

**Kenai Peninsula Borough—Forest Management Sale Report
Resource Inventory and Evaluation**

Taiga Resource Consultants—1995

Description: Salmo Lake FMSR #1

KPB/TRC#	4 A	Name	Salmo Lake	Acres	308
Location	1.1 miles NE of the end of North Kenai Road parking lot.				
Description	A 308 acre rectangular tract, bisected by the North Kenai Access Road and the Nikiski Gas Pipeline ROW with the SW corner on Salmo Lake and the NW corner on Cook Inlet.				
Access	From parking lot at the end of the Kenai Spur Hwy, North 1.1 miles along the North Kenai Access Road & Nikiski Gas Pipeline ROW to tract.				
Elevation	75' along Cook Inlet and ROW side to 125' near Salmo Lake.				

Legal

Township	8N	Range	10W	Sec(s)	2 (See patents)		
Maps:KPB	1:1320		1:25		1:12	Other	
AirPhotos: KPB/TRC	84 CIR	L13-10	75-C	20A-41	93 CIR		93-C
Patent #	#6223 & 6224 Total Acres: 308						
Subsurface	STATE AK						

Area of Forest Vegetation & Landcover Types in Acres

Spruce-Birch Forest	Black Spruce	Muskeg	Shrub	Grasses	Urban/ROW	Water	Total
190	72	36	0	0	5	5	308

White Spruce-Hardwood Forest Types in Acres

(Low Vol.=1-3 mbf/ac, Med Vol.=3-5 mbf/ac, Hi Vol.=5-9 mbf/ac)

Spruce-Hardwood Forest Type	Code	S-B Acres
Spruce-Low Volume	S 31	0
Spruce-Med Volume	S 32	0
Spruce Hi Volume	S 33	0
Spruce/Birch Low Volume	SB 31	0
Spruce/Birch Med Volume	SB 32	0
Spruce/Birch-Hi Volume	SB 33	0
Birch/Spruce-Low Volume	BS 31	7
Birch/Spruce-Med Volume	BS 32	103
Birch/Spruce-Hi Volume	BS 33	73
Birch-Low Volume	B 31	3
Birch-Med Volume	B 32	4
Birch-Hi Volume	B 33	0
TOTAL		190

Wetlands	Symbol	Acres
Muskegs	M	36
Black Spruce	M##	72
TOTAL		108

Lake & Wetlands Reserve Area		Acres
Exterior Boundaries	(66')	20
Salmo Lake Buffer	(300')	9
Wetlands Buffer/Reserves	(66')	65
TOTAL		94

Commercial Forest Land	
Birch/Spruce-Hi & Med Volume	
TOTAL	106

Resources & Uses:

Timber Management Aspects	Salvage the beetle infested & dead white spruce and old birch to ensure regeneration of white spruce & paper birch and enhance setting. Leave and protect all spruce seedlings and two birch seed trees per acre. Scarify or disturb 25% of the area to provide new seed bed.
Age & Health of Stand	The old white spruce are 150 to 225 years old. They have had numerous attacks by the spruce beetle, especially 15-20 years ago and now a new infestation is impacting the remaining older trees.
Species Present	White Spruce, Paper Birch, Black Spruce and some Cottonwood.
Export/Domestic	Little spruce export left/ mostly domestic pulp logs Birch: firewood and possibly pulp if new markets develop in the next 6-12 months
Soils	Silty loamy type. No problems within commercial forest types.
Other Land & Resources Management Aspects	Kenai National Wildlife Refuge land to the east, Capt. Cook State Park land to the south & west. Borough land to the north with private rural residential subdivision farther north in Grey Cliff Subdivision.
Visual Impacts	From the air, and with some along the ROW corridor and a minor impact in the Salmo Lake area, but only during harvesting operations.
Air Quality	Negligible effect on air quality due to the inland protected nature and the wind pattern. Relatively isolated from present human activity.
Wildlife	Parcel contains moose and other species habitat. ROW provides access across the parcel for moose and wolves etc. Birch & willow stumps will sprout with 25% of area disturbed during logging in addition to the two birch seed trees per acre. This regeneration of hardwoods should improve the moose habitat. Leave areas around muskegs, uncut birch and spruce stands and 300' setback from Salmo Lake will provide cover area for wildlife adjacent to the THU's.
Impacts on Water Quality	The 300' setback around Salmo Lake and 66' buffer around wetlands, plus the use of winter roads should provide protection for the water quality. The scarification during logging (or after) should be timed to create a minimum impact on the water quality.
Wetlands	These will be protected with the 66' Zone of Sensitivity around wetlands adjacent to THU's.

Resources & Uses:(cont)

Transportation Access	A winter road along the N.Kenai Access road from the parking lot will provide the main access to the tract. Coordination will be needed with Nikiski Gas Pipeline Co. Winter roads will be built in the two THU's. No all season roads are planned for this tract.
Archaeological & Historical	None documented according to SHPO records.
Silvicultural: -Strategy -Management -Reforestation	<p>Spruce: Harvest/designate all spruce 6" & larger, except special individual seed trees. Leave and protect all spruce less than 5" and all seedlings. Advanced reproduction and these leave trees could exceed 25 to 50+ spruce trees per acre.</p> <p>Birch: Leave two birch seed trees per acre, plus 30 to 50 under diameter trees per acre. Cut and haul birch to landings. Stumps will sprout & provide browse for moose. Leave buffers around lake, wetlands and ROW. Design harvest units with future subdivision in mind with scarification for natural regrowth of spruce and birch.</p> <p>Cottonwood: Do not cut. Leave for cover and wildlife</p>

Local Knowledge:

KPB Personnel	Rural with retention. Not to be placed in land bank at this time. Timber harvest is number one use.
Agency/Other	<u>AF&G Steve Albert:</u> Protect lake and wetlands. Cut birch, but leave 2 seed trees per acre. Scarify 25% of area for seedlings.
Activities/MGMT Adjacent Owners	A 66' buffer is left between DNR-Capt Cook Park and the US Fish and Wildlife managed Kenai National Wildlife Refuge.

FMSR #1 SALMO TYPES & VOLUME ESTIMATES by John L. Hall, TRC 7/95

Volume Estimates by Cubic Feet and Board Feet of Spruce-Hardwood Forest Types, including Proposed Reserve and Harvest Areas by John L. Hall, Taiga Resource Consultants, July 1995									
CATEGORY	Acres	Cubic Feet				Board Feet (SC Dec C.)			
		Spruce		Birch		Spruce		Birch	
		Gross	Net	Gross	Net	Gross	Net	Gross	Net
Total Area	308								
Tot. SP-Hdwd Forest	190	150,540	105,378	220,394	90,000	516,270	361,389	392,828	157,131

RESERVES	Acres								
Exterior Boundaries (66')	20		10,520		8,496		36,064		19,064
Streams & Lakes (300')	9		4,890		4,086		16,764		9,222
Wetlands/Isolated Tract (66')	65		26,540		21,183		90,982		47,434
Total Reserved Area	94	0	41,950	0	33,765	0	143,810	0	75,720

HARVEST								
Units # 1 & #2	106		63,428		56,235		217,579	81,411
Rounded Down	106		63,000		56,000		217,000	81,000

FMSR #1 Salmo Lake

1. **Location:** *Description of each tract, including a map at a scale of 1"=1320' from EPB 1"=1320' aerial photos, photo stand analysis from aerial photos at 1"=1320'. Size of tracts outlined.*

The Salmo Lake tract is located 1.1 miles from the end of the improved North Kenai Road. It is located along and bisected by the North Kenai Access road corridor and the Nikiski Gas Pipeline .

It is further described as: KPB Parcel #4A Salmo Lake. Patent #6223 & 6224. Legal Description: GLO Lot 1 & 2, S1/2NE1/4, N1/2SE1/4, SE1/4SE1/4 & GLO Lot 8 SEC 2, T8N, R10W, S.M.. (307.98 acres).

This 307.98 acre rectangular shaped parcel, is predominantly mixed birch-spruce forest with small black spruce stands and several large muskeg areas. The southwest corner borders Salmo Lake. Predominantly flat topography with elevations ranging from 75 to 125 feet.

Included are maps which show the location, surrounding landowners and land uses. The site maps show the legal location, boundaries, easements, forest and land cover types, access routes, Timber Harvest Units (THU's) and reserved and no-cut zones.

2. **Timber Management Aspects:** *Predominant vegetation, age and health of stand. Species present and anticipated mix of domestic and export grades.*

Recommendation: Immediate salvage of beetle killed spruce and threatened spruce. Ensure regeneration of white spruce through scarification and leave all spruce under 6" DBH which could allow up to 50 trees per acre to remain. Require tree length logging with delimiting and slash disposal on the landings. Dispose of slash by burning at the landings during times of low fire danger. Require harvest of designated birch and leave all other hardwoods (cottonwoods) for increased browse for sucker growth out of stumps. Two birch seed trees per acre will be left. No harvest buffers around lake (300') and ROW (66') will be required as a part of timber sale layout and design. Aesthetics and wildlife cover will be enhanced by the quicker regeneration of

the hardwood component. The birch could become commercially viable and is envisioned to be primarily utilized for firewood or pulp logs, with little saw log quality.

A stand analysis reveals predominantly paper birch with white spruce as a secondary component. The spruce is 150 to 225 years old. There is a healthy understory of small spruce poles, saplings and seedlings. These trees should and will be protected in the harvest of the mature spruce. The age of the understory is from 1 to 30 years old. Birch is extensively distributed throughout the parcel with heavy defects generally occurring as frost cracks and then fungus infections. Spruce has been repeatedly infested by the spruce bark beetle, currently from 40 to 60 percent of the spruce is either infested or dead.

There is also a minor component of cottonwood or balsam poplar north of Salmo Lake. This component is a minor portion of the stand, no more than 2% of the total forest cover.

The spruce beetle infestation has reduced the quality of the spruce. Eighty percent can still be used as pulp logs or chips and only twenty percent for export or domestic saw logs or house logs. A thirty percent defect allowance was used due to spruce beetle destruction to the trees for commercial wood products.

Brush species present and distributed in open areas throughout the forested portion of the parcel are: (highbush cranberry, Alaska spirea, rusty menziesia, prickly rose & alder) and grass (calamagrostis canadensis) which will tend to take over the stand with increasing mortality from the bark beetle epidemic.

3. **Soil Information:** *Data extracted from SCS soil maps and TRC archives, 1986 KPB Forest Management Plan.*

The moderately deep well drained and silty loam soils and are from the Series (SCS). These soils tend to be 40 to 50 inches deep. Apparently developed in a moderately deep to deep mantle of wind-laid silty material over a thick deposit of gravelly sand or coarse sand. These layered sediments are from the Kenai geologic formation. These soils are very strongly acid near the surface

but only moderately acid in the lower layers. Generally operable for timber harvest the year round with temporary shutdowns for muddy conditions during breakup and freeze-up. Topography and drainage not anticipated to cause any restrictions for access or harvest on this parcel.

4. Other Land and Resource Management Aspects: *Current and anticipated future uses of EPB land and surrounding land owners concerns and plans.*

The North Kenai is an increasingly popular area for recreation and rural residential. Immediate area is presently used for moose hunting by residents of North Kenai and Stariski. The fisheries in the area, as well as other activities, such as cross country skiing and snowmachining on the North Kenai Public Access ROW trails is increasing in popularity. The surrounding lands of Captain Cook State Park and the Kenai National Wildlife Refuge are currently managed in their natural state.

With anticipated increasing demand for cabin sites this parcel will become very marketable. With KPB access through this tract to Salmo Lake and with planned small rural residential lots, the Salmo tract will be a valuable tract for future use and KPB disposal.

5. Visual Impacts: *Assess visual impact of resource management and extraction. Conduct a view scape analysis using aerial reconnaissance, aerial photos and site visits.*

Some impact when viewed from the air, however, leaving the birch and the irregular pattern of the cutting units should mitigate the negligible impact from this view. Majority of parcel well buffered from views associated with the North Kenai Public Access ROW. The 300 foot setback from Salmo Lake will provide an adequate visual screen of vegetation for views from the lake.

6. Air Quality: *An analysis will be made of the potential impact to air quality from the harvest of timber and increased temporary industrial activity. The prevailing wind directions from NOAA will be consulted.*

It is anticipated that there will be a negligible effect on air quality due to the protected inland location of this parcel during normal timber harvest activities.

Parcel is fairly isolated from significant human activity. Wind patterns in this area are consistently from the northeast in the winter, from the north in the spring and fall and from the southwest in the summer. Average velocity is seven knots with highest velocities in the forty knot range. However, since the burning of slash piles will be a requirement of the timber sale, there will be potentially a major impact, albeit temporary, impact on air quality from the smoke generated. This can be minimized by burning on days when the wind is light to medium (10 to 20 knots) with winds from the northeast, which will tend to push the smoke out over Cook Inlet, where it will have the least impact. Other factors will need to be taken into account when slash burning occurs, primarily the securing of the appropriate and required permits from the state and local governments.

7. **Wildlife:** *Populations and habitat of wildlife currently using the area will be considered with consultation with peninsula based wildlife biologist and existing ADF&G surveys. Changes to the forest cover which could result in increased populations or decreased populations will be addressed.*

Whether through harvest or continued spruce bark beetle epidemic the spruce component of this stand will be reduced significantly, the difference between harvest or status quo is entirely in the rapidity and vigor of the resulting spruce regeneration or lack of due to *calamagrostis canadensis*. Under either scenario the following will be true: there will be a significant reduction in the size and number of live large spruce trees and the wildlife habitat functions they provide. According to ADF&G (Wiedmer 94') Moose, red squirrels, and many bird species are at least seasonally dependent on the mature spruce stands for cover and/or food. During periods of deep or long lasting snow, moose, for example, seek the cover of densely stocked mature spruce stands where snow is shallower and browse more accessible. The 66 foot buffers around the muskegs is composed of dense black spruce stands from 8 to 25 feet tall. Only 106 acres of the 190 acres of the birch-spruce forest will be cut. There are adequate spruce stands on the adjoining land of state parks and wildlife refuge lands. The 106 acres of harvested land will provide birch and willow browse from the stump sprouts and birch seedlings.

Red squirrels and several bird species are dependent on spruce seeds for a major portion on their diet. Loss of mature, seed producing spruce will cause

a reduction in these populations. In winter, spruce grouse feed almost exclusively on spruce needles; however younger trees can provide this diet. Bird species that nest in large live spruce trees may experience population declines. Cavity nesters will experience delayed impacts as dead trees continue to fall.

Some migratory bird species that frequent early successional, shrubby habitats, such as some of the sparrows and warblers, will benefit from the expansion of open and shrubby areas. Waterfowl populations should remain relatively unaffected.

Dr. William Collins of ADF&G Game has studied the various harvest methods in the boreal forest on the Matanuska Moose Range. His reports and studies on the Biological Basis for Clear Cutting in the Boreal Forest emphasize that the positive effects on wildlife populations and enhancement of wildlife habitat far outweigh the negative impacts of timber harvest. The major wildlife species Collins analyzed are: Lynx, hares, wolves & coyotes, moose, passerine songbirds and raptors.

8. **Impacts on Water Quality:** *Project potential impacts of resource management on water quality in lakes and streams. Estimate FPA mandated stream buffers and preservation of important riparian zones. Consult ADF & G catalog of anadromous streams.*

Some very localized, negligible impact on water quality anticipated due to the flat topography of the tract. Site has moderate drainage characteristics with natural buffer zones on the south and east and south by muskeg and the Salmo Lake to the southwest. Muskegs in the center of parcel and to the south will absorb much of the anticipated increase in runoff created by timber harvest activities. Only winter roads will be constructed.

Fisheries are not likely to be impacted. The distance to the nearest anadromous fish stream – the Swanson river – is approximately four miles. The potentially impacted watersheds are well buffered by an extensive network of muskegs. Tract also abuts Salmo Lake, with resident Dolly Varden char and Rainbow trout. Salmo Lake will require a Kenai Peninsula Borough buffer of 300' (minimum). Timber harvesting and winter road building should be timed to

avoid periods with high runoff (late spring or fall before freeze-up) to minimize potential impacts.

9. **Transportation:** *Address access via state highways, EPB maintained roads or private roads. Estimate use of section line and seismic line easements. Estimate any access fees or construction costs necessary for proceeding with the sale of the resources.*

Access is fair via the North Kenai highway and the North Kenai Public Access ROW which bisects the northwest section of the tract. Construction of winter roads within the parcel as a component of the proposed timber harvest is recommended. Anticipated use of North Kenai Public Access ROW (A.S.L.S 81-23).

A winter road for access will need to be constructed along the Stariski Gas Pipeline. This Right-of-Way (ADL #69354) is 50 feet wide and is located on the east side of the 100 foot wide North Kenai Public Access road ROW (ADL #209574). The exact location of the pipeline route will need to be determined prior to the final location of the winter road route. Coordination will be needed with the pipeline owners and manager. Our field inspection indicated that there was ample space for a 16 to 24 foot winter road on the west side of the cleared ROW. Encourage clearing of 80 foot ROW to facilitate access to this parcel and the Grey Cliff subdivision to the north. The sale of trees within the ROW should be considered as an alternative addition to the timber sale contract.

Consultation with surrounding landowners, including the State Parks Division of DNR and U.S. Fish & Wildlife Service is recommended.

10. **Archaeological and Historical:** *An analysis will be made using the latest information from the State Historical Office or other sources i.e. the U.S. Fish and Wildlife Service surveys.*

Research conducted with Tim Smith of the State Historic Preservation Office (SHPO) revealed no known archaeological or historic sites on or near this parcel. And, in addition concluded that this area is not likely to contain these type of sites due to its distance from rivers or the coastal area where typically these sites are found on the Kenai peninsula. U.S. Fish and Wildlife surveys

indicate the same conclusions.

11. **Silvicultural Prescription:** *Based upon the stand age and condition, and with the concerns of competition of calamagrostis, an appropriate silvicultural prescription will be devised with the goal of maximum regeneration with minimum impact to view scapes, water quality and disturbance to remaining vegetation. Reforestation measures will be proposed and discussed.*

Out of the 190 acres of potential commercial land in the predominantly birch-spruce stands, 106 acres is proposed for harvest in two cutting units (THUs). These units are classed as medium and high volume birch-spruce types. The majority of the white spruce has, or will be hit, by the spruce beetle.

Based upon the stand age and condition, and with the concerns of competition of calamagrostis, an appropriate silvicultural prescription has been devised with the goal of regeneration for moose browse, future rural residential, timber values, and compliance with the Forest Practices Act, with a minimum impact to view scapes, water quality and disturbance to remaining vegetation. However, with this proposed silvicultural prescription, all necessary reforestation will occur naturally from the leave trees and blown in seed source on this parcel and provide more than the FPA mandated 450 stems per acre within five years. The silvicultural prescription for the birch-spruce stands in THU's #1 and #2 by species is:

Spruce: Harvest all dead and dying spruce 6" DBH & larger to a 4" top, tree length. (Based upon market conditions, tree length could be expanded to include a 3" top). All spruce less than 6" and all seedlings will be left and protected. Advanced reproduction and designated leave trees could exceed 25 to 50+ trees per acre. In the THU's, high quality and beetle resistant spruce trees will be left for seed source. Dead and dying spruce trees will be marked in the adjoining 66 foot Zones of Sensitivity in wetland and lake buffers for harvest.

Birch: Two birch seed trees per acre will be left in the THU's. The birch over 6 inches DBH will be harvested and

skidded to the landings in tree lengths. Birch saplings and seedlings and poles under 6 inches will be protected. The cut birch stumps will sprout with new growth. The tree length logging of spruce and birch should provide site disturbance over 25 percent of the THU's. If this 25 percent disturbance does not occur from this method, the logging operator shall be required to do additional scarification with a brush rake in the spring, summer or fall to meet this requirement.

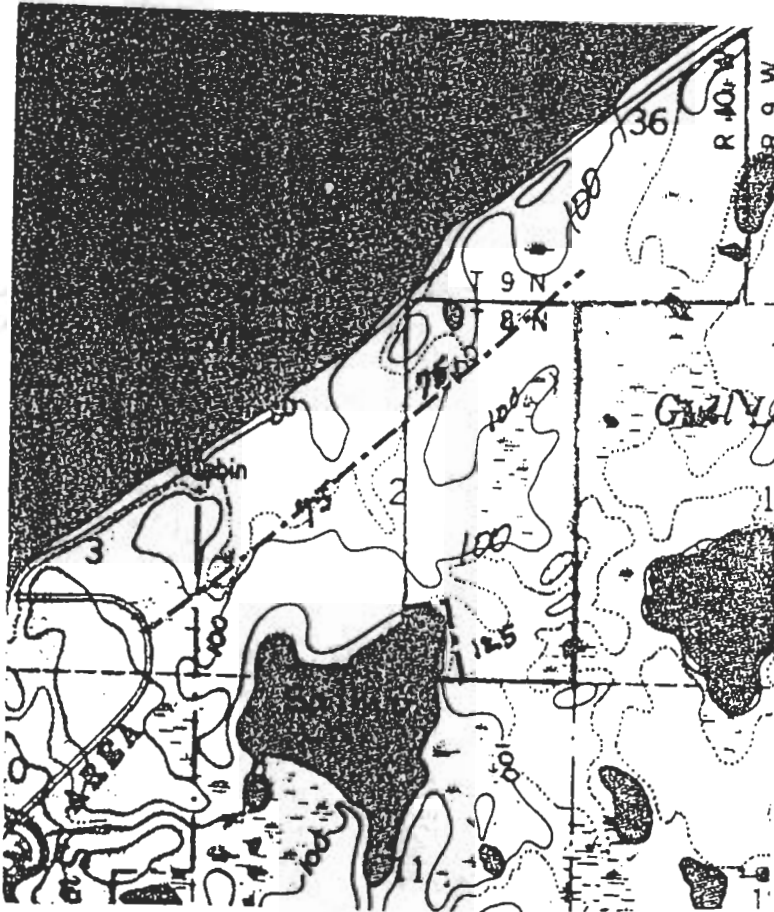
Only dead and dying spruce trees will be harvested from the Zones of Sensitivity, located around the wetlands (muskegs and black spruce stands) and Salmo Lake.

This silvicultural prescription should provide adequate spruce and birch trees for futures use of this tract as rural residential by the KPB. The winter road locations and the proposed harvest of the dead and dying spruce, the layout of the THU's and the Zones of Sensitivity are located with this future use in mind.

Salmo Lake
Legal Description
Patent #'s & Elevations

July 1995

Scale: approx 1": 1,320'



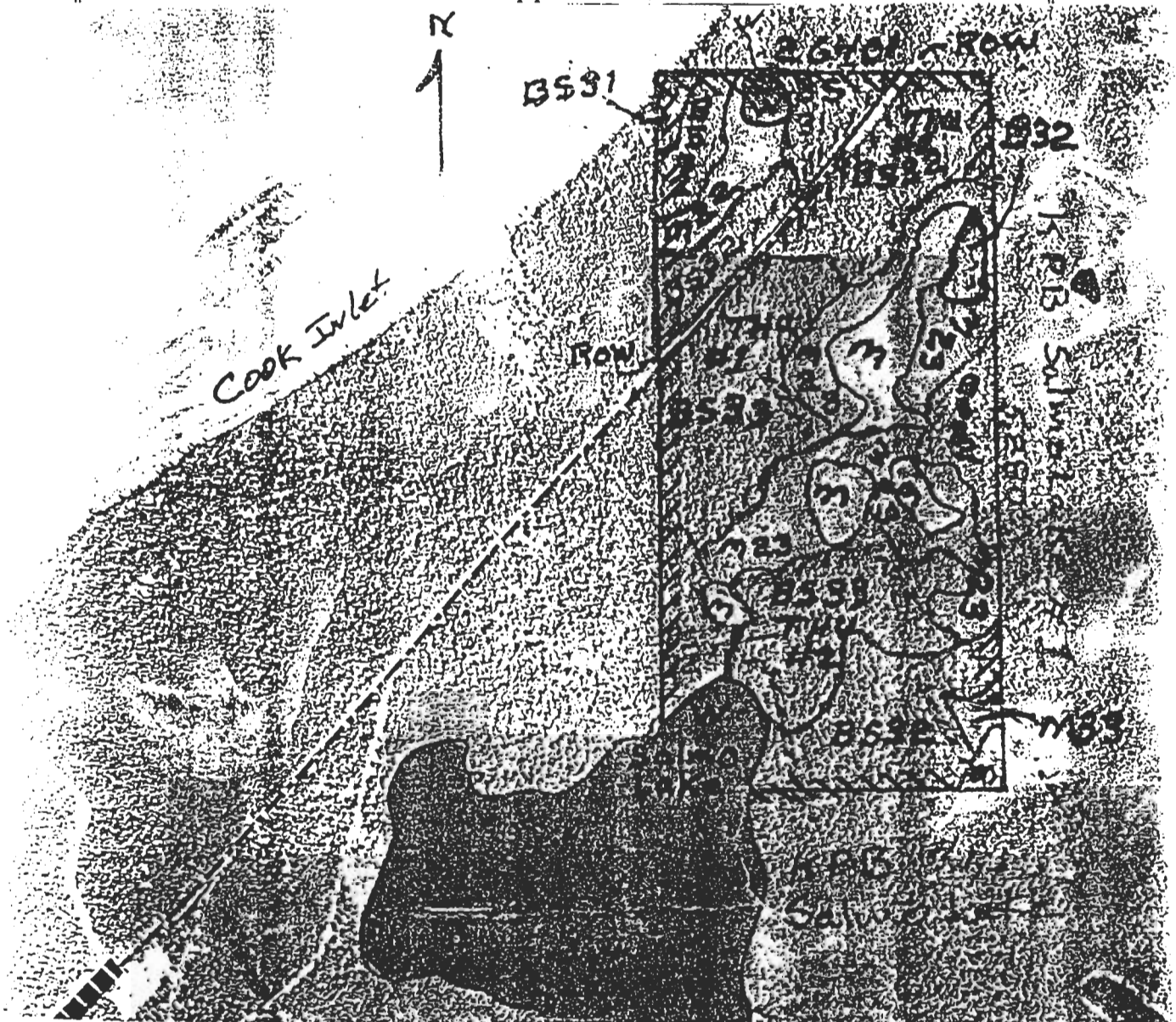
Legal

Patent: 6223	GLO Lot 1 & 2 S1/2NE1/4, N1/2SE1/4, SE1/4SE1/4
Description:	SEC 2, T8N R10W, S.M 279.11 acres.
Patent: 6224	GLO Lot 8, T8N R10W, S.M.
Description:	28.87 acres
TOTAL: 307.98 acres	
North Kenai Road Right-of-Way Public Access Road (ADL 209574) -100'	
Nikiski Alaska Pipeline/Phillips Petroleum Co. ROW (ADL 69354) - 50'	
Access & Natural Vegetation Easement—Salmo Lake -100'	
Elevation Range: 75 feet to 125 feet.	


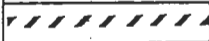

Timber Harvest Units
&
Reserved Areas
Salmo Lake

July 1995

Scale: approx 1": 1,320'



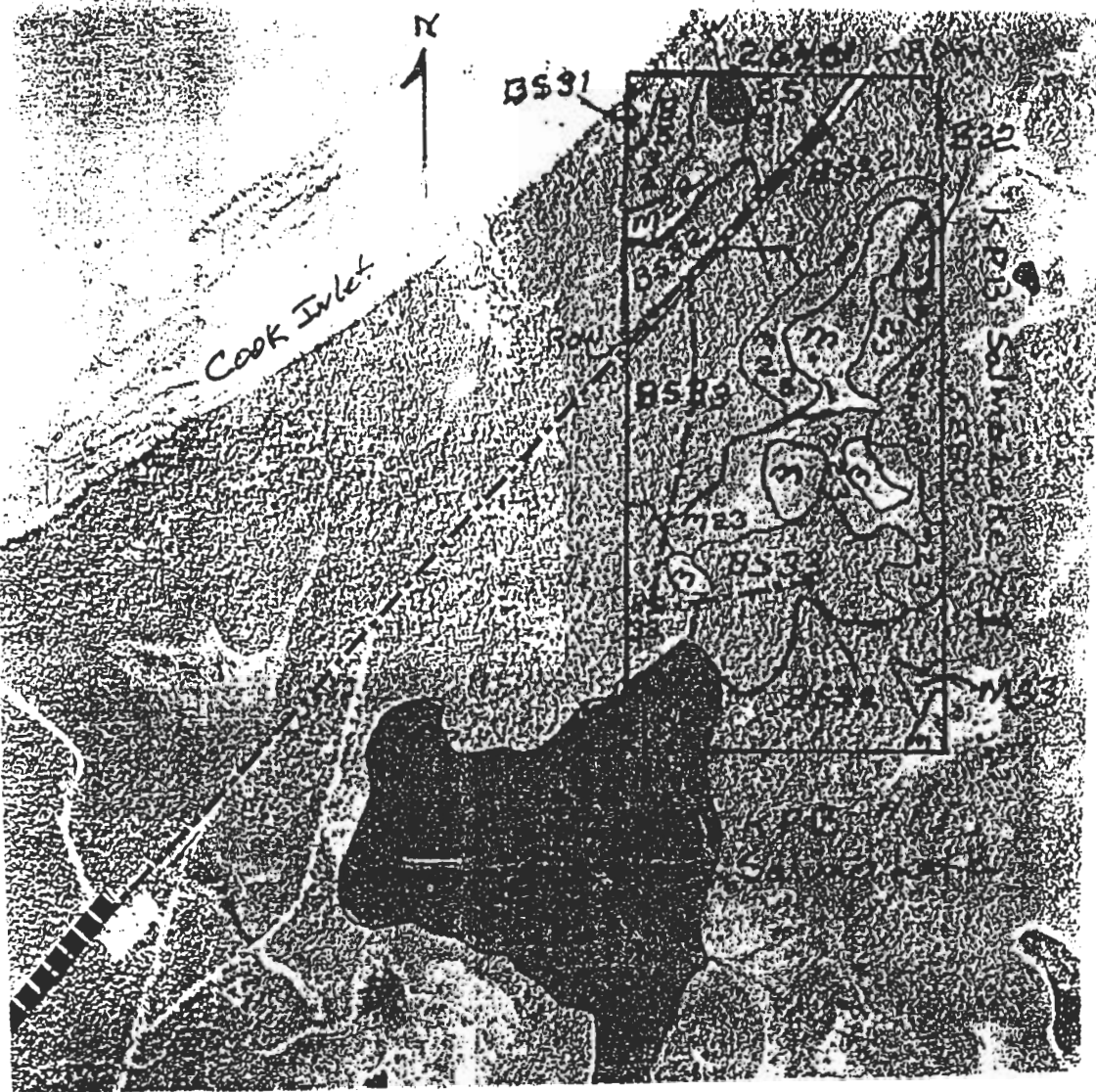
Legend

Reserves	
	Exterior Boundaries = 66'
	Salmo Lake Buffer = 300'
	Wetlands = 66'
Cutting Units	
	THU #1
	THU #2

Transportation Plan
Salmo Lake


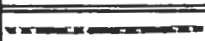
July 1995

Scale: approx 1": 1,320'



Legend

Roads

	North Kenai Road
	Winter Road
Data: Miles	
115	End of North Kenai to Homer
1.5	Winter Road to Unit
1.1	Winter Roads Within Unit

-Wildwood FMSR Executive Summary-

This 30 acre tract is located along Borgen Avenue, one mile east of Kenai Spur highway, 4 miles from the center of the City of Kenai. It is on the northern boundary of the City of Kenai.

The spruce trees on this tract have and will continue to be impacted by the spruce beetle. The land use and forest prescription is to harvest all spruce with a diameter measuring over six (6") inches. All of the spruce trees under five (5") inches and under will be protected. These are the advanced reproduction of saplings and seedlings. Twenty five percent of the harvested area will be disturbed or scarified by the harvest to provide a seed bed for the spruce and birch. This silvicultural prescription will provide for a desirable forest setting for future rural residential lots. Permanent roads will be used for access and the harvest of timber.

On the 30 acre Wildwood tract the salvage timber harvest will occur in a single unit which totals 23 acres of the spruce type. The estimated net volume to be removed totals 33,000 cubic feet of white spruce. The conversion from cubic foot volume to board foot volume equals approximately 113,000 bf of white spruce.

Wildwood will have a 66 foot No-Cut Zone along the exterior boundaries in the Timber Harvest Units (THU).

Two acres of the thirty acre tract is in the powerline right-of-way, and contains small spruce trees and shrubs.

Out of the 28 acres of the spruce forest impacted by the spruce bark beetle, 5 acres will be in a reserve status in the following categories:

<u>Exterior Boundaries</u>	<u>5 acres</u>
Total Reserve	5 acres

The Wildwood FMSR #2, tract, contains 113 thousand board feet of white spruce on 23 acres, which is appraised at a value of \$39.06 per mbf or \$4,414.00 dollars. The minimum total bid for spruce which the Kenai Peninsula Borough should accept is \$2,200.00 dollars.

The timber on this 23 acres should be sold as a lump sum sale, by area, for all the spruce, as designated for harvest.

**Kenai Peninsula Borough—Forest Management Sale Reports
Resource Inventory and Evaluation**

Taiga Resource Consultants—1995

Description: Wildwood FMSR #2

KPB/TRC#	27	Name	Wildwood #1	Acres	30.00
Location	660' NW of the corner of the Wildwood Correctional Facility.				
Description	A small, 30 acre rectangular parcel with 28 acres of mature white spruce. Two acres are in the powerline ROW>				
Access	VIA Borgen Avenue, 4 miles from Kenai on the Kenai Spur highway.				
Elevation	90'				

Legal

Township	6N	Range	12W	Sec(s)	25		
Maps:KPB	1:1320		1:25		1:12	Other	
AirPhotos: KPB/TRC	84 CIR	L11-18	92-C	K9:2-4	93 CIR	93-C	
Patent #	#6210						
Subsurface	STATE AK						

Area of Forest Vegetation & Landcover Types in Acres

Spruce Forest	Black Spruce	Muskeg	Shrub	Grasses	Urban/ROW	Water	Total
28	0	0	0	0	2		30

White Spruce-Hardwood Forest Types in Acres

(Low Vol.=1-3 mbf/ac, Med Vol.=3-5 mbf/ac, Hi Vol.=5-9 mbf/ac)

Spruce-Hardwood Forest Type	Code	S-B Acres
Spruce-Low Volume	S 31	0
Spruce-Med Volume	S 32	28
Spruce Hi Volume	S 33	0
Spruce/Birch Low Volume	SB 31	0
Spruce/Birch Med Volume	SB 32	0
Spruce/Birch-Hi Volume	SB 33	0
Birch/Spruce-Low Volume	BS 31	0
Birch/Spruce-Med Volume	BS 32	0
Birch/Spruce-Hi Volume	BS 33	0
Birch-Low Volume	B 31	0
Birch-Med Volume	B 32	0
Birch-Hi Volume	B 33	0
TOTAL		28

Wetlands	Symbol	Acres
Muskegs	M	0
Black Spruce	M##	0
TOTAL		0

Lake & Wetlands Reserve Area		Acres
Lake Buffer	(300')	0
Exterior Boundaries Buffer	(66')	5
Wetlands Buffer	(66')	0
TOTAL		5

Commercial Forest Land Spruce-Med Volume	
TOTAL	23

Resources & Uses:

Timber Management Aspects	Salvage the beetle infested & dead white spruce to ensure regeneration of the white spruce and enhance setting. Leave and protect all spruce saplings and seedlings. Scarify or disturb 25% of the area to provide new seed bed.
Age & Health of Stand	The old white spruce are 150 to 225 years old. They have been attacked by the spruce beetle. Stands within 1/2 to 1 mile are being hit heavily by the spruce beetle.
Species Present	White Spruce
Export/Domestic	Some export left/ mostly domestic pulp logs.
Soils	Good to excellent. See SCS maps for final.
Other Land & Resources Management Aspects	Len Mar Subdivision is to the west. All lines exterior boundaries should be surveyed and well flagged prior to harvest. Surrounding land and subdivisions are presently vacant.
Visual Impacts	From the air with some minor impact along the edge shared with the Wildwood facility.
Air Quality	Negligible effect on air quality due to the inland protected nature and the wind pattern. Presently isolated from significant human activity. Burn permits for slash disposal will be required.
Wildlife	Parcel contains some winter moose habitat with habitat for other species to a lesser degree.
Impacts on Water Quality	Negligible impact anticipated due to flat, well drained nature of the parcel. Roads constructed should have adequate ditches and culverts for abnormal flow during spring runoff or heavy fall rains.
Wetlands	None.
Transportation Access	VIA Borgen Avenue and the Kenai Spur hwy. Recommend 12 foot spur roads constructed by operator for a route for a future subdivision. Timber harvest access road should be located down the center of the parcel to provide security for the operator.
Archaeological & Historical	None documented according to SHPO records & City of Kenai records.
Silvicultural: -Strategy -Management -Reforestation	Spruce: Harvest/designate all spruce 6" & larger, except special individual seed trees. Leave and protect all spruce less than 5" and all seedlings. Advanced reproduction and these leave trees could exceed 25 to 50+ spruce trees per acre. Design harvest unit with subdivision in mind with deliberate scarification for natural regrowth of spruce.

Local Knowledge:

KPB Personnel	Rural residential with potential. Recommend retention. Not to be placed in land bank at this time. Timber harvest is number one use. Future subdivision with increased demand property in this area.
Agency/Other	<u>AF&G Steve Albert</u> : Protect lake and wetlands. Cut birch, but leave 2 seed trees per acre. Scarify 25% of area for seedlings.
Activities/MGMT Adjacent Owners	A 66' buffer is designated between tract and the roads surrounding this tract.

FMSR #2 WILDWOOD TYPES & VOLUME ESTIMATES by John L. Hall, TRC 7/95

Volume Estimates by Cubic Feet and Board Feet of Spruce Forest Types,
including Proposed Reserve and Harvest Areas
by John L. Hall, Taiga Resource Consultants, July 1995

CATEGORY	Acres	Cubic Feet				Board Feet (SC Dec C.)			
		Spruce		Birch		Spruce		Birch	
		Gross	Net	Gross	Net	Gross	Net	Gross	Net
Total Area	30								
Tot. Spruce Forest	28	51,660	41,328	0	0	172,228	137,788	0	0

RESERVES									
Exterior Boundaries (66')	5	9,225	7,380	0	0	30,755	24,605	0	0
Streams & Lakes (300')	0								
Wetlands (66')	0								
Total Reserved Area	5	9,225	7,380	0	0	30,755	24,605	0	0

HARVEST									
Units # 1	23	42,435	33,948			141,473	113,183		
Rounded Down	23		33,000				113,000		0

*Medium spruce type, approximately 1 to 2 percent birch

FMSR #2 Wildwood

1. **Location:** *Description of each tract, including a map at a scale of 1"=1320' from KPB 1"=1320' aerial photos, photo stand analysis from aerial photos at 1"=1320'. Size of tracts outlined.*

The Wildwood tract is located 1 mile east of the Kenai Spur Highway, and just to the west of the Wildwood Correctional Facility, lying within the northern boundary of the City of Kenai. Len Mar Subdivision lies on the west boundary of this tract and the Kenai Native Association, Inc. owns a portion of the lands to the east.

It is further described as: Parcel #27 Wildwood #1. Patent #6210. Legal: W1/2NE1/4NW1/4, W1/2E1/2NE1/4NW1/4 Section 25, T6N, R12W, S.M.

This 30.00 acre rectangular shaped parcel, is all closed spruce. Predominantly flat topography, with an average elevation 100 feet.

Included are maps which show the location, surrounding landowners and land uses. The site maps show the legal location, boundaries, easements, forest and land cover types, access routes, Timber Harvest Units (THU's) and reserved and no-cut zones.

2. **Timber Management Aspects:** *Predominant vegetation age and health of stand. Species present and anticipated mix of domestic and export grades.*

Recommendation: Immediate salvage of beetle killed spruce and threatened spruce. Ensure regeneration of white spruce through scarification and leave all spruce under 6" DBH which could allow up to 50 trees per acre to remain. Require tree length logging with delimiting and slash disposal on the landings. Dispose of slash by burning at the landings during times of low fire danger. Mix is anticipated to be primarily domestic or pulp 80% with 20% export. Leave the few existing birch. Scarification and natural wind distribution from the remaining birch should accelerate the natural reforestation and increase the browse in the near term.

A stand analysis reveals predominantly white spruce as a primary component.

The spruce is be 200 to 225 years old. Stands within one mile are in serious decline with numerous, recent attacks by the spruce bark beetle. Beetle infestations have already begun within this tract and will likely continue. There is a healthy understory of small spruce poles, saplings and seedlings. These trees should and will be protected during the harvest of the mature spruce. The age of the understory is from 1 to 30 years old. Surrounding spruce stands are in serious decline due to the beetle infestation.

The spruce beetle infestation has reduced the quality of the spruce. Eighty percent can still be used as pulp logs or chips and only twenty percent for export or domestic saw logs or house logs. A twenty percent defect allowance was used due to spruce beetle destruction to the trees for commercial wood products.

Brush species present and distributed in open areas throughout the forested portion of the parcel are: (highbush cranberry, Alaska spirea, rusty menziesia, prickly rose & alder) and grass (calamagrostis canadensis) which will tend to take over the stand with increasing mortality from the bark beetle epidemic.

3. **Soil Information:** *Data extracted from SCS soil maps and TRC archives, 1986 KPB Forest Management Plan.*

The moderately deep, moderately drained and silty loam soils on this site are from the Longmare Series (SCS). These soils tend to be 40 to 50 inches deep. Apparently developed in a moderately deep mantle of wind-laid silty material over a thick deposit of gravelly sand or coarse sand. These layered sediments are derived from the Kenai geologic formation. The Longmare Series are characterized by the underlying material being cemented by iron deposited by ground water. This indurated layer severely restricts the movement of water from the soil into the underlying gravel. Generally operable for timber harvest the year round with temporary shutdowns for muddy conditions during breakup and freeze-up. Topography and drainage not anticipated to cause any restrictions for access or harvest on this parcel.

4. **Other Land and Resource Management Aspects:** *Current and anticipated future uses of KPB land and surrounding land owners concerns and plans.*

This area has excellent potential for future residential. This area can also be considered for future expansion of the Wildwood Correctional Facility. Parcel is within the City of Kenai limits. Parcel is zoned for residential. With anticipated increasing demand for home sites this parcel will become very marketable. The economy in the area continues to grow and expand. Len Mar Subdivision is to the west. All lines and exterior boundaries should be surveyed and well flagged prior to timber harvest. Surrounding land and subdivisions are presently vacant, except for Wildwood Correctional Facility.

5. **Visual Impacts:** *Assess visual impact of resource management and extraction. Conduct a view scape analysis using aerial reconnaissance, aerial photos and site visits.*

Some impact when viewed from the air. Entire parcel is presently well buffered from land based views and other owners. A 66 foot buffer will be left along Borgen Avenue and the private land to the west and south.

6. **Air Quality:** *An analysis will be made of the potential impact to air quality from the harvest of timber and increased temporary industrial activity. The prevailing wind directions from NOAA will be consulted.*

It is anticipated that there will be a negligible effect on air quality due to the protected inland location of this parcel during normal timber harvest activities. Parcel is fairly isolated from significant human activity. Wind patterns in this area are consistently from the northeast in the winter, from the north in the spring and fall and from the southwest in the summer. Average velocity is seven knots with highest velocities in the forty knot range. However, since the burning of slash piles will be a requirement of the timber sale, there will be potentially a major impact, albeit temporary impact on air quality from the smoke generated. This can be minimized by burning on days when the wind is light to medium (10 to 20 knots) with winds from the northeast, which will tend to push the smoke out over Cook Inlet, where it will have the least impact. Other factors will need to be taken into account when slash burning occurs, primarily the securing of the appropriate and required permits from the state and local governments, including a burn permit from the City of Kenai Fire Department.

7. **Wildlife:** *Populations and habitat of wildlife currently using the area will be considered with consultation with peninsula based wildlife biologist and existing ADF&G surveys. Changes to the forest cover which could result in increased populations or decreased populations will be addressed.*

Whether through harvest or continued spruce bark beetle epidemic the spruce component of this stand will be reduced significantly, the difference between harvest or status quo is entirely in the rapidity and vigor of the resulting spruce regeneration or lack of due to *calamagrostis canadensis*. Under either scenario the following will be true: there will be a significant reduction in the size and number of live large spruce trees and the wildlife habitat functions they provide. According to ADF&G (Wiedmer 94') Moose, red squirrels, and many bird species are at least seasonally dependent on the mature spruce stands for cover and/or food. During periods of deep or long lasting snow, moose, for example, seek the cover of densely stocked mature spruce stands where snow is shallower and browse more accessible. The 66 foot buffers around the THU is composed of mature white spruce. There are adequate spruce stands on the adjoining lands for wildlife cover.

Red squirrels and several bird species are dependent on spruce seeds for a major portion on their diet. Loss of mature, seed producing spruce will cause a reduction in these populations. In winter, spruce grouse feed almost exclusively on spruce needles; however younger trees can provide this diet. Bird species that nest in large live spruce trees may experience population declines. Cavity nesters will experience delayed impacts as dead trees continue to fall. Predators may adapt by seeking alternative prey species. However, in this case since this a more urban parcel, wildlife concerns will focus primarily on those species which frequent the more urban settings, including moose squirrels and the passerine birds. Moose should probably find the increased browse an advantage while still being able to use the surrounding, mature forest for cover until the bark beetle, age and rot take their toll and reduce this forest type substantially, which is expected based, upon past epidemics.

Some migratory bird species that frequent early successional, shrubby habitats, such as some of the sparrows and warblers, will benefit from the expansion of open and shrubby areas. Waterfowl populations should remain relatively unaffected.

This parcel contains some anticipated winter moose habitat due to the closed nature of the present stand and the ADF&G Moose Habitat maps for this portion of the Kenai Peninsula. This winter habitat will be replaced by more browse for spring, summer and fall moose habitat. This could encourage moose population growth in this area if the effect is taken into consideration of the harvests of other, nearby land owners.

Dr. William Collins of ADF&G Game has studied the various harvest methods in the boreal forest on the Matanuska Moose Range. His reports and studies on the Biological Basis for Clear Cutting in the Boreal Forest emphasize that the positive effects on wildlife populations and enhancement of wildlife habitat far outweigh the negative impacts of timber harvest. The major wildlife species Collins analyzed are: Lynx, hares, wolves, coyotes, moose, passerine songbirds and raptors.

8. **Impacts on Water Quality:** *Project potential impacts of resource management on water quality in lakes and streams. Estimate FPA mandated stream buffers and preservation of important riparian zones. Consult ADF&G personnel catalog of anadromous streams.*

Some very localized, negligible impact on water quality anticipated due to the flat topography of the parcel. Site has excellent drainage characteristics. Permanent roads constructed should have adequate ditches and culverts for abnormal flow during spring runoff or heavy fall rains.

Fisheries are not likely to be impacted, distance to the nearest fisheries is Cook Inlet. No anadromous streams would be impacted by this action. Potentially impacted watersheds are well buffered by sufficient distance. Harvest and road building should be timed to avoid periods with high runoff (late spring or fall before freeze-up) to minimize even negligible impacts.

9. **Transportation:** *Address access via state highways, KPB maintained roads or private roads. Estimate use of section line and seismic line easements. Estimate any access fees or construction costs necessary for proceeding with the sale of the resources.*

Access is excellent via the Kenai Spur highway and Borgen Avenue roads to

the north. Construction of permanent gravel topped spur roads and culverts within the parcel as a component of the proposed timber harvest is recommended. Anticipated use Borgen Avenue for access from KPB or City of Kenai maintained roads. Borgen Avenue is recently paved and care should be taken to load and off load heavy equipment directly onto the Borough's tract in order to maintain the road in its present condition. Consultation with City of Kenai for necessary permits and coordination will be required of logger.

10. **Archaeological and Historical:** *An analysis will be made using the latest information from the State Historical Office or other sources i.e. the U.S. Fish and Wildlife Service surveys.*

Research conducted with Tim Smith of the State Historic Preservation Office (SHPO) revealed no known archaeological or historic sites on or near this parcel. And, in addition concluded that this area is not likely to contain these type of sites due to its distance from rivers or the coastal area where typically these sites are found on the Kenai peninsula. U.S. Fish and Wildlife surveys indicate the same conclusions.

11. **Silvicultural Prescription:** *Based upon the stand age and condition, and with the concerns of competition of calamagrostis, an appropriate silvicultural prescription will be devised with the goal of maximum regeneration with minimum impact to view scapes, water quality and disturbance to remaining vegetation. Reforestation measures will be proposed and discussed.*

Out of the 28 acres of potential commercial land in the predominantly birch-spruce stands, 23 acres is proposed for harvest in one cutting unit (THUs). This unit is classed as a medium volume spruce type. The majority of the white spruce has, or will be hit, by the spruce beetle.

Based upon the stand age and condition, and with the concerns of competition of calamagrostis, an appropriate silvicultural prescription has been devised with the goal of regeneration for moose browse, future rural residential, and timber values while in compliance with the Forest Practices Act, and with minimum impact to view scapes, water quality and disturbance to remaining vegetation. The silvicultural prescription for the spruce stands in THU's #1 by

species is:

Spruce: Harvest all dead and dying spruce 6" DBH & larger to a 4" top, tree length. (Based upon market conditions, tree length could be expanded to include a 3" top). All spruce less than 6" and all seedlings will be left and protected. Advanced reproduction and designated leave trees could exceed 25 to 50+ trees per acre.

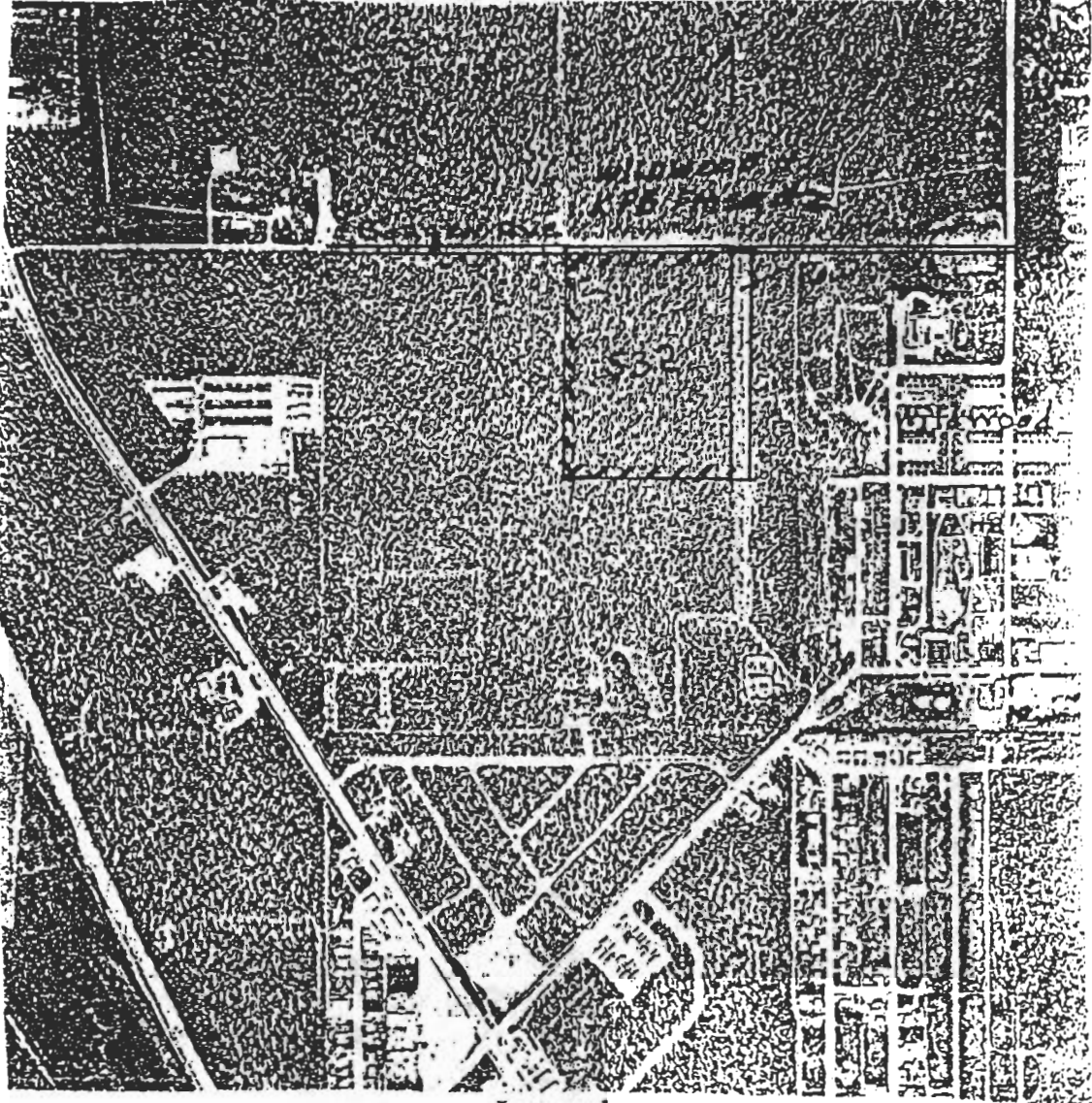
Require tree length logging with delimiting and slash disposal on the landings. Dispose of slash by burning at the landings during times of low fire danger. Hardwoods present will be retained as leave trees for subsequent development as a subdivision. Harvest units and roads will be designed with a future subdivision as the anticipated highest and best use. Roads will bisect the parcel in the center to provide security for the logger and to maximize the distance from the neighboring landowners for noise and fumes from harvest activities. Views for most potential subdivision lots will be enhanced if possible. Due to the anticipated conversion of the parcel to residential (which would require platting of a subdivision), no manual reforestation should be necessary under the Forest Practices Act requirements. However, with this proposed silvicultural prescription, all necessary reforestation will occur naturally from the leave trees and blown in seed source on this parcel and provide more than the FPA mandated 450 stems per acre within five years. A Zone of Sensitivity will be designated consisting of a buffer of 66' to all the surrounding landowners.

In addition, this silvicultural prescription should provide more than adequate spruce regeneration and an increase in residual birch for future rural residential use of this tract.



Timber Harvest Units
&
Reserved Areas
Wildwood

July 1995

Scale: approx 1": 1,000'



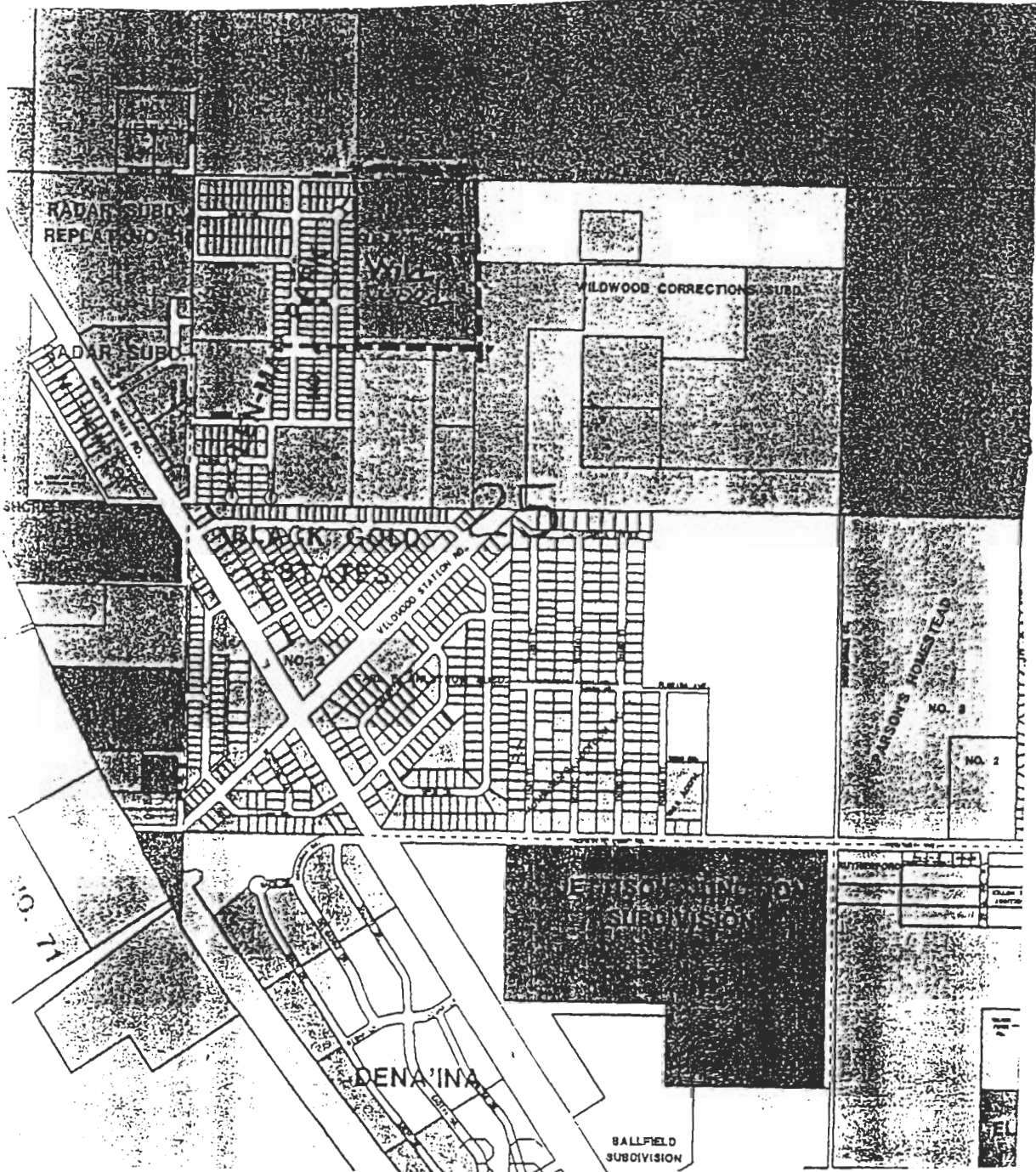
Legend

Reserves	
	Exterior Boundaries = 66'
Cutting Units	
	THU #1

Wildwood
 Legal Description
 Patent #'s & Elevations

July 1995

Scale: approx 1" = 1,320'



Legal

Patent: 6210	Parcel #27 Wildwood #1. Patent #6210. Legal:
Description:	W1/2NE1/4NW1/4, W1/2E1/2NE1/4NW1/4 Section 25, T6N R12W, SM.

TOTAL: 30.00 acres

-Cohoe Tower FMSR Executive Summary-

This 240 acre tract is located along the Sterling Highway at mile 112.6, a distance of 1.1 to 1.5 miles from the community of Kasilof.

The spruce trees on this tract have and will continue to be impacted by the spruce beetle. The land use and forest prescription is to harvest all spruce with a diameter measuring over six (6") inches. All of the spruce trees under five (5") inches and under will be protected. These are the advanced reproduction of saplings and seedlings. To provide for moose habitat, the birch trees over six (6") inches in diameter will be harvested. These stumps will provide sprouts for future trees. Two mature birch per acre will be left for additional seed source. Twenty five percent of the harvested area will be disturbed or scarified by the harvest to provide a seed bed for the spruce and birch. This silvicultural prescription will provide for a desirable forest setting for future rural residential lots. Gravel topped roads will be used for access and the harvest of timber.

On the 240 acre Cohoe Tower tract, the salvage timber harvest will occur in two units which total 145 acres of the birch-spruce forest. The estimated net volume to be removed from the commercial timber sale in THU #2 (130 acres), totals 82,000 cubic feet of white spruce and 49,000 cubic feet of paper birch. The conversion from cubic foot volume to board foot volume equals approximately 292,000 board feet of white spruce and 88,000 board feet of paper birch. This does not include the volume contained in THU #1 (15 acres) , which is set aside for local, personal use, which contains 29,000 board feet of spruce and 6,000 board feet of birch.

The unnamed lake to the west will have a 300 foot setback zone while the wetlands will have a 66 foot buffer zone. Dead and dying spruce trees which meet the harvest requirements will be marked for harvest on an individual tree basis in these zones. Consideration not to cut will be given if the the harvest will cause any undue damage to the wetlands. A 66 foot No-Cut Zone will be marked along the exterior boundaries in the Timber Harvest Units (THU).

In addition, the portion of this tract bordering the Sterling highway to the edge of the 1100 road in this tract will be a designated personal use area for KPB residents to cut firewood, by permit only, for their own use.

Out of the 178 acres of the birch-spruce forest impacted by the spruce bark beetle, 33 acres will be in a reserve status in the following categories:

Exterior Boundaries	13 acres
Lake Buffers	3 acres
<u>Wetlands</u>	<u>17 acres</u>
Total Reserve	33 acres

Consulting Foresters • Natural Resource Consultants

TAIGA RESOURCE CONSULTANTS
P.O. Box 750 • Girdwood, Alaska • 99587

The Coho Tower FMSR #3 tract, contains 292 thousand board feet of white spruce on 130 acres, which is appraised at a value of \$34.27 per mbf or \$10,008.00 dollars. The minimum bid price for spruce which the Kenai Peninsula Borough should accept is \$5,000.00 dollars. In addition, this tract contains 88 thousand board feet of paper birch on the same 106 acres, which is appraised at a value of \$5.00 per mbf or \$440.00 dollars. The minimum bid price for birch is \$220.00 dollars. The combined minimum bid for both spruce and birch is \$5,220.00 dollars.

The timber on this 130 acres should be sold as a lump sum sale, by area, for all the spruce and birch, as designated for harvest.

**Kenai Peninsula Borough—Forest Management Sale Reports
Resource Inventory and Evaluation**

Taiga Resource Consultants—1995

Description Cohoe Tower FMSR #3

KPB/TRC#	98	Name	Cohoe Tower #1	Acres	240.00
Location	One mile south of Kasilof and 1/4 mile north of the Cohoe Loop south intersection with the Sterling Highway at Mile 112.6.				
Description	A 240 acre L shaped tract, hilly, wooded with both spruce-birch forest type prevalent. Bisected in the southeast corner by the Sterling Highway.				
Access	Via Cohoe Tower road off of milepost 112.6 Sterling Hwy. Red Ribbon road also provides access.				
Elevation	220 feet near hwy to 270 feet on highest hill.				

Legal

Township	2N	Range	12W	Sec(s)	11		
Maps:KPB	1:1320		1:25		1:12	Other	
AirPhotos: KPB/TRC	84 CIR	L8-99	92-C	K9:2-4	93 CIR	142	93-C
Patent #	#7220						
Subsurface	STATE AK						

Area of Forest Vegetation & Landcover Types in Acres

Spruce-Birch Forest	Black Spruce	Muskeg	Shrub	Grasses	Urban/ROW	Water	Total
178	8	40	12	0	2	0	240

White Spruce-Hardwood Forest Types in Acres

(Low Vol.=1-3 mbf/ac, Med Vol.=3-5 mbf/ac, Hi Vol.=5-9 mbf/ac)

Spruce-Hardwood Forest Type	Code	S-B Acres
Spruce-Low Volume	S 31	3
Spruce-Med Volume	S 32	0
Spruce Hi Volume	S 33	0
Spruce/Birch Low Volume	SB 31	67
Spruce/Birch Med Volume	SB 32	64
Spruce/Birch-Hi Volume	SB 33	0
Birch/Spruce-Low Volume	BS 31	0
Birch/Spruce-Med Volume	BS 32	44
Birch/Spruce-Hi Volume	BS 33	0
Birch-Low Volume	B 31	0
Birch-Med Volume	B 32	0
Birch-Hi Volume	B 33	0
TOTAL		178

Wetlands	Symbol	Acres
Muskegs	M	40
Black Spruce	M##	8
TOTAL		48

Lake & Wetlands Reserve Area		Acres
Exterior Boundaries	(66')	13
Lake Buffer	(300')	3
Wetlands Buffer	(66')	17
	TOTAL	33

Commercial Forest Land Birch/Spruce-Hi & Med Volume Only (THU's)	
TOTAL	145

Resources & Uses:

Timber Management Aspects	Salvage the beetle infested & dead white spruce and old birch to ensure regeneration of white spruce & paper birch and enhance setting. Leave and protect all spruce seedlings and two birch seed trees per acre. Scarify or disturb 25% of the area to provide new seed bed. Local use area designated on border with Sterling hwy.
Age & Health of Stand	200-225 In decay with numerous attacks by the spruce bark beetle almost all spruce are hit, 40 to 60% mortality.
Species Present Export/Domestic	White Spruce, Paper Birch, Black Spruce and some cottonwood. Little spruce export left/ mostly domestic pulp logs, with some house logs. Birch: firewood and pulp if new market develops in the next 6-12 months
Soils	Silty loamy type. No problems within commercial forest types. SCS soils map referenced.
Other Land & Resources Management Aspects	High value are for recreation and rural residential. All lines exterior boundaries should be surveyed and well flagged prior to harvest.
Visual Impacts	From the air with some minor impact along the eastern edge visible from the Sterling Hwy. Green and growing, new forest will replace dead and dying grey and red spruce trees.
Air Quality	Negligible effect on air quality due to the inland protected nature and the wind pattern. Fairly isolated from significant human activity.
Wildlife	Parcel contains moose and other species habitat. Birch & willow stumps will sprout with 25% of area disturbed during logging in addition to the two birch seed trees per acre. This should improve moose habitat. Leave areas around muskegs, uncut birch and spruce stands and 300' setback from unnamed lake to the west will provide cover area for wildlife adjacent to the THU's.
Impacts on Water Quality	Some impact anticipated due to hilly but, well drained nature of the parcel. Roads constructed should have adequate ditches and culverts for abnormal flow during spring runoff or heavy fall rains. The 300' setback around the unnamed lake to the west and 66' buffer around wetlands, plus the well placed location of the roads should provide protection for the water quality. The scarification during logging (or after) should be timed to create a minimum impact on the water quality

Resources & Uses:(cont)

Wetlands	These will be protected with the 66' Zone of Sensitivity around wetlands adjacent to THU's.
Transportation Access	VIA Sterling Hwy access & Red Ribbon Road shares access with tract owned by Ninilchik Corp., can be logged year round except for the muddy spring or rainy fall closures common to Kenai peninsula logging operations. Recommend construction of permanent roads by operator for permanent access and future subdivision.
Archaeological & Historical	None documented according to SHPO records
Silvicultural: -Strategy -Management -Reforestation	Spruce: Harvest/designate all spruce 6" & larger, except special individual seed trees. Leave and protect all spruce less than 5" and all seedlings. Advanced reproduction and these leave trees could exceed 25 to 50+ spruce trees per acre. Birch: Leave two birch seed trees per acre, plus 30 to 50 under diameter trees per acre. Cut and haul birch to landings. Stumps will sprout & provide browse for moose. Leave buffers around lake, wetlands and exterior boundaries. Design harvest units with future subdivision in mind with scarification for natural regrowth of spruce and birch.

Local Knowledge:

KPB Personnel	Rural residential with potential. To be placed in land bank at a future time. Timber harvest is number one use. Future subdivision or another compatible use with the surrounding land use and ownership pattern with demonstrated market demand.
Agency/Other	<u>AF&G Steve Albert:</u> Protect lake and wetlands. Cut birch, but leave 2 seed trees per acre. Scarify 25% of area for seedlings.
Activities/MGMT Adjacent Owners	Private and NNAI owned. More intensive development is found on the E side of the Sterling Hwy. A '66' buffer is designated between Ninilchik Natives parcel and other adjoining landowners.

FMSR #3 COHOE TYPES & VOLUME ESTIMATES by John L. Hall, TRC 7/95

Volume Estimates by Cubic Feet and Board Feet of Spruce-Hardwood Forest Types, including Proposed Reserve and Harvest Areas by John L. Hall, Taiga Resource Consultants, July 1995									
		Cubic Feet				Board Feet (SC Dec C.)			
CATEGORY	Acres	Spruce		Birch		Spruce		Birch	
		Gross	Net	Gross	Net	Gross	Net	Gross	Net
Total Area	178								
Tot. SP-Hdwd Forest	178	179,055	107,363	104,424	62,550	647,754	388,531	182,216	109,305

RESERVES									
Exterior Boundaries (66')	13	10,608	6,357	5,668	3,393	41,899	25,129	9,347	5,603
Streams & Lakes (300')	3	4,221	2,532	1,413	846	14,814	8,886	2,469	1,482
Wetlands (66')	17	13,872	8,313	7,412	4,437	54,791	32,861	12,223	7,32
Total Reserved Area	33	28,701	17,202	14,493	8,676	111,504	66,876	24,039	14,412

COMMERCIAL FOREST LAND									
TOTAL HARVEST	145	150,354	90,161	89,931	53,874	536,250	321,655	158,177	94,893
Unit # 1 Local Use*	15	12,240	7,335	6,540	3,915	48,345	28,995	10,785	6,465
Unit #2 Timber Hvst	130	138,114	82,826	83,391	49,959	487,905	292,660	147,392	88,428
Unit #2 Rounded Down	130	138,000	82,000	83,000	49,000	487,000	292,000	147,000	88,000

* Note: Unit #1 is designated for local use and is not included in the commercial timber sale.

FMSR #3 Cohoe Tower

1. **Location:** *Description of each tract, including a map at a scale of 1"=1320' from KPB 1"=1320' aerial photos, photo stand analysis from aerial photos at 1"=1320'. Size of tracts outlined.*

The Cohoe Tower tract is located 1 mile south of Kasilof. It is located along and bisected by the Sterling highway at mile 112.6.

It is further described as: KPB Parcel #98 Crooked Creek. Patent #7220. Legal: SE1/4NE1/4, Exc. Sterling Hwy ROW, SW1/4NE1/4, N1/2SW1/4, S1/2NW1/4. SEC 11, T2N R12W, SM.

This 240 acre L shaped parcel, is predominantly mixed spruce-birch and birch-spruce forest types with some small areas black spruce and several muskeg areas. Hilly and well drained with elevations ranging from 200 to 270 feet.

Included are maps which show the location, surrounding landowners and land uses. The site maps show the legal location, boundaries, easements, forest and land cover types, access routes, Timber Harvest Units (THU's) and reserved and no-cut zones.

2. **Timber Management Aspects:** *Predominant vegetation age and health of stand. Species present and anticipated mix of domestic and export grades.*

Recommendation: Immediate salvage of beetle killed spruce and threatened spruce. Ensure regeneration of white spruce through scarification and leave all spruce under 6" DBH which could allow up to 50 trees per acre to remain. Require tree length logging with delimiting and slash disposal on the landings. Dispose of slash by burning at the landings during times of low fire danger. Require harvest of designated birch for increased browse for sucker growth out of stumps. Two birch seed trees per acre will be left. No harvest buffers around lake (300') and ROW (66') will be required as a part of timber sale layout and design. Aesthetics and wildlife cover will be enhanced by the quicker regeneration of the hardwood component. The birch could become commercially viable and is envisioned to be primarily utilized for firewood or pulp logs, with little sawlog quality.

A stand analysis reveals predominantly white spruce with birch and birch-spruce as the major forest types. The spruce is 180 to 230 years old. Almost all spruce have been hit by bark beetle with 60% to 80% mortality. There is a healthy understory of small spruce poles, saplings and seedlings. These trees should and will be protected in the harvest of the mature spruce. The age of the understory is from 1 to 30 years old. Parcel timber has experienced an economic loss of its timber being downgraded from export quality to domestic pulp logs or firewood. Some house logs still remain. Birch is mixed throughout the tract ranging from 20 to 60 percent of the forested areas of the parcel with the general health of the stand categorized by heavy defects generally occurring as frost cracks and fungus. There is a very open nature to the stands on this parcel with brush (highbush cranberry, Alaska spirea, rusty menziesia, prickly rose & alder) and grass (calamagrostis canadensis) which will tend to take over the stand with increasing mortality from the bark beetle epidemic.

3. Soil Information: *Data extracted from SCS soil maps and TRC archives, 1986 KPB Forest Management Plan.*

The well drained and silty loam soils on this site are from the Kenai Soil Series (SCS). These soils tend to be 10 to 24 inches deep to the underlying till. The texture of the till is underlain by layers of gravelly or sandy material. Apparently developed from the wind borne component above the layered sediments of the Kenai geologic formation. These soils are very strongly acid near the surface but only moderately acid in the lower layers. Because of the of the relatively slow permeability of the underlying glacial till, water accumulates above it in the spring. In most years, however, this water either penetrates slowly into the underlying material or moves through the soil above it into lower lying areas. Generally operable for timber harvest the year round with temporary shutdowns for muddy conditions during breakup and freeze-up. Topography and drainage not anticipated to cause any restrictions for access or harvest on this parcel.

4. Other Land and Resource Management Aspects: *Current and anticipated future uses of KPB land and surrounding land owners concerns and plans.*

This is a an increasingly popular area for recreation and rural residential. Immediate area is presently used for cabin and permanent home sites for residents of Kasilof. With anticipated increasing demand for rural residential sites, this parcel will become very marketable. Views of the Kenai mountains and the Alaska range across Cook Inlet should enhance the marketability of this parcel. The fisheries in the area, as well as winter sports such as cross country skiing and snowmachining on the seismic trails, is increasing in popularity.

In addition, the portion of this tract bordering the Sterling highway to the edge of the 1100 road in this tract will be a designated personal use area for KPB residents to cut firewood for their own use. This area contains 28 thousand board feet of spruce and 6 thousand board feet of birch.

5. Visual Impacts: *Assess visual impact of resource management and extraction. Conduct a viewscape analysis using aerial reconnaissance, aerial photos and site visits.*

Some impact when viewed from the air, however, leaving the birch and the irregular pattern of the cutting units should mitigate the negligible impact from this view. Majority of harvest in THU's #1 and #2 will be well buffered from views from the Sterling highway. The local use only area proposed along the highway (see 1'=100' photo of Cohoe Tower parcel and overlay for depiction) should also help mitigate visual impacts. Dead and dying (grey and red) spruce trees will be replaced by a young, green and growing forest.

6. Air Quality: *An analysis will be made of the potential impact to air quality from the harvest of timber and increased temporary industrial activity. The prevailing wind directions from NOAA will be consulted.*

It is anticipated that there will be a negligible effect on air quality due to the protected inland location of this parcel during normal timber harvest activities. Parcel is fairly isolated from significant human activity. Wind patterns in this area are consistently from the

northeast in the winter, from the north in the spring and fall and from the southwest in the summer. Average velocity is seven knots with highest velocities in the forty knot range. However, since the burning of slash piles will be a requirement of the timber sale, there will be potentially a major impact, albeit temporary impact on air quality from the smoke generated. This can be minimized by burning on days when the wind is light to medium (10 to 20 knots) with winds from the northeast, which will tend to push the smoke out over Cook Inlet, where it will have the least impact. Other factors will need to be taken into account when slash burning occurs, primarily the securing of the appropriate and required permits from the state and local governments.

7. **Wildlife:** *Populations and habitat of wildlife currently using the area will be considered with consultation with peninsula based wildlife biologist and existing ADF&G surveys. Changes to the forest cover which could result in increased populations or decreased populations will be addressed.*

Whether through harvest or continued spruce bark beetle epidemic the spruce component of this stand will be reduced significantly, the difference between harvest or status quo is entirely in the rapidity and vigor of the resulting spruce regeneration or lack of due to *calamagrostis canadensis*. Under either scenario the following will be true: there will be a significant reduction in the size and number of live large spruce trees and the wildlife habitat functions they provide. According to ADF & G (Wiedmer 94') Moose, red squirrels, and many bird species are at least seasonally dependent on the mature spruce stands for cover and/or food. During periods of deep or long lasting snow, moose, for example, seek the cover of densely stocked mature spruce stands where snow is shallower and browse more accessible. The loss of the mature spruce canopy resulting from the from the beetle infestation and the subsequent reduction in cover will stress populations that currently depend on this winter shelter. The 66 foot buffers around the muskegs is composed of spruce-birch stands. Only 145 acres of the 178 acres of the birch-spruce forest will be cut. There are adequate spruce stands on the adjoining private lands. The 145 acres of harvested land will provide birch and willow browse from the stump sprouts and birch seedlings.

Red squirrels and several bird species are dependent on spruce seeds for a major portion on their diet. Loss of mature, seed producing spruce will cause a reduction in these populations. In winter, spruce grouse feed almost exclusively on spruce needles; however younger trees can provide this diet. Bird species that nest in large live spruce trees may experience population declines. Cavity nesters will experience delayed impacts as dead trees continue to fall.

Some migratory bird species that frequent early successional, shrubby habitats, such as some of the sparrows and warblers, will benefit from the expansion of open and shrubby areas. Waterfowl populations should remain relatively unaffected.

Dr. William Collins of ADF & G Game has studied the various harvest methods in the boreal forest on the Matanuska Moose Range. His reports and studies on the Biological Basis for Clearcutting in the Boreal Forest emphasize that the positive effects on wildlife populations and enhancement of wildlife habitat far outweigh the negative impacts of timber harvest. The major wildlife species Collins analyzed are: Lynx, hares, wolves & coyotes, moose, passerine songbirds and raptors.

- 8. Impacts on Water Quality:** *Project potential impacts of resource management on water quality in lakes and streams. Estimate FPA mandated stream buffers and preservation of important riparian zones. Consult ADF & G personnel and catalog of anadromous streams.*

Some very localized, negligible impact on water quality anticipated due to the rolling topography of the parcel. Site is well drained with natural buffer zones on the south and west and south by muskeg and the small lake to the west. Roads constructed for timber harvest should have adequate ditches and culverts for abnormal flow during spring runoff or heavy fall rains.

Fisheries not likely due to the distant proximity of the nearest anadromous fish streams, only potentially (remotely) impacted watersheds are Crooked Creek and Kasilof river. Parcel is also naturally well buffered by distance and the many muskegs from any nearby lakes containing resident fish. Unnamed lake to the west will require a Kenai Peninsula Borough buffer of 300' (minimum). Timber harvesting and winter road building should be timed to avoid

periods with high runoff (late spring or fall before freeze-up) to minimize potential impacts.

- 9. Transportation:** *Address access via state highways, KPB maintained roads or private roads. Estimate use of section line and seismic line easements. Estimate any access fees or construction costs necessary for proceeding with the sale of the resources.*

Access is excellent via the Sterling highway and Red Ribbon Drive which intersect in the northeast section of the parcel. Construction of 12 foot gravel roads over a layer of TYPAR within the parcel as a component of the proposed timber harvest is recommended. No anticipated use of easements or section lines. No access fees anticipated due to the state and KPB maintained access.

- 10. Archaeological and Historical:** *An analysis will be made using the latest information from the State Historical Office or other sources i.e. the U.S. Fish and Wildlife Service surveys.*

Research conducted with Tim Smith of the State Historic Preservation Office (SHPO) revealed no known archaeological or historic sites on or near this parcel. And, in addition concluded that this area is not likely to contain these types of sites due to its distance from rivers or the coastal area where typically these sites are found on the Kenai peninsula. U.S. Fish and Wildlife surveys indicate the same conclusions.

11. Silvicultural Prescription: *Based upon the stand age and condition, and with the concerns of competition of calamagrostis, an appropriate silvicultural prescription will be devised with the goal of maximum regeneration with minimum impact to viewsapes, water quality and disturbance to remaining vegetation. Reforestation measures will be proposed and discussed.*

Require tree length logging with delimiting and slash disposal on the landings. Dispose of slash by burning at the landings during times of low fire danger. All of the old birch over 6" DBH, except the two designated seed trees per acre will be harvested based upon their age and vigor to promote additional sucker growth from the stumps. The cut birch will provide enhanced moose browse. Harvest units and roads will be designed with a future subdivision as the anticipated highest and best use. Roads will bisect the parcel in the middle to provide security for the logger and to maximize the distance from the neighboring landowners for noise and fumes from harvest activities. Views for most potential subdivision lots will be enhanced if possible. Harvest units and roads will be designed with a subdivision in mind. Roads will be curvilinear with a shallow (3%) grade. However, with this proposed silvicultural prescription, all necessary reforestation will occur naturally from the leave trees and blown in seed source on this parcel and provide more than the FPA mandated 450 stems per acre within five years. Only manual reforestation that is anticipated will be a requirement for the logger to ensure scarification of 25 percent of the THU's, either as a part of the timber harvest or through mechanical means (brush rake) after the harvest is complete. All reforestation will occur naturally from the seed trees and deliberate scarification, preferably during the summer months. Scarification will be increased due to yarding all tree length logs to central landings. A Zone of Sensitivity will be designated consisting of a buffer of 66' to all the surrounding landowners or along ROW's and a 300' buffer to the lake on the west boundary of this parcel. Harvest within these zones will be allowed for the harvest of dead or dying beetle impacted spruce only.

In addition, the portion of this tract bordering the Sterling highway to the edge of the 1100 road in this tract will be a designated personal use area for KPB residents to cut firewood, by permit only, for their own use.

Based upon the stand age and condition, and with the concerns of competition of calamagrostis, an appropriate silvicultural

prescription has been devised with the goal of regeneration for moose browse, future rural residential, and timber values with minimum impact to views, water quality and disturbance to remaining vegetation. The silvicultural prescription for the birch-spruce stands in THU's #1 and #2 by species is:

Spruce: Harvest all dead and dying spruce 6" DBH & larger to a 4" top, tree length. (Based upon market conditions, tree length could be expanded to include a 3" top). All spruce less than 6" and all seedlings will be left and protected. Advanced reproduction and designated leave trees could exceed 25 to 50+ trees per acre. Dead and dying spruce trees will be marked in the adjoining 66 foot Zones of Sensitivity in wetland and lake buffers for harvest.

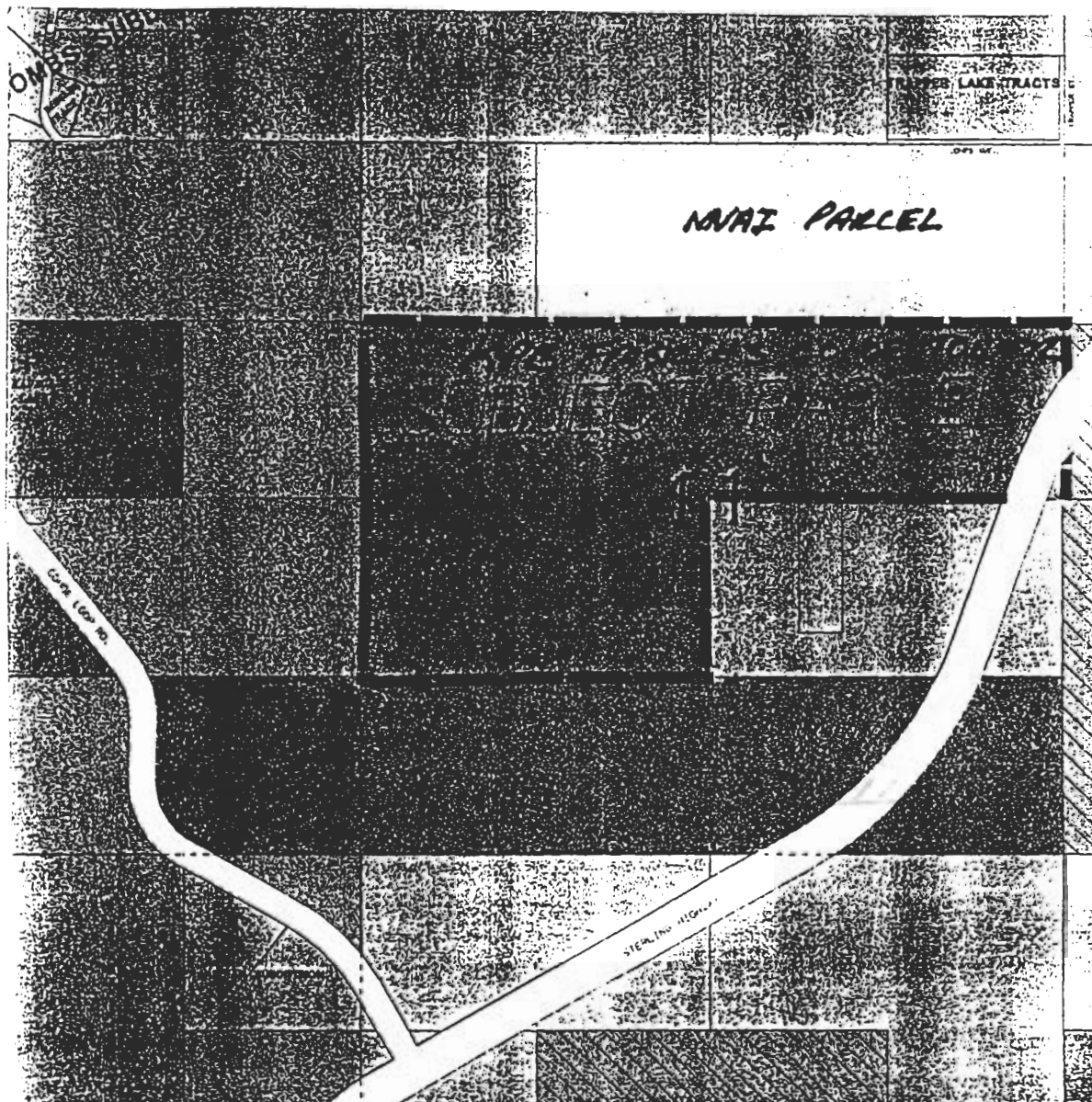
Birch: Two birch seed trees per acre will be left in the THU's. The birch over 6 inches DBH will be harvested and skidded to the landings in tree lengths. Birch saplings and seedlings and poles under 6 inches will be protected. The cut birch stumps will sprout with new growth. The tree length logging of spruce and birch should provide site disturbance over 25 percent of the THU's. If this disturbance does not occur, the logging operator shall be required to do additional scarification, by mechanical means.

Only dead and dying spruce trees will be harvested from the Zones of Sensitivity, located around the wetlands (muskegs and black spruce stands) and the unnamed lake to the west. This silvicultural prescription should provide adequate spruce and birch trees with the expected minimum of 450 stems per acre of both birch and spruce within five years, highly sufficient for future use of this tract as rural residential by the KPB. The road locations and the proposed harvest of the dead and dying spruce, the layout of the THU's and the Zones of Sensitivity are located with this future use in mind.

Cohoe Tower
Legal Description
Patent #'s & Elevations

July 1995

Scale: approx 1": 1,320'



Legal

Patent: 7220	Legal: SE1/4NE1/4, Exc. Sterling Hwy ROW, SW1/4NE1/4,
Description:	N1/2SW1/4, S1/2NW1/4. SEC 11, T2N R12W, SM.

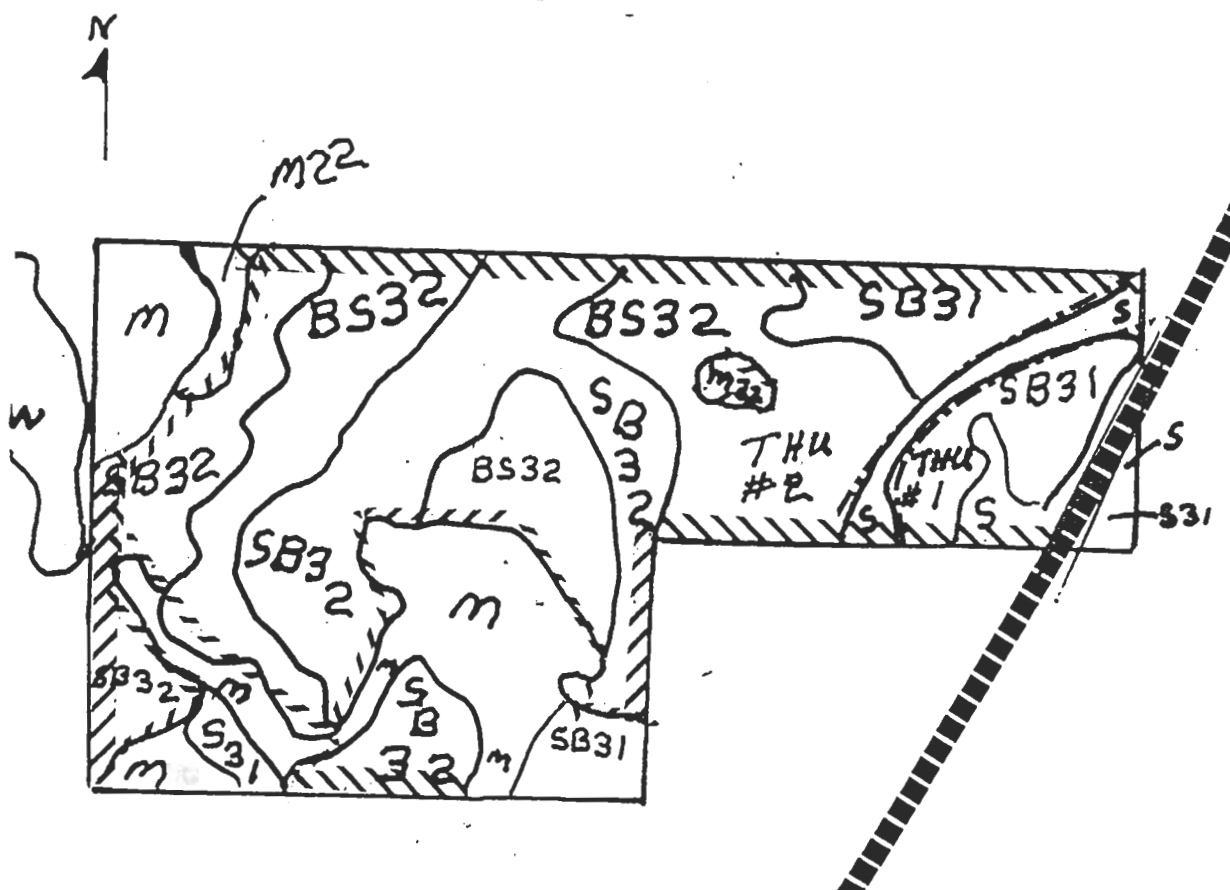
TOTAL: 240.00 acres

Elevation Range: 200 feet to 270 feet.

Timber Harvest Units
&
Reserved Areas
Cohoe Tower

July 1995

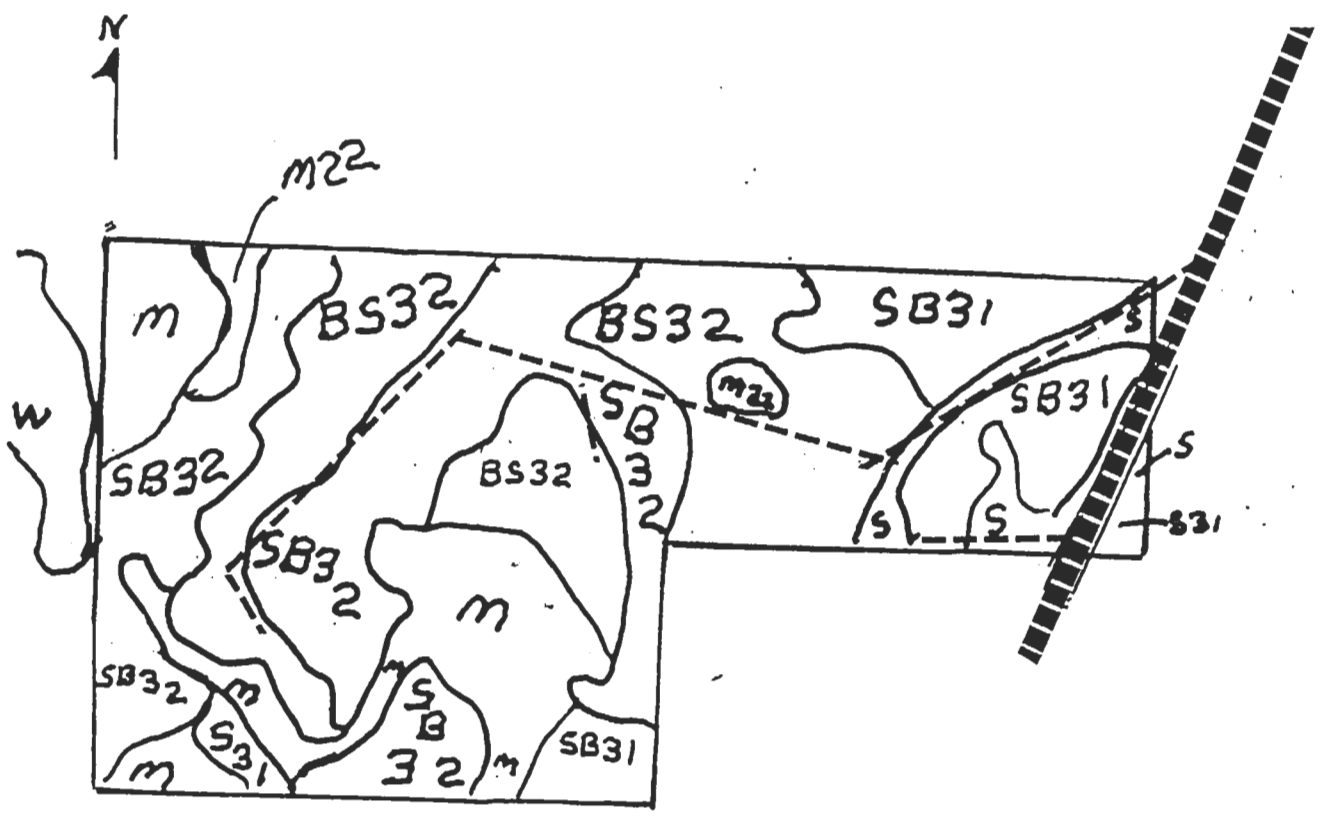
Scale: approx 1": 1,000'



Legend

Reserves	
13 acres	Exterior Boundaries = 66'
3 acres	Unnamed Lake Buffer = 300'
17 acres	Wetlands = 66'
Cutting Units	
15 acres	THU #1
130 acres	THU #2

Transportation Plan
Cohoe Tower
 July 1995
 Scale: approx 1": 1,000'



Legend

Roads	
▬▬▬▬▬	Sterling Highway
- - - - -	Timber Harvest Roads
Data: Miles	
68.5	Milepost 112 Sterling Highway to Homer
1.1	Timber Harvest Roads Within Unit

TAIGA RESOURCE CONSULTANTS
P.O. Box 750 • Girdwood, Alaska • 99587
Phone (907) 783-2416

July 24, 1995

Lisa Parker
Planning Director
Kenai Peninsula Borough
144 N. Binkley
Soldotna, Alaska 99669

Dear Ms. Parker

You have contracted with us to produce Forest Management Sale reports and Appraisals for three tracts on the Kenai Peninsula. The following is our professional opinion of the fair market value of the merchantable timber owned by the Kenai Peninsula Borough on FMSR's: Salmo Lake #1, Wildwood #2 and Coho Tower #3 as of July 1995.

The fair market value is described as the price that would be paid for the subject timber that has been exposed to the market for a reasonable length of time, and that price which would be agreed upon by a seller and buyer, both of whom are equally well informed and have a reasonable knowledge of the facts concerning the subject timber and both of whom are willing, but under no compulsion to buy or sell.

You have furnished us certain records and maps concerning this timber as to its location, quantity, quality and condition. We have viewed the timber on site, and have knowledge of the timber, logging and road building conditions as well as the markets in the area. Our general knowledge and my specific knowledge of the forest products industry in Southcentral and Southeast Alaska, as well as the Pacific Northwest, was also critical in reaching our opinion of value for this timber.

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After taking into account all the timber valuation factors herein mentioned, as well as other factors not specifically mentioned, it is my opinion that this is fair market value of the spruce and birch timber contained on these three tracts. And, based on the best available information, the following are estimates of the timber volumes, estimated stumpages and recommended minimum acceptable bids, on the three tracts, for both birch and spruce, in thousand board feet, Scribner scale, of merchantable timber available for sale as of July 1995.

FMSR	Thousand Board Feet	Stumpage \$/mbf	Total Value	Min Bid
Salmo Lake FMSR #1				
Spruce	217 mbf	\$18.63	\$4,043.00	\$2,000.00
Birch	82 mbf	\$5.00	\$405.00	\$200.00
Total			4,448.00	2,200.00

FMSR	Thousand Board Feet	Stumpage \$/mbf	Total Value	Min Bid
Wildwood FMSR #2				
Spruce	113 mbf	\$39.06	\$4,414.00	\$2,200.00
Birch	None	\$0.00	\$0.00	\$0.00
Total			4,414.00	2,200.00

FMSR	Thousand Board Feet	Stumpage \$/mbf	Total Value	Min Bid
Cohoe Tower FMSR #3				
Spruce	292 mbf	\$34.27	\$10,008.00	\$5,000.00
Birch	88 mbf	\$5.00	\$440.00	\$220.00
Total			10,448.00	5,220.00

These sales were appraised as lump sum sales, and sale by area, with the area designated by the timber harvest units (THU's).

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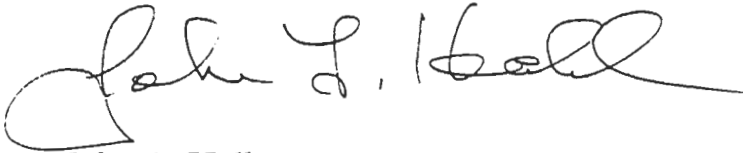
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The selling value for the white spruce was determined by using the best available market information. This was the price per ton that log buyers were willing to pay for delivery to Homer during the middle part of 1995.

The selling value for the paper birch was determined by using the best available market information. Based on the present questionable market for birch for firewood and pulp logs on the Kenai peninsula, we estimate that the that birch has a value of \$3.00 to \$5.00 per thousand board feet.

The attached report, and accompanying maps, are a part of this appraisal.

Sincerely,



John L. Hall
President
Taiga Resource Consultants

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Remote Sensing • Photogrammetry • Environmental Studies
Timber Appraisal • Land Classification and Use

-Salmo Lake FMSR Executive Summary-

This 308 acre tract is located along the North Kenai Road Access corridor, from 1.1 to 1.5 miles from the end of the maintained road and parking lot.

The spruce trees on this tract have and will continue to be impacted by the spruce beetle. The land use and forest prescription is to harvest all spruce with a diameter measuring over six (6") inches. All of the spruce trees under five (5") inches and under will be protected. These are the advanced reproduction of saplings and seedlings. To provide for moose habitat, the birch trees over six (6") inches in diameter will be harvested. These stumps will provide sprouts for future trees. Two mature birch per acre will be left for additional seed source. None of the cottonwood will allowed to be cut. Twenty five percent of the harvested area will be disturbed or scarified by the harvest to provide a seed bed for the spruce and birch. This silvicultural prescription will provide for a desirable forest setting for future rural residential lots. Winter roads will be used for access and the harvest of timber.

On the 308 acre Salmo Lake tract the salvage timber harvest will occur in two units which total 106 acres of the birch-spruce forest. The estimated net volume to be removed totals 63,000 cubic feet of white spruce and 56,000 cubic feet of paper birch. The conversion from cubic foot volume to board foot volume equals approximately 217,000 bf of white spruce and 81,000 bf of paper birch.

Salmo Lake will have a 300 foot setback zone while the wetlands will have a 66 foot buffer zone. Dead and dying spruce trees which meet the harvest requirements will be marked for harvest on an individual tree basis in these zones. Consideration will be given if the the harvest will cause any undue damage to the wetlands. A 66 foot No-Cut Zone will be marked along the exterior boundaries in the Timber Harvest Units (THU).

Out of the 190 acres of the birch-spruce forest impacted by the spruce bark beetle, 84 acres will be in a reserve status in the following categories:

Exterior Boundaries	20 acres
Lake Buffers	9 acres
<u>Wetlands</u>	<u>55 acres</u>
Total Reserve	84 acres

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The Salmo Lake FMSR #1 tract, contains 217 thousand board feet of white spruce on 106 acres, which is appraised at a value of \$18.63 per mbf or \$4,043.00 dollars. The minimum bid price for spruce which the Kenai Peninsula Borough should accept is \$2,000.00 dollars. In addition, this tract contains 81 thousand board feet of paper birch on the same 106 acres, which is appraised at a value of \$5.00 per mbf or \$405.00 dollars. The minimum bid price for birch is \$200.00 dollars. The combined minimum bid for both spruce and birch is \$2,200.00 dollars.

The timber on this 106 acres should be sold as a lump sum sale, by area, for all the spruce and birch, as designated for harvest.

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