

# Susitna-Watana Hydroelectric Project Document

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**Susitna-Watana Hydroelectric Project  
(FERC No. 14241)**

**Evaluation of Wildlife Habitat Use Study  
Study Plan Section 10.19**

**Final Study Plan**

Alaska Energy Authority



July 2013

## 10.19. Evaluation of Wildlife Habitat Use

On December 14, 2012, Alaska Energy Authority (AEA) filed with the Federal Energy Regulatory Commission (FERC or Commission) its Revised Study Plan (RSP), which included 58 individual study plans (AEA 2012). Section 10.19 of the RSP described the Evaluation of Wildlife Habitat Use Study. This study focuses on analyzing both existing information on wildlife habitat use in Alaska (e.g., from the scientific literature) and new, Project-specific information on wildlife habitat use derived from survey data to be collected for the Project (see Sections 10.5 to 10.18). This habitat-use information will be used to systematically evaluate the use of the specific wildlife habitat types being mapped for the Project (see Section 11.5). In this study, categorical habitat values will be determined for each mapped habitat type and each wildlife species of concern to be assessed for impacts during the FERC licensing process. RSP 10.19 provided goals, objectives, and proposed methods for data collection regarding wildlife habitat use.

On February 1, 2013, FERC staff issued its study plan determination (February 1 SPD) for 44 of the 58 studies, approving 31 studies as filed and 13 with modifications. RSP Section 10.19 was one of the 31 studies approved with no modifications. As such, in finalizing and issuing Final Study Plan Section 10.19, AEA has made no modifications to this study from its Revised Study Plan.

### 10.19.1. General Description of the Proposed Study

The Evaluation of Wildlife Habitat Use Study will be an analysis of both existing information on wildlife habitat use in Alaska (e.g., from the scientific literature) and new, Project-specific information on wildlife habitat use derived from survey data to be collected for the Project (see Sections 10.5 to 10.18). This habitat-use information will be used to systematically evaluate the use of the specific wildlife habitat types being mapped for the Project (see Section 11.5). In this study, categorical habitat values will be determined for each mapped habitat type and each wildlife species of concern to be assessed for impacts during the FERC licensing process.

#### Study Goal and Objectives

The goal of the study is to provide Project-specific habitat evaluation information for birds, mammals, and amphibians to facilitate quantitative assessments of the impacts on wildlife habitats from development of the proposed Project.

The wildlife habitat evaluation has two fundamental objectives:

- Use Project-specific survey data and the scientific literature to determine local habitat associations for those wildlife species occurring in the Project area that are of conservation, management, cultural, or ecological concern and that are specific to the wildlife habitat types to be mapped in the Project area.
- Categorically rank habitat values for each wildlife species of concern for each of the wildlife habitat types that will be mapped in the Project area.

The habitat-association data to be developed in this study, together with the wildlife habitats that will be mapped digitally in the Vegetation and Wildlife Habitat Mapping Study in the Upper and Middle Susitna Basin and the Riparian Vegetation Study Downstream of the Proposed Susitna-

Watana Dam (see Sections 11.5 and 11.6, respectively), will be used in spatially-explicit analyses with a Geographic Information System (GIS) to derive quantitative estimates of habitat loss, habitat alteration, and disturbance effects for birds, mammals, and amphibians (see Section 10.19.7 below). This impact assessment work, which is not part of this study but is dependent on the results of this study, will be conducted during preparation of the FERC License Application for the Project.

### **10.19.2. Existing Information and Need for Additional Information**

Wildlife habitat evaluations for the Susitna basin were conducted in several studies in the early 1980s for the Alaska Power Authority (APA) Susitna Hydroelectric Project and for another study effort in the lower portions of the drainage (AEA 2011). Those habitat evaluations were based on vegetative cover types that were mapped within 16 kilometers (10 miles) on each side of the Susitna River between Gold Creek and the Maclaren River (TES 1982). That vegetation mapping and the subsequent habitat evaluations were conducted three decades ago.

Both the vegetation mapping and the habitat evaluations should be updated for the current Project for three primary reasons. First, the wildlife habitat evaluations completed in the early 1980s were based solely on vegetation types, not wildlife habitat types. Wildlife habitat maps provide land-cover classifications that are better suited to evaluations of habitat use by birds, mammals, and amphibians than is a vegetation map alone, primarily through the incorporation of physiography, landform, and vegetation structure information (see Section 11.5). Second, populations of wildlife species undoubtedly have fluctuated in size since the early 1980s, and it is known that habitat use by birds and mammals can be influenced by density (a greater diversity of habitats often is used when densities are high). Third, vegetation cover, structure, and even landforms are likely to have changed to some degree within the Project area because of landslides, erosion, thermokarst, fire, forest succession, expansion/contraction/decadence of birch and aspen clones, and increases in woody shrub cover associated with increased summer temperatures. To provide accurate information to use in evaluating the impacts of habitat loss and alteration for wildlife species during the FERC licensing process, it is imperative that wildlife habitat evaluations be updated for the currently proposed Project, and that those habitat evaluations are based on a recently prepared wildlife habitat map for the Susitna basin.

### **10.19.3. Study Area**

The wildlife habitat evaluation study area will be identical to the area mapped for wildlife habitats in the upper and middle Susitna basin (Section 11.5), plus the area downstream of the proposed dam mapped to be mapped for riparian wildlife habitats (Section 11.6). These two areas overlap between the dam site and Gold Creek (Figure 10.19-1), but wildlife habitats in that section of the Susitna River floodplain will be mapped only in the Riparian Vegetation Study Downstream of the Proposed Susitna-Watana Dam (Section 11.6). The wildlife habitat evaluation study area (Figure 10.19-1) includes a 4-mile buffer surrounding those areas in the upper and middle Susitna basin that could be directly affected by Project construction and operations (the proposed reservoir impoundment zone, areas for infrastructure of the dam and powerhouse and supporting facilities, the proposed access route and transmission line corridors, and materials sites). The portion of the study area along the Susitna River downstream of Gold Creek includes the width of the active floodplain, as represented by the extent of riverine physiography (see Section 11.6). The downstream extent and width of the riparian zone to be

evaluated in the Evaluation of Wildlife Habitat Use Study will match the final study area boundaries developed for the Riparian Vegetation Study Downstream of the Proposed Susitna-Watana Dam, which will be determined in the first quarter of 2013 (see Section 11.6).

#### **10.19.4. Study Methods**

##### *10.19.4.1. Habitat Evaluation Procedures*

The proposed methods for the Evaluation of Wildlife Habitat Use Study involve the use of current and Project-specific survey data for birds, mammals, and amphibians in coordination and conjunction with the preparation of a current wildlife habitat map for the Project area. This study will be an office-based effort, performed after the wildlife habitat mapping for the Project area is completed. The methods to be used will follow those outlined in ABR (2008) and Schick and Davis (2008).

The first task in the Evaluation of Wildlife Habitat Use Study is selection of a set of wildlife species of concern for which Project-related habitat impacts will be evaluated. The selection criteria to be used to determine which animals are included will be finalized with input from the federal and state resource management agencies and other interested licensing participants in Q1 2013 as part of the planned Technical Workgroup (TWG) meetings, which will be scheduled quarterly in 2013 (see Section 10.19.6 below). Specific criteria will be established for the species-selection process. It is proposed that a species be selected if it meets one or more of the following criteria:

- A federally- or state-protected species.
- A bird species of conservation and management concern, determined from lists maintained by various management agencies, agency working groups, and non-governmental conservation organizations (as outlined in the FERC–USFWS Memorandum of Understanding [MOU] on migratory birds; FERC and USFWS [2011]).
- A bird or mammal species of management concern for federal and/or state management agencies (primarily game and furbearer species).
- A species that is an important subsistence resource or is culturally significant for Alaska Natives.
- An ecologically important species with demonstrable ecosystem effects, such as ecosystem engineers (e.g., beaver), and species that occupy prominent positions in the trophic structure as predators or prey.

As agreed to during meetings with resource management agencies, the preliminary list of bird species of concern for the Project area (Table 10.19-1) comprises those species listed in Table 2 of the wildlife data-gap report for the Project (ABR 2011) and in Table 4.8-2 of the Project Pre-Application Document (PAD; AEA 2011), plus two additional shorebird species (Short-billed Dowitcher and Hudsonian Godwit) requested by the U.S. Fish and Wildlife Service (USFWS). The list of mammal species of concern will include big game, furbearers, and selected species of smaller mammals, including the little brown bat and Alaska tiny shrew. The list of wildlife species of concern, which is likely to include birds, mammals, and amphibians, will be refined further with input from resource management agencies.

A matrix will be constructed listing each species of concern and each wildlife habitat type mapped in the Project area, and a habitat-value ranking will be assigned to each cell in the

matrix. As with the species selection process, the ranking procedure will be developed further with input from federal and state resource management agencies and other interested licensing participants, but it is likely that a habitat-value categorization system will be used (e.g., negligible, low, moderate, and high value). The habitat-value rankings will be derived in different ways among species, depending on the level of Project-specific data that are available to assess habitat use in each of the mapped wildlife habitat types. Observations of wildlife species will be tagged to mapped habitats using global positioning system (GPS) coordinates and a GIS, and the data quality will be assessed for each species and mapped habitat type (e.g., adequately sampled, under-sampled, or not sampled). Data-supported quantitative evaluations of habitat use will be employed whenever possible in the habitat-value rankings. However, in cases in which the habitats in question were under-sampled or not sampled, or for which sufficient Project-specific data are not available, then habitat-use information from the scientific literature and from field experience with the species elsewhere in Alaska will be used to derive habitat-value rankings.

Habitats will be ranked for the various life history stages of each of the species of concern addressed (e.g., breeding/calving, post-calving, spring and fall migration, overwintering) to encompass the complete seasonal range of habitat use. Additionally, specific habitat-use maps can be prepared for high-value game animals such as caribou, moose, and bears to illustrate specific areas and seasons of use, in addition to identifying habitat types that are important to those species.

#### *10.19.4.2. Reporting and Deliverables*

Because the Evaluation of Wildlife Habitat Use Study cannot be completed until after the wildlife habitat mapping for the Project area is completed in October 2014, a brief Initial Study Report will be completed in February 2014, but the final habitat evaluations will not be available until the Updated Study Report is completed in February 2015 (see Section 10.19.6 below). The Updated Study Report will include descriptions of the methods used, including summaries of habitat use for each species assessed, and tables indicating habitat-values by species and habitat type. As agreed to with the resource management agencies, individual sections for each species assessed will be prepared in which the available habitat-use information will be linked to the specific habitat values derived (to illustrate the logic used in determining habitat values for each species).

### **10.19.5. Consistency with Generally Accepted Scientific Practice**

The study methods discussed above have been successfully used for recent wildlife habitat evaluations on several projects in Alaska (e.g., ABR 2008; Schick and Davis 2008; PLP 2011). The methods have been favorably received by agency reviewers.

### **10.19.6. Schedule**

The schedule for implementation of the Evaluation of Wildlife Habitat Use Study is summarized below (Table 10.19-2). The wildlife habitat evaluation can be completed only after the wildlife habitat mapping for the Project area is available in October 2014. Preliminary information to be used in the habitat-use rankings can be obtained through literature review in 2013 and earlier in 2014, however. The initial selection of species for analysis and accompanying literature review

to support the habitat evaluations will be conducted during February–April 2013. A preliminary report of progress to date will be prepared for the Initial Study Report in February 2014 and the initial habitat-value rankings will be prepared during February–April 2014, using the preliminary results of wildlife field studies that are available by that time. The final selection of species for the final evaluation matrix will be completed by September 2014 and the final data analyses and habitat-value rankings will be conducted during September–December 2014, for presentation in the Updated Study Report in February 2015.

TWG meetings will be planned on a quarterly basis in 2013 and 2014 to review study progress. Licensing participants will have the opportunity to review and comment on the Initial Study Report and Updated Study Report.

#### **10.19.7. Relationship with Other Studies**

The relationships between the wildlife habitat-use evaluation and other Project studies are summarized here and illustrated below (Figure 10.19-2). Primary sources of information for the wildlife habitat-use evaluation include the wildlife habitat map polygons for the upper and middle Susitna basin from the Vegetation and Wildlife Habitat Mapping Study in the Upper and Middle Susitna Basin (Section 11.5), and the wildlife habitat map polygons for riparian areas downstream of the proposed dam from the Riparian Vegetation Mapping Study (Section 11.6). As was described above, these mapped wildlife habitats will be evaluated for wildlife use and will be ranked categorically in terms of habitat value for a selected set of wildlife species of concern. Project-specific habitat-use information for mammals, birds, and amphibians will be obtained from each of the wildlife studies (Sections 10.5–10.18). These Project-specific data will be provided in GIS so that they can be directly associated with the mapped habitat types. From each of the wildlife studies, information on the locations of observations, the species and numbers recorded, seasonality, and behaviors observed, when available, will be used to evaluate the use of the wildlife habitats mapped for the Project.

The information on wildlife habitat values derived in this study will be used in the FERC License Application to assess the expected impacts of the proposed Project on the habitats known to be used by each wildlife species of concern in the study area. In addition, the wildlife habitat values will be used in the License Application to develop protection, mitigation, and enhancement (PM&E) measures, as appropriate.

Data from the Evaluation of Wildlife Habitat Use Study will be used in quantitative assessments of habitat loss and habitat alteration for each of the wildlife species of concern. With habitat-value rankings for each bird, mammal, and amphibian species of concern for each mapped habitat type, the areas within the Project footprint that are important for each species of concern can be identified, and the total areas of each to be directly affected (e.g., habitat loss and habitat alteration) by development of the Project can be determined quantitatively in GIS. Similarly, the indirect effects of disturbance will be assessed by applying species-specific disturbance buffers to the Project footprint and determining quantitatively the total areas of important habitats for each species of concern that could be influenced indirectly by disturbance effects during Project construction and operations. Data from the Evaluation of Wildlife Habitat Use Study will also be used to help address the potential for fragmentation of habitat patches for species of concern because of Project development.

Also in the FERC License Application, for areas downstream of the proposed dam, the habitat-value rankings from this study will be used to help predict how wildlife species will respond to the changes in riparian wildlife habitats in the Susitna River floodplain that are expected to occur with construction and operation of the proposed dam.

As agreed to during meetings with resource management agencies, the finer-scale habitat types mapped in the Project area (see Section 11.5) will be “crosswalked” with the coarser-scale habitats (30-meter pixel resolution) mapped in the Alaska Gap Analysis Project (GAP). The habitat-value rankings for each wildlife species of concern in each mapped habitat type in the Project area will also be “crosswalked” to the coarser-scale GAP habitats, and averaged, when multiple values need to be combined, to derive appropriately-scaled habitat rankings. With the habitat-value rankings upgraded to the GAP habitat types, the habitat loss and habitat alteration effects from the proposed Project can be placed in a broader regional context (e.g., habitat impacts can be assessed at the eco-regional scale).

#### **10.19.8. Level of Effort and Cost**

The wildlife habitat evaluation will be an office-based effort and is expected to be completed relatively quickly once the wildlife habitat mapping tasks are completed. The Evaluation of Wildlife Habitat Use Study can be completed in several months. The habitat evaluation will be conducted by up to two vegetation ecologists and four wildlife biologists (with specific expertise with various vertebrate species groups). The total cost of this study over both years is estimated to be approximately \$200,000.

#### **10.19.9. Literature Cited**

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## 10.19.10.Tables

Table 10.19-1. Bird species of conservation/management concern that are known or likely to occur in the Susitna River basin, Alaska.

English Name	USFWS BCC <sup>1</sup>	USFWS BMC <sup>2</sup>	ADFG <sup>3</sup>	BLM <sup>4</sup>	NAWCP <sup>5</sup>	NAWMP <sup>6</sup>	ASG (USSCP) <sup>7</sup>	BPIF (PIF) <sup>8</sup>
Greater White-fronted Goose (Tule)		■				■		
Snow Goose		■						
Brant		■				■		
Canada Goose		■				■		
Trumpeter Swan		■		■				
Tundra Swan		■						
Gadwall		■						
American Wigeon		■				■		
Mallard		■				■		
Blue-winged Teal		■				■		
Northern Shoveler		■						
Northern Pintail		■				■		
Green-winged Teal		■						
Canvasback		■				■		
Redhead		■				■		
Ring-necked Duck		■						
Greater Scaup		■						
Lesser Scaup		■				■		
Harlequin Duck		■						
Surf Scoter		■	■			■		
White-winged Scoter		■	■			■		
Black Scoter		■				■		
Long-tailed Duck		■				■		
Common Goldeneye		■				■		
Rock Ptarmigan			■					

Table 10.19-1. Continued.

English Name	USFWS BCC <sup>1</sup>	USFWS BMC <sup>2</sup>	ADFG <sup>3</sup>	BLM <sup>4</sup>	NAWCP <sup>5</sup>	NAWMP <sup>6</sup>	ASG (USSCP) <sup>7</sup>	BPIF (PIF) <sup>8</sup>
White-tailed Ptarmigan								■
Red-throated Loon	■		■	■*	■			
Pacific Loon			■					
Common Loon			■					
Horned Grebe	■		■		■			
Red-necked Grebe			■					
Osprey			■					
Bald Eagle			■					
Northern Harrier			■					
Sharp-shinned Hawk			■					
Northern Goshawk			■					
Red-tailed Hawk			■					
Golden Eagle			■	■				
Merlin			■					
Gyrfalcon			■					■
Peregrine Falcon <sup>9</sup>	■		■					
American Golden-Plover							■	
Solitary Sandpiper	■	■	■				■	
Lesser Yellowlegs	■	■	■				■	
Upland Sandpiper	■	■					■	
Whimbrel	■	■					■	
Hudsonian Godwit	■	■					■	
Ruddy Turnstone <sup>10</sup>							■	
Black Turnstone <sup>10</sup>							■	
Short-billed Dowitcher	■	■					■	
Surfbird							■	
Sanderling							■	

Table 10.19-1. Continued.

English Name	USFWS BCC <sup>1</sup>	USFWS BMC <sup>2</sup>	ADFG <sup>3</sup>	BLM <sup>4</sup>	NAWCP <sup>5</sup>	NAWMP <sup>6</sup>	ASG (USSCP) <sup>7</sup>	BPIF (PIF) <sup>8</sup>
Wilson's Snipe		■						
Black-legged Kittiwake			■					
Arctic Tern			■					
Great Horned Owl			■					
Snowy Owl			■					
Northern Hawk Owl			■					
Short-eared Owl	■		■	■				■
Boreal Owl			■					■
Belted Kingfisher			■					
Hairy Woodpecker			■					
American Three-toed Woodpecker			■					
Black-backed Woodpecker			■					■
Northern Flicker			■					
Olive-sided Flycatcher	■		■	■				■
Western Wood-Pewee								■
Northern Shrike								■
Violet-green Swallow			■					
Bank Swallow			■					
Cliff Swallow			■					
Boreal Chickadee			■					
Brown Creeper			■					
American Dipper								■
Golden-crowned Kinglet			■					
Gray-cheeked Thrush				■ *				■
Hermit Thrush			■					
Varied Thrush			■					■
Bohemian Waxwing								■

Table 10.19-1. Continued.

English Name	USFWS BCC <sup>1</sup>	USFWS BMC <sup>2</sup>	ADFG <sup>3</sup>	BLM <sup>4</sup>	NAWCP <sup>5</sup>	NAWMP <sup>6</sup>	ASG (USSCP) <sup>7</sup>	BPIF (PIF) <sup>8</sup>
Smith's Longspur	■		■					■
Blackpoll Warbler			■	■				■
Townsend's Warbler			■	■*				■
Wilson's Warbler			■					
White-crowned Sparrow			■					
Golden-crowned Sparrow								■
Dark-eyed Junco			■					
Rusty Blackbird	■		■	■				■
Gray-crowned Rosy Finch			■					
Pine Grosbeak			■					
White-winged Crossbill			■					■
Pine Siskin			■					

Species list derived from Kessel et al. (1982) and APA (1985: Appendices E5.3 and E6.3), plus Townsend's Warbler, Hudsonian Godwit, and Short-billed Dowitcher.

<sup>1</sup> USFWS (2008) Birds of Conservation Concern.

<sup>2</sup> USFWS (2009) Birds of Management Concern.

<sup>3</sup> ADF&G (2006) Featured Species.

<sup>4</sup> BLM (2010a) Sensitive Species; asterisk denotes Watch List Species (BLM 2010b).

<sup>5</sup> North American Waterbird Conservation Plan (Kushlan et al. 2002, 2006).

<sup>6</sup> North American Waterfowl Management Plan Committee (2004).

<sup>7</sup> Alaska Shorebird Group (2008).

<sup>8</sup> Boreal Partners in Flight Working Group (1999).

<sup>9</sup> Previously listed as threatened under the Endangered Species Act (ESA), the American Peregrine Falcon (*Falco peregrinus anatum*) was delisted in August 1999.

<sup>10</sup> Species identity (Ruddy Turnstone, Black Turnstone) of sole record in the Susitna basin was unconfirmed (Kessel et al. 1982), but both are on the ASG list.

**Table 10.19-2. Schedule for implementation of the wildlife habitat-use evaluation.**

Activity	2013				2014				2015
	1 Q	2 Q	3 Q	4 Q	1 Q	2 Q	3 Q	4 Q	1 Q
Initial selection of species for analysis	—								
Literature review of habitat-use information	—	—							
Initial Study Report					△				
Initial habitat-value ranking					—				
Final selection of species for analysis								—	
Data analysis and habitat-value ranking								—	—
Updated Study Report									▲

Legend:

- Planned Activity
- △ Initial Study Report
- ▲ Updated Study Report

10.19.11.Figures

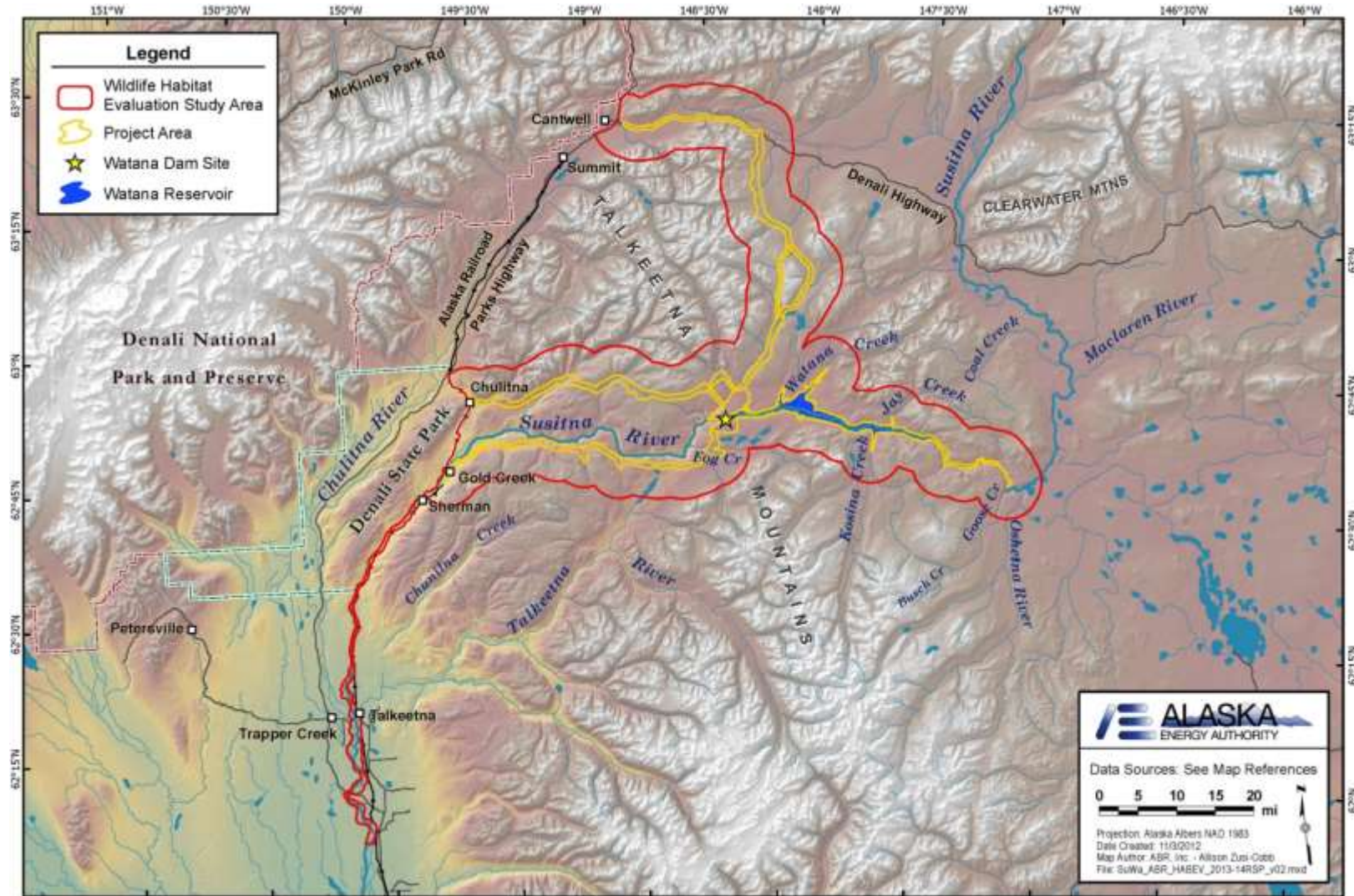


Figure 10.19-1. Study area for evaluation of wildlife habitat use. The study area is a combination of the wildlife habitat mapping areas from the Vegetation and Habitat Mapping Study (Section 11.5) and the Riparian Vegetation Study (Section 11.6).



### STUDY INTERDEPENDENCIES FOR WILDLIFE HABITAT-USE EVALUATION

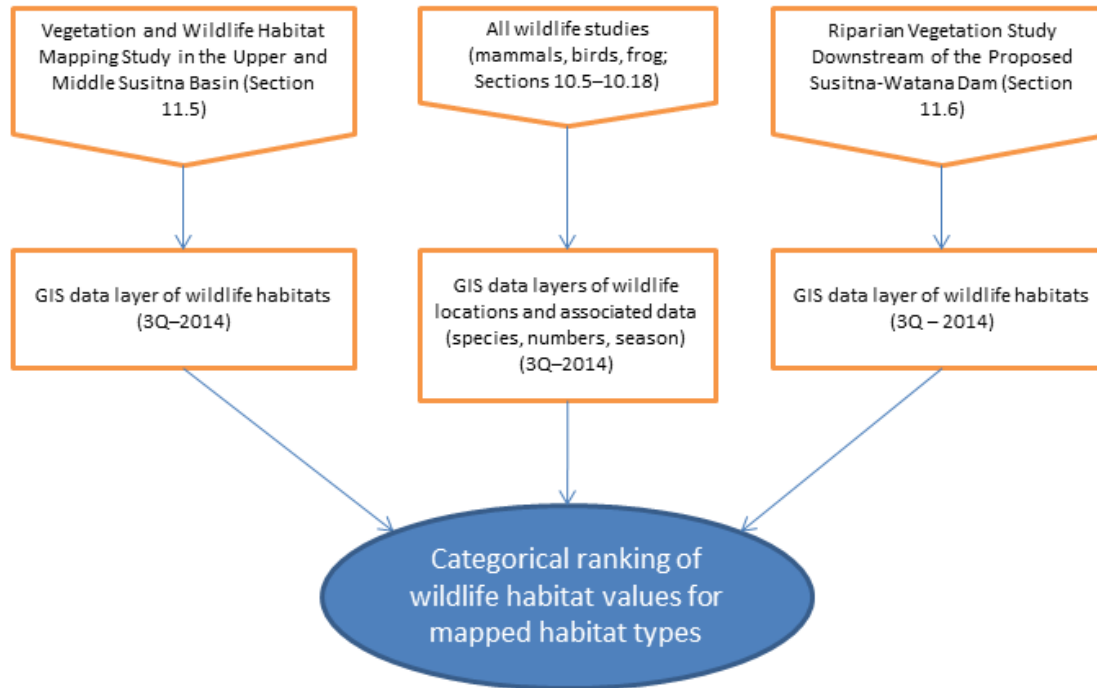


Figure 10.19-2. Study interdependencies for the wildlife habitat-use evaluation.