

**HB**

**474**

# FISCAL NOTE

**STATE OF ALASKA**  
**2002 LEGISLATIVE SESSION**

Fiscal Note Number: 1  
 Bill Version: CSHB 474(CRA)  
 (H) Publish Date: 3/20/02

Revision Date/Time (Note if correction): \_\_\_\_\_ Dept. Affected: \_\_\_\_\_  
 Title Alaska Coastal Wildlife Refuge BRU \_\_\_\_\_  
 Component \_\_\_\_\_  
 Sponsor Representative Green  
 Requester House C&RA Component No. \_\_\_\_\_

**Expenditures/Revenues** (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
<b>TOTAL OPERATING</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

<b>CAPITAL EXPENDITURES</b>						
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<b>CHANGE IN REVENUES ( )</b>						
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**FUND SOURCE** (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type-Do not abbreviate)						
<b>TOTAL</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

Estimate of any current year (FY2002) cost: 0.0  
 Check this box (X) if funding for this bill is included in the Governor's FY 2003 budget proposal:

**POSITIONS**

Full-time						
Part-time						
Temporary						

**ANALYSIS:** (Attach a separate page if necessary)

Prepared by: Lorali Carter, HC&RA Committee Aide Phone 465-6588  
 Division \_\_\_\_\_ Date/Time 3/19/02 4:24 PM  
 Approved by: Representative Meyer and Representative Morgan Date 3/19/02  
 Agency Co-Chairs House Community & Regional Affairs Committee

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Representative Joe Green  
District 10

**To:** Sen. John Cowdery  
Chair, Senate Transportation Committee

**From:** Rep. Joe Green

**Date:** April 22, 2002

**RE:** House Bill 474

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Please schedule House Bill 474, "An Act relating to public rights-of-way and easements for surface transportation affecting the Anchorage Coastal Wildlife Refuge," for a hearing in the Senate Transportation Committee at your earliest convenience.

I have attached a current copy of the bill, and an updated sponsor statement. I have also attached three articles from the Anchorage Daily News regarding the Anchorage Coastal Wildlife Refuge as well as a report on the refuge from the Alaska Department of Fish and Game.

If you have any questions, please call Laura Achee in my office at ext. 6585.

**CS FOR HOUSE BILL NO. 474(CRA) am**  
**IN THE LEGISLATURE OF THE STATE OF ALASKA**  
**TWENTY-SECOND LEGISLATURE - SECOND SESSION**

**BY THE HOUSE COMMUNITY AND REGIONAL AFFAIRS COMMITTEE**

Amended: 4/17/02  
Offered: 3/20/02

Sponsor(s): REPRESENTATIVES GREEN, McGuire, Rokeberg

**A BILL**

**FOR AN ACT ENTITLED**

1 "An Act relating to public rights-of-way and easements for surface transportation  
2 affecting the Anchorage Coastal Wildlife Refuge."

3 **BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:**

4 \* Section 1. AS 16.20.031(c) is amended to read:

5 (c) A public right-of-way for surface transportation and a utility corridor are  
6 created across state-owned land and water within the Anchorage Coastal Wildlife  
7 Refuge between the Anchorage mainland and Fire Island. The management plan  
8 prepared under (b) of this section shall identify the actual location on the land and  
9 water of the right-of-way and of the utility corridor between the Anchorage mainland  
10 and Fire Island. Except for the public right-of-way and utility corridor created in  
11 this subsection and identified in the management plan, for a realignment of the  
12 right-of-way for the new Seward Highway, and for a realignment of the right-of-  
13 way for the Alaska Railroad, a state agency may not take final action to acquire  
14 or create a right-of-way or other easement for surface transportation within the

1 refuge until 45 days after the agency has submitted notice of the proposed action  
2 to the legislature; the notice must be submitted to the legislature during the  
3 regular legislative session before February 1

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## Representative Joe Green

District 10

### **Sponsor Statement for House Bill 474**

**"An Act relating to public rights-of-way and easements for surface transportation affecting the Anchorage Coastal Wildlife Refuge."**

The Alaska State Legislature created the Potter Point State Game refuge in 1971, later expanding it to form the Anchorage Coastal Wildlife Refuge (ACWR) in 1988. ACWR runs 16 miles along Anchorage's coastline, from Point Woronzof to Potter Marsh.

The ACWR is one of few coastal salt marshes in Cook Inlet, in part because Fire Island protects the refuge from the ice scour that ravages other Cook Inlet shorelines. Because of its unique habitat, it is heavily used by waterfowl and shore birds, as well as other animals including coyotes, bears, moose, lynx and hares.

House Bill 474 would provide an extra layer of protection for this fragile habitat by creating a notification and waiting period before the State of Alaska may acquire or create any new surface transportation easements in the refuge. If any new easements are proposed through ACWR, the Legislature must be notified by February 1 of the next session, and the state may not proceed until 45 days later. This will allow the Legislature time to review any public comment on the proposed easement and take action to alter or prohibit the easement if it is deemed necessary.



## FIRE FROM EARTH

So-called "earthquake lights" are nothing new. The ancient Japanese and Greeks wrote about them. What's new is the possibility that scientists may be able to duplicate them in the lab and, perhaps, learn to predict earthquakes.

Monday in Life & Change

# LIFE Arts

ANCHORAGE DAILY NEWS • www.adn.com

SUNDAY, JANUARY 20, 2002

# Hidden Coastline

*Anchorage refuge is a wildlife crossroads that's never far from civilization*

## 1 Anchorage Coastal Wildlife Refuge

The Anchorage Coastal Wildlife Refuge encompasses 32,000 acres that border Turnagain Arm and extend west into the Arm. It was established in 1988 to protect wildlife and was set aside for public use and enjoyment. Some major access points to the refuge are shown here.

- 1 Point Woronzof
- 2 Coastal Trail at Kincaid Park
- 3 John's Park
- 4 Oceanview Bluff Park
- 5 Rabbit Creek Rifle Range

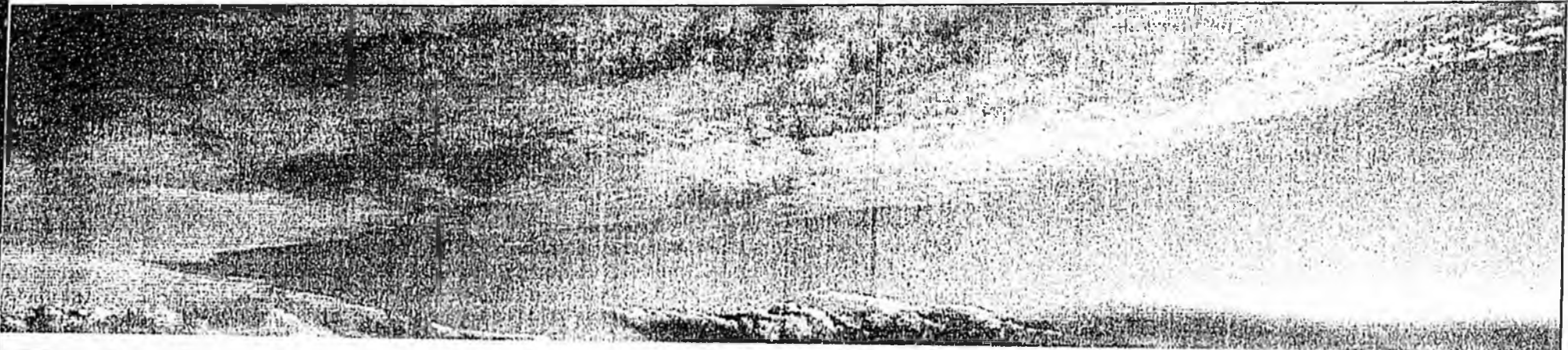
2 Kincaid Park

Diamond Blvd.

Campbell Lake

Turnagain Arm

Seward Hwy.



**Anchorage Daily News**[<--Back](#)© Copyright 1985-1999 - Anchorage Daily News. [Email this article](#)**Sunday, January 20, 2002**

Page: D1

Section: Lifestyles

Edition: Final

**HIDDEN COASTLINE**

By Doug O'harra, Anchorage Daily News

Photos By Bob Hallinen, Anchorage Daily News

Like a row of postholes partly filled with snow, the big tracks crossed the melt-slicked crust near the bank of Campbell Creek. They angled along the steep slope of willow and alder, skirting the broad, white flat that forms the bulk of the Anchorage Coastal Wildlife Refuge.

Clearly, some large animal had passed recently, following a foraging route nearly hidden from people in the expensive homes on top of the bluff. But what could it be?

Refuge manager Rick Sinnott, on a three-mile coast walk to look for winter life, called the tracks somewhat "weird" for the second week of January.

"I'd say it looked like a bear if I didn't know they were sleeping. I don't know."

But the mystery tracks weren't alone. Day-old lynx prints padded along the same route, recording a quest for snowshoe hares. Moose had passed too, leaving snapped buds and gnawed trunks. Also puckering the snow highway were fresh coyote tracks, old magpie and raven scratches, muskrat push-ups, and etchings that hinted at squirrels, weasels and voles.

Suddenly, three coyotes trotted into view, crossing the snow a little farther from the trees. A squad of chortling ravens dogged them, one drifting overhead, one landing in front, another prancing to the side.

Full winter or not, Anchorage's coastal fringe was hopping.

**BEYOND POTTER MARSH**

Rarely visited and hardly known, a strip of mostly undeveloped public land rims Anchorage's west and southwest shore, buffering Alaska's largest coastal city from the sea. It runs for 16 miles from Point Woronzof to Potter Creek, almost all of it within the coastal refuge.

The refuge was founded in 1971 and expanded in 1988 to about 32,500 acres. Most people know it from visiting Potter Marsh, hunting ducks or exploring over the bluff from the Tony Knowles Coastal Trail. But the refuge's heart may beat strongest between the Oceanview neighborhood and Kincaid Park, a 10-mile stretch of woods, seeps, marsh, creek bottoms and tidal flats. A surprising concentration of wildlife calls it home.

Where private property or other public land doesn't overlap, the refuge begins near the 20-foot elevation contour. It descends through a succession of habitats until vegetation gives way to intertidal mud that yawns toward the horizon. On some maps, this vast offshore expanse appears almost like Anchorage's shadow, a nether world that spends half the time submerged.

In spring and summer, huge congregations of cranes, geese and ducks converge. The June air jangles with the cries of 10,000 screeching birds. But take a look during January -- say, from the overlook at the end of Johns Road or from the Kincaid Park motocross fence -- and you might think of desolation, a frozen plain ending in a gobble of silt-blackened bergs, a place as uninviting as an ice cap.

But it's no dead zone. Instead, winter has shrunk the action to its essence -- a traveling path where habitats overlap, what biologists call an ecotone.

"There really seems to be a defined movement corridor between the toe of the bluff and the outer edge of the woods," Sinnott said. "The bluff and the marsh kind of channel everything together."

Few people see this. Of four defined legal access points between the Rabbit Creek Rifle Range and Kincaid Park, one drops off a sheer bluff and another slips unmarked between two houses in a quiet cul-de-sac. Even Johns or Oceanview

Bluff parks offer parking for only a few vehicles at a time.

All that could change under a proposal to extend the Coastal Trail from Kincaid to Potter. But would a stream of walkers, skiers, joggers and bikers -- and their dogs -- drive off or harm the wild animals? That's one of the issues fueling an argument among residents, biologists and trail advocates.

Sinnott said his agency is looking for ways to avoid or minimize conflict with wildlife. There may be places a trail shouldn't go, for example. Or a trail below the bluff might need to be elevated or screened.

## DISCOVERIES

While tracking problem black bears near the refuge last fall, Sinnott began to keep track of other animal sign. As snow deepened and ponds froze, he kept returning, partly to gather data for trail planners and partly to document the surprising intensity of winter activity.

Since October, he's visited the coastal refuge eight times after snowfalls, logging 30.3 miles on the ground and scores of observations. He's made a few startling discoveries.

For one thing, he found tracks of people and dogs crossing into the refuge from a dozen access points, some public and some private. Though prohibited, snowmachines had regularly crossed into the refuge from the Campbell Lake neighborhood, racing over the flats between Point Campbell and Oceanview. But humans seldom roamed right below the bluff.

That's where muskrats pushed up breathing holes from inside frozen ponds. Lynx prowled the woods with the densest populations of snowshoe hares. Moose bedded down just inside the tree line or followed the benches left long ago by slumping earth.

During October and November, at least two black bears meandered the route. Since then, Sinnott has found sign of at least five coyotes as well as several coyote bedding sites under low-hanging spruce. Sometimes the coyotes rendezvoused in the open, trampling the snow in what he called a "hoedown."

At one such gathering, he found a depression the size of a snowshoe hare that was spotted with blood, suggesting that one thoughtful canine had brought fresh food to the party.

## SOUNDS OF CIVILIZATION

Even with its carousing coyotes and stealthy lynx, the refuge never fully escapes the city.

At Oceanview Bluff Park, a trail hardened by people and their dogs led toward the sea. Along its route, spruce-birch forest turned to willow, willow to brush, brush to frozen marsh broken by stands of dead, bone-white trees. This human trail finally passed a rusting 55-gallon drum and stopped where the icy flats began. A red plastic gas can hanging from a branch in the last dead tree presented the only bright color in a moonscape.

The landward view was jarringly different. From a mile out, scores of big houses looked like fortifications along the bluff. The air filled with the shouts of sledding children in Oceanview, gunfire at the Rabbit Creek Rifle Range, the roar of cars on the Seward Highway.

But the winter wildlife still came. A lone moose foraged in the brush a half-mile off. In the old, gnarled crust near the sledding hill, animals had pounded a trail along the slope beneath the Alaska Railroad. So many tracks cratered the snow, it looked as if there had been a stampede.

Farther up the coast, in a tangled woods at the base of the bluff in Johns Park, this overlap of human and animal life continued. Red squirrels had skittered across the forest floor, leaving thousands of tiny, intricate tracks in a dusting of new snow. Moose had stomped past a rusting hulk that had been a sedan. Near a half-buried tire, a raven had landed, pranced forward a few steps and taken off.

## WILDLIFE ENCOUNTERS

The three coyotes halted and stared at Sinnott and two companions. The animals appeared healthy: ears erect, thick brown-gray coats, bushy tails. After continuing at the same unhurried pace, they crossed the creek and again halted. Two smaller coyotes sat on their haunches like dogs, while the largest zigzagged through frozen sedges and hummocks with nose to the ground. The ravens skittered to driftwood and watched.

A mother coyote demonstrating the fine art of vole hunting for her pups? She found nothing. After a moment, the trio

moved on, ravens flapping after them.

Sinnott led on to the northwest. A half-mile farther, the coyote tracks converged on the exposed backbone and flesh of a beluga whale, long since washed ashore and frozen in place under snow. Five vertebrae arched from the depression scratched from the ice, and sinews of flesh lay twisted on the stained surface. Coyotes and ravens had been trying to feed, but the ice was too hard.

An inventory of animal sign continued along the bluff until Sinnott reached the wreckage of rusting cars and debris below the Kincaid motocross area: coyote beds, lynx tracks, seeps littered with magpie tracks.

In the middle of one frozen pond, wads of frozen grass and stems surrounded a small open hole. Judging from the open water, a muskrat must have gnawed through the ice that morning, taking in fresh air and a snack of tubers.

In the woods at the bluff's toe, the animal trail continued along a distinct shelf, leaving a snow ditch as hard as a sidewalk. A broken tree branch stabbed out at shoulder height. Snarled in the sharp tip was a tuft of curly brown hair.

Bear hair.

The biologist fingered the stuff, marveling at bruin sign in January. Surely it had been left last summer?

He shrugged. "Maybe those were bear tracks back there along the creek," he said.

Along this coast, animals set their own schedule.

Doug O'Harra can be reached at do'harra@adn.com or 907 257-4334. Photographer Bob Hallinen can be reached at bhallinen@adn.com.

#### ILLUSTRATION SHOWS MAP OF REFUGE

*: The Anchorage Coastal Wildlife Refuge stretches for almost 16 miles along the southwest edge of the city, between the shoreline bluff and the waters of Turnagain Arm. Rick Sinnott, Anchorage area biologist for the Alaska Department of Fish and Game, leaps over open water on the Anchorage Coastal Wildlife Refuge. A trio of coyotes moves across the refuge, with several ravens tagging along. Junk cars are heaped along the lower portion of the bluff at Kincaid Motocross Park. A dead spruce near the edge of the refuge shows a twisted grain. Rick Sinnott, right, and a companion walk across the frozen flats of the Anchorage Coastal Wildlife Refuge. The refuge buzzes with animal activity year-round despite being at the doorstep of Anchorage. Stark spruce trees frame the sunset on the refuge. From Potter Marsh to Kincaid Park, houses line the bluff overlooking the refuge.*

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**TOP ALASKA STORIES**

**State takes over Coastal Trail plan**  
**Opponent of long-delayed 12-mile extension calls maneuver a betrayal**

By Don Hunter  
 Daily News Reporter  
*(Published December 22, 2000)*

Three state agencies are taking over development of a planned 12-mile extension of the Tony Knowles Coastal Trail from Kincaid Park to Potter Marsh, Gov. Tony Knowles announced Thursday.

An environmental analysis of potential routes that generally hug the coastline will begin next month, said Pat Pourchot, commissioner of the Alaska Department of Natural Resources. Previously considered alignments that would have taken the trail along highways miles from the coast are no longer part of the project.

"Those have been dropped as Coastal Trail alternatives, but most of them still appear in the municipality's trails plan," Pourchot said. Those trails may be built separately.

City and state planners have been working on the trail extension since late 1997. Initially, they said they hoped to settle on a route by the end of 1998.

But some South Anchorage residents, including homeowners who own bluff property, strongly objected to locating the new trail there. State biologists said a heavily used trail could damage a marshy habitat used by animals and migrating waterfowl. The project became mired in a battle between trail users who wanted a coastal route and those who said money would be better spent building trails in neighborhoods.

Knowles, who is on record supporting a shoreline route, said in a written statement Thursday that transferring oversight, along with better coordination among the state agencies, "should ensure that the project stays on schedule."

The project will be managed by Pourchot's DNR, the Department of Fish

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and Game, and the Department of Transportation and Public Facilities, which has been working on it with city planners for three years. The products of that effort, including the proposed alignments, will be finished next month.

The surviving trail prospects are broken into segments half a mile to two miles long, with at least two alternatives for each segment, Pourchot said. Some run along the toe of the Turnagain Bluffs, skirting the Anchorage Coastal Wildlife Refuge. Others are atop the bluff, and some may run inland half a mile or farther, he said.

Knowles and Mayor George Wuerch have discussed transferring the trail extension to the state, and Wuerch agreed in concept, said spokesman Dennis Fradley. But Wuerch hasn't seen the state's plan in writing yet and won't sign off on it until he does, Fradley said.

Jim Posey, the city's director of cultural and recreational services, said he will continue to be involved.

City officials want to make sure the trail eventually built can be sensibly managed and maintained. "It'll be turned over to the city for maintenance and operations," Posey said. "And we build a lot more trails than they do."

The switch was good news to Mike Frank, a proponent of keeping the new leg of the trail close to the character of the existing one.

"I don't think it could go any slower than it's going, and I know the governor is interested in seeing it built," Frank said. "Maybe that will instill some speed into what's been a very, very slow process."

An opponent, however, described the state takeover as "extremely disappointing" and a betrayal of the efforts of citizens who volunteered time to the project.

"We knew this was coming for a long time," said Smiley Shields, a biologist and naturalist who lives atop the bluffs overlooking the wildlife refuge. "The whole planning had been biased and absolutely pro-trail, to put it down there at any cost. This is the proof of it."

Pourchot said the environmental analysis of the alternatives should be completed by the end of 2001, with the project then in position to go to design. Some work has already been done. Counts of animals and migrating birds that use the refuge have been going on since March.

The land above and below the bluff is a patchwork of private and public ownership. Scores of homeowners own lots atop the bluff, and some own property extending out into the mud flats and marsh below. Pourchot said the state will work to minimize the trail's effect on private property.

In many spots, the trail might cut along the base of the bluff, "substantially below the view line of the property owners . . . and shielded by the bluff and woods," he said.


If property owners refuse to negotiate and a route through their property seems best, "there obviously are condemnation procedures available through DOT."

Building the extension would add another link to what someday might be a continuous trail from downtown Anchorage to Portage, Pourchot said. The state has already built trails from Indian to Bird and from Bird to Girdwood.

"Clearly, this is a project of interest to the governor, and it fits into a larger view of enhancing recreational values along Anchorage and down Turnagain Arm," he said.

As mayor of Anchorage from 1981 through 1987, Knowles championed construction of the existing trail, which runs about 11 miles from Second Avenue downtown to the ski chalet in Kincaid Park and quickly became one of the city's most popular recreational venues. It was named for him days before he left office.

Reporter Don Hunter can be reached at [dhunter@adn.com](mailto:dhunter@adn.com) and 257-4349.

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TOP ALASKA STORIES

### Coastal trail extension is sidetracked

**REVIEW: Guidelines may determine route, refuge cannot coexist.**

By Don Hunter  
Anchorage Daily News

*(Published April 12, 2001)*

Just when it looked like the plodding effort to extend the Tony Knowles Coastal Trail south was picking up momentum, the contentious project got stuck in a dispute that might block construction along Turnagain Arm to Potter Marsh.

Final route alternatives that were expected in January have been held up while the Federal Highway Administration determines if an obscure section of the 1966 Transportation Act applies to a trail through or near the Anchorage Coastal Wildlife Refuge. The refuge encompasses a broad band of salty marsh and mud flats at the base of the Turnagain Bluffs.



The proposed coastal trail extension would run through this mud flat between Point Campbell and Potter Marsh. (Bill Roth / Anchorage Daily News)

If it does, planners would have to demonstrate no "feasible and prudent" alternative inland route exists.

Such a requirement, state officials and trail advocates say, could effectively prevent a shore trail. The federal agency is involved because federal funds would pay more than 90 percent of the trail's cost, loosely estimated between \$12 million and \$19 million.

"I've heard the words 'death knell' used," said Joan Nockels, an attorney and member of Friends of the Coastal Trail, a group formed to lobby for a shoreline route.

State transportation officials asked for the federal review. A state wildlife biologist has written a memo arguing that the trail's potential effect on the refuge is so pervasive that the federal law should apply, and two state lawmakers have sent a letter to the highway administration

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State lawmakers have sent a letter to the highway administration demanding to know why it has not been invoked already.

However, top state officials say the provision, section 4F of the transportation act, is intended for highway construction. It has rarely, if ever, applied to trails in Alaska, which normally are considered enhancements to parks and refuges, said Natural Resources Commissioner Pat Pourchot and Transportation Commissioner Joe Perkins.

The biologist's boss, Fish and Game Commissioner Frank Rue, added in a letter Wednesday that he thinks the proposed extension is compatible with the refuge.

Gov. Tony Knowles in December directed three state agencies to take over the project, which had been a joint effort between city and state transportation planners. He said that would keep the long-delayed project on schedule, and other state officials predicted two or three fi route alternatives would be available within a few weeks.

Pourchot said at the time that the alternatives likely would hug the coastline, with perhaps a few shallow detours inland. Several earlier alternatives that would have taken the trail miles inland were discarded.

Knowles said in an interview Wednesday that this latest controversy caught high-level officials by surprise this week. He said Rue's letter explains the official agency position on the trail and refuge, and that he's optimistic: the project will move forward.

"As Frank has said, he believes the coastal trail is compatible (with the refuge) and the Department of Fish and Game is going to see that it makes it compatible," Knowles said. "It's up to the Federal Highway Administration to decide what process they put it through."

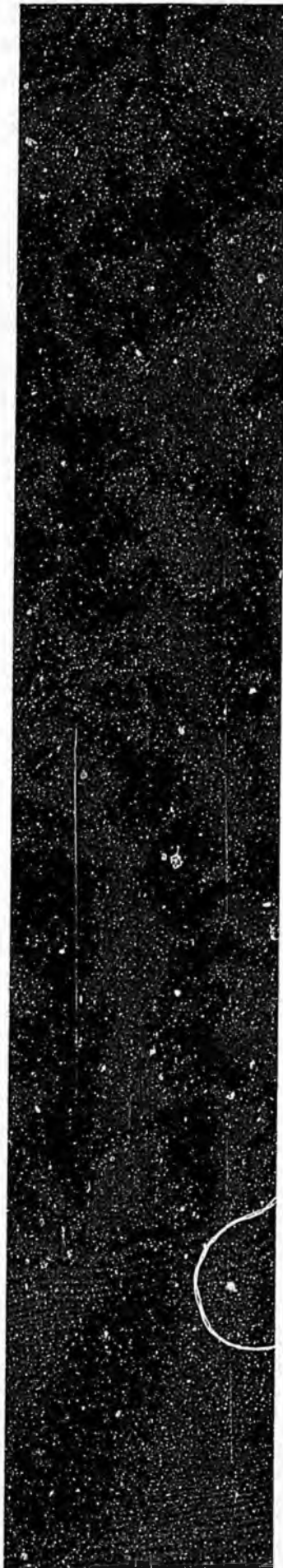
Tim Haugh, an environmental and right of way specialist with the highway administration, said his agency hopes to make a decision later this month. The agency normally relies on advice from people and agencies responsible for managing a park or refuge -- in this case, Fish and Game.

Until Rue wrote his letter Wednesday, the only document from Fish and Game on record in the 4F debate was a March 16 memo by habitat biologist Mark Kuwada.

Kuwada's memo says putting a trail on either state-owned coastal wetlands or adjoining private property "will diminish the value of wildlife habitat, and substantially interfere with migration, staging and feeding areas used by species such as trumpeter and tundra swans, snow geese, and sandhill cranes that are sensitive and vulnerable to human interference." The memo generally repeats concerns that have been voiced by other state biologists for several years.

In an interview Tuesday, Kuwada said his memo is consistent with what agency officials, including Rue, have told transportation planners all along: "There are certain trail segments within the refuge that are just going to be too damaging."

Kuwada said some trail possibilities could work with the refuge, such as



building spurs from an inland trail to the edge of the bluffs overlooking the marsh. The public already has access to the refuge for such pursuits as bird-watching, fall duck hunting and winter skiing, but a "heavily used, multipurpose trail" in use year-round, especially during critical nesting periods, presents "very clearly, some potential conflicts," he said.

Regardless of what the 4F decision is, any trail in or near the refuge would be subject to stringent standards imposed under the National Environmental Policy Act, Haugh said.

Two state lawmakers who represent South Anchorage also are weighing in. Sen. Jerry Ward and Rep. Joe Greene, both Republicans, last month wrote a letter to the highway administration pointing out the 4F requirements. This week, they asked the chairmen of the House and Senate transportation committees to schedule a joint meeting to investigate what they termed "inadequate planning and legal ramifications."

Ward said he first heard about the 4F issue when a question came up at a meeting of the Bayshore-Klatt Community Council. He said he has talked to people on both sides and that some of his constituents complain the route-selection process has been biased. "There's a lot of emotions about this trail," he said.

The idea of building a trail along Turnagain Arm has been mentioned in city and state plans since the 1970s. But over the years, homes and neighborhoods have grown up along the bluffs overlooking the Arm.

Many of those homeowners object to building a trail on or below the bluffs, raising some of the same issues as the biologists and arguing that trail money should be used to improve and tie together existing trails. At the same time, a city survey showed the coastal route enjoys broad popularity.

Knowles, who championed the original coastal trail while mayor of Anchorage in the 1980s, said the extension will provide another link in a longer trail that eventually will run from downtown to Girdwood. "I can't think of anyplace in the world that has anything like that," he said.

Reporter Don Hunter can be reached at [dhunter@adn.com](mailto:dhunter@adn.com) or 257-4349.

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# Winter Distribution and Movement Patterns of Wildlife Along the Coastal Bluff in Anchorage, Alaska: Interim Report

Rick Sinnott  
Wildlife Biologist  
Alaska Department of Fish and Game  
January 11, 2002

## Introduction

Although it is difficult to estimate population size of wild animals using their tracks, tracking can provide information on species composition, distribution, and movement patterns. I began this study in October 2001, after the first snowfall of the winter, initially with the intent of tracking several black bears. The bears were using the Anchorage Coastal Wildlife Refuge and adjacent neighborhoods and upland natural areas. During three bear tracking attempts (October 18-23), I became aware of the opportunity to track other species on the refuge and adjacent lands. Beginning October 26, I began recording all mammal tracks and concentrations of bird tracks. I will continue to conduct track surveys through the winter as conditions and time permit.

## Methods

I conducted each survey after a fresh snowfall obscured previous tracks. This let me judge the age of the fresh tracks, usually within plus or minus a day. Surveys were conducted 1-8 days after a fresh snowfall. I surveyed tracks along proposed Coastal Trail routes--Orange (primarily along the toe of the bluff), Red and Gold (in Klatt and Jewel Lake bogs)--and in Connor's Bog. These routes are depicted in the series of orthophoto maps (1 inch = 200 feet) produced by HDR Alaska, Inc. (dated November 5, 2001). I zigzagged often to compare tracks in areas adjacent to the routes. Locations were recorded using a GPS unit. Locations recorded in 2001 with WGS84 coordinates were converted to NAD27 for mapping purposes.

Most local mammal species are easy to identify by tracks: moose, black bear, brown bear, lynx, snowshoe hare, porcupine, red squirrel, and muskrat. Raven and magpie tracks are also easy to identify. Other species were differentiated as follows.

Coyote tracks can be confused with dog tracks. I used physical and behavioral clues to differentiate these species. Dog tracks are often associated with human tracks. Dogs tend to be more erratic; turning, circling, and running for no obvious reason. Tracks clearly larger or smaller than a coyote track were considered to belong to a dog. Coyotes tend to have a regular stride and when trotting the hind tracks register almost exactly on the front tracks, unlike dogs, which tend to have a less efficient gait.

Both least and short-tailed weasels are found in the Anchorage area. Short-tailed weasels are also known as ermine. Small weasels have distinct track patterns; however, a male least weasel can be about the size of a female short-tailed weasel,

making tracks difficult to identify to species. Therefore, unless a track was clearly too large to be a least weasel, all weasel tracks were lumped.

Several species of voles and shrews inhabit woods and marshes in the Anchorage area. It is difficult to impossible to distinguish between species of voles and shrews by their tracks, therefore these small mammals were lumped.

I recorded encounters with people and dogs along the proposed routes and noted well-used trails. I also noted areas used by snowmachiners.

## Results

I completed 4 track surveys from Kincaid motocross area to Oceanview Bluff Park between October 26, 2001, and January 9, 2002. The total distance surveyed was about 30.3 miles along the coastal bluff, not including side trips. Several additional partial surveys were conducted for black bear tracks along the coastal bluff. I also surveyed Klatt Bog twice (total 4.2 miles), Jewel Lake Bog once (1 mile), and Connor's Bog 3 times (total 2.5 miles).

October 18: I took advantage of the winter's first snowfall to track a black bear around Mrs. Kyzer's property, west of the mouth of Campbell Creek. The woman who reported the bear had seen it at about 0700 yesterday morning. It had also been seen in her yard yesterday morning during the snowfall. It was still snowing lightly, but I decided to follow its tracks in case it had a den nearby. I started tracking about 1530.

The woman lived at 4411 Edinburgh. The bear had been seen walking between two houses across the street, so I began there. The tracks were somewhat obscured by today's flurries. Initially, several sets of tracks were going in two directions, but then I found a relatively fresh set, from that morning, on Mrs. Kyzer's property.

I followed the bear's tracks west through the woods along the proposed Red route. Near the Jade Street easement the bear's tracks headed down the bluff to the old wooden fence on the coastal flats that demarks Mrs. Kyzer's boundary. After walking a few feet along the edge of the marsh, the bear headed uphill. I heard brush cracking uphill and found a fresh day bed (N 61.13327 W 149.97184) approximately 30 feet from the overlook shown on the 11/5/01 orthophoto maps of the Coastal Trail routes prepared by HDR. The bear had obviously been sleeping there most of the day. I followed the bear's tracks, now fresh, up the bluff, south of the houses on Byrd Street. The bear turned and went back downhill near Jade Street. It then walked along the "bench" at the toe of the bluff to the bend of Campbell Creek that is closest to the bluff. The bear's trail went uphill, then down, then up again over the southernmost point of the bluff, then downhill. The bear continued walking between the top and toe of the slope until it finally stayed on top, crossed Mrs. Kyzer's access road and then the clearing in the trees near her house. The bear then walked north and west, following the proposed Red route, back to the exact spot I started following its tracks. The bear's tracks continued west, but I returned to my truck.

This odyssey suggests several important points. The bear did not want to leave the woods and enter a neighborhood in the middle of the day, even when pressed. The bear didn't want to walk out onto the flats. The bear had a day bed a few feet above the

"bench" that the proposed Orange route would use. The bear used the "bench" and wooded strip at the toe of the bluff for 1,800 feet along the proposed Orange route. The bear used the proposed Red route for an additional 2,600 feet. The entire course was about a mile, all on Mrs. Kyzer's property.

**October 21:** A black bear was reported in a spruce tree at 6262 W. Dimond. It was still in the tree when I arrived. When the bear came down it grabbed a bag of garbage. I shot it in rump three times with rubber slugs. It dropped the garbage and ran over the bluff. I back-tracked its trail down the bluff about 100 yards to a well-defined day bed (N61.13990 W150.00209) under a large spruce tree about 20 yards up the bluff from the lower bench. The bear had slept there for a while because there were no tracks leading to the tree, previous tracks were covered with today's snow. There were signs of digging in the soft dirt under the new snow, but the bear did not den there.

I received another call about half an hour after I had chased the bear over the bluff. The same bear had walked along the top of the bluff and was in garbage about 6 houses (900 feet) east of the original house. The bear climbed a tree as I approached. I left 20 minutes later as it was getting dark.

**October 23:** Black bear tracks from last night were seen in the back yard of 200 Pacific View Drive (near Johns Road). I followed them east along and just below the top of the bluff. The bear crossed the Johns Road easement at the top of the bluff. It checked out two empty bird feeders in back yards. In one back yard the bear turned sharply, walked around the house to the garage door, grabbed a bag of garbage, pawed through it in the side yard, then walked back to the top of the bluff and continued east. It was obvious that the bear smelled the garbage from the back yard. Two houses east of Admiralty Place the bear walked onto Oceanview Drive and I lost the trail in the neighborhood. Total distance traveled along the top of the bluff was about 1,800 feet.

**October 26:** I looked for tracks along the toe and slope of the bluff between the Kincaid motocross area and Campbell Creek, a distance along the bluff of about 2.7 miles. It hadn't snowed for 3 days. Snow depth was about 6 inches along the bluff, although it was over a foot near the toe of the bluff, in the coastal marsh, and less than an inch under dense spruce trees.

*Black bear.* Black bear tracks were found on the bluff slope below 6262 West Dimond. The tracks had no snow in them and were estimated to be 2 days old. The bear walked through the day bed I found on October 21. Several bear trails zigzagging up and down the bluff intersected in this area. I followed one set east about halfway between the top and toe of the bluff. It angled downhill to the bench at the toe of the bluff, then turned west along the bench. The bear found a pile of old moose bones (mostly spinal column and pelvic girdle) and dug them up (N 61.13904 W 149.99973). It walked the bench another ¼ mile, perhaps 1/3 mile overall, then angled back uphill to where I first saw its trail.

I found an older set of bear tracks, perhaps 3-4 days old and about ½ full of snow, below 6262 West Dimond. I back-tracked the bear along the bench for 0.3 miles, then up the bluff. I lost the trail on top of the bluff about 100 yards west of Seacliff Condos in a tangle of people and moose tracks. This and the previous trail crossed the switchback on the Red route shown on the 11/5/01 orthophoto maps of the Coastal Trail provided by HDR.

Another bear trail crossed this one near the top of the bluff about halfway between the Carey's house on this largely undeveloped lot and Seacliff Condos. This trail was heading downhill. It may have been the same bear, but not the same day, as the two trails angled downhill in opposite directions and this trail was about 4-5 days old. The trail soon came to the bench at the toe of the bluff and headed east on the bench. I left the trail at the Jade Street easement to try to catch a snowmachiner in the refuge. The last two bear trails followed the toe of the bluff for 0.85 miles.

*Moose.* Moose trails were observed along the toe of the bluff from the Kincaid motocross to below Jodhpur Drive, then again near Campbell Creek. Moose walked along the toe of the bluff in the marsh and on the bench. At least 5 moose trails crossed Campbell Creek on the fill over the culverts; this was obviously a major corridor over lower Campbell Creek. Moose had walked up and down the bluff in several areas, but I saw no clear movement corridors up and down the bluff.

*Coyotes.* Coyote tracks were abundant. Coyotes used the toe of the bluff as a movement corridor. If there was no bench, they used the wetlands within 20 feet of the toe. They seemed to prefer using the benches, however. I found two, well-defined coyote day beds (N 61.13858 W 149.99683) under a spruce tree about 5 feet above the bench. Several well-used trails radiated out from this spot. However, coyotes also traveled well out into the marsh, so their tracks were constantly veering away from the main trails along the bluff and then back to the bluff. There was no place along the entire route that you couldn't see one or more coyote trails from. On Mrs. Kyzer's property the coyotes also trotted along the bank of Campbell Creek. A well-used trail of old and fresh tracks was already evident. In some places there were many trails circling through the sedges. The coyotes were hunting voles in the sedges on the flats. I heard two coyotes yapping near Campbell Creek about 1400. One was near the AWWU pump station and one was at least ¼-mile offshore. I saw the latter coyote a few minutes later. I found a small den (N 61.13350 W 149.97340) near the Jade Street easement. It was in the upturned end of a root wad. The entrance was about a foot in diameter, but there were no tracks to identify the occupant.

*Weasels.* The characteristic dumbbell prints of weasels were abundant in the marsh near the toe of the bluff. They occasionally ventured away from the bluff, but didn't seem to go far. I found some tracks on the benches, but didn't see any tracks going up or down the bluff above the benches. There were areas with concentrations of tracks, such as between the Kincaid motocross area and Jodhpur Road and between Seacliff Condos and Kyzer's property. However, weasel tracks were abundant along the entire route.

*Maggies.* Black-billed magpie tracks and wing prints were abundant near the many, unfrozen seeps at the toe of the bluff. They appeared to be scratching at the sodden leaves, perhaps finding invertebrates.

*Raptors.* A bald eagle was perched in a large cottonwood near the west end of Mrs. Kyzer's property (N 61.13275 W 149.96992).

**October 29:** I walked from Furrow Creek to Bayshore Creek, mostly along the base of the bluff, a distance of about 2.2 miles. Snow was about 6 inches deep. Furrow Creek has created an alluvial fan and the forested area extends farther from the bluff than most

areas. The forest is mixed birch, cottonwood, alder, and white spruce, no different in composition from other areas along the bluff.

*Voles and shrews.* Some trails and holes in the snow were found in the forested areas, but tracks and holes of these small mammals were most abundant in the *Calamagrostis* zone between the forest and the marsh sedges.

*Weasels.* Weasel tracks were observed in forested areas; however, they were one of the most common tracks in open areas heavily used by voles. These areas included the *Calamagrostis* and sedges near the bluff from Victor Drive to Bayshore Creek, especially between the sewer berm and the bluff.

*Snowshoe hares.* The forested area below the bluff was criss-crossed with numerous snowshoe hare tracks. The strip of trees between Furrow Creek and the west end of Botanical Heights Circle had the highest density of hares I've seen in the Anchorage Bowl so far this winter. Snowshoe hare tracks were also relatively abundant in other forested areas along the entire route. Hares seldom seemed to venture into the open marsh.

*Lynx.* Because of the abundant hares, the number of predators also appears high. Lynx tracks were numerous in Johns Park below the bluff and the adjacent refuge, in all directions. Some tracks went up and down the bluff, but most tracks were on the flat area between the toe of the bluff and the open marsh. As the forested area narrowed to a strip along the base of the bluff south of Shore Drive, the lynx tracks continued to be abundant only in cover, with occasional short forays into the marsh along the ecotone. Lynx tracks followed the sewer berm and the toe of the bluff from Victor Drive to the Klatt peat disposal peninsula. I did not follow the sewer berm west of the peat dump, but two sets of lynx tracks followed the toe of the bluff from the peat dump to Bayshore Creek and beyond. At least two sets of lynx tracks were visible at every point during this survey. This area had the highest density of lynx tracks I've ever seen in the Anchorage Bowl.

*Coyotes.* Coyote tracks were also numerous in Johns Park below the bluff and the adjacent refuge. Coyotes were less confined to the forested strip along the toe of the bluff. Their tracks often went well into the open marsh. However, their tracks were most concentrated in the forested area at the base of the bluff. Coyotes obviously use the toe of the bluff as a movement corridor. Coyote tracks were more numerous than lynx tracks in areas with only a thin strip of cover at the toe of the bluff; i.e., from Victor Drive to Bayshore Creek. Coyotes also followed the sewer berm.

*Moose.* Johns Park was well-used by moose below the bluff, judging from the tracks in all directions. As the forested area narrowed to a strip along the base of the bluff below Shore Drive, the moose tracks and beds were concentrated on the sewer berm until it became less prominent near Spyglass Circle.

*Raptors.* Feathers from a small passerine killed by a raptor were found at the toe of the bluff near Spyglass Circle.

**October 30:** I walked from Furrow Creek to the sledding hill at Oceanview Bluff Park, about 1.1 miles along the bluff. Snow conditions were the same as yesterday. The Orange route along the toe of the bluff is a treacherous area, with frequent seeps or

upwelling pools of water from the bluff creating open water or thin ice conditions. It was difficult to walk through the underbrush and deadfalls without stepping or slipping into these icy puddles, and some were well over knee deep.

From the sledding hill at Oceanview Bluff Park to the old Oceanview sewer berm lies a sweetgale (*Myrica gale*) brush zone sandwiched between the black spruce near the bluff and the sedges farther out in the marsh. The sweetgale, about 2 or 3 feet high, was holding a heavy load of snow off the ground. I saw no tracks in this area except moose trails. The high, snowy brush may limit visibility and movement of medium-sized mammals (e.g., hares and coyotes) until the snow pack builds up.

*Voles and shrews.* The tracks and holes of these small mammals were most abundant in open areas.

*Weasels.* A few weasel tracks were seen in the forest. I didn't spend much time in the *Calamagrostis* and sedges beyond the forest where weasel tracks are normally more abundant.

*Snowshoe hares.* Hare tracks were abundant in forested cover, comparable to yesterday. I saw no hare tracks in the sweetgale brush between the sledding hill at Oceanview Bluff Park and the old Oceanview sewer berm. As I walked from the black spruce bog towards the bluff, hare tracks and droppings did not become abundant until the black spruce mixed with alders.

*Lynx.* Lynx tracks were abundant in all forested areas, comparable to yesterday. Lynx appeared less likely than coyotes to follow hares into the black spruce/alder zone away from the toe of the bluff.

*Coyotes.* Coyote tracks were abundant in forested areas and in the open marsh, comparable to yesterday. Coyote tracks were also abundant in the black spruce/alder zone between the sledding hill at Oceanview Bluff Park and the old Oceanview sewer berm. Coyotes traveled the entire length of the old sewer berm.

*Black bears.* Bear tracks were observed climbing the bluff on the ridge east of Furrow Creek. They joined a well-defined human trail on top of the bluff. I back-tracked the trail down the ridge and to the east, where it came out of the subdivision and down the bluff. Another set of bear tracks climbed down the bluff nearby and headed east. The total distance traveled by both sets of tracks in Johns Park and the refuge was 0.2 miles. There were so many lynx, coyote, and moose tracks stepping into the bear prints in this part of Johns Park and the refuge that the bear tracks were frequently obscured.

Another set of bear tracks climbed the bluff into the subdivision about 100 yards east of the last set. I back-tracked this trail for 0.5 mile until they came down the bluff out of the Oceanview subdivision, between Beach and Gulf circles.

I found another set of bear tracks heading eastward near the sledding hill at Oceanview Bluff Park. I back-tracked this trail 0.2 mile until I lost it on a human/moose trail coming out of the Oceanview subdivision at the base of the old sewer berm.

It is likely that all of the bear trails followed today were made by the same bear. All appeared to be almost two weeks old, made after the major snowfall but before the

flurries ended. Except for the trails directly up and down the bluff, all of the trails hugged the toe of the bluff, sometimes following a narrow bench above wet areas, sometimes veering away from the bluff to get around tangles of dead trees. In total, black bear tracks were found along 0.9 miles of the 1-mile route I walked today along the toe of the bluff.

*Moose.* Moose tracks were numerous in forested areas and moose occasionally forayed into the marsh. The old Oceanview sewer berm had numerous moose trails heading in and out. Moose apparently use the berm as a movement corridor.

*Raptors.* I saw or heard no raptors; however, I found a blood stain from a hare killed, probably by a goshawk, on the top of the bluff adjacent to Furrow Creek. I found a pile of feathers from a robin killed by another raptor at the toe of the bluff about halfway between Furrow Creek and Oceanview Bluff Park.

*Humans and dogs.* People use the marsh in winter more than I thought. There were well-defined human trails at several access points, including the old Oceanview sewer berm, Johns Road, and Furrow Creek. Yesterday I found well-defined human trails at west Johns Park, Victor Road, Spyglass Circle, and Bayshore Creek, to name a few. I saw one person walking 2 dogs without leashes in the refuge near Shore Drive.

**November 3:** I walked from Kincaid motocross area to Bayshore Creek, about 3.6 miles along the bluff. About 6 inches of snow had fallen on the old snow, erasing most tracks more than a week old. The snow stopped falling about 30 hours ago, which helped age new tracks.

*Voles and shrews.* I found some tracks on the new snow. Holes in the snow were the most abundant sign.

*Weasels.* Numerous weasel tracks were seen in the open marsh near the toe of the bluff between the Kincaid motocross area and Retherford's boardwalk. Tracks were less common between the boardwalk and the AWWU lift station. Several sets were found in the open marsh at the toe of the bluff between the AWWU lift station and Bayshore Creek. Weasels were primarily using the open marsh, especially in areas with *Calamagrostis* and drift logs; however, their tracks also ventured into the forest edge along benches.

*Red squirrels.* Sporadic networks of tracks on the bluff face and benches, rarely in open marsh. The networks generally radiated from a large spruce or group of spruces with large piles of cone detritus and den holes.

*Snowshoe hares.* No concentrations of tracks. Hares tend to stay on benches or parallel the bluff slope rather than move up and down the bluff. A small area on the bench and slope between the AWWU lift station and Bayshore subdivision had many hare tracks. Noticeable lack of fresh tracks of any kind in pole stand of birch on bluff near Resolution Pointe subdivision.

*Lynx.* Fresh lynx tracks were seen at the toe of the bluff near Retherford's boardwalk traveling east about 200 yards. One or more old sets of lynx tracks also began here and continued east to Seacliff Condominiums. More fresh lynx tracks were found between Carey's house, west of Seacliff condos, and Shorecrest Drive (about 300 yards total).

Another set of fresh lynx tracks moved up and down the bluff all along Mrs. Kyzer's property. The fresh tracks occasionally led to the edge of Campbell Creek. Another set of fresh lynx tracks was found along the toe of the bluff below Bayshore subdivision to Bayshore Creek. The lynx climbed the bluff at Bayshore Creek and continued east along the top of the bluff, but this trail was not followed. Lynx seemed to prefer walking on the bench or just inside the edge of the forest, unless deadfalls or heavy brush forced them into the open marsh at the toe of the bluff.

*Coyotes.* Old coyote tracks were always in sight. Old tracks criss-crossed the open marsh. Fresh tracks were almost as abundant, but they were predominantly on the benches and in the open marsh within 30 yards of the forest edge. Unlike lynx, coyotes seemed to prefer traveling along the open edge and in the marsh to forested areas, although almost every bench had at least one fresh trail. Coyotes crossed the culverts on Campbell Creek.

A coyote had investigated the day bed I found last time. However, they had another day bed nearby under a large spruce tree at the toe of the bluff (N 61.13774 W 149.99354) with four beds that were used since the new snow. Many trails radiated up the bluff, out into the marsh, and both east and west along the bench and toe of the slope from this day bed. Nearby, about 10 feet into the open marsh (N 61.13844 W 149.99786), was a rendezvous site where at least 4 coyotes had joined from different directions and trampled an area about 10 feet by 10 feet, before splitting up. One coyote had a freshly killed hare, judging from spots of blood and an impression in the snow. There were no hare tracks leading to the rendezvous site, suggesting the hare was caught and killed elsewhere.

A dead beluga whale had been carried by high tides to within 200 feet of the base of the bluff off Shorecrest Drive (N 61.13337 W 149.97726). Fresh coyote tracks radiated in all directions from the carcass. A group of 5 coyotes had approached the carcass from the east, and a large communal day bed was trampled in the fresh snow about 20 yards from the carcass.

*Black bears.* Old tracks were observed up and down the bluff at the Kincaid motocross area.

*Moose.* Old moose tracks were found on all benches and in the open marsh at the toe of the bluff along the entire route. Fresh moose tracks were sporadic. The fresh trails angled downslope and then walked on the benches or open marsh near the forest edge. Several fresh beds were found on benches or in the open marsh near the edge.

Three sets of moose tracks crossed Campbell Creek over the culverts. These same 3 moose had walked through the municipal uplands near Resolution Pointe subdivision north of the AWWU lift station and across the access road. These three moose (one left spots of blood in left hind prints) eventually turned and walked back west along the toe of the bluff, and then climbed the bluff back into the municipal uplands. Other moose had walked up and down the access road. Moose seemed to prefer walking in the open marsh below Resolution Pointe and Bayshore subdivisions due to the thick undergrowth and occasional deadfalls in this area.

*Raptors.* Two eagle perches were found in large cottonwood trees at the toe of the bluff on Mrs. Kyzer's property (N 61.13275 W 149.96992; N 61.13140 W 149.96653). The eastern roost tree was near the bend of Campbell Creek closest to the bluff.

*Ravens and magpies.* Ravens and magpie tracks were abundant along the base of the bluff. Open seeps between the Kincaid motocross area and Retherford's boardwalk had again attracted magpies. The snow within 10 feet of the largest seeps was packed by magpie tracks.

Ten or more ravens were feeding on the beluga carcass (see coyote section).

*Humans and dogs.* The only heavily used human trail entered the refuge through a natural cut in the bluff from the municipal uplands near Resolution Pointe subdivision. Fresh dog tracks were seen there and in several locations at the base of the bluff near Bayshore subdivision. Several of these free-ranging dog trails led into the open marsh.

**November 5:** For comparison with the Orange route, I walked one of the least developed segments of the Red route, through Klatt Bog from the junction of C Street/Klatt Road to Northwood Drive, about 2.1 miles. I took occasional side loops through adjacent habitats. A snowfall of 4-6 inches 2 days ago covered most existing small and medium-sized mammal tracks and a snowfall of 2 inches about 24-30 hours ago covered all existing small mammal and bird tracks. This allowed me to age tracks as fresh (less than 1 day old), 1-2 days old, and 2-7 days old.

*Voles and shrews.* A few fresh vole tracks and holes were found, primarily in *Calamagrostis*.

*Red squirrels.* A few fresh squirrel tracks were found in wooded areas near Tower Road and the Klatt/Northwood corner.

*Weasels.* No weasel tracks were seen.

*Snowshoe hares.* Fresh hare tracks were abundant, even more abundant in some places than below Johns Park. Hares used disturbed habitat along Tower and Klatt roads. Disturbed areas along Tower and Klatt roads have narrow strips, about 10 yards wide, of alder and birch trees mixed with spruce parallel to the road. Fresh hare tracks were abundant in heavy cover, with trees at least 8-10 feet tall. Areas with low black spruce trees had few hare tracks and long distances with no tracks at all. Undoubtedly, the abundant hare population will attract lynx, coyotes, and avian predators like goshawks and great horned owls. However, it is notable that there was fresh sign of only one predator in 2.1 miles. This area is not used by predators as frequently as the refuge and adjacent marsh and ecotone along the bluff.

*Lynx.* One set of 1 to 2-day-old tracks cut across the proposed Red route just north of the proposed parking lot near the corner of Klatt/Northwood roads. A fresh set of lynx tracks paralleled Northwood Drive where the Red route would cross the road.

*Coyotes.* Two sets of 2 to 7-day-old coyote tracks were observed. One set was near the west edge of the subdivision north of Klatt Road and one near Northwood Road.

*Moose.* Fresh and old moose tracks were seen sporadically following and crossing the Red route. There was no obvious movement corridor like that below the bluff. Moose had fed in the disturbed habitat along Klatt Road. Other areas along the route had little or no browse and moose were just passing through. Moose had crossed Klatt Road at several locations. The number of fresh moose tracks seemed comparable to many areas at the toe of the bluff.

*Humans and dogs.* There were no wild mammal or bird tracks from C Street to Tower road, about ½ mile. This area around the softball fields was heavily used by sledders and people walking dogs. Humans, with and without dogs, had also walked along the north shoulder of Klatt Road and along both of the roadbeds in Klatt Bog that exit the proposed parking lot near the corner of Klatt and Northwood. All or most of the dogs were off leash, judging from their tracks. One dog walker was seen along the route with his dog on a leash.

**November 8:** I walked the Orange route from Oceanview Bluff Park to Bayshore Creek, a distance of about 3.3 miles along the bluff. I took occasional side trips through adjacent habitats. A snowfall of 4-6 inches 5 days ago covered most existing small and medium-sized mammal tracks and a snowfall of 2 inches 4 days ago covered all existing small mammal and bird tracks.

*Voles and shrews.* Many fresh vole tracks and holes were found, primarily in *Calamagrostis* or, in the forest, under deadfalls.

*Red squirrels.* Squirrel tracks were common in wooded areas. They were most abundant in areas with large white spruce.

*Weasels.* Weasel tracks were common in the alder/black spruce bog between Oceanview Bluff Park and the old Oceanview sewer line. Weasel tracks were abundant in the alder and *Calamagrostis* habitat in Johns Park and between the Klatt peat disposal peninsula and Bayshore Creek. They were most abundant in the *Calamagrostis* south of Shore Drive and Diligence Circle. An estimated 60-70 sets of fresh (1-4 day old) tracks were seen in this area alone (some of these were undoubtedly made by the same weasel). Some weasel tracks were found in the forested habitat at the toe of the bluff.

*Snowshoe hares.* Hare tracks were common to abundant throughout the forested habitat and in all cover with trees or shrubs at least 8 feet tall. Hares occasionally ventured into the open marsh between "islands" of low shrubs.

*Lynx.* At least one set of lynx tracks transected the entire forested strip between the toe of the bluff and the open marsh. Lynx occasionally walked up to 10 yards into the open marsh along the ecotone. From Johns Road to the west edge of Johns Park lynx tracks of various ages (fresh to over 5 days old) were abundant and criss-crossed in all directions. Lynx tracks were observed at the outermost fringe of alder shrubs around the mouth of Furrow Creek (e.g., N 61.10388 W 149.89164 and N 61.10346 W 149.89310). The fringe of alder shrubs extends to the lower edge of HDR's orthophoto map sheet 11, well into the wildlife refuge. Some tracks were about 800 feet from the toe of the bluff, measured with GPS. A lynx bed (1-2 days old) was found under a birch tree near the mouth of Furrow Creek, about 50 yards from the bluff (N 61.10444 W 149.88751). A set of 2-4 day old lynx tracks followed the toe of the bluff south of Shore Drive. Fresh (1-2

days) and old (at least 5 days) sets of lynx tracks followed the toe of the bluff between the Klatt peat disposal peninsula and Bayshore Creek. A hare killed by a lynx was found on top of the bluff east of the mouth of Bayshore Creek. Lynx tracks criss-crossed the top of the bluff in all directions at Bayshore Creek where only one set was present on November 3. Some of the trails went up and down the bluff into the wildlife refuge.

The alder habitat at the mouth of Furrow Creek is one of the most hazardous areas along the route. The habitat is about half tussocks and half pools and watercourses. I broke through the ice into water 3-24 inches deep at least once every 5 steps and was soon wet to the crotch. About a foot of snow held up by *Calamagrostis* stems covered the ground, compounding the difficult footing because I couldn't see my feet or the condition of the substrate.

*Coyote.* I found coyote tracks 2-4 days old near the bottom of the sledding hill at Oceanview Bluff Park. Coyotes had used the old Oceanview sewer berm in the last 4 days. Two sets of coyote tracks (2-4 days old) left the base of the sewer berm and headed west into the open marsh. The only fresh coyote tracks (less than 1 day old) were seen heading west into the open marsh from the Klatt peat disposal peninsula. Many sets of old coyote tracks (over 5 days old) were observed in the open marsh along the forested strip and angling to and from the open marsh along the entire route walked.

*Black bear.* No recent bear tracks were observed. One set of old bear tracks (over 10 days) walked east along the top of the bluff at Johns Park. The bear's tracks left a well-packed human/dog trail in Johns Park and crossed into the wildlife refuge heading toward the houses on Pacific View Drive. I did not follow it onto the first private lot.

I found a large cottonwood tree (over 4 feet in diameter) with clawed bark leading to a large horizontal limb about 25 feet above the ground. The tree was about 20 yards from the toe of the bluff (N 61.10413 W 149.88470).

*Moose.* Moose tracks were ubiquitous, especially in the open marsh along the forested strip at the base of the bluff. Moose often walked along the toe of the bluff as well, and tracks were seen criss-crossing in all directions. Occasionally moose traveled up or down the bluff. Some routes up and down the bluff are used more than others. Many moose tracks converged at the sledding hill at Oceanview Bluff Park, the old Oceanview sewer berm access road, the old road leading into the refuge south of Beach Circle, Johns Road easement, Furrow Creek, the Klatt peat disposal peninsula, and Bayshore Creek. These appear to be movement corridors that moose use to enter and leave the wildlife refuge.

Moose tracks were abundant in the open marsh south of Shore Drive where they were moving along the forest fringe and between low, heavily browsed willows in the marsh.

Moose tracks were the only tracks found in the black spruce bog between the sledding hill at Oceanview Bluff Park and the old Oceanview sewer berm. Deep snow, suspended by *Myrica gale* and *Calamagrostis* stems made it difficult to walk on the snow.

Moose had walked around the Klatt peat disposal peninsula, especially near the base and the isthmus. I counted 12 moose beds (1-3 days old); 6 of the beds were along the

sewer berm south of Shore Drive. I saw 1 cow browsing at the toe of the bluff south of Shore Drive.

*Humans and dogs.* Human and dog tracks were abundant at the sledding hill in Oceanview Bluff Park, along the old Oceanview sewer berm and access road, on the Johns Road easement, on the refuge access trail at the west edge of Johns Park, south of the corner of Shore and Skyway drives, on the Victor Road and Spyglass Circle easements, the local sledding hill and 2 nearby skating rinks in the marsh south of Seaport Circle, and Bayshore Creek.

November 17: I walked the Orange route from the sledding hill at Oceanview Bluff Park to Campbell Creek, a distance of about 4.2 miles. I took occasional side loops through adjacent habitats. About 1/2 inch of snow fell 3 days ago.

*Voles and shrews.* Many fresh vole and some shrew tracks and holes were found, primarily in *Calamagrostis* and beach rye or, in the forest, between and under logs.

*Red squirrels.* Squirrel tracks were found in wooded areas. They were most abundant in areas with large white spruce.

*Muskrats.* A muskrat den was dug into the bank at the toe of the bluff near the west end of Bree Drive (N 61.10462 W 149.88633). Fresh tracks were on the ice and snow on and around a small, mostly unfrozen puddle.

*Weasels.* Weasel tracks were abundant in the *Calamagrostis* south of Shore Drive and Diligence Circle. Some weasel tracks were found in the forested habitat at the toe of the bluff. About 20 small weasel, presumably least weasel, trails were found in the birch forest on top of the bluff east of Campbell Creek.

*Snowshoe hares.* Hare tracks were common to abundant throughout the forested habitat and in all cover with trees or shrubs. Hares occasionally ventured into the open marsh between "islands" of low shrubs.

*Lynx.* Old lynx tracks were seen in the brush between the sledding hill and the old Oceanview sewer line. Old lynx tracks were abundant between the old Oceanview sewer line and Shore Drive in all directions. These old tracks were more abundant than last time (i.e., 4-9 days old) and at least one set was about 3 days old. A lynx had walked down Bayshore Creek about 3 days ago. A fresh set (today) of lynx tracks went up Bayshore Creek. I backtracked this set and an older set (about 3 days old) into all the brush at the mouth of Bayshore Creek, almost out to the sewer berm. Another set of fresh lynx tracks, probably the same lynx, was on top of the bluff east of Campbell Creek along with old lynx tracks.

*Coyote.* Coyote tracks were not as abundant, compared with previous visits, between the sledding hill and Shore Drive; however, fresh and old tracks were in Furrow Creek canyon and were very abundant from the Shore Drive sewer line to Campbell Creek, in all directions. Old sets of coyote tracks were found along the entire route, but were most abundant west of Johns Park. Old and fresh coyote tracks were on top of the bluff east of Campbell Creek.

*Moose.* Old moose tracks were ubiquitous. Fresh tracks were discontinuous, but common. Two yearling bulls were seen near the old Oceanview sewer line and on a bed near the toe of the bluff 200 yards east of the Klatt peat disposal peninsula. The latter bull ran west along the toe of the bluff over the peat disposal isthmus and continued west along the toe of the bluff.

Old moose tracks followed the old Oceanview sewer line and turned east and west from the southern end of the berm. A well-defined moose trail led from near the southern end of the berm northwest towards Johns Road. I followed it through the *Myrica gale* and black spruce bog until it seemed to peter out in the brush about halfway to the bluff. Another heavily used moose trail left the bluff near the base of the sewer line and crossed the other trail in the *Myrica gale*, heading southwest into the ghost forest.

A heavily used moose trail ran along the toe of the bluff from Johns Road to the sewer berm near Shore Drive. Another moose trail came down the bluff near the eagle nests and headed south into the open marsh and refuge. The trail was less defined in sections with lots of blowdowns. The trail split at the berm with one fork following the berm and one staying at the toe of the bluff. The trail split at the Klatt peat disposal peninsula and then rejoined along the toe of the bluff to Campbell Creek. Lots of moose tracks on top of the Klatt peat disposal peninsula.

*Raptors.* One eagle was flying parallel to the bluff near the Klatt peat disposal peninsula. A goshawk or great horned owl had killed and eaten a snowshoe hare at a perch near the toe of the bluff about 100 yards west of Furrow Creek.

*Humans and dogs.* Human and dog tracks were abundant at the sledding hill in Oceanview Bluff Park. People had snowshoed from the sledding hill to the sewer line along a survey line cut roughly parallel to the bluff. Skiers and snowshoers had used the sewer line and swung back from the end toward the sledding hill. These trails should be clear in an aerial photo. Other trails heavily used by people and dogs came down the bluff east of Furrow Creek and into the refuge, west of Furrow Creek to the creek, at the west end of Johns Park and into the refuge, Victor Drive, and the local sledding hill at Seaport Drive, Bayshore subdivision out into the open marsh and parallel to the bluff toward Campbell Creek. The two skating rinks in the marsh near Bayshore had been obliterated by high tides and blocks of ice. Several heavily used trails were on top of the bluff east of Campbell Creek. Lots of free-ranging dog tracks entered the refuge near Bayshore subdivision. Snowmachines, walkers, and dogs used the AWWU access road to access the refuge.

**November 18:** I walked approximately 1 mile through Connor's Bog and edge habitat adjacent to the athletic fields at de la Vega park. About ½ inch of snow fell 4 days ago.

*Voles.* Two short vole trails were observed. The black spruce bog was essentially a clean slate, with no other small or medium-sized mammal tracks or bird sign on the snow.

*Moose.* Old moose tracks were common and some fresh trails were observed. There was no obvious direction of trails, except along fence lines.

*Humans and dogs.* Human and dog tracks were abundant along the sewer berm, fence lines, and following several old snowmachine tracks in the bog. Three skijorers with dogs passed by on the sewer berm.

**November 20:** I walked from the Kincaid motocross area to Campbell Creek, a distance of about 2.7 miles. A light freezing rain fell 2 days ago. Recent high tides left ice and crusty snow at the toe of the bluff between the motocross area and Retherford's boardwalk and below Shorecrest Drive and the Kyzer's property. This proved to be a good substrate for tracking larger mammals, as coyote and moose tracks were clearly visible and could be aged.

*Voles and shrews.* Snow conditions were not ideal for finding small mammal tracks. Some vole and shrew trails were observed in the same locations as before.

*Red squirrels.* Tracks were not abundant, and were only observed in wooded areas and along the edge of the open marsh.

*Weasels.* Tracks were not abundant; however, snow conditions were not ideal for finding small tracks in open areas due to tidal flooding.

*Snowshoe hares.* Tracks were common, but not abundant along ecotone.

*Lynx.* Two sets of old lynx tracks were observed along the ecotone, beginning where the bench widens west of Retherford's boardwalk. They were 1-2 weeks old (i.e., newer than my last set of tracks but before last week's snow). A fresh set (less than 1 day) of lynx tracks was observed below Seacliff Condos, heading east. Another set, probably a day older, was also observed below Seacliff Condos. Both sets of lynx tracks were lost on the bluff at Kyzer's property. Lynx tracks usually followed the bench in the trees, but occasionally ventured up to 10 yards into the open marsh.

*Coyote.* Fresh coyote tracks were very abundant along the entire route. As many as 4 coyotes (1 adult, 3 pups) had traveled in a group and singly along the entire route in both directions at the edge of the open marsh and along all benches during the last 1-3 days. Fresh and old tracks also went up the bluff and out into the marsh.

A coyote had dug up and inspected a moose leg bone on the bluff near the motocross area, about 40 yards below the top (N 61.14231 W 150.01987), about a week ago. A coyote had inspected on an old beaver carcass at the toe of the bluff less than 100 yards east of the motocross area (N 61.14176 W 150.01954). This was probably a beaver I left near the antenna tower on top of the bluff last June. One or two coyotes had dug up and played with the old goose carcass (mostly feathers) on the bench west of Retherford's boardwalk (N 61.14051 W 150.01057). Since yesterday at least 2 coyotes had dug up and inspected the old moose vertebral column and pelvic girdle (on the bench) that the black bear had found and inspected several weeks ago. Multiple old and fresh coyote tracks led to and from the beluga carcass near Campbell Creek. In addition to these scavenging efforts, several dozen digs were observed in the sedges near the toe of the bluff where coyotes had attempted to catch a vole or shrew.

Groups of 3-4 coyote day beds, used in the last 1-2 days, were found at the toe of the bluff under a large spruce and adjacent birch tree (N 61.14073 W 150.01245), about 15 feet above the bench under two large spruce trees (N 61.13876 W 149.99898), and on

the bench under a large spruce tree (N 61.13781 W 149.99317). The last set of day beds was the same as those observed on November 3. The coyotes had trampled another rendezvous site in the snow about 200 yards to the east of these day beds over a week ago. Like the one I observed on November 3, this rendezvous site was about 10 feet in diameter and was located about 10 feet into the open marsh.

*Moose.* Moose tracks were ubiquitous. There is an obvious trail in the open marsh at the edge of the trees and on every bench from the motocross to Campbell Creek. Moose beds were observed mostly in the open at the edge of the trees, but several were on the benches.

*Magpies and ravens.* Pools of open water are still available at the toe of the bluff between the Kincaid motocross area and Retherford's boardwalk. Magpies and ravens continue to use the pools and the surrounding snow surface. A group of 10-20 ravens has been seen near the west boundary of Kyzer's property on every visit. Today approximately 15 were in the cottonwoods, occasionally flying to the beluga carcass, which is in the same location as last time. Ravens had left almost no untracked snow for 200 feet along toe of the bluff, centered on Mrs. Kyzer's wooden fence, and from inside the tree line to about 20 yards into the open marsh.

*Raptors.* A bald eagle flew the length of Campbell Lake and over the dam into the refuge.

*Humans and dogs.* Human tracks were abundant at the motocross area and some people had walked part way down the bluff. Human tracks were also abundant in the trees below Seacliff Condos, but people had not entered the open marsh, which is flooded, with a thin crust of ice. Many people and dogs had walked along the AWWU access road.

Snowmachines have run the entire route from Campbell Lake to Point Campbell, and presumably beyond. Most or all of the snowmachines are coming from houses around the lake. Below the motocross area, several sets of old trails were 20-40 yards offshore. Trails tended to stay farther from the tree line between the motocross area and Mrs. Kyzer's property to avoid wet areas and hidden logs. At Mrs. Kyzer's the trails funneled into the area between the creek and the bluff. Snowmachines crossed Campbell Creek at the culverts below the dam. Old and new snowmachine trails ran along the east bank of the creek and between the lake and the refuge along the AWWU access road.

**November 21:** I walked the portion of the Red route through Klatt Bog from the junction of C Street/Klatt Road to Northwood Drive, about 2.1 miles. I took occasional side loops through adjacent habitats. The last snowfall, about ½ inch, was 7-8 days ago.

*Voles and shrews.* A few fresh vole tracks and holes were found, primarily in *Calamagrostis*.

*Red squirrels.* A few fresh squirrel tracks were found in wooded areas near Tower Road and the Klatt/Northwood corner.

*Snowshoe hares.* Hare tracks were abundant in the same areas they were found last time. Hares seldom ventured into the black spruce bog. A few hare tracks were found just inside the fence east of Tower Road.

*Coyotes.* Two sets of fresh coyote tracks were observed in the irrigation ditch west of Tower Road. Another fresh set of tracks was in the gravel pits west of the housing area. A hare was killed near the route in this area judging by the pieces of fur, but the kill site was not found, so the predator is unknown.

*Moose.* Fresh and old moose tracks were seen sporadically following and crossing the Red route. The only movement corridors appeared to be along the strip of disturbed habitat along Klatt Road, where moose are browsing on alders and birches along the strip, and the dike behind the subdivision, where moose seem to follow the fence line. Moose had crossed Klatt Road at many locations. The number of fresh moose tracks seemed comparable to many areas at the toe of the bluff.

*Humans and dogs.* There were no wild mammal or bird tracks from C Street to Tower road, about 1/2 mile. This area around the softball fields was heavily used by sledders and people walking dogs. Humans, with and without dogs, had also walked along the north shoulder of Klatt Road and along both of the roadbeds in Klatt Bog that exit the proposed parking lot near the corner of Klatt and Northwood. One dog walker was seen along the route with her dog on a leash. A couple had two dogs not on leashes. Another pair of dogs was seen with no owner.

**November 22:** I walked approximately 1/2 mile through Connor's Bog and edge habitat adjacent to the athletic fields at de la Vega park. The last snowfall was 8-9 days ago; however recent heavy hoarfrost facilitated identification of recent tracks.

*Voles.* No vole or shrew trails were observed.

*Snowshoe hares.* A few hare tracks were observed in the black spruce bog near clumps of taller spruce and in the fringe of mixed birch/spruce next to the athletic fields.

*Moose.* Old moose tracks were common and some fresh trails were observed. There was no obvious direction of trails, except along fence lines.

*Humans and dogs.* Human and dog tracks were abundant along the sewer berm, fence lines, and following several old snowmachine tracks in the bog. One skier was observed with 2 loose dogs.

**December 22:** I walked approximately 1 mile through Connor's Bog and edge habitat adjacent to the athletic fields at de la Vega park. It had snowed about 1/2 inch 4 days before.

*Voles.* No vole or shrew trails were observed.

*Red squirrels.* One set of tracks was observed in a black spruce "island."

*Snowshoe hares.* No tracks were observed, even in suitable habitat.

*Moose.* No new tracks were observed.

*Humans and dogs.* Human and dog tracks were abundant along the sewer berm.

**January 8, 2002:** I walked approximately 0.6 mile along the "adjusted Gold Route" and 0.4 mile along the "original Gold Route" in a loop through Jewel Lake Bog and edge habitat between Jewel and Sand lakes. It snowed about 1 inch about 24 hours ago.

*Voles.* Two vole trails were observed on the brushy berm near where it intersects with the northernmost crossing of the bog.

*Snowshoe hares.* No tracks observed.

*Weasels.* One set of short-tailed weasel tracks (36" bounds) crossed the original Gold Route at the southwest corner of the loop.

*Moose.* Old moose tracks were visible. A fresh cow and calf trail crossed the proposed trail near the Sand Lake canal. There was no obvious direction of trails.

*Humans and dogs.* Human and dog tracks were abundant along a packed snowmachine trail at the northernmost crossing of the bog and in the southeast corner of the loop, where it connects with 84<sup>th</sup> Avenue. A person with two loose dogs and a person with one leashed dog had walked the western side of the loop. A loose dog had crossed the bog at the southern crossing, and dog tracks were seen along the east side of the bog. Numerous old snowmachine tracks crossed the bog in all directions.

**January 9:** I walked from Campbell Creek to the Kincaid motocross area, approximately 2.7 miles. It snowed about 2 days ago; however chinook winds glazed all but this morning's tracks. The crusty snow and large expanses of ice obscured most tracks smaller than coyote.

*Muskrats.* Three muskrat pushups were found about 20 yards from the bluff near Retherford's boardwalk (N 61.14039 W 150.00442). One of the pushups had an unfrozen hole through the ice.

*Moose.* Fresh moose tracks were observed on the AWWU access road. One to two day old tracks were observed around Campbell Creek and west along the toe of the bluff on Kyzer's property. Many older tracks followed the same movement pattern as previous observations.

*Coyotes.* I saw a group of 3 coyotes in the vicinity of the beluga carcass. They were moving slowly east and crossed Campbell Creek about 150 yards from the bluff. The creek was about ½ full of water, with large overhanging cornices of ice lining both banks. The map marks the location where the coyotes were last seen, hunting voles in a sedge meadow. The coyotes had examined the beluga carcass a few minutes earlier, judging from tracks and a fresh scat. I backtracked the sets of tracks to the bluff and along the toe of the bluff to the Kincaid motocross area. The 3 coyotes had followed benches and the ecotone at the toe of the bluff, with occasional loops into the open marsh.

*Lynx.* A 1-day-old set of lynx tracks walked east and west along the toe of the bluff below Kyzer's property. Snow conditions were not ideal for following these tracks, but occasional 1-2 day old lynx prints were seen as far west as Retherford's boardwalk, probably from the same lynx.

*Raptors.* At least 2 eagles soared slowly overhead repeatedly during the entire survey. A goshawk was observed flying along the top of the bluff at the Kincaid motocross area.

*Ravens and magpies.* As many as 10 ravens were seen in the vicinity of the beluga carcass. The beluga was entirely covered with ice. Ravens had pecked through the ice to the carcass to feed. These ravens also followed and swooped on the coyotes in the same area. Most of the seeps between the Kincaid motocross area and Retherford's boardwalk were still open, although icing and recent cold weather had closed some of them. Magpie tracks were visible around the openings.

*Humans and dogs.* Human and dog tracks were abundant on the AWWU access road and at the toe of the bluff below Seacliff condos. A person had walked along the toe of the bluff most or all the way from Seacliff condos to the Kincaid motocross area.

Snowmachine tracks were numerous on the AWWU access road and both banks of Campbell Creek. A snowmachine had been driven down the bluff on the Kyzer's property. At least one old snowmachine track was visible from Campbell Creek to the Kincaid motocross area and beyond.

## Conclusions

The strip of natural habitat below the coastal bluff between Oceanview Bluff Park and the Kincaid motocross is heavily used by wildlife for several reasons. First, it is natural habitat in and adjacent to the wildlife refuge, with relatively little disturbance from people and pets compared to other parts of the Anchorage Bowl.

Second, the marsh and woodland form an ecotone, or edge between two habitat types. Ecotones often support more abundant and diverse wildlife populations than a single habitat type. Coastal marshes are relatively rare in Cook Inlet, and the Anchorage Coastal Wildlife Refuge encompasses over 95% of the coastal marsh in the Anchorage Bowl. The coastal marsh-woodland ecotone at the toe of the coastal bluff supports large numbers of snowshoe hares and, in some areas, voles and shrews. Small birds and squirrels are found primarily in the wooded habitat. These small animals attract numerous small and medium-sized predators. Goshawks and great-horned owls hunt the voles, squirrels, hares, and small birds. Trees provide nest sites and perches for raptors and other birds that forage in the coastal marsh. Lynx hunt primarily hares. Coyotes hunt hares and voles. Weasels hunt voles and shrews.

Third, the coastal bluff is a physical barrier. Moose moving along the bluff usually walk at the toe of the slope or in the open marsh along the wooded edge. The bluff is too steep in many areas for a moose to easily walk up, down, or across and they usually avoid doing so. Coyotes, lynx, and bears can negotiate the steep slope, but they tend to follow the path of least resistance at the toe of the bluff as well. Black bears also walk along the top of the bluff when they are foraging for garbage and bird seed.

Finally, some species tend to avoid the phalanx of houses, roads, and yards in neighborhoods on top of the bluff.

For all of the above reasons, the toe of the bluff is a critical movement corridor for moose, coyotes, lynx, and black bears. No other area in the Anchorage Bowl is

comparable. Species use the wildlife refuge and adjacent lands in different patterns, as follows.

*Moose.* Moose tend to walk along "benches" adjacent to the open marsh or in the marsh along the edge of the trees if there is no bench and the bluff is steep. Where the woods extend seaward of the toe of the bluff, for example in Johns and Oceanview Bluff parks, moose follow the toe of the slope and the wooded edge. Moose also follow sewer berms. Sometimes moose leave the toe of the bluff and wooded areas to walk well into the marsh, even as far as the mud flats. There are several well-defined routes up and down the bluff, primarily the sledding hill at Oceanview Bluff Park, the access road to the Oceanview sewer berm, several ravines in Johns Park, Bayshore Creek, and the AWWU access road near Campbell Creek. Moose use these routes to travel between upland areas and the coastal marsh. The density of moose seems to be comparable to that in parks and greenbelts in the Anchorage Bowl.

*Coyotes.* Coyotes also tend to follow benches and the open marsh along the edge of the trees. However, they frequently wander out into the marsh and occasionally climb the bluff. At least 5 coyotes have used the surveyed area. They are most often seen west of Campbell Creek. A group of 3 or 4 coyotes seen by a homeowner near Shore Drive may have been the same animals. On the other hand, west of Campbell Creek the coyotes often travel together, while east of Campbell Creek it is unusual for more than 2 coyotes to travel together. There is a concentrated area of day beds and rendezvous sites west of Campbell Creek along the toe of the bluff. Residents often report hearing and seeing this group in the marsh. This area has the highest use by coyotes of any I have seen in the Anchorage Bowl. Wolves are seen every year in the coastal marsh between Potter Marsh and Point Campbell; however, no tracks were observed during this study.

*Lynx.* Lynx seldom stray more than 10 yards from the trees and woody shrubs where the hares are found. Along most of the coastal bluff lynx tracks generally follow the toe of the bluff. Exceptions are in Johns Park and Bayshore Creek where lynx hunt throughout the riparian habitat on alluvial fans and occasionally walk up and down the creeks and hunt on top of the bluff. The strip of woods along the toe of the bluff in Johns Park is the only place I know in the Anchorage Bowl where one can expect to find lynx tracks within 2 days after a snowfall. At least 2 lynx use the study area.

*Black bears.* Most local black bears were in dens, or at least out of town, by the first snowfall; however, at least 2 black bears and a brown bear were seen in or near the study area in October and November. The brown bear was seen in Kincaid Park. It approached the coastal bluff south of the chalet, but tracks were not found in the study area. The 2 black bears were seen on top of the bluff, and tracks were found on several occasions on the top and at the toe of the bluff. Based on many reports from bluff homeowners, black bears are increasingly common along the coastal bluff. At least 4 black bears were seen in the study area during summer and fall 2001. Homeowners observed bears traveling on top of the bluff, but judging from tracks the bears also followed the toe of the bluff. Black bears often cross Campbell Creek below the dam; however, it is unclear where, so this segment of the general movement corridor along the toe of the coastal bluff is not depicted on the maps.

*Weasels.* Weasels were found in areas with abundant voles and shrews; i.e., primarily in grasses or sedges. I have never seen a density of weasel tracks as high as the area east of the Klatt peat disposal peninsula.

*Snowshoe hares.* The density of hare tracks below the bluff in Johns Park 1-2 days after a snowfall is among the highest I have seen in the Anchorage area.

*Raptors.* The bluff is critical habitat for goshawks and great horned owls, due to the density of hares. Some areas are critical habitat for bald eagles, particularly around nest and roost trees.

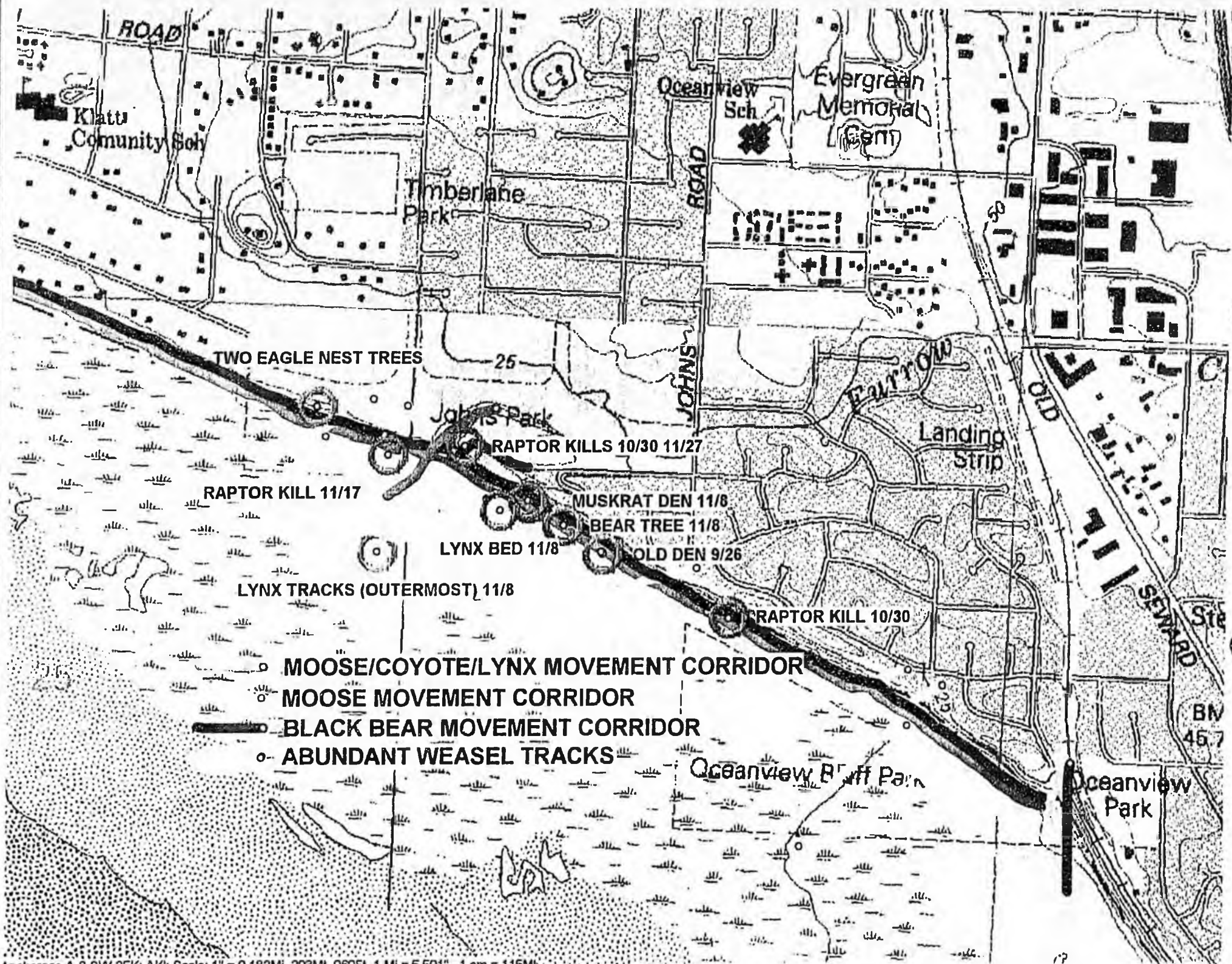
*Humans and dogs.* Humans and dogs were seldom observed below the coastal bluff; however, tracks were common in several areas. The Oceanview Bluff sledding hill was the most popular area. The bluff was used as a neighborhood sledding hill on Seaport Circle and there were 2 skating rinks built in the marsh nearby. People used many routes to access the refuge for snowshoeing, skiing, and walking a dog. The routes included the Oceanview Bluff Park sledding hill, the access road to the Oceanview sewer berm, Johns Road easement, several trails in Johns Park, the Victor Road and Spyglass Circle easements, Bayshore Creek, several places in Bayshore and Resolution Pointe subdivisions, the AWWU access road, and the Seacliff Condominium's trail. People generally used these access routes to walk into the open marsh; they seldom walked along the toe of the bluff. In most cases, dogs were not on leashes, but their tracks were associated with human tracks; i.e., most were not free-roaming. No cat tracks were seen below the bluff.

Numerous snowmachine tracks come out of the Campbell Lake neighborhood and turn west and east to run in the open marsh. Snowmachine tracks were seldom close to the bluff, except where they left the mouth of Campbell Creek. Snowmachiners probably stay offshore to avoid brush, thin ice, and driftwood logs. Snowmachine tracks were observed as far west as Point Campbell. I did not attempt to follow tracks to the east; however, snowmachines from Campbell Lake have been seen as far east as the Oceanview sewer outfall. Snowmachine use seems to be heaviest on weekends, but residents have also reported use at night. Most snowmachiners using the refuge are probably minors. Recreational snowmachining is prohibited in the refuge, but the regulation is difficult to enforce.

*Freshwater bogs.* Wildlife and human use of Klatt, Jewel Lake, and Connor's bogs was much different than below the coastal bluff. Animal tracks were seldom found in the black spruce bogs, except moose in transit. Disturbed habitats along roads, trails, and berms supported hardwoods eaten by hares. The density of hares in a small area west of Tower Road in Klatt Bog was among the highest I have seen in the Anchorage Bowl. This area was also frequented by at least 1 coyote. Moose foraged in these disturbed habitats. There was little other use by wild mammals. Unlike in the coastal marsh, people and dogs were common along almost every road, trail, and berm in these bogs. Most of the dogs observed were either not leashed or free-roaming. Snowmachine use was heavy on Jewel Lake Bog.

The Anchorage Coastal Wildlife Refuge is a well-known sanctuary for waterfowl, shorebirds, cranes and other wildlife in spring, summer, and fall. Until now, winter wildlife use was a well-kept secret. Tracks and other sign left in the snow are clear evidence of the importance of the coastal marsh-woodland ecotone to avian and

terrestrial predators, hares, and moose in winter. Although this survey was conducted during winter, taking advantage of snow for tracking, it is likely that the same habitats and movement corridors are used year-round. The forested bluff and ecotone at the toe of the bluff are critical in maintaining wildlife populations in the refuge, irrespective of property lines.



ROAD

Klattu Community Sch

Timberlane Park

Oceanview Sch

Evergreen Memorial Cent

JOHN'S ROAD

TWO EAGLE NEST TREES

25

John's Park

RAPTOR KILLS 10/30 11/27

RAPTOR KILL 11/17

MUSKRAT DEN 11/8

BEAR TREE 11/8

LYNX BED 11/8

OLD DEN 9/26

SEWARD

Landing Strip

OLD

SEWARD Ste

RAPTOR KILL 10/30

BM 457

Oceanview Bluff Park

Oceanview Park





MOOSE/COYOTE/LYNX MOVEMENT CORRIDOR

MOOSE MOVEMENT CORRIDOR

BLACK BEAR MOVEMENT CORRIDOR

ABUNDANT WEASEL TRACKS

ANCHORAGE A-1

-  MOOSE/COYOTE/LYNX MOVEMENT CORRIDOR
-  MOOSE MOVEMENT CORRIDOR
-  BLACK BEAR MOVEMENT CORRIDOR
-  ABUNDANT WEASEL TRACKS

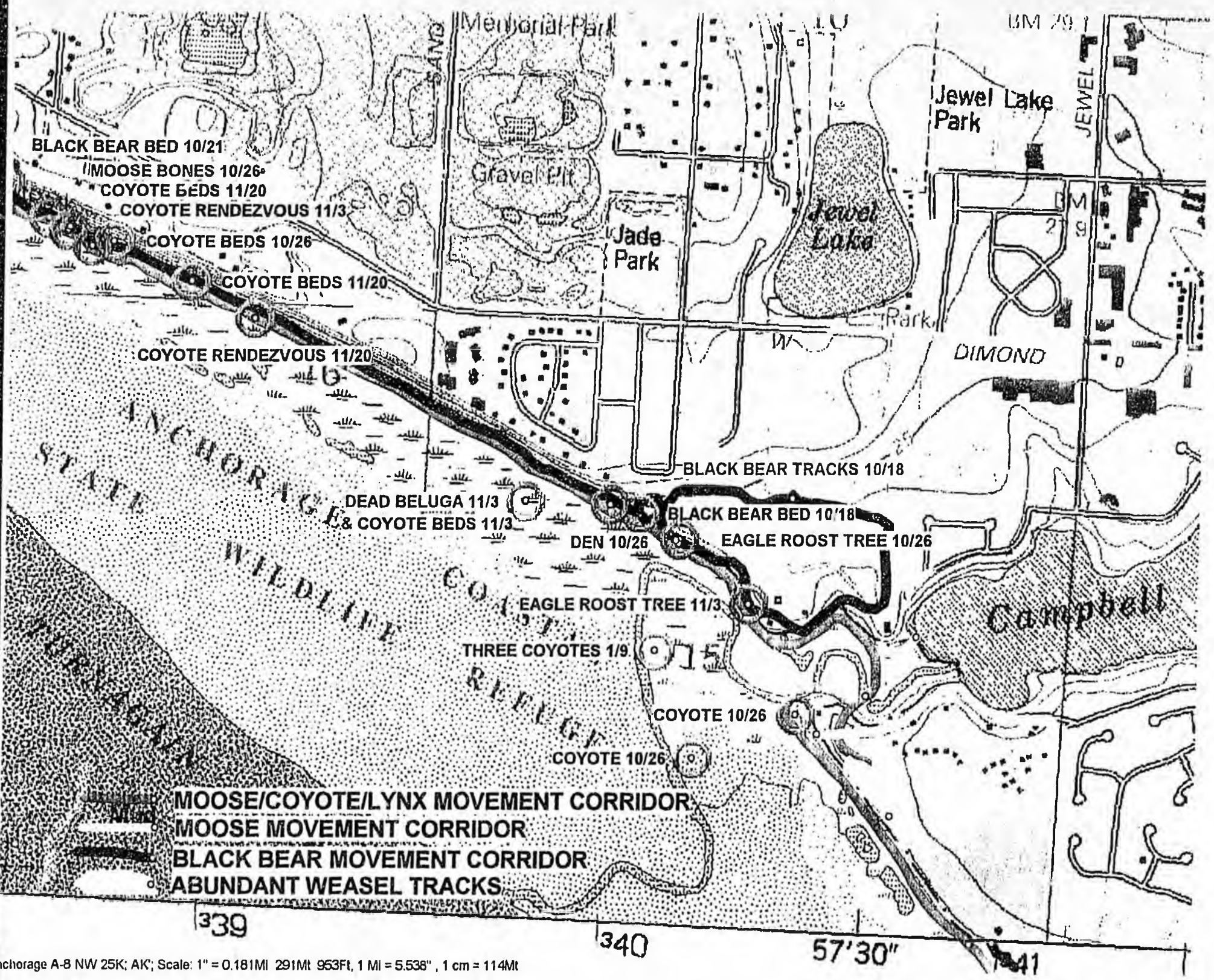
LYNX KILL 11/8

RAPTOR KILL 10/29

KLATT

ROAD

Klattu Community



BLACK BEAR BED 10/21  
 MOOSE BONES 10/26  
 COYOTE BEDS 11/20  
 COYOTE RENDEZVOUS 11/3  
 COYOTE BEDS 10/26  
 COYOTE BEDS 11/20

COYOTE RENDEZVOUS 11/20

BLACK BEAR TRACKS 10/18

DEAD BELUGA 11/3  
 & COYOTE BEDS 11/3

DEN 10/26

BLACK BEAR BED 10/18  
 EAGLE ROOST TREE 10/26

EAGLE ROOST TREE 11/3

THREE COYOTES 1/9

COYOTE 10/26

COYOTE 10/26

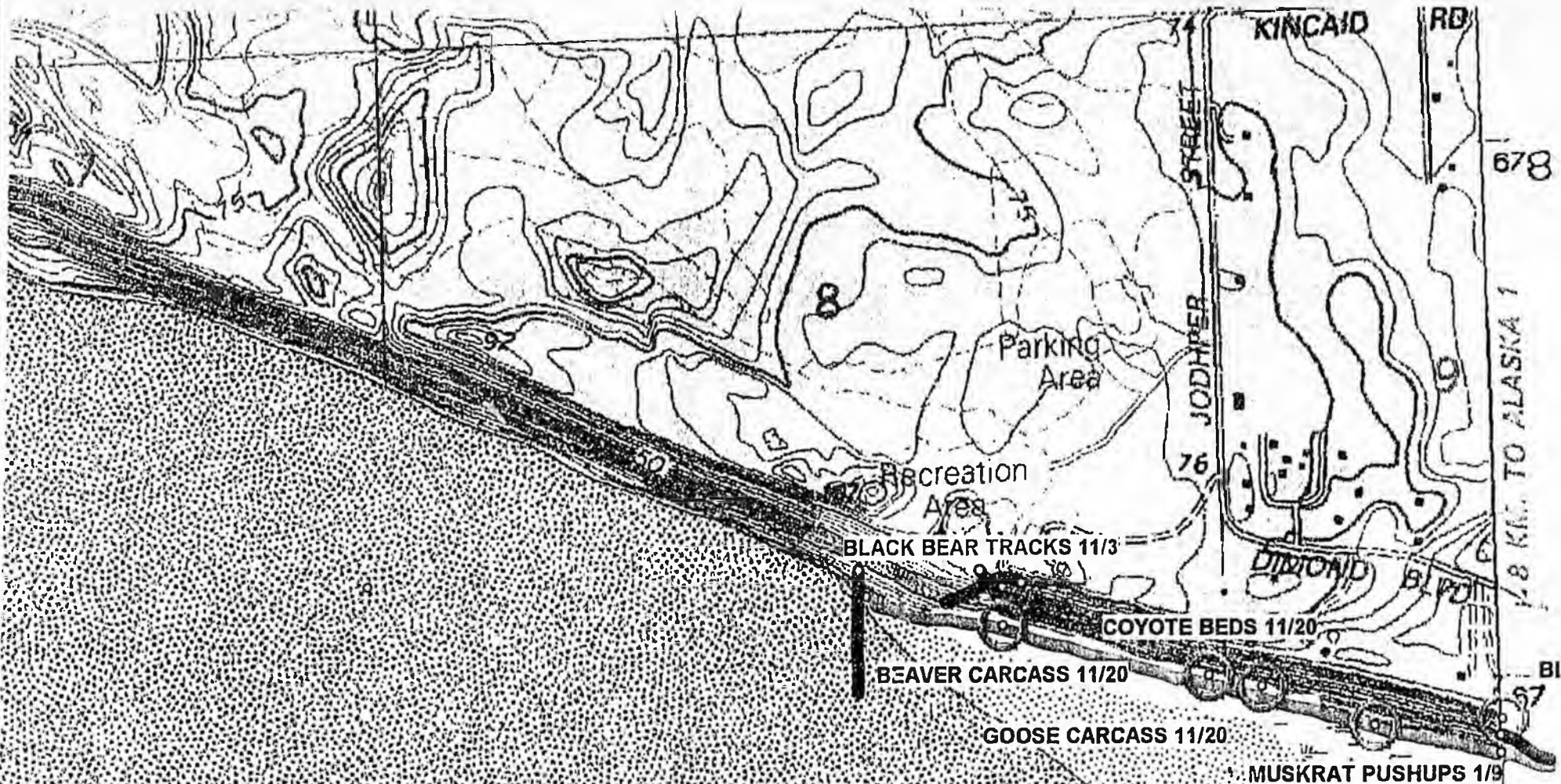
**MOOSE/COYOTE/LYNX MOVEMENT CORRIDOR**  
**MOOSE MOVEMENT CORRIDOR**  
**BLACK BEAR MOVEMENT CORRIDOR**  
**ABUNDANT WEASEL TRACKS**

339

340

57'30"

41



F U G E

- ▬ MOOSE/COYOTE/LYNX MOVEMENT CORRIDOR
- ABUNDANT WEASEL TRACKS AND MAGPIE SEEPS