



# PEBBLE PROJECT

## DRAFT ENVIRONMENTAL BASELINE STUDIES PROPOSED 2008 STUDY PLANS

### CHAPTER 9. WILDLIFE AND HABITAT

***DRAFT***



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**State of Alaska Large Mine Permitting Team**  
**Department of Natural Resources**

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## 9. WILDLIFE AND HABITAT

ABR, Inc. will lead the terrestrial wildlife and habitat program for the mine study area and the transportation corridor in 2008.

The objectives and scope of work for 2008 are the same as those described in the 2007 Study Plans with the exceptions noted below. A summary of the wildlife and habitat tasks undertaken for 2004 through 2008 is shown in Table 9-1.

### 9.1 Mammals

The methods and approaches for 2008 are the same as those described in Sections 9.1.1.2, 9.1.2.2, and 9.7.2 of the 2007 Study Plan.

The radio-telemetry study of brown bear in mine study area and transportation corridor will begin in 2008 to better understand seasonal movements, habitat use and population.

The trace element sampling of brown bear tissue was initiated will begin in 2008 in order to document contaminants for the mine study area and transportation corridor and compare this data to data collected in the future during and after mine development.

No additional aerial survey transects will be conducted in 2008.

### 9.2 Wildlife Habitat Mapping

Digital wildlife habitat mapping will continue into 2008 for the mine study area and transportation corridor. The study area for the mine area is described in Figure 9.2-1 and the study area for the corridor is described in Figure 9.2-2 and has not changed from the 2007 Study Plan.

ABR Inc. will use vegetation mapping, led by Three Parameters Plus for the mine study area and HDR Inc. for the transportation corridor. ABR Inc. will add information on physiography and surface form to the vegetation data to yield a multivariate map of wildlife habitats for the mine and transportation corridor study areas.

### 9.3 Raptor Studies

No new field surveys are planned in 2008 for raptors. Surveys for nesting raptors were conducted in 2004 and 2005 as described in Chapter 9 of the respective Study Plans for those years.

### 9.4 Landbirds and Shorebirds

No new field surveys are planned in 2008 for the landbirds and shorebirds. Surveys for these bird groups were conducted in 2004 and 2005, as described in Chapter 9 of the Study Plans for those years.

## 9.5 Wood Frogs

No new wood frog field surveys are planned in 2008. Surveys for wood frogs were conducted in 2007 in the mine study area and transportation corridor, as described in Chapter 9 of the Study Plan for this year.

## 9.6 Marine Wildlife Studies

Helicopter surveys will be expanded from 2007 to provide greater temporal coverage of the winter months to improve understanding of seasonal use, movement, distribution, and abundance of Iliamna-Iniskin-Chinitna bays by marine wildlife, including Steller's Eider, northern sea otter, Steller's sea lion and the beluga whale.

Fixed-wing harbor seal surveys in 2008 will be an addition to 2005 and 2007 surveys. The study area for the harbor seal surveys is described in Figure 9.6-1.

## 9.7 Threatened and Endangered Species Summaries

Existing information on threatened and endangered species and species of conservation concern for vertebrate animals and vascular plants will be summarized in the Environmental Baseline Document.

## 9.8 Waterbirds

No field surveys for waterbirds will be conducted in 2008. Surveys for migrating and nesting waterbirds were conducted in 2004 and 2005, as described in Chapter 9 of the Study Plans for those years.

**TABLE 9-1  
Pebble Project Environmental Studies  
Study Summary for Wildlife, 2004-2008  
Consultant: ABR, Inc.**

Discipline	2004 Data Collected or Tasks	2005 Data Collected or Tasks	2006 Data Collected or Tasks	2007 Data Collected or Tasks	2008 Tasks to be Completed
<b>Mammals</b>	<b>Mine Studies Area</b>				
	Information Gathering / Literature Search	Information Gathering / Literature Search & Review	Information Gathering / Literature Search & Review	Information Gathering / Literature Search & Review	Information Gathering / Literature Search & Review
	Scope, Schedule, Field Sampling Plan 2004 Study Plan	Scope, Schedule, Field Sampling Plan 2005 Study Plan	Scope, Schedule, Field Sampling Plan 2006 Study Plan Summary	Scope, Schedule, Field Sampling Plan 2007 Study Plan Summary	Scope, Schedule, Field Sampling Plan
	Aerial Transect Surveys (1 each in April, May, July, August, October, November)	Aerial Transect Surveys (1 in March, 2 in May, 1 in June, 1 in July, 1 in August, 1 in October, 1 in December)	Aerial Transect Surveys (2 in May, 1 in June, 1 in July)	Aerial Transect Surveys (1 in June, 1 in July)	
	Bear Den Survey (August)	Bear Den Surveys (1 each in May and July)	Bear Den Surveys (1 each in May and July)	Bear Den Surveys (1 each in May and July)	Bear Den Surveys (1 each in May and July)
		Beaver Cache Survey in mine area (1 in October)			
		Mulchatna Caribou Herd Telemetry Data Analysis	Mulchatna Caribou Herd Telemetry Data Analysis	Mulchatna Caribou Herd Telemetry Data Analysis	
	Preliminary Impact Analysis of Mine Development Scenarios and Mitigation Planning	Initial Environmental Analysis of Mine Development Concepts and Mitigation Planning	Input to Preliminary Environmental Evaluation Document	Input to Preliminary Environmental Evaluation Document	
				Plan Brown Bear GPS Telemetry Study	Brown Bear GPS Telemetry Study
				Develop Plan for Baseline Trace Elements Analysis of Tissues from Terrestrial Mammals	Collect Brown Bear Tissue Samples
	Data Entry and Analysis	Data Entry and Analysis	Data Entry and Analysis	Data Entry and Analysis	Data Entry and Analysis
	Communication and Data Management	Communication and Data Management	Communication and Data Management	Communication and Data Management	Communication and Data Management
	Coordination with NDM, Agency Meetings	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting
		2004 Progress Report	Draft Environmental Baseline Document	Draft Environmental Baseline Document	Draft Environmental Baseline Document
<b>Raptors</b>	<b>Mine Studies Area</b>				
	Information Gathering / Literature Search	Information Gathering / Literature Search & Review	Information Gathering / Literature Search & Review		
	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Recommendations		
	2004 Study Plan	2005 Study Plan	2006 Study Plan Summary		
	Aerial Surveys for Tree-nesting Raptors (April)	Aerial Surveys to Determine Occupancy (May)			
	Aerial Surveys for Cliff-nesting Raptors (May-June)	Aerial Surveys to Determine Nesting Success and Productivity (June-August)			
		Aerial Surveys for Wintering Bald Eagles (November and February)			
	Preliminary Impact Analysis of Mine Development Scenarios and Mitigation Planning	Initial Environmental Analysis of Mine Development Concepts and Mitigation Planning	Input to Preliminary Environmental Evaluation Document		
	Data Entry and Analysis	Data Entry and Analysis	Data Analysis		
	Communication and Data Management	Communication and Data Management	Communication and Data Management	Communication and Data Management	
	Coordination with NDM, Agency Meetings	Coordination with NDM, agency meetings, and monthly reporting	Coordination with NDM, agency meetings, and monthly reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting	
		2004 Progress Report	Draft Environmental Baseline Document	Draft Environmental Baseline Document	Draft Environmental Baseline Document

Discipline	2004 Data Collected or Tasks	2005 Data Collected or Tasks	2006 Data Collected or Tasks	2007 Data Collected or Tasks	2008 Tasks to be Completed
<b>Waterfowl</b>	<b>Mine Studies Area</b>				
	Information Gathering / Literature Search	Information Gathering / Literature Search & Review	Information Gathering / Literature Search & Review		
	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Recommendations		
	2004 Study Plan	2005 Study Plan	2006 Study Plan Summary		
	Spring and Fall Waterfowl Migration Surveys (April, May, Sept, Oct)	Spring and Fall Migration Surveys (April, May, August, Sept, Oct)			
	Breeding Waterfowl Surveys (early June)	Breeding Waterfowl Surveys (late May)			
	Breeding Swan Surveys (early June)	Breeding Swan Surveys (late May)			
	Breeding Harlequin Duck Surveys (May)	Breeding Harlequin Duck Surveys (May)			
	Brood-rearing Harlequin Duck Surveys (July)	Brood-rearing Harlequin Duck Surveys (July, August)			
	Brood-rearing Waterfowl Surveys (July)	Brood-rearing Waterfowl Surveys (July)			
		Breeding Gull Surveys (June)			
		Molting Waterfowl Surveys (July, August)			
	Preliminary Impact Analysis of Mine Development Scenarios and Mitigation Planning	Initial Environmental Analysis of Mine Development Concepts and Mitigation Planning	Input to Preliminary Environmental Evaluation Document		
	Data Entry and Analysis	Data Entry and Analysis	Data Analysis		
	Communication and Data Management	Communication and Data Management	Communication and Data Management	Communication and Data Management	
	Coordination with NDM, Agency Meetings	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting	
		2004 Progress Report	Draft Environmental Baseline Document	Draft Environmental Baseline Document	Draft Environmental Baseline Document
<b>Breeding Birds</b>	<b>Mine Studies Area</b>				
	Information Gathering / Literature Search	Information Gathering / Literature Search & Review	Information Gathering / Literature Search & Review		
	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Recommendations		
	2004 Study Plan	2005 Study Plan	2006 Study Plan Summary		
	Breeding Bird Point-Count Surveys (June)	Breeding Bird Point-Count Surveys (June)			
	Preliminary Impact Analysis of Mine Development Scenarios and Mitigation Planning	Initial Environmental Analysis of Mine Development Concepts and Mitigation Planning	Input to Preliminary Environmental Evaluation Document		
	Data Entry and Analysis	Data Entry and Analysis	Data Analysis	Data Analysis	
	Communication and Data Management	Communication and Data Management	Communication and Data Management	Communication and Data Management	
	Coordination with NDM, Agency Meetings	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting	
		2004 Progress Report	Draft Environmental Baseline Document	Draft Environmental Baseline Document	Draft Environmental Baseline Document
<b>Habitat Mapping</b>	<b>Mine Studies Area</b>				
	Information Gathering / Literature Search	Information Gathering / Literature Search	Information Gathering / Literature Search		
	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Plan	Scope, Schedule	Scope, Schedule	Scope, Schedule
	2004 Study Plan	2005 Study Plan	2006 Study Plan Summary		
	Habitat Surveys to Ground Truth Aerial Photography (August)	Habitat Surveys to Ground Truth Aerial Photography (August)			
	Map Coordination with 3PP	Map Coordination with 3PP	Map Coordination with 3PP	Map Coordination with 3PP	Map Coordination with 3PP
	Data Entry and Analysis	Data Entry and Analysis	Data Analysis and Digital Habitat Mapping	Data Analysis and Digital Habitat Mapping	Data Analysis and Digital Habitat Mapping
	Communication and Data Management	Communication and Data Management	Communication and Data Management	Communication and Data Management	Communication and Data Management
	Coordination with NDM, Agency Meetings	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting

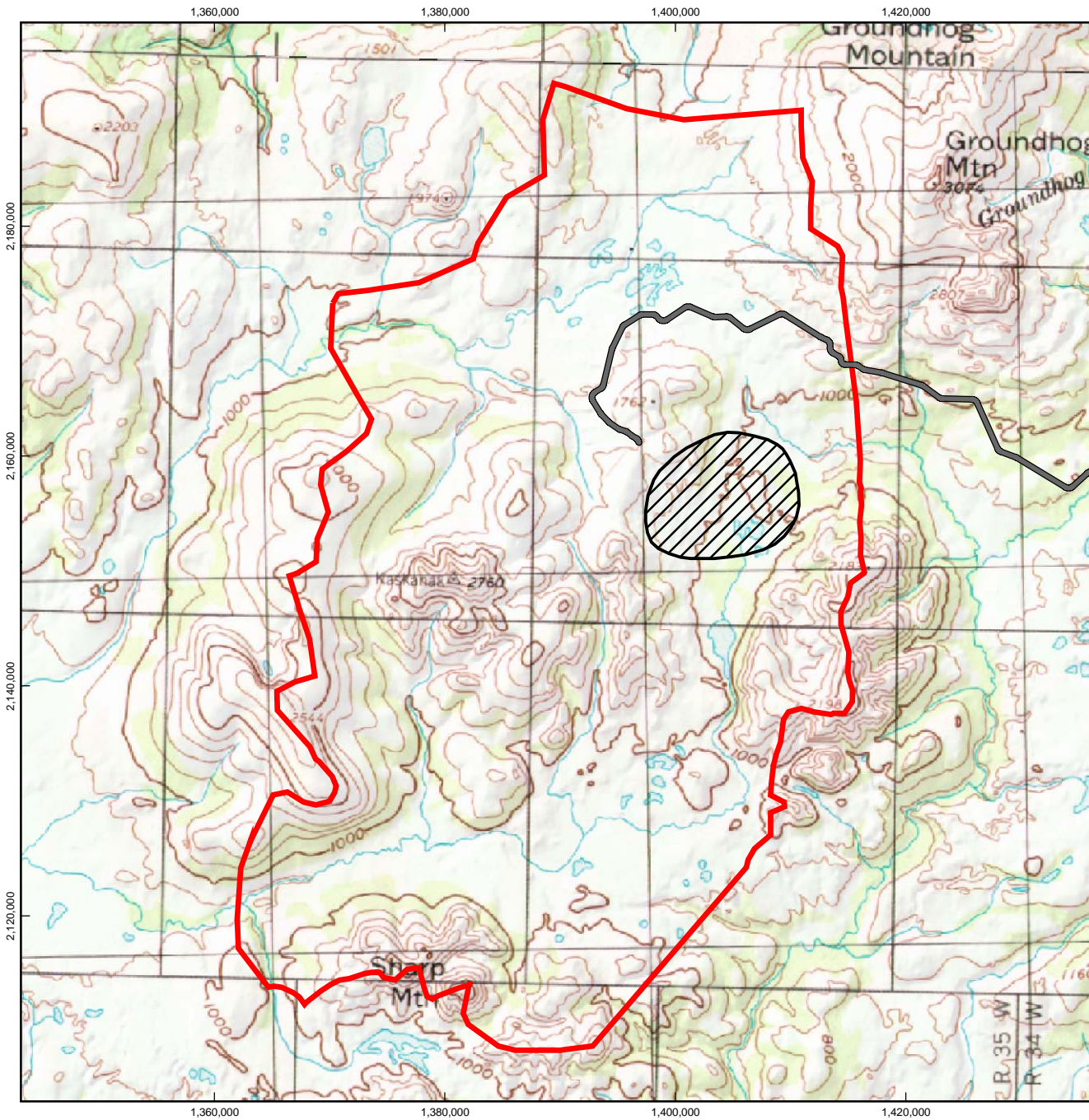


Discipline	2004 Data Collected or Tasks	2005 Data Collected or Tasks	2006 Data Collected or Tasks	2007 Data Collected or Tasks	2008 Tasks to be Completed
		2004 Progress Report			
<b>Threatened and Engangered Species</b>		<b>Mine Studies Area</b>			
	Scope	Information Gathering Scope, Schedule 2005 Study Plan Data Compilation and Analysis	Information Gathering Scope, Schedule 2006 Study Plan Summary Data Compilation and Analysis Draft Environmental Baseline Document		
				Draft Environmental Baseline Document	Draft Environmental Baseline Document
<b>Wood Frogs</b>		<b>Mine Studies Area</b>			
				Information Gathering / Literature Search & Review Scope, Schedule, Field Sampling Plan 2007 Study Plan Summary Presence/absence Surveys (mid-May) Data Analysis Communication and Data Management Coordination with PLP, Agency Meetings, and Monthly Reporting Draft Environmental Baseline Document	
					Draft Environmental Baseline Document
<b>Harbor Seals</b>		<b>Iliamna Lake</b>			
		Information Gathering / Literature Search & Review Scope, Schedule, Field Sampling Plan 2005 Study Plan Aerial Transect Surveys (May-October) Communication and Data Management Coordination with NDM, Agency Meetings, and Monthly Reporting Draft Environmental Baseline Document	Information Gathering / Literature Search & Review Scope, Schedule, Field Sampling Plan 2007 Study Plan Aerial Surveys of Harbor Seal Haul-outs in Iliamna Lake (12 total; May-October) Communication and Data Management Coordination with NDM, Agency Meetings, and Monthly Reporting Draft Environmental Baseline Document	Information Gathering / Literature Search & Review Scope, Schedule, Field Sampling Plan 2007 Study Plan Aerial Surveys of Harbor Seal Haul-outs in Iliamna Lake (12 total; May-October) Communication and Data Management Coordination with PLP, Agency Meetings, and Monthly Reporting Draft Environmental Baseline Document	Information Gathering / Literature Search & Review Scope and Schedule Aerial Surveys of Harbor Seal Haul-outs in Iliamna Lake (12 total; May-October) Communication and Data Management Coordination with PLP, Agency Meetings, and Monthly Reporting Draft Environmental Baseline Document
<b>Mammals</b>		<b>Transportation Corridor</b>			
	Information Gathering / Literature Search Scope, Schedule, Field Sampling Plan 2004 Study Plan Aerial Reconnaissance Surveys (1 each in April, May, July, August, October, November) Aerial Survey of Bears on Salmon Spawning Streams (1 in August)	Information Gathering / Literature Search & Review Scope, Schedule, Field Sampling Plan 2005 Study Plan Aerial Transect Surveys (1 in March, 2 in May, 1 in June, 1 in July, 1 in August, 1 in October, 1 in December)	Information Gathering / Literature Search & Review Scope, Schedule, Field Sampling Recommendations 2006 Study Plan Summary Beaver Cache Survey in transportation corridor (1 in October)	(See above for information on harbor seal surveys in Iliamna Lake, now listed under a separate task)	Brown Bear GPS Telemetry Study and Tissue Sampling
	Data Entry and Analysis Communication and Data Management Coordination with NDM, Agency Meetings	Data Entry and Analysis Communication and Data Management Coordination with NDM, Agency Meetings, and Monthly Reporting 2004 Progress Report	Data Analysis Communication and Data Management Coordination with NDM, Agency Meetings, and Monthly Reporting Draft Environmental Baseline Document Planning for Cooperative Survey Efforts with Agencies	Data Analysis Communication and Data Management Coordination with PLP, Agency Meetings, and Monthly Reporting Draft Environmental Baseline Document Planning for Cooperative Survey Efforts with Agencies	Data Analysis Communication and Data Management Coordination with PLP, Agency Meetings, and Monthly Reporting Draft Environmental Baseline Document Planning for Cooperative Survey Efforts with Agencies
<b>Raptors</b>		<b>Transportation Corridor</b>			
	Information Gathering / Literature Search	Information Gathering / Literature Search & Review	Information Gathering / Literature Search & Review		

Discipline	2004 Data Collected or Tasks	2005 Data Collected or Tasks	2006 Data Collected or Tasks	2007 Data Collected or Tasks	2008 Tasks to be Completed
	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Recommendations		
	2004 Study Plan	2005 Study Plan	2006 Study Plan Summary		
	Aerial Surveys for Tree-nesting Raptors (April)	Aerial Surveys to Determine Occupancy (May)			
	Aerial Surveys for Cliff-nesting Raptors (May-June)	Aerial Surveys to Determine Nesting Success and Productivity (June-August)			
		Aerial Surveys for Wintering Bald Eagles (November and February)			
	Data Entry and Analysis	Data Entry and Analysis	Data Analysis		
	Communication and Data Management	Communication and Data Management	Communication and Data Management		
	Coordination with NDM, Agency Meetings	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with NDM, Agency Meetings, and Monthly Reporting		
		2004 Progress Report	Draft Environmental Baseline Document	Draft Environmental Baseline Document	Draft Environmental Baseline Document
<b>Waterfowl</b>	<b>Transportation Corridor</b>				
	Information Gathering / Literature Search	Information Gathering / Literature Search & Review	Information Gathering / Literature Search & Review		
	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Recommendations		
	2004 Study Plan	2005 Study Plan	2006 Study Plan Summary		
	Spring and Fall Waterfowl Migration Surveys (April, May, Sept, Oct)	Spring and Fall Migration Surveys (April, May, August, Sept, Oct)			
	Breeding Waterfowl Surveys (early June)	Breeding Waterfowl Surveys (late May)			
	Breeding Swan Surveys (early June)	Breeding Swan Surveys (late May)			
	Breeding Harlequin Duck Surveys (May)	Breeding Harlequin Duck Surveys (May)			
		Brood-rearing Harlequin Duck Surveys (July, August)			
	Data Entry and Analysis	Data Entry and Analysis	Data Analysis		
	Communication and Data Management	Communication and Data Management	Communication and Data Management		
	Coordination with NDM, Agency Meetings	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with NDM, Agency Meetings, and Monthly Reporting		
		2004 Progress Report	Draft Environmental Baseline Document	Draft Environmental Baseline Document	Draft Environmental Baseline Document
<b>Breeding Birds</b>	<b>Transportation Corridor</b>				
	Information Gathering / Literature Search	Information Gathering / Literature Search & Review	Information Gathering / Literature Search & Review		
	Scope, Schedule	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Recommendations		
	2004 Study Plan	2005 Study Plan	2006 Study Plan Summary		
		Breeding Bird Point-Count Surveys (June)			
		Data Entry and Analysis	Data Analysis		
	Communication and Data Management	Communication and Data Management	Communication and Data Management		
	Coordination with NDM, Agency Meetings	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with NDM, Agency Meetings, and Monthly Reporting		
		2004 Progress Report	Draft Environmental Baseline Document	Draft Environmental Baseline Document	Draft Environmental Baseline Document
<b>Habitat Mapping</b>	<b>Transportation Corridor</b>				
	Information Gathering / Literature Search	Information Gathering / Literature Search	Information Gathering / Literature Search		
	Scope, Schedule, Field Sampling Plan	Scope, Schedule, Field Sampling Plan	Scope, Schedule	Scope, Schedule	Scope, Schedule
	2004 Study Plan	2005 Study Plan	2006 Study Plan Summary		
	Habitat Surveys to Ground Truth Aerial Photography (August)	Habitat Surveys to Ground Truth Aerial Photography (August)			
	Map Coordination with HDR	Map Coordination with HDR	Map Coordination with HDR	Map Coordination with HDR	Map Coordination with HDR

Discipline	2004 Data Collected or Tasks	2005 Data Collected or Tasks	2006 Data Collected or Tasks	2007 Data Collected or Tasks	2008 Tasks to be Completed
	Data Entry and Analysis	Data Entry and Analysis	Data Analysis and Digital Habitat Mapping	Data Analysis and Digital Habitat Mapping	Data Analysis and Digital Habitat Mapping
	Communication and Data Management	Communication and Data Management	Communication and Data Management	Communication and Data Management	Communication and Data Management
	Coordination with NDM, Agency Meetings	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with NDM, Agency Meetings, and Monthly Reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting
		2004 Progress Report			
<b>Threatened and Engangered Species</b>		<b>Transportation Corridor</b>			
	Scope	Information Gathering	Information Gathering		
		Scope, Schedule	Scope, Schedule		
		2005 Study Plan	2006 Study Plan Summary		
		Data Compilation and Analysis	Data Compilation and Analysis		
			Draft Environmental Baseline Document	Draft Environmental Baseline Document	Draft Environmental Baseline Document
<b>Wood Frogs</b>		<b>Transportation Corridor</b>			
				Information Gathering / Literature Search & Review	
				Scope, Schedule, Field Sampling Plan	
				2007 Study Plan Summary	
				Presence/absence Surveys (mid-May)	
				Data Analysis	Data Analysis
				Communication and Data Management	Communication and Data Management
				Coordination with PLP, Agency Meetings, and Monthly Reporting	Coordination with PLP, Agency Meetings, and Monthly Reporting
				Draft Environmental Baseline Document	Draft Environmental Baseline Document





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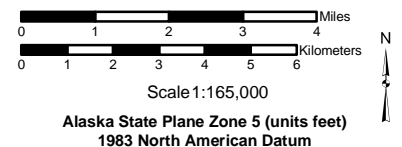
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**Figure 9.2-1.**  
**2008 Study Plan,**  
**Mapping Area**  
**for Wildlife Habitats,**  
**Mine Study Area**  
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**Legend**

-  2008 Mapping Area for Wildlife Habitats
-  General Deposit Location
-  Possible Road Alignment



File: HabMapping_Mine_StudyPlan2008_v01.mxd	Date: May 5, 2008
Version: 1	Author: ABR-AZC







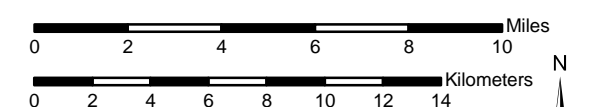
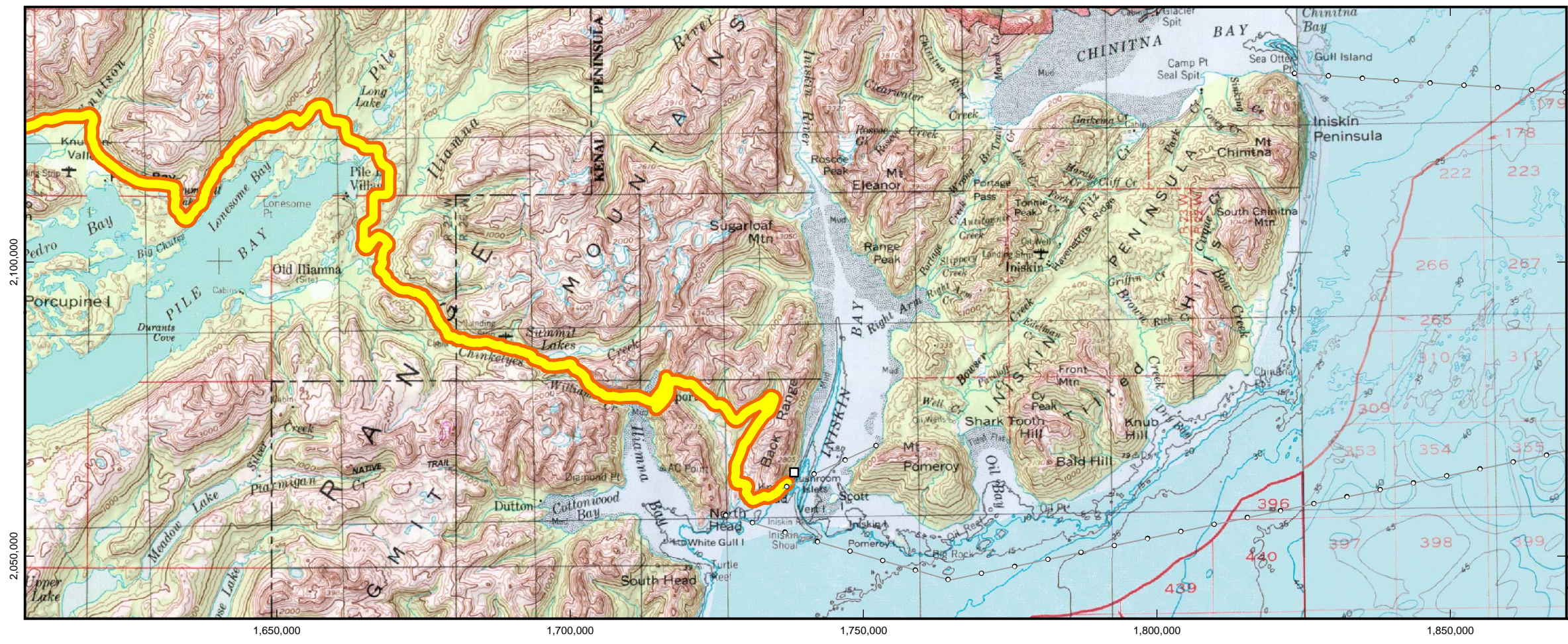


**Figure 9.2-2.**  
**2008 Study Plan,**  
**Mapping Area for Wildlife Habitats,**  
**Transportation-corridor Study Area**

**DRAFT**

**Legend**

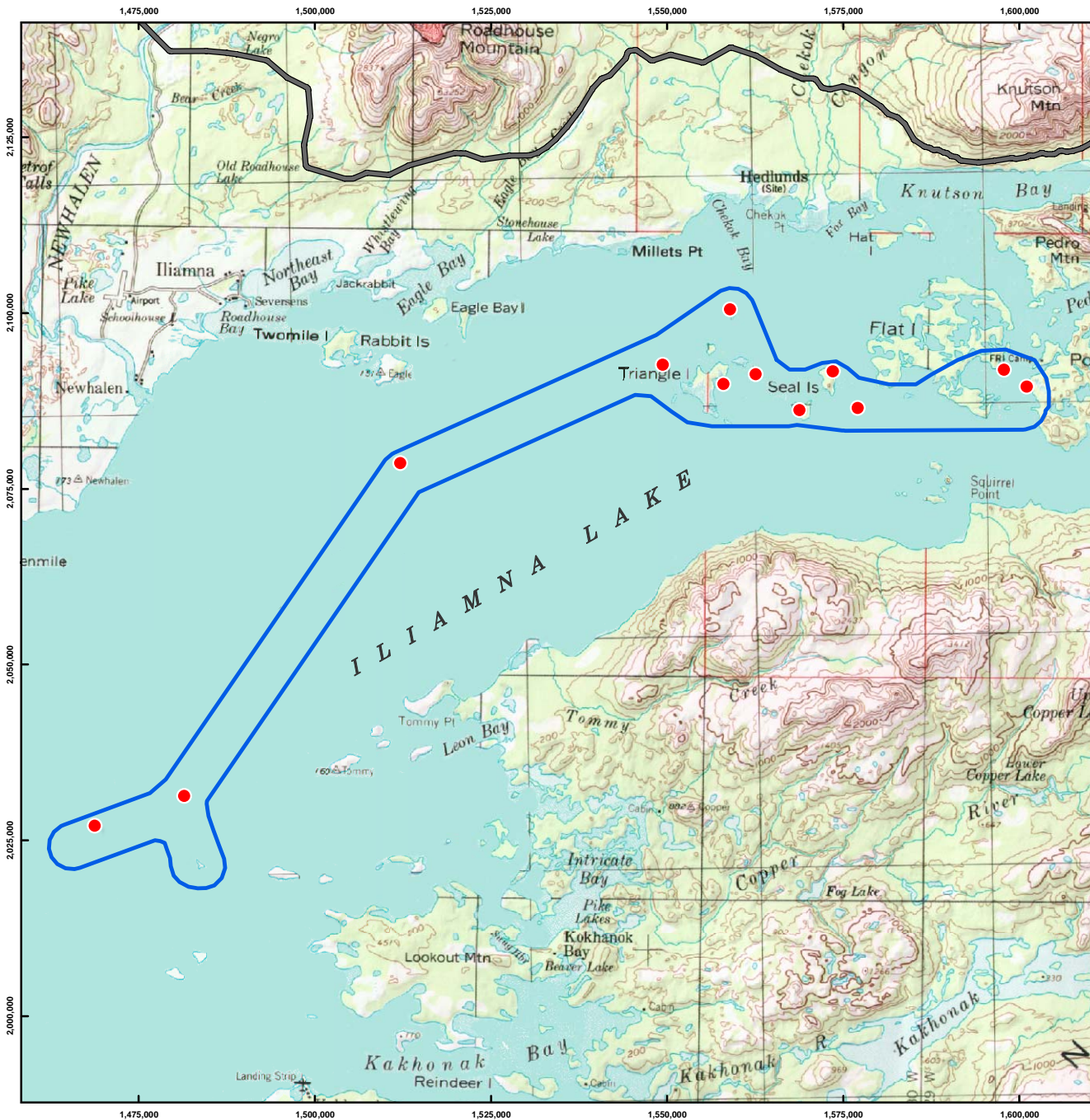
-  2008 Mapping Area for Wildlife Habitats (2000-ft road corridor)
-  General Deposit Location
-  Possible Submarine Powerline
-  Possible Port Site



Scale 1:260,000  
 Alaska State Plane Zone 5 (units feet)  
 1983 North American Datum

File: HabMapping_Rd_StudyPlan2008_v01.mxd	Date: May 5, 2008
Version: 1	Author: ABR-AZC

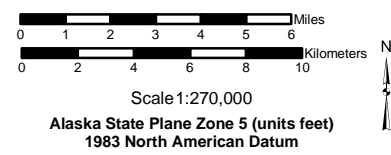




**Figure 9.6-1.**  
**2008 Study Plan,**  
**Survey Area for**  
**Harbor Seals,**  
**Iliamna Lake**  
**DRAFT**

**Legend**

- Harbor Seal Haul-out
- 2008 Iliamna Lake Seal Survey Area
- Possible Road Alignment



File: IliamnaLake_Seals_StudyPlan2008_v01.mxd	Date: May 5, 2008
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