Susitna-Watana Hydroelectric Project Document
ARLIS Uniform Cover Page

Title: Population ecology of willow ptarmigan in Game Management Unit 13, Southcentral Alaska	**SuWa 170**
Author(s) – Personal:	
Author(s) – Corporate: Alaska Energy Authority	
AEA-identified category, if specified: Wildlife resources study requests	
AEA-identified series, if specified:	
Series (ARLIS-assigned report number): Susitna-Watana Hydroelectric Project document number 170	**Existing numbers on document:**
Published by: [Anchorage] : Susitna-Watana Hydroelectric Project, [2012]	**Date published:** 5/16/2012
Published for:	**Date or date range of report:**
Volume and/or Part numbers:	**Final or Draft status, as indicated:**
Document type:	**Pagination:** 5 p.
Related work(s):	**Pages added/changed by ARLIS:**
Notes:	

All reports in the Susitna-Watana Hydroelectric Project Document series include an ARLIS-produced cover page and an ARLIS-assigned number for uniformity and citability. All reports are posted online at http://www.arlis.org/resources/susitna-watana/

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SUSITNA-WATANA HYDRO

1.1. Population Ecology of Willow Ptarmigan in Game Management Unit 13, Southcentral Alaska

1.2. Requester of Proposed Study

AEA anticipates resource agencies will request this study.~~on behalf of Alaska Department of Fish and Game (ADF&G), Division of Wildlife Conservation~~

1.3. Responses to Study Request Criteria (18 CFR 5.9(b))

1.3.1. Describe the goals and objectives of each study proposal and the information to be obtained.

The goal of the proposed study is to provide the necessary data to evaluate the potential effects of the proposed Susitna-Watana Hydroelectric Project, including potential access and transmission routes from the west and north (AEA 2011), and in adjacent management subunits, on Willow Ptarmigan (*Lagopus lagopus*), the predominant species of upland gamebird in the Project area and surrounding areas. The area of interest consists of Subunits 13A, 13B, and 13E of Game Management Unit (GMU) 13.

This study has four objectives:

1) Estimate the seasonal distribution of Willow Ptarmigan;
2) Delineate seasonal migratory patterns of Willow Ptarmigan;
3) Estimate fall and spring abundance and occupancy of ptarmigan; and
4) Estimate seasonal survival of Willow Ptarmigan.

Data collected through radio telemetry and transect surveys for Willow Ptarmigan will provide a clearer understanding of the distribution, abundance, seasonal movements and seasonal habitat use of the species in Subunits 13A, 13B, and 13E. These data will be used to manage and mitigate potential Project-related impacts on Willow Ptarmigan and their habitats.

1.3.2. If applicable, explain the relevant resource management goals of the agencies and/or Alaska Native entities with jurisdiction over the resource to be studied. [Please include any regulatory citations and references that will assist in understanding the management goals.]

ADF&G is responsible for the management, protection, maintenance, and improvement of Alaska's fish and game resources in the interest of the economy and general well-being of the State (AS 16.05.020). ADF&G manages subsistence and sport hunting for small game, including upland gamebirds (5 AAC 85.065), through regulations set by the Board of Game (AS 16.05.255). The Federal Subsistence Board, which comprises representatives from the U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, Bureau of Indian Affairs, and U.S. Forest Service, oversees the Federal Subsistence Management Program (57 FR 22940; 36 CFR 242.1–28; 50 CFR 100.1–28), with responsibility for managing subsistence resources, including ptarmigan, on Federal public lands for rural residents of GMU 13.

Ptarmigan are of recreational, economic, and subsistence value to thousands of Alaskans and provide revenue to several lodges and retail outlets near and within GMU 13. Much of GMU 13 is readily accessible by road and provides hunting opportunities for many Alaskans. The potential for increased human access and activity within Subunits 13A, 13B, and 13E without

additional understanding of potential implications on ptarmigan ecology is a resource management concern. Creating access points to the project site from the Denali Highway on the north or from the rail corridor on the west could allow increased motorized vehicle access for hunters and recreational users to portions of GMU 13 that are currently inaccessible. Newer snowmobiles allow riders to access more remote locations to pursue ptarmigan than was historically possible.

1.3.3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.

Wildlife resources are owned by the State of Alaska, and the Project could potentially affect these public interest resources.

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1.3.4. Describe existing information concerning the subject of the study proposal, and the need for additional information.

The Willow Ptarmigan is the most common and widespread ptarmigan in Alaska, constituting an estimated 65–70 percent of all ptarmigan individuals, followed by Rock Ptarmigan (*L. mutus*) at 25–30 percent, and White-tailed Ptarmigan (*L. leucurus*) at <10 percent (Taylor 1994). All three ptarmigan species occur in GMU 13 (Taylor 2000).

Ptarmigan hunting is a very popular activity in the fall and winter months in GMU 13 due to accessibility of the unit. Beginning in 1997, the ADF&G conducted springtime ptarmigan surveys along the Denali, Parks, and Richardson highways to quantify the relative abundance of territorial males. Most of the survey effort was centered near road-accessible areas within GMU 13. Those surveys suggested that willow ptarmigan along the road-accessible portions of GMU 13 were declining in abundance or remained at low abundance over the past 10 years. Due to this chronic low abundance, ADF&G recommended that the Board of Game reduce the bag limit of ptarmigan from 10 per day to 5 per day in Subunits 13A, 13B, and 13E between December 1 and March 31, which took effect during the 2005–2006 regulatory year. Continued low abundance resulted in further harvest restrictions in Subunit 13B, beginning in 2009–2010, which closed the ptarmigan season after November 30 each year. ADF&G has been unable to commit additional resources to better understand the life history of GMU 13 ptarmigan populations and there is no information on the habitat value of the Project area for ptarmigan.

1.3.5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

Potential effects of the Project may include wildlife habitat loss and alteration, displacement from seasonally used sensitive habitats, blockage of movements, disturbance, and changes in human activity and access as a result of construction and operation of the Project.

The ptarmigan study addresses the following direct, indirect, and cumulative effects (AEA 2011):

- W1: Potential direct loss and alteration of wildlife habitats, including key habitat features such as den sites and mineral licks, from Project construction and operation.

- W2: Potential direct physical and behavioral blockage and alteration of movements due to reservoir water and ice conditions; access and transmission corridors; and new patterns of human activities.
- W4: Potential cumulative impact of changes in predator and prey abundance and distribution related to increased human activities and habitat changes resulting from Project development.
- W5: Potential indirect impacts to wildlife from changes in hunting, vehicular use, noise, and other disturbance due to increased human presence resulting from Project development.

Remote portions of Subunits 13A and 13E may offer refugia for ptarmigan, which are hunted heavily in the more easily accessible portions of GMU 13. Increased human access and changes in harvest patterns as a result of this Project may increase hunting pressure and decrease the amount of unhunted or lightly hunted refugia available to ptarmigan, potentially leading to changes in unit-wide ptarmigan abundance.

Transmission-line towers may provide vantage points for hunting raptors, thereby facilitating predation on ground-nesting birds such as ptarmigan, and traffic on roads will increase collision mortality. Currently, ADF&G does not conduct ptarmigan assessment work in the vicinity of the proposed Project due to the lack of accessibility and the presumed low exploitation of ptarmigan in the area by hunters. ADF&G will complete a small game hunter survey to better understand recreational hunter use and ptarmigan harvest patters within GMU 13 and other GMUs in central Alaska.

With a clearer understanding of willow ptarmigan distribution, abundance, seasonal movement patterns, and seasonal habitat use in Subunits 13A, 13B, and 13E developed through this study, more effective management and mitigation of potential Project-related impacts on ptarmigan and their habitats can be developed.

1.3.6. Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

Beginning in spring 2013, Willow Ptarmigan will be captured between April and May at one site to be selected in each Subunit (13A, 13B, and 13E). Capture sites will be located based on ptarmigan abundance and potential access road corridors evaluated for the Project (AEA 2011). Birds will be captured using the most effective techniques, which may include noose poles and flushing birds into fixed nets. Thirty of the adult birds (approximately equal numbers of males and females) captured at each site will be tagged each year with a necklace radio transmitter. All captured birds would be weighed and measured to assess body condition and fitted with an aluminum leg band, and individually color coded leg bands that can be read using spotting scopes. Leg bands may provide post-harvest information if bands are reported by hunters and a marked population will be useful if subsequent monitoring studies are initiated. All potential capture and marking methods will be fully evaluated and compliant with Alaska Interagency Animal Care and Use Committee (IACUC) certification. ADF&G will ensure compliance with all IACUC policies.

Birds equipped with radio transmitters will be relocated six times per year during aerial surveys from a fixed-wing aircraft on two relocation flights in late summer and fall (August, September); two in winter (November to March); and two during breeding and spring (April, May).

During September and March, transect surveys will be flown in each subunit to estimate distribution and abundance using line transect or repeat count techniques. In addition to abundance, these surveys will provide data on the overall distribution of ptarmigan in Subunits 13A, 13B, and 13E.

Study Activity	Schedule	Objectives
Telemetry – movements, survival	Deploy and maintain 90 active radio transmitters April–May 2013, 2014, 2015	1, 2, 4
Aerial Survey – telemetry relocations, movements, survival	2 late summer and fall movement surveys: August, September 2 winter surveys: November to March 2 breeding and spring surveys: April, May	1, 2, 4
Aerial Survey – transect, distribution and density estimate	2 transect surveys September, March 2013, 2014, 2015, 2016	3

Movement and survival rates of tagged birds will be estimated using multistate models. Occupancy models of aerial survey data will be used to estimate the probability that an area is used and identify changes in the probability of use between fall and spring surveys.

The combination of telemetry transmitters and large-scale aerial surveys will provide both specific information on individual movements and habitat use and general information on species distribution. These survey techniques are being developed and implemented for another study of ptarmigan north of the Brooks Range.

1.3.7. Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

ADF&G does not currently conduct ptarmigan assessment work in the vicinity of the proposed Project. A combination of animal-specific movement and survival information from telemetry data with abundance distribution for the entire area are necessary to assess the current abundance and distribution of ptarmigan in the area. This sample size of necklace transmitters is necessary to get accurate survival estimates and for understanding patterns of movement in the study area. The transects will be distributed to gain a larger-scale understanding of distribution and abundance patterns for the Project area and adjacent areas.

Period	Item	Estimated Effort
Fiscal Year 2013 (1 March 2013 – 30 June 2014	Biologist/Technician	3 @ 2 months
	Graduate Student	1 @ 1 year
	Spring capture (90 ptarmigan)	3 trips
	Monitoring flight	1 flight
Fiscal Year 2014 (1 July 2013 – 30 June 2014)	Biologist/Technician	3 @ 2 months
	Graduate Student	1 @ 1 year
	Spring capture (maintain 90 ptarmigan)	2 trips
	Monitoring flights/abundance surveys	6 flights
Fiscal Year 2015 (1 July 2014 – 30 June 2015)	Biologist/Technician	3 @ 2 months
	Graduate Student	1 @ 1 year
	Spring capture (maintain 90 ptarmigan)	2 trips
	Monitoring flights/abundance surveys	6 flights
Fiscal Year 2016 (1 July 2015 – 30 June 2016)	Biologist	2 @ 1.5 month
	Graduate Student	1 @ 1 year
	Monitoring flights/abundance surveys	6 flights

1.3.8. Literature Cited

AEA (Alaska Energy Authority). 2011. Pre-Application Document: Susitna-Watana Hydroelectric Project, FERC Project No. 14241. Prepared for the Federal Energy Regulatory Commission by the Alaska Energy Authority, Anchorage.

Taylor, W. P. 1994. Game Management Unit 13 ptarmigan hunter and harvest report, 1992–94. Unpublished report, Alaska Department of Fish and Game.

Taylor, W. P. 2000. Game Management Unit 13 ptarmigan population studies. Federal Aid in Wildlife Restoration final research performance report, 1 August 1997–30 June 1999. Grants W-27-1 and W-27-2, Study 10.70. Alaska Department of Fish and Game, Juneau. 12 pp.