Kodiak Island
Afognak Island
Field Summary Report

Introduction

The purpose of this field trip was to ground truth as many representative wetlands as possible and correlate their field classification with a typical photographic signature. Nearly fifty sites were documented on Kodiak and Afognak Islands. This aids in accurate photointerpretation and is especially necessary for Alaskan wetlands due to their abundancy on hillsides and slopes.

Maps

Kodiak 1:250,000
All quads
Afognak 1:250,000
A-3 quad (15')

Personnel

Barbara Schuster (Biologist, Photointerpreter, Martel Laboratories, Inc.)

Marsha Martin (Geographer, Photointerpreter, Martel Laboratories, Inc.)

Jonathan Hall (USFWS - Region 7)
Dave Dall (USFWS - Region 7)

Dates of Field Reconnaisance

August 25 to August 27, 1985

Method of Field Checking

Helicopter (majority of islands)
Automobile (around Kodiak City)

Photography

Type: color infrared transparencies
Scale: majority 1:60,000
other 1:65,000
Dates: 6/78, 7/79, 7/14,83, 8/3/82

Collateral Data

USGS Quadrangles
Exploratory Soil Survey of Alaska U.S.C.S.
Flora of Alaska by Erci Hulten, 1968, Stanford Univ. Press.
Alaska Intertidal Survey Atlas, National Marine Fisheries by Howard Sears and Steven Zimmerman Oct. 77.
Major Ecosystems of Alaska, USGS map.
"Characteristics, grassland, Marsh & other communities" by Hanson C., Ecological Monographs-vol.21.,#4,

Physical Characteristics

Kodiak's large size of 3588 square miles is one of the ~~U.S.'s~~ Nations largest islands. Elevation ranges from sea level to 4,400 ft. The Kodiak and Afognak mountains are a continuation of the nonvolcanic Pacific Mountain System which connects with the coastal mountain system of Canada and U.S. The eastern coastline bordering the Gulf of Alaska is a high energy rocky shore compared to the western side of the island bordering the Shelikof Strait. On this western side a protected series of fjords, ~~are thought to be~~ bays eroded by glaciers during the ice age. These lower energy coasts support shorelines of gravel and sand. The foothills associated with this coast are comprised of glacial drift.

The rocks of the coastal mountains are mesozoic in origin and are primarily sedimentary sandstone and shale. Not enough research has been done on the geology of Alaska's varied frontier.

No permafrost is sustained on these maritime islands. The mean temperature is 40.7°F with the high in August of 55°F and the low in December of 30°F. Annual precipitation is 56.71 inches including the wettest month of October with 6 inches and the dryest month of July with less than 4 inches.

These islands have survived two major natural disasters that have altered or affected much of their ecology as it is today. In 1912 a nearby volcano to the west of Kodiak emitted six cubic miles of earth from its depths. This thick blanket of ash that now covers the island is half its original thickness of approximately 18 inches. It is present over most of the northwestern area of Kodiak and some of Afognak. Volcanic ash can reach a thickness of 3 feet in the lower elevations. Even by July of 1914 there was evidence that ashes had washed down from steeper slopes into the valleys. Well drained loamy soil on mountain slopes and steep hills was formed from this fine volcanic ash.

More recently in 1964, there was an earthquake which was accompanied by a devastating tsunami. Evidence of the town of Afognak's destruction still remains today as houses stand in coastal water while waves lap at their doors. Flooded trees that could not survive their abrupt change in environment are now part of the wetlands.

Vegetation in the northern part of Kodiak and eastern side of Afognak is a forest of Sitka spruce associated with older, tall grasses such as blue joint, and small shrub~~s~~. These Sitka spruce are the only conifer on Kodiak and occur in coastal areas up to elevations of 400 feet. Scattered areas of strongly acidic dark organic soils are among these Sitka spruce forests on hillsides and valleys. Characteristically, the sloping valley bottoms are filled with gravelly outwash deposits. Cottonwoods and willows grown in the floodplains.

Where the Sitka spruce disappears at higher elevations and elsewhere on foothills and marshes the vegetation changes to more grasses, alder, mtn. ash, salmonberry, willow, current, heath-type shrubs, and forbs.

At high elevations there is little or no soil cover. Alpine tundra occurs usually above 1,000 ft. especially where accumulated snow is present into the latter part of springtime. Low plant mats consisting of lichens, moss, crowberry, cranberry, dwarf willows, and some heathes may cover the mountain range.

The land of Kodiak and Afognak supports rangeland for cattle and timber for logging, but primarily the industrial interests lie in commercial fishing.

Bilogical Characteristics

Marine

Kodiak's mean tidal range is approximately 8 feet. Much of the marine coast on the western side of Kodiak is mapped as an M2RSN linear or M2RSP polygon. Often algae in visible as a bright orange tone on the rock or on the water in the photographs. If the algae covers enough area it is pulled out as M2ABIN. Also present is the marine intertidal unconsolidated shore with a gravel or sand substrate mapped as M2USN or P depending upon the tidal reach. The Intertidal Survey Atlas was used as collateral data to determine substrate and gradient of shore. Marine kelp is common in Alaska's waters and was found washed upon shore.

Much of our field observations involved more estuarine than marine systems. The breaks made between the marine and estuarine system are arbitrary and take into consideration wave action, freshwater input, and depth of water.

Estuarine

Afognak's and Kodiak's inlets along the Shelikof Strait are composed of fjord estuaries - these coastlines here are protected from the high energy wave action and usually mapped as E2USN. Rocky coasts and algae are also present and mapped similar to the marine system. Our estuarine field check sites mainly included the small inlets on the seawardside of Kodiak Island south of the town of Kodiak...

The dominant vegetation in the coastal marsh is Carex ~~lynbaeia~~ lyngbaeia, Potentilla ~~egedii~~ egedii, Puccinellia phragmites, and P. Hultenii and Calamagrostis canadensis. These plants usually are not flooded on a regular basis. The signature is a bright pink tone. The regularly flooded mudflats were usually a combination of mud and algae. Algae present was Ulva sp. and Enteromorpha. Mud flats show a blue tone or a green tone that are lighter than the subtidal dark tone. Often the presence of a whitish color on the mudflats indicates it is not as wet as the rest. If the algae is present as a thin layer on the mud it may show no return on the photo or it can be abundant enough to give a vivid orange signature.

Many lakes with a small beach bar separating them from the salt water systems were found to be high in salinity. If not vegetated these were classified as E1UBL. If vegetated its appropriate label was applied. Algae beds were commonly seen from the helicopter covering estuarine lakes. Rooted vascular aquatic beds were observed in low energy bays and included Zostera, Ruppia, Potamageton, and Meriophylum and labeled E1AB3L. Vegetation around these lakes may be estuarine or fresh.

On Afognak's coastline another type of vegetation was observed due to the earthquake. Large stands of dead Sitka spruce were classified as E2FO5P. Their distinct signature is a whitish or light gray tone with spindly tress visible. Rarely are shrubs part of an estuarine intertidal zone. We observed no salt tolerant shrubs on our field check of these islands.

Palustrine

Palustrine areas bordering the estuarine vegetation were typically influenced by the tide and vegetated by a mix of shrubs and emergents. The PSSI/EMIR classification was used for a light pinkish or pale orange smoothed over tone. There is usually a wide vegetated floodplain community as one continues inland from the estuarine bay. Riparian forests of cottonwoods and paper birch with an understory of mixed vegetation were temporarily flooded: PFO1/SS1A, or when the canopy of orange trees is dense enough on the photo: PFO1A. Rarely were the trees in any regime wetter than A or B, as their prescence indicated a better drained substrate than the surrounding wetlands. However, some trees are flooded by beaver activity.

A pure stand of shrubs Floodplains long the river floodpain was usually an indicator of a wetter water regime: PSS1C. In the eastern part of Kodiak large ~~floodpains~~ of PSS1/EM1C were abundant and gave a grayish mottled, pink ~~[illegible]~~ signature which appeared similar to the same saturated vegetation outside of the floodplain. Many acres of hillside vegetation are mapped as PSS1/EM1B or PEMI/SSIB. Common plants found were willows, sedge, moss, dwarf birch, cott grass, cranberry, crowberry, Myrica, Vaccinium spp., and grasses.

Many drainages were dominated by shrubs and labeled PSS1A. Alder and willow gives a textured orange signature which is easily distinguished. Hillside depressions and ledges were a saturated emergent-shrub mix. Seasonally flooded or semipermantly flooded emergent pockets were found within these saturated areas. A dark green signature was indicative of very wet vegetation. Wet alpine vegetation was seen in the field, however it is often covered by snow on the photography. Many pockets of seasonally wet emergents are partially exposed from the snow giving a dark green almost blackish color on the photos. Larger basins of hummocky wet emergent and shrub vegetation were in high elevations. Mottled signatures ranged from a mix of orange and brown to reddish and dark gray. These were labeled either PSS1/EM1B or PEM1/SS1B.

In northern Kodiak among the Sitka forests much is saturated and classified PFO4B unless the spruce are young, PSS4B. There were boggy areas that the spruce were able to persist on, therefore the typical bog plants make up the understory such as sphagnum and sedge.

Palustrine ponds were sometimes found to be semipermanent up in higher elevations, but generally they were permanent elsewhere. Aquatic beds of yellow water lily have a distinct pink specked signature and labeled PAB3H. Beavers are extremely abundant and have affected a great number of rivers with their dams. Characteristic beaver indicators are a white dot in the pond which is their lodge, a whitish impoundment across one edge of the pond which is the pile of dead trees, or dead trees lying nearby. These beaver ponds are labeled PUBHb. Many times there is a string of beaver impoundments along a river in succession and are pulled out as a linear or collective polygon of PUBHb.

Lacustrine

Lacustrine open water bodies were almost entirely permanently wet: L1UBH. Yellow water lily present on some lakes was classified L2AB3H. Lakes are present in high altitudes and they are often covered with snow and ice. Beaver activity is also present but not to the extent it is in the palustrine system.

Riverine

Many of the rivers draining the lakes of the upper elevations are steep and characterized by a bright white spotted signature typical of a fast moving river and labeled R3UBH. Many rivers as they level out become a braiding mix of open water and unconsolidated shore. Many are still upper-perrenial and labeled R3UB/US or R3US/UB with no water regime. However the river is usually permanent and its shores of either light blue are seasonal or pale blue are temporary. The Buskin River was a typical R3UBH. Many intermittent rivers drain the snow topped mountains and are R4SBF or R4SBC. Lower perennial rivers are not as common but are present. As the rivers reach the bay they become tidally influenced and labeled R1UBV if water is visible or R1USN if only the lighter blue tone of unconsolidated shore is visible.

Imagery, Primary Delineations and Field Checking

Overall imagery for Kodiak is of fairly good quality. The resolution is good and tones are easily differentiated in the upper half of the Kodiak 1:250,000. This photography was taken in June of 1978 and the wetlands covertypes are distinct. Covertypes on the southern half of Kodiak are more difficult to distinguish from each other since the tones are more bleached out to an orange color. These photographs were taken in July of 1979 and have much less snow cover. Field trip reconnaissance in late August also exposed much more of the higher altitude's wetlands. ZTS will transfer lakes and large ponds that are on the topographical maps but are not visible on snow covered photos.

Water regimes were similar on the photo and in the field at each check site. Cloud cover is not a real problem, only in a few isolated spots. Manmade influences have altered the town of Ouzinkie. On one earlier strip of photography the area on the edge of one photo appears as a wetland, however on the tie photo an airstrip is present so the wetland is not delineated.

Summary

The quality of photography for Kodiak and Afognak is sufficient for cover typing and can allow good wetland delineation under stereo. This can best be achieved by completing the upper half of Kodiak's better quality photographs to get a good feel for wetland location and water regime and then applying this knowledge to distinguish the subtle covertype differences of the southern half. More field time in this southern area would have aided in better photographic interpretation on these photos. However, a wide range of covertypes were visited in the field and were similar to what the photos indicated.

Kodiak Wetland Vegetation

Temporary Water Regime

Epilobeum spp.
Calamagrostis spp.
Sanquisorba stipulata
~~*Iris versicolor*~~
Rumex sp.
Achillea borealis
Hordeum spp.
Rhinanthus minor
Cicuta occidentalis
Heracleum lanatum
Iris setosa single line

Saturated Bogs - common plants

Myrica gale tomentosa
Eriophorum spp.
Sphagnum sp.
Vaccinium uliginosum
Vaccinium vitus-idiae
Vaccinium mycrocarpus
Rubus chaemaemorus
Andromeda polifolia
Empetrum nigrum
Veratrum viride
Viola spp.
Salix reticulata
Betula glandulosa
Betula nana
Cladonia spp.
Hypnum spp.
Ferns

Saturated Bogs - less common plants

Aconitum delphinium
Parnassia sp.
Arctostaphalus rubra

Temporary

Epilobeum spp.
Calamagrosh's spp.
Sanquisorba stipulata
Iris versicolor
Rumex sp.
Achillea borealis
Hordeum spp.
Rhinanthus minor

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Moneses uniflora

Solidago spp.

Drosera rotundifolia

Spiraea Beauverdiana

Lupinus nootkatensis

Potentilla spp

~~Gen~~ Platanthera convallariaefolia

Pedicularis spp.

Campanula rotundifolia

~~Eleocharis spp.~~ Petasites hyperboreus

Sencio triangularis

Seasonal - Semipermermanent

Eleocharis spp.

Ranunculus - spp.

Juncus spp.

Triglochin spp.

Semipermanent

Menyanthes trifoliata

Shrubs - Temporary and occasionally Seasona

Salix spp.

Alnus crispa

Sorbus sp.

Rubus spectabilis

Rosa nutkana

Trees

Populus spp.

Betula papyrifera

~~Picea~~ Picea sitchensis

Kodiak Wetland Vegetation (cont.)

Bogs Saturated - common

Myriea gale tomentosa
Eriophorum spp.
Sphagnum sp.
Vaccinium uliginosum
Vaccinium vitus-idiae
Vaccinium myrocarpus
Rubus chaemaemorus
Andromeda polifolia
Empetrum nigrum
Veratrum viride
Viola spp.
Salix reticulata
Betula glandulosa
Betula nana
Ceadonia spp.
Hypnum spp.

Bogs Saturated - less common

Aconitum delphiruim
Parnassia sp.
Arctostaphalus rubra

Transition zone from salt marsh to fresh water

Lathyrus palustris
Carex lyngbaei
Puccinellia Hultenii
Elymus spp.
Potentilla egedii
Atriplex sp.

Aquatic Bed

Nuphar polysepalum