

# Laaqudaâ, the Northern Fur Seal: an Integrated Approach to Education on the Pribilof Islands

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**O**n a small group of islands in the middle of Alaska's Bering Sea, half of the world's population of northern fur seals gathers each summer to breed on crowded rookeries, alive with the calls of mother fur seals, their pups, and adult males defending territories. The Pribilof Islands, legendary to the Russians of the 1700s for their wealth of seal pelts, were the central location of the commercial harvest of fur seals from the mid-1700s until 1984. The northern fur seal has always been an integral part of the history, culture and ecosystem of the Unangam (Aleut)<sup>1</sup> community in the Pribilof Islands. Although the Unangan knew of the Pribilof Islands, there were no settlements there until Russian fur hunters moved the Unangan from the Aleutian Islands to the Pribilof Islands to harvest fur seals for them in the mid-1700s. Because of the northern fur seal's significance to the people of the Pribilofs, the Aleut Community of St. Paul Island-Tribal Government (TGSPI) and the Pribilof School District wanted to develop a comprehensive northern fur seal curriculum to address northern fur seal natural history, the cultural importance of northern fur seals to the Unangan, the history of the fur seal commercial and subsistence harvest, and research, conservation, and sustainability of the northern fur seal population.

## A Collaborative Effort

Educators from the National Oceanic and Atmospheric Administration's Alaska Fisheries Science Center (NOAA / AFSC) in Seattle, WA worked closely with the Pribilof School District and TGSPI to develop "Laaqudax, the Northern Fur Seal," a curriculum integrating science, math, language arts, culture, history and art into an engaging course on northern fur seals. With funding to develop the curriculum provided by NOAA and the Central Bering Sea Fishermen's Association (CBSFA) of St. Paul Island, the curriculum was truly a community effort.

## Local Relevance

AFSC educators are in a unique position to create this curriculum. Federal government scientists have been studying fur seals on St. Paul and St. George Islands in the Pribilof Islands for over 100 years, with data extending back to government counts

<sup>1</sup> "Aleut" is the Russian word used historically for the people of the Aleutian Islands. Today, people of this region use the words "Unangan" (Eastern dialect) and "Unangas" (Western dialect) to refer to the Aleut people. In this curriculum, the term "Unangan" is used for simplicity. "Unangam" is the adjective form.



Middle school students from St. Paul School, Alaska, discuss a timeline of the northern fur seal's annual cycle, moving plastic animals to show how the fur seal rookery structure changes over the year.

of fur seals in the 1920s, and commercial harvest records extending back to 1867. AFSC educators worked directly with NOAA Fisheries researchers and TGSPI staff to incorporate current research and traditional ecological knowledge into the Pribilof School District science curriculum while encouraging stewardship of the natural environment.



A female northern fur seal calls to her pup on the rookery.

A challenge in creating the curriculum was that rural schools in Alaska often have high educator turnover, and most new

teachers from outside Alaska are unfamiliar with local ecosystems and Alaska history. Additionally, even teachers who have worked in rural Alaska for many years may not have any basic knowledge about the animals closest to their schools. To address this need, the northern fur seal curriculum provides information and activities that can be taught by teachers without background knowledge of the Bering Sea ecosystem and Unangam culture. The curriculum also incorporates traditional ecological knowledge and cultural perspectives and provides activities across several subjects so that teachers can meet educational standards in a variety of areas while focusing on northern fur seals. For example, Lesson 1 (“What is a fur seal?”) includes activities on taxonomy and classification (science and math), graphing (science, math), a Venn diagram (science, math, language arts), a diagram of seals labeled in Unangan (science, culture), a writing exercise to describe a seal (science, language arts), and a physical activity about how seals and sea lions walk and swim (science, physical education).

### A Curriculum with a Multi-grade Structure

The curriculum was developed as a spiraling curriculum, a curriculum that uses the same subject area for all grades but goes into deeper levels for older students. For example, kindergarteners learn that fur seals eat fish, while middle schoolers use reference keys to identify fish bones from fur seal diet samples, and high schoolers analyze actual data to compare what fish are eaten at different fur seal rookeries on the Pribilof Islands. The curriculum is structured so that the first three lessons introduce students to fur seals, the Unangam people and culture, and fur seal rookeries. Subsequent lessons

tackle what fur seals eat, adaptations to diving, and winter migrations. Middle and high school students have more complex and data-driven exercises, including lessons on the commercial harvest of fur seals, population management, and the Marine Mammal Protection Act. All lessons and activities have been aligned to Alaska State Educational Standards and Ocean Literacy Principles, and will be aligned to the new Common Core Standards and the upcoming 2013 Next Generation Science Standards.

### Testing the Curriculum

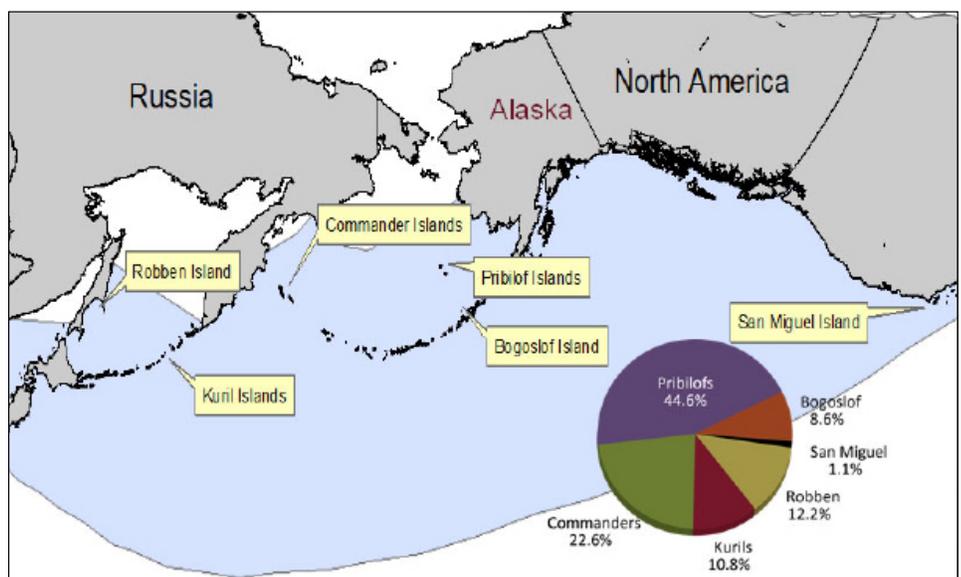
In September of 2011 and 2012, AFSC educators worked with students and teachers from St. Paul School to test activities from the northern fur seal curriculum. Whenever possible, teachers are encouraged to collaborate and teach across subject areas, to promote interactions between students from different



7th grade students help 4th grade students investigate adaptations to diving.

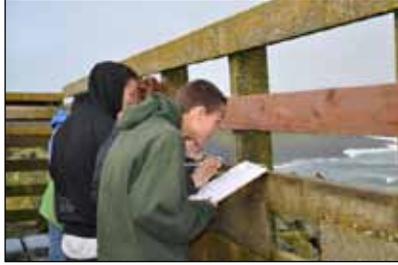
grades. In 2012, high school students studying Russian read Rudyard Kipling’s story “The White Seal,” talked about the origins of the names of the characters in the story, wrote the names in Cyrillic script,

and discussed whether events depicted in the story were accurate or fictional. Language arts students in 10<sup>th</sup>-12<sup>th</sup> grades compared a timeline of events (1700s to the present) from a St. Paul Island community perspective to a more general historical timeline, then joined the 9<sup>th</sup> grade math class, who



Map of northern fur seal rookeries. The blue area indicates the range where northern fur seals can be found in the water. About half of the world’s population of northern fur seal breeds on the rookeries in the Pribilof Islands.

had graphed fur seal commercial and subsistence harvest numbers from 1860-2010. Together, the students looked at how the historical events coincided with fluctuations in commercial fur seal harvest numbers and discussed subsistence harvest from the 1980s-2010.



8th grade students count seals, and a 6th grade student records observations at the rookery.



High school students work on aligning historical timelines.

Highlights of the curriculum testing included:

- middle school students helping younger students learn about adaptations of fur seals for diving
- high school students creating rubber stamps of fur seals and helping first, second and third grade students make murals of a fur seal rookery with the stamps
- field trips for seven classes (K-12) to visit the observation blind at a fur seal rookery near the school, where students observed fur seal behavior and discussed the difficulties scientists have to accurately count seals at the rookery
- community outreach during parent-teacher conference day, where fur seal activities were set up in the school lobby to engage parents
- presenting an overview of the curriculum to all teachers from St. Paul and St. George schools during a school inservice day
- teaching students from St. George School (10 students, 1<sup>st</sup>-10<sup>th</sup> grade) by videoconference
- an impromptu lesson by students on how to use an Aleut yoyo (a fur seal rib bone, twirled around the index finger)

Students and educators learned a great deal from one another: educators learned about the process for stretching and drying the fur seal throats (esophagus) to make traditional Unangam clothing, and high schoolers engaged in a spirited discussion of the subsistence harvest and the role it still plays in their lives. Through the 2 ½ years of development of this curriculum, NOAA fur seal scientists have also taken part in educational and summer camp events with the school and community on St. Paul Island, using fur seal activities for informal education. The success of this project is due to the collaboration of its partners, each of whom brought different skills and perspectives to the development of the curriculum.

#### Access and availability

Once the curriculum is complete, it will be available free of charge on the AFSC education website (<http://www.afsc.noaa.gov/education/>), in two grade bands (K-6 and 7-12). The elementary curriculum will be available in early 2013; the middle/high school curriculum's estimated date of completion is fall 2013.



High school students help younger students with rubber stamps. Inset: detail of stamp.

#### Evaluation and Assessment

Because the curriculum is in the final stages of development, a formal evaluation and assessment framework has not been completed. Short-term evaluation of material is conducted by individual teachers (e.g., writing assignments and quizzes), and most activities have some aspect of assessment in the form of worksheets and maps. The AFSC educators have been evaluating the effectiveness of specific activities through focal group discussions with teachers and individual feedback from students and teachers. The structure of each class is unique every year in small rural schools, depending on the number of students in each grade. For example, at St. Paul School (K-12 population 88 students), the elementary classes in 2011 were K-1, 2-3-4, 5-6, while in 2012 the elementary classes were K, 1-2-3, 4-5, 6. In small schools with multi-grade classes, it is more flexible to have teachers conduct short-term evaluation of results rather than to have a program-developed assessment. AFSC educators will work closely with Pribilof School District educators to develop a long-term evaluation plan to track knowledge retention of students from one year to the next.