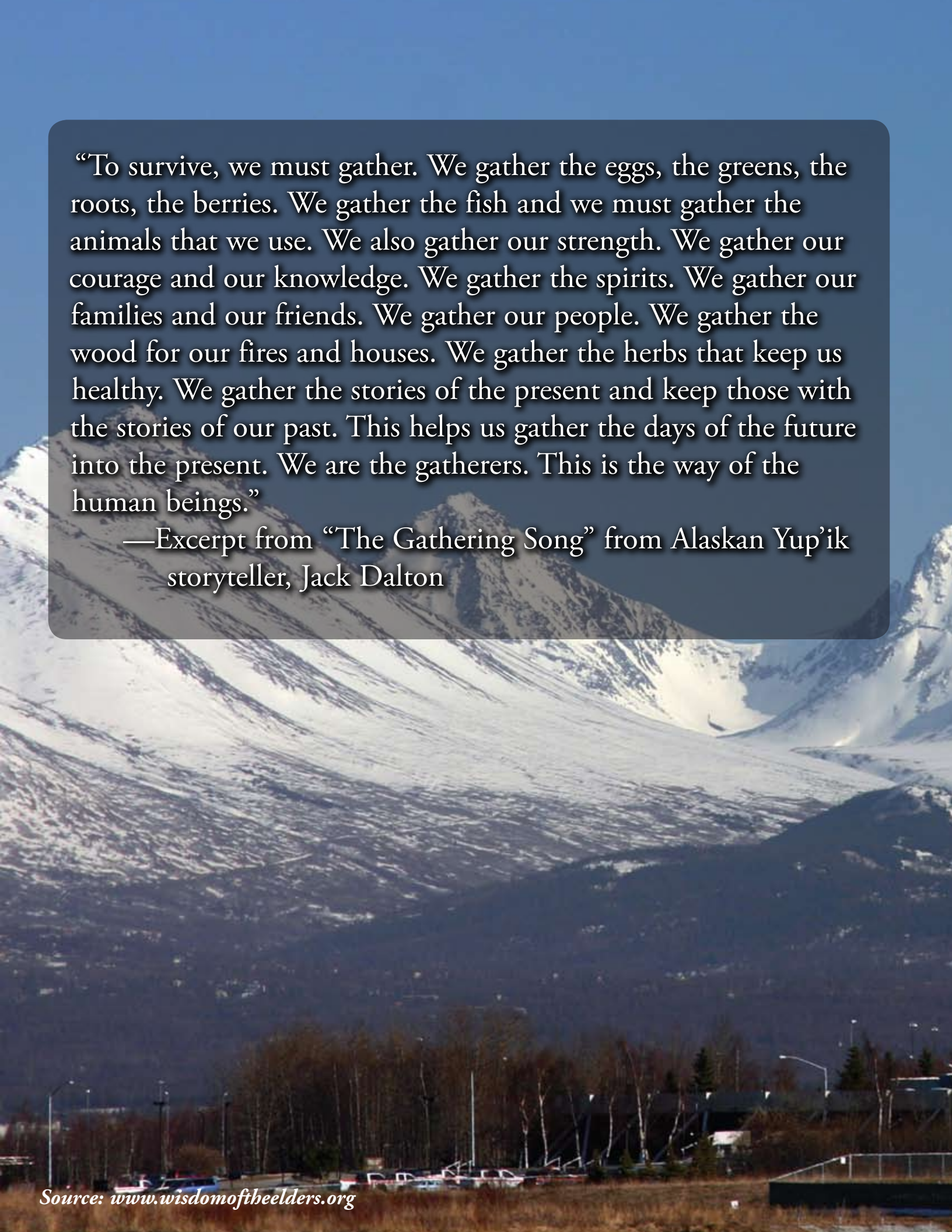
landfill inspection forms, as well as funding resources.

The manual was produced by Susanne Unger, an environmental outreach specialist from the Chugachmiut, and was supported by the U.S. EPA and the State of Alaska Department of Environmental Conservation in Chagachmiut. Copies of the manual may be obtained from the Alaska Department of Environmental Conservation, Division of Statewide Public Service, Rural Issues Program, located in Anchorage, Alaska. Contact the program staff toll free at 1-800-510-2332.

The Profile of Tribal Government Operations is a plain language guide that provides an overview of many tribal government operations and activities,

presents the potential environmental impacts of the operations and activities, and identifies the environmental requirements they must meet. Information includes, but is not limited to, pollution prevention techniques, compliance and technical assistance, and financial resources. This document is a must have reference on a variety of environmental topics and issues. For more information on this guidance document, contact Jonathan Binder at 202-564-2516 or binder.jonathan@epa.gov. The Profile is available at www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/tribal.html or by calling 1-800-490-9198 and asking for the Profile of Tribal Government Operations, EPA Document number: EPA/310-R-05-001.





“To survive, we must gather. We gather the eggs, the greens, the roots, the berries. We gather the fish and we must gather the animals that we use. We also gather our strength. We gather our courage and our knowledge. We gather the spirits. We gather our families and our friends. We gather our people. We gather the wood for our fires and houses. We gather the herbs that keep us healthy. We gather the stories of the present and keep those with the stories of our past. This helps us gather the days of the future into the present. We are the gatherers. This is the way of the human beings.”

—Excerpt from “The Gathering Song” from Alaskan Yup’ik storyteller, Jack Dalton

Success Stories

Renewable Energy, The Alaskan Tribal Experience

Brian H. Hirsch, Ph.D.

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Daily life in remote Alaskan communities, from harvesting traditional foods to producing electricity from expensive and dirty diesel fuel, is more like a third world country than the “lower 48” United States.

While electricity costs roughly 10 cents per kilowatt-hour (kWh) in Anchorage, Alaska’s largest city, it costs more than 60 cents per kWh in some Alaska villages, and gasoline is now rocketing past \$6 per gallon. There are several reasons for this, including high fuel delivery and storage costs in remote areas and low efficiencies and high maintenance costs for diesel generators in general. The true cost of diesel-produced electricity in Alaska villages is even more, since fuel storage tanks are highly subsidized and environmental impacts are not factored into the market price.

This economic reality, and environmental nightmare, has led many to look at renewable energy options, such as wind and solar power, as possible alternatives to diesel fuel for electricity production in remote areas.

In Alaska, there are several ongoing efforts to capture the wind and/or sun to produce clean, and hopefully cheaper, electricity, thus reducing the need for diesel fuel. While there are many examples of renewable energy use throughout Alaska, this article focuses on tribally owned projects.

Wind Development From the Ground Up

The Bristol Bay region of Alaska is famed for the largest wild sockeye salmon runs in the world, but the global price drop caused by salmon farming elsewhere and high diesel costs has these commercial fishing communities reeling.

While some villages have literally shut down and residents moved to Anchorage and elsewhere, five of the communities on the southern Alaska Peninsula decided that their best response may be blowing in the wind. The communities, all predominately indigenous Aleut, Yupik, and/or Aluutiq with populations hovering around 100, are Egegik, Pilot Point, Ugashik, Port Heiden, and Chignik Bay.

Over three years ago they all joined forces to form the Sustainable Energy Council of the Alaska Peninsula (SECAP). In short order they pooled resources, held meetings in each community, and created a multi-village organizational structure that includes each community’s Tribal Council, electric utility, and city government, along with technical assistance providers and other regional stakeholders.

On the ground, they have already installed two 10 kW wind turbines in two different communities and wind monitoring towers to determine project feasibility in two other communities. Ongoing projects, in part funded with EPA support, include solar photovoltaics combined with a wind turbine to power a community building and additional wind turbines.

The overall plan is to use wind power to reduce diesel use and electricity costs throughout the year

and produce ice in the summer months for value-added processing of fish, according to Bob Kramer, President of SECAP and the utility operator for Pilot Point. “Our economies and people are hurting, and wind power can help us hold on to more of the value of our fish. Wind can also help us hold down electricity rates and maintain our clean environment,” says Kramer.

The grassroots approach and community involvement, which includes local energy education and employing village youth to help with the projects, is particularly appealing to many, though it has resulted in less funding and smaller projects than some of the other high profile efforts across the state. But with other communities in the region expressing interest in joining SECAP and ongoing success of the organization, government officials and private funders are taking notice of the innovative group and their fresh approach to community development.

Harnessing the Midnight Sun

Far from the windy west coast of Alaska, the indigenous Athabascan communities of Arctic Village, Venetie, and Chickaloon are using the sun’s rays to produce electricity directly from photovoltaic (PV) panels.

All of these communities are located in the interior region of Alaska, nestled in river and mountain valleys, sheltered from strong winds. But the sun shines there more regularly than coastal areas that are often shrouded in fog. These Athabascan communities are now turning the sun into kilowatt-hours.



Of course there are a few months each year, namely late November through early February, when the PV panels are nothing more than dark, expensive snow collectors. But for the rest of the year the panels make up for it and, in fact, work better in the cold (about a 15 percent efficiency gain because of lowered heat resistance), and get an added boost from snow-reflected sunlight in the spring and early winter.

What makes all of these projects even more unique is the use of a customized “dual-axis tracking system” that rotates the PV panels to follow the sun as it moves across the sky. In the far north, such tracking systems significantly increase power production as compared to stationary PV panels because the sun moves so much across the horizon, especially in the summer months.

“The solar tracking array has more than tripled our production. Even in the winter it has provided incredible energy savings for our community,” says Lance Whitwell, Energy Programs Manager for the Native Village of Venetie Tribal Government. “The fuel savings alone have more than paid for the cost of the system,” Whitwell adds.

Venetie, population 250, has a 1.2 kW stationary and a 2.2 kW tracking PV system. The community has also developed an innovative heat recovery system that uses waste heat from its diesel generating plant to dry clothes in the village laundry facility, thus meeting almost 10 percent of the entire village energy load with renewable energy and conservation in the summer months, according to Whitwell.

In the very far-north Gwich'in communities of Arctic Village and Venetie, the tracking systems needed additional customizing to

construct an above-ground foundation to avoid disturbing or melting the permafrost soils.

Chickaloon Village's 2.2 kW tracking PV system, which began production in late 2004, provides power to their award-winning Tribal School, and will be the focus of an energy curriculum for the entire community. “We've been looking into renewable energy for some time, and we're very excited about this solar project. This is just the beginning of a long-term development plan that includes hydrogen and fuel cells along with solar and hydropower,” said Chickaloon Chief Gary Harrison.

Chickaloon Village's school won an Honoring Nations award from Harvard University for their innovative program that combines traditional and academic subjects from language to math. The curric-

ulum for the solar PV system is an evolving effort that demonstrates how the tribe and the school are merging traditions such as living with the seasons and only taking what you need with modern technology such as solar panels and computer-based data collection and analysis.

All three solar projects are owned and managed by Alaska Native Tribes. Since the PV systems are much smaller and less expensive than the wind turbines discussed above, projects can be started with much less money up-front. PV systems are also well-suited for individual homes, cabins, and hunting camps, and can be added to incrementally as funding and local capacity permits.



Beth Jackson, USFWS, Digital Library System

Success Stories

The Indian General Assistance Program in Alaska – Success Stories from Alaska

*Adapted from The Indian General Assistance Program – Success Stories from Alaska
U.S. Environmental Protection Agency, Region 10, Alaska Office, October 2004*

The General Assistance Program (GAP) increases communities' ability to meet their environmental needs and encourages partnerships between tribes and other entities. Capacity building is one goal of the GAP. To attain this goal, community members participate in training programs on topics such as hazardous waste operations, above-ground storage tank operations, rural landfill operator certification, emergency planning and response, and freshwater aquatic assessment/monitoring. Another goal of the GAP is to promote the improvement of fiscal and administrative program management. Such improvements help the Tribal Governments in obtaining other funding opportunities.

Alaskan Tribes participating in the GAP shared the following success stories with the Region 10 Alaska Tribal Office.

UGASHIK

Ugashik is located on the northwest coast of the Alaskan Peninsula, 16 miles up the Ugashik River. Hattie Albecker, Ugashik Traditional Council's Environmental Coordinator, provided this account of what the GAP has accomplished.

Before the GAP, Ugashik did not have an environmental program. Our program began in February of 2000. The availability of the capacity-building opportunities through the GAP and the initiative of the Ugashik residents have resulted in a much cleaner and healthier environment for all residents. We have set the groundwork for our future generations.

Through the GAP, our village has been able to begin dealing with some of our solid-waste issues, such as 8000+ pounds of lead-acid batteries and several buckets of household batteries back-hauled, 416 triple-rinsed fuel drums back-hauled, and 500+ pounds of crushed aluminum cans that have been flown out of Ugashik. A monitored collection site has been set up for recycle/reuse products; the site is a depository for clean 55-gallon drums, scrap metals, and white goods. As the opportunity arises, these items are back-hauled out of the village either by free back-haul, or the use of available grant funds. It is very helpful to our village that GAP provides grant funds for the implementation of such programs. With the increase award that Ugashik recently received, we will be able to accomplish two more important steps toward the construction of the needed Ugashik Class III Landfill. Another major accomplishment made possible through GAP is that the villages in our region have begun to work more closely with one another. Two examples are the formation of the Ugashik Watershed Council and the Sustainable Energy Commission of the Alaska Peninsula.

The ALEUT COMMUNITY of ST. PAUL ISLAND

St. Paul Island is located 770 air miles from Anchorage, in the Bering Sea. Phil Zavadil, co-director of the Ecosystem Conservation Office, provided this background information about the Island, the tribe, and

the importance of the work that they do.

Up until 20 years ago, all island activities were regulated and controlled by the Federal Government. Therefore, when the government pulled out and the fishing industry came in to fill the economic void, the tribal government was not ready or able to build a tribal environmental program. The impact on the water quality, the increase in noise and air pollution, and the general impact on the environment are taking their toll. Economic development needs to be balanced with monitoring of the environment to ensure its health and wellbeing, as well as the sustainability of the development taking place.

Aleut cultural continuity, social traditions, and the economic wellbeing of the community rely on customary/traditional practices. Due to the increased human interactions with the Pribilofs' Bering Sea environment, the need for monitoring and watching these interactions, and protecting and conserving our island ecosystem has become vital.

The Tribal Government of St. Paul has made great strides in the development and implementation of a tribal environmental protection program. In April 1998, the Tribal Government of St. Paul created the Ecosystem Conservation Office (ECO) to address concerns and issues such as customary/traditional uses (subsistence), water quality, air quality, land management, etc. ECO provides a place for community members to take their



concerns, have them investigated and dealt with, and communicated back to them. In addition, ECO provides a local point of contact for off-island organizations with the same or similar concerns. The EPA GAP grant helped to lay this foundation.

During our first year of participating in the GAP, we began developing a Tribal Environmental Agreement (TEA) and collecting surveys previously prepared by other organizations regarding environmental issues. We also developed a Village Environmental Planning Survey and contacted Federal and state agencies to conduct a full environmental assessment, as well as monitored and assessed environmental hazards within the community and around the island.

In our second year, we continued the work on issues identified in the FY 1999 grant, and signed a Tribal Environmental Agreement (TEA) with EPA in Fall 2000. We also began working on a Specific Action Plan (SAP) and began monitoring and observing the changes occurring in the island's environment using indigenous/traditional knowledge and wisdom and western science.

In our third year, we worked on the SAP and using traditional knowledge in monitoring our island environment. We focused on addressing our community's solid and hazardous waste issues and educating our community on a variety of environmental issues.

We recently completed our fourth year of the GAP. We continued building upon the foundation laid over the past three years by reassessing our community's environmental concerns and targeting specific issues identified by ECO and the community. We completed the Environmental

Management Plan for St. Paul Island and the final draft of our Integrated Waste Management Plan.

Now in the fifth year of the GAP, we are continuing to focus on solid waste with the continued implementation of a recycling program, including developing a recycling management plan. We are finishing our Environmental Management Plan; conducting on-going observations of our island ecosystem; working with community representations to conduct pollution prevention education; and providing on-going environmental education to children and the community.

GAP has given ECO staff the skills and capacity to successfully apply for many environmental grants as well as other non-environmental grants and contracts. Some environmental grants that we have received include: Alaska Native Health Board's Alaska Solid Waste Management Demonstration Grant (3 years in a row); Tribal Open Dump Cleanup Project Grant; and, Alaska Inter-Tribal Council's Integrated Waste Management Grant.

NEW KOLIGANEK

Koliganek is located on the left bank of the Nushagak River and lies 65 miles northeast of Dillingham. Anu Wysocki, Koliganek's Environmental Director, has this to say about what the GAP has done in their community.

The GAP has benefited my village in many ways. Our village is cleaner and more educated on environmental issues. We have addressed our solid waste issues, and have applied for and received the Solid Waste Grant for three consecutive years. We have hired a solid waste operator, implemented

trash separation and recycling (aluminum cans and batteries) programs, and cleaned up the village. We have a burn box and a waste-oil heater. Last year, we removed about three totes of batteries and are continuing to do so. We back-haul batteries by barge and back-haul cans by air. Many tribes participate in Alaskans for Litter Prevention and Recycling - a program that creates opportunities for back-haul of clean aluminum cans by local airlines. This program is widely known as Flying Cans.

NATIVE VILLAGE OF EKWOK

Ekwok is located along the Nushagak River, 43 miles northeast of Dillingham and 285 miles southwest of Anchorage. Submitted by Loraine King, Environmental Planner.

The GAP benefits our community by providing us with the opportunity to build our tribal capacity to effectively manage and develop an environmental program in our community. We were able to provide employment for two community members and, thereby, cut back on unemployment.

The staff and a council member were able to obtain training and needed skills to learn about different aspects of the GAP grant such as requirements, laws, and regulations, as well as learn about many other programs we can tap into for funding implementation projects. The staff was also able to receive other high-tech training, such as computer program training. Through educating the community, the

Success Stories

members became more aware of environmental issues and concerns. Now we are able to issue a newsletter and provide youth activities to the students, as well as hold community meetings. We were able to start a recycling center through the Alaska Native Health Board (ANHB) grant, and pass a resolution for nonsmoking in and near public buildings through the Clean Indoor Air Demonstration Grant.

We have also signed off on a Tribal Environmental Agreement with Region 10. We have revised our memorandum of understanding with the City of Ekwok to include Ekwok Native Limited and are starting to hold joint meetings to work on issues together. We have developed working relationships with federal and state agencies, as well as other surrounding communities. We are involved with the Nushagak Mulchatna Watershed, which involves networking and cooperative working with other tribes along the Nushagak River and the Nushagak Bay Villages. We have eight certified HAZWOPER students, and are working to complete our generic oil-spill plan.

We have addressed some solid and hazardous waste issues with the GAP grant. The solid-waste issues are: recycling aluminum cans, newspapers, cardboard boxes, Styrofoam, and education of the students and community on solid waste (littering, effort of recycling, and landfill issues). We also have purchased a chipper/shredder through the ANHB grant. The community has shredded the brush that was cut, and some community members used the brush as chips to light their steam baths and for flower gardens and plants. The hazardous-waste issues are: recycling of batteries of all sizes and shapes, and providing information

on hazardous waste through our newsletter and community presentations. We are looking at starting a household hazardous waste collection soon. We've already started some used-oil collection, and have back hauled many pounds of batteries.

NATIVE VILLAGE OF EAGLE

Eagle village is on the southern bank of the Yukon River, three miles east of the City of Eagle, on the Taylor Highway. Submitted by Barry Westphal, Environmental Planner

We started with GAP three years ago. We began with developing an environmental plan that identified environmental issues within our community and laid a foundation of where we were at that time. The plan will be updated periodically and act as a form of direction for our program to develop. The GAP has produced the funds and guidance necessary for our village to develop and maintain an environmental program. The program is raising awareness of environmental issues and concerns in our community and is enabling us to present information and answers that in turn make changes in the community. Because of GAP, our capacity to deal with environmental issues will grow.

After developing the foundational environmental plan, we have been able to start several different projects. There have been seven environmental presentations done in our school that included two field trips that gave the upper grades (6-12) an introduction to rapid bio-assessment methods. Other topics included groundwater and recycling. We also had an art contest to raise awareness of environmental issues. The students used environmental themes to

decorate canvas bags and then distributed them in the community. We include an environmental page each month in the village newsletter. We have developed special projects within the village (such as home assessments) in order to get people more directly involved with environmental issues. We are working on a water quality assessment program, an oil-spill response plan, and a Tribal Environmental Agreement.

Our recycling program is successful for two reasons: our accessibility to a large village truck for hauling recyclable items to Anchorage, and the efforts of volunteers. Recycling doesn't work without community effort. At times, individuals volunteer to take items, such as old appliances, out to a recycling center when they go to town. We hope to be able to expand to other items such as cardboard and plastics.

GWICH'YAA ZHEE (FORT YUKON) TRIBAL GOVERNMENT

Fort Yukon is located on the Arctic Circle, at the confluence of the Yukon and Porcupine Rivers, 145 air miles northeast of Fairbanks. 2003 GAP accomplishments were submitted by Vickie Thomas, Environmental Manager.

Fort Yukon is participating in the household hazardous waste back-haul with Yutana barge lines. Our environmental program successfully back-hauled 93 lead acid batteries, 63 drums of waste oil, 8 old vehicles, and 318 pounds of aluminum cans out of Fort Yukon in 2003. We hope to increase the amount of aluminum cans that are being back-hauled and recycled in Fairbanks.

We plan and coordinate the volunteer, community-wide, spring



and fall cleanups. We receive small grants from local organizations to purchase prizes, plastic bags, gift certificates, and food for a cookout. We usually have prizes for the cleanest yard, most-improved yards, and best landscaping. Prizes and give-aways increase participation in the cleanups.

We received a grant through the Alaska Native Health Board to purchase a used oil burner. During our “Fall Cleanup,” we got the businesses involved. The local government and power plant found a lot in their storage areas. We shipped it all out on the barge. We have a small amount in storage for the waste-oil burner to burn during the winter months. Plus, we are receiving used oil from the community members. We are also educating the community about the danger of contaminating our groundwater. I have a volunteer

environmental committee set up to discuss environmental issues and concerns that we receive from community members. I also have a complaint form that is available for people to fill out.

Recycling

The tribal government’s garage is being used as the recycling center. All recyclables are dropped off or picked up by our department. Some items we collect are: aluminum cans and tabs, lead-acid batteries, ink cartridges, cardboard boxes, newspapers, paper bags, Styrofoam, used tires, and plastic grocery bags. We are teaching community members how to reuse other items. The local government passed an ordinance banning the use of plastic grocery bags in the stores. Instead, customers are asked to use canvas bags, purchase paper bags, or use the cardboard boxes from the

store. Another project is our “used clothing and appliance exchange program.”

Other Projects

We are facing the possibility of closing an old dumpsite. We are working with a trainer to conduct Hazmat or HAZWOPER training. Our current landfill has been cleaned up and a drop-off area has been established for community members. There is an area for wood materials and batteries. We are now working on establishing areas for aluminum cans, as well as household hazardous waste. We just constructed a burn box and are now deciding on when and what to burn. We are still working on establishing a solid-waste management plan for our area.



Success Stories

Non-pesticide Reliant Approaches to Rat Control in the Aleutian/Pribilof Islands Region

Adapted from an article provided by Ron Kendall, EPA Office of Pesticides

The Aleutian/Pribilof Islands Tribe was awarded a grant in 2004 for “Rat Prevention, Rat Control and Rodenticide Certification Training in the Aleutian/Pribilof Islands Region—Alaska Maritime National Wildlife Refuge.” The focus of this project is two-fold: to develop a program to control rats in areas where rats are established; and, to develop strategies to ensure areas that are rat free remain that way. The Aleutian/Pribilof Islands Region is part of the Alaska Maritime National Wildlife Refuge. It is home to some of the largest colonies of seabirds in the world. Beginning with the arrival of outsider seafaring visitors, numerous islands in the Aleutians have become infested with invasive Norway rats. The bird population, native vegetation, and human health are threatened by this omnivorous and disease carrying invasive species.

The Aleutian/Pribilof Islands Association (APIA) will partner with the U.S. Fish and Wildlife Service (USFWS) and the State of Alaska Department of Environmental Conservation. These agencies will provide comprehensive training and certification, and assist in the development of integrated pest management (IPM) plans. Aleutian/Pribilof Islands Association expects this project will develop programs that can be transferred to other Aleutian communities.

The following story is framed from the Tribes first status report in March 2005.

History of Rats in Adak

Adak is an incorporated city with a year round population of approximately 100 people. Rats were probably brought to Adak by U.S. military ships. While the military was on the island, they had 30 or more people whose sole job was rat control. At its peak, the base was home to 6,000 people, complete with housing. Since the military began to pull out in 1996, the responsibility of rat control has fallen on the Community Council.

The community’s approach to rat control does not rely on pesticides. Instead, the community manages its rat population by changing the rat’s habitat, thus making it difficult for them to live and breed. An 80 percent reduction in rat numbers can be achieved by

changing the habitat in the target zone. The remaining rats can then be trapped and poisoned to an acceptable level.

Adak’s draft IPM Plan was successful. The city was able to use APIA’s contribution to their project as leverage to get another \$20,000 towards supplies from the USFWS.

The most economical order of any rat control strategy is sanitation and habitat modification, then traps and poison. If you hope to completely eradicate an established rat population, the cost is estimated to be \$150/acre.

The Initial Plan

A committee was established to create an IPM specifically designed for Adak. The committee was comprised of representatives from each entity in Adak. An IPM is a



holistic method of reducing pest numbers. It involves modifying the environment to reduce favorable habitat, thereby reducing the population dramatically. Once the population has been reduced, trapping and/or poisoning the remaining rats are not such daunting or expensive tasks. An IPM requires establishing a target area, defining tolerance levels, developing a monitoring plan, and creating an evaluation process that can be used to refine the plan as needed.

Target Area

Everyone agreed that the housing, fish plant, dock, harbor, and airport were critical areas. A steep mountain on one side borders the housing area and a road on the other side borders the whole area. Those border areas will be designated as “buffer zones.”

Tolerance Level

- ▶ No rats in homes where people live
- ▶ No rats coming off or getting on ships
- ▶ No rats coming off or getting on airplanes
- ▶ No rats in the fish plant.

The following habitat changes were suggested for the target and buffer zones:

Fisheries Plant

- ▶ One of the two docks in Adak: Traps will be placed every 20 meters on the docks and on the walkways beneath.
- ▶ Adak Fisheries plant: Crates will be moved 18” from outside walls, creating a path for traps.

Warehouses

- ▶ Grass will be cut or herbicide applied along shoreline and the lumber will be stacked on pallets.

- ▶ Materials stacked beside this warehouse near the fish plant will be stacked on pallets away from the building.

Housing Area

- ▶ Eliminate the tall grass surrounding the unused elementary school.
- ▶ Eliminate the tall grass between housing units which provides safe transit for rats between houses.

Airport

- ▶ Traps should be placed around the perimeter of cargo areas to ensure no rats escape that might come in with cargo and that no rats get into cargo leaving the island.
- ▶ Grass around the perimeter of the airport should be mowed/weed-whacked, and trap lines should be set and monitored as needed.

Fire Station

The fire station was not included in the target zone, but should follow the same procedures as the warehouses, including mowing/weed-whacking a perimeter around the outside of the building that can be defended with a line of traps placed 20 meters apart. The traps should be monitored and data recorded.

Buffer Zones

Buffer zones will be kept mowed or a herbicide will be applied to eliminate the grass, thereby reducing the ease of rats entering the target area. Traps can be set throughout buffer zones to help prevent rat penetration. Owls should be encouraged to frequent the buffer zones by placing more perches or roosts for them.

The tribe and their partners

developed a monitoring plan and evaluation methods to track success. They also trained a group of certified rodenticide applicators.

The Future of Rat Control on Adak

The city plans to create a full-time position for rat control. The position will be funded through grants, if possible, and contributions from the City, The Aleut Corporation (TAC), and Aleut Enterprise Corporation (AEC). APIA will provide the City of Adak with \$14,000 for help with personnel for rat control and \$1,000 towards rat control supplies.

Trap and Bait Information

All traps should be secured either by staking or wiring as rats may drag traps away or eagles may abduct the rat and the trap it is in.

The best bait, as suggested by Peter Dunlevy, is small pieces of sponge soaked in herring oil. The oil does not go rancid, the sponge pieces can be stored in a jar indefinitely and reused, and the rats like it. Alternatives are peanut butter, apples, nuts, and just about anything else the rats are used to eating. Rats are wary of new foods.

Alaska Faces Spruce Bark Beetle Infestation

Adapted from "Forest Health Update - A Decade of Beetle Activity in Alaska," Roger Burnside

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

For the last decade, natives of Alaska have witnessed a devastating infestation of beetles in natural land areas filled with spruce trees. The beetles live in and feed on the phloem of the spruce trees and have caused the death of tens of millions of trees. The spread of the spruce bark beetle in Alaska is concentrated mainly in the Kenai Peninsula, but has continued to spread to the Copper River regions of the state.

According to Roger Burnside, an entomologist with the Alaska State Department of Natural Resources, Division of Forestry, the spruce bark beetle epidemic has affected over 1.4 million acres of the Kenai Peninsula and 680,500 acres in the Copper River valley between Glennallen and McCarthy

regions. Significant infestation also has been witnessed along the lower Yukon and Kuskokwim rivers and tributaries, the Lake Clark/Iliamna region, the Cook Inlet west of Anchorage (including 88,000 acres within this municipality) and in southeast Alaska, predominantly near Haines, Juneau and Gustavus.

The following table (Table 1) has been replicated from Roger Burnside's article "Forest Health Update - A Decade of Beetle Activity in Alaska."

The infestation creates wildfire hazards and an overwhelming decrease in the population of spruce trees across the region. The Spruce Bark

Beetle Mitigation Program is headed by the Kenai Peninsula Borough and establishes program partnerships with public and private landowners to address these concerns and reduce wildfire hazards and other related threats to the public's life and safety. Initiatives supported by the program and Kenai Peninsula Borough began in 1999 and have included a wildfire hazard and risk assessment for the peninsula, the identification of fire escape routes, the creation of community zones of refuge, and the production of a landcover map of the

Table 1. Cumulative infested acres based on aerial surveys 1989-2000: A cumulative breakdown, by ownership, of areas infested by spruce beetle within the Kenai Peninsula and Copper River regions of Alaska (GIS estimate from 1989-2000 aerial survey data).

Ownership	Kenai Peninsula Region*	Copper River Region**
State of Alaska	425,200	147,400***
Federal	538,600	313,200
Borough	46,000	
Other Municipal	1,600	
Alaska Native	260,600	219,900
Other Private	122,500	
University of AK	13,100	
Total:	1,407,600	680,500

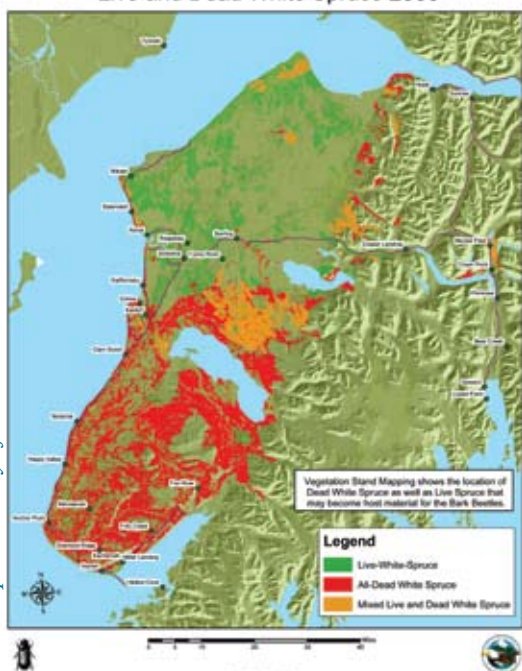
*Source: Kenai Peninsula Borough ELVMI vegetation mapping project (A. DeVolder) **Source: AkDNR DOF & IISFS, S&PF Forest Conditions survey database (D. Wittier) *** Total Copper River region infested acreage may include miscellaneous small private parcels, University of Alaska parcels or floating Native Allotments (land ownership codes were not specific enough to pull this information from the forest damage database).

Borough. Other programs created to support this mission include the FireWise Community Mitigation Plans, which provide community slash disposal, remove dead trees along utility corridors, and utilize regional fire crews to remove hazard trees in high use public areas, campgrounds, and public buildings.

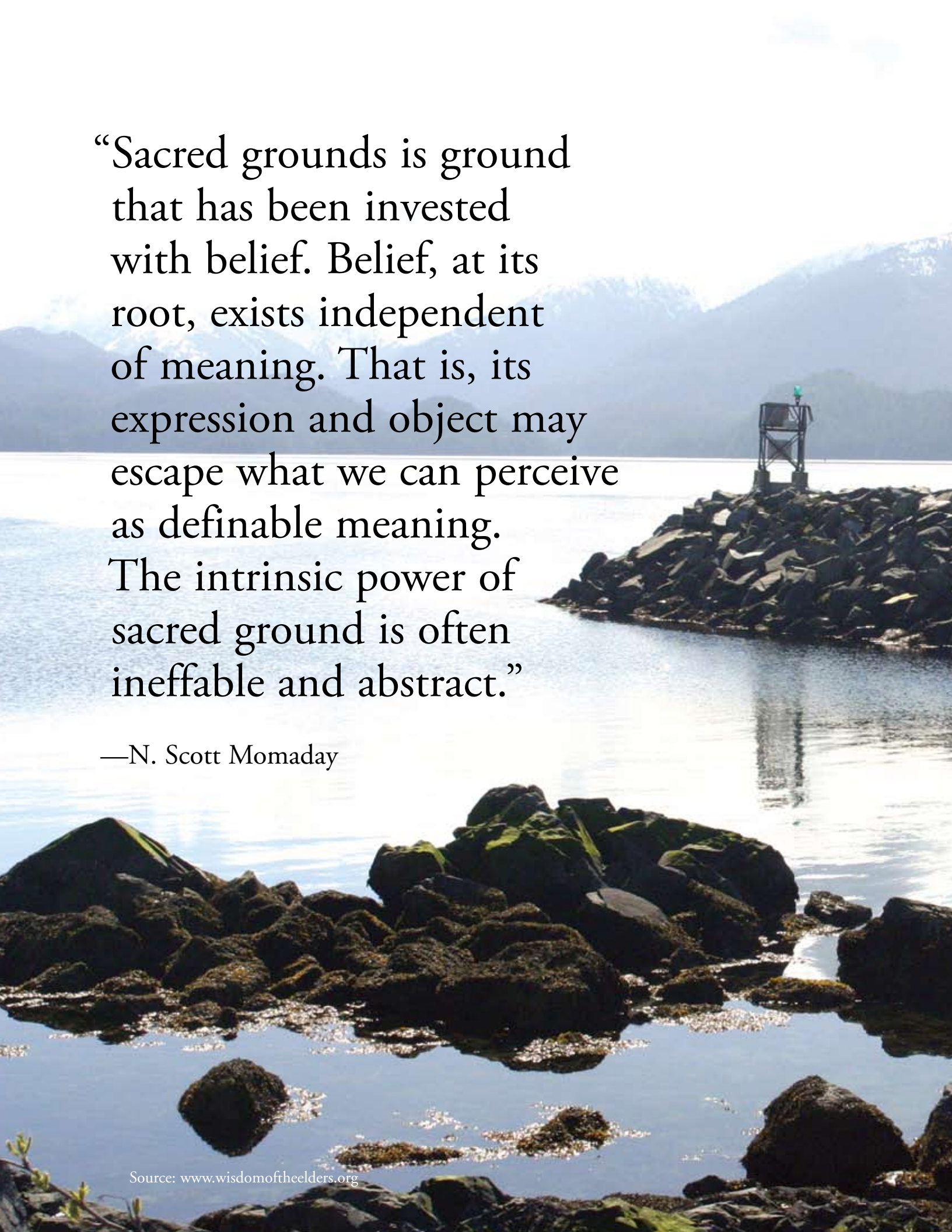
For more information on the Spruce Bark Beetle Mitigation Program and other programs led by the Kenai Peninsula Borough, visit www.borough.kenai.ak.us/sbb.

Editor's note: Since the posting of this website, lindane is no longer registered for use for beetle control.

Live and Dead White Spruce 2006



Graphic courtesy of Rivers Without Borders

A scenic view of a rocky coastline. In the foreground, there are large, dark, moss-covered rocks in the water. In the middle ground, a small lighthouse sits on a rocky outcrop. The background features a calm body of water and distant, hazy mountains under a bright sky.


“Sacred grounds is ground that has been invested with belief. Belief, at its root, exists independent of meaning. That is, its expression and object may escape what we can perceive as definable meaning. The intrinsic power of sacred ground is often ineffable and abstract.”


—N. Scott Momaday


“The Smelly Shirt of the Shaman Tiuk”


Written and Contributed by: Howard Norman

Edited by: Jennifer Sweigart

This happened a long time ago, when boats were first coming into the Hudson Bay and the town of Churchill was new. The tundra had all the same animals; the sky had all the same birds. Beluga whales (Qilaläqáq)  came in to feed in the Churchill River. The weather was the same. But now there was a town right on the coast. Some Inuit people lived there. Many people who were European lived there too. It was a new town.

Tiuk – the shaman (Angakuq)  from Padlei – was a very powerful magician. In those days, Tiuk traveled with a smelly shirt. It was made of seal-hide and it smelled so rancid that, in every Inuit village Tiuk visited, people had a named for the shirt. In Eskimo Point, they called it “Nose-choker.” In Chesterfield Inlet, they called it, “Seal-guts-rotting-in-the-sun.” In Whale Cove, they called it “Stink-shirt.”

Tiuk and his shirt traveled away fast from the new town, along the river. It was winter then. It was snowing (Áput)  hard.

While Tiuk and his smelly shirt were fishing on a frozen sea (Táriuq) , they heard a strange sound in the distance. But Tiuk could not see anything because it was snowing so thickly.

“Go and see what is making such a sound!” Tiuk said to his shirt and the shirt flew off. When the shirt came back, it said “It is the sound of homesickness-wailing. There are ghosts. They are wandering about. They are wailing.” The wails were of some Europeans who died in Churchill.

Then – one-by-one—the ghosts of the European people appeared out of the falling snow.


“What do you want?” said Tiuk.

“We heard that you, Tiuk, could cure people back from the dead.”

“That is true,” said Tiuk.

“Cure us back to life, then,” said the ghosts. “We are homesick.”

“So many homesick-wails at once is a sound I had never heard before,” said Tiuk. “I like the sound. If I cure you, I won’t hear it anymore.”






“No, no, we have taught it to the wolves (Ámartüq),”  said the ghost. “They already howl, but we taught them human homesickness-wails. You can make them howl it for you. Just use your magic on them. Just threaten them with your smelly shirt.”

“Very well then,” said Tiuk. He used his magic to cure the European people back to life. They set out for Churchill. Tiuk set out far inland. It is said that Tiuk never stepped foot in Churchill again.

*This is part of a story originally told by Marc Nuqac, a Caribou Eskimo. Caribou Eskimos live up and down the Northwest coast of the Hudson Bay. The Caribou Eskimos tell this story in their native language Inuit.



Match the following words from the story to their picture to find the Inuit translation:

English language	Inuit translation	Graphic matching Inuit translation
Whale	Áput	
Sea	Táriuq	
Snow	Ámarüq	
Wolf	Qilaläqáq	
Shaman	Angakuq	

Elders

“When an elder dies, a library burns.”

—Proverb



“The World of nature is the source of all life...Balance is required in the world of nature.”

—Dr. Walter Soboleff, Tlingit
(Source: EPA Region 10 Tribal Elders Summit)

“We have one great word in our culture: haa shage-inyaa. This was a Great Spirit above us, and today we have translated that reverence to God.”

—Dr. Walter Soboleff, Tlingit

“...Keeping the past with the future”

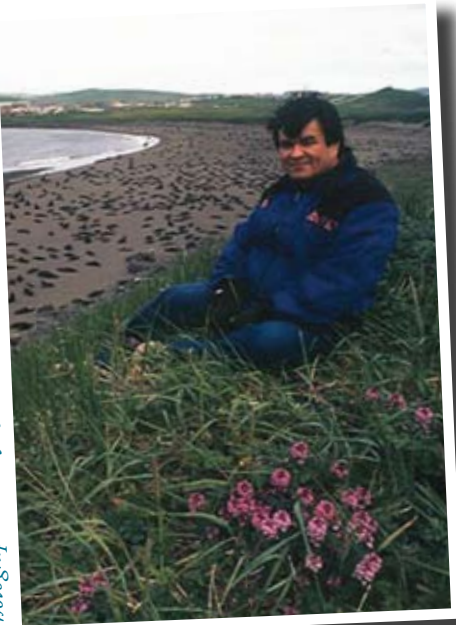
—Natalie Kvasnikoff, Village of Nanwalek



“English is my second language, not first language”

—Rhoda Moonin, Village of Nanwalek

Photograph courtesy of Roy Corral



“When I was four years old, after one very beautiful day on the island where I was raised, I was so joyous in trying to describe in words the beauty of the nature that surrounded us that my grandfather and village elder spoke to me...

‘You know that as soon as you use words to describe the beauty in nature, you diminish its value.’

Perhaps in those few words he encapsulated the very basis of Aleut survival.”

- Larry Merculieff, Tribal Elder, Aleut St. Paul, Pribiloff Islands

“Cycle of Life

That is our calendar

We live by our calendar
our way of life

Based on Life

November - Sheep

October - Caribou

September - Moose

August - Harvest”

- Sarah James, Tribal Elder, Arctic Village



