

**Alaska Department of Fish and Game
Wildlife Restoration Grant**

Grant Number: AKW-20 FY2017
Project Number: 24.0
Project Title: A 5-year summary of fire management planning for wildlife habitat
Project Duration: Ongoing
Report Period: July 1, 2012 – June 30, 2017
Report Due Date: September 1, 2017
Principal Investigators: Thomas F. Paragi and Susanne U. Rodman
Work Location: Statewide

I. PROBLEM OR NEED THAT PROMPTED THIS PLANNING COORDINATION

Wildland fires in Alaska are detected and monitored to inform decisions on whether subsequent suppression activities are warranted to protect resources at risk (Alaska Interagency Wildland Fire Management Plan 2016). Initial attack for suppression is guided through the assignment of fire management options by the land managers to achieve protection of human life, property or infrastructure, and natural resources. Where defined resources are at low risk, fire can exist as a natural disturbance that maintains a diversity of vegetation types and age classes for wildlife habitat and stimulates an abundance of wildlife species attracted to early-seral communities, including game such as moose, grouse, and hares. ADF&G Division of Wildlife Conservation (DWC) has the lead role in advocacy for wildlife habitat for the State of Alaska.

II. REVIEW OF PRIOR COORDINATION AND RESEARCH IN PROGRESS ON THE PROBLEM OR NEED

DWC staff in Region III has been actively involved in fire planning with federal, state, and Alaska Native corporation land managers since the late 1970s to ensure that the positive ecological values of fire are considered. DWC has represented ADF&G on the Alaska Wildland Fire Coordinating Group (AWFCG) since its inception, and ADF&G has had a fire policy in support of habitat maintenance since 1993 (revised in 2009). Fire planning is a statewide coordination project that has been funded primarily by Region III since the late 1990s because the area burned by wildland fire has been greatest in the Interior. However, as human settlement and recreation spreads with community growth and associated public access to wild lands, it is becoming more challenging to retain the option of wildland fire to enhance wildlife habitat near the wildland-urban interface, particularly in southcentral Alaska.

24.0 Fire Planning for Wildlife Habitat FY2017 5-year Performance Report

Another role of planning has been to assist fire professionals in the Alaska Division of Forestry and Alaska Fire Service (U.S. Bureau of Land Management) in developing the capacity to implement prescribed burns during periods of low or moderate spread risk. These burns are intended to maintain productive wildlife habitat at the stand and landscape scales and serve to fragment large expanses of hazardous fuels, particularly black spruce, wherein fires are difficult to contain during hot dry conditions. There were relatively few large wildland fires during the 1960s to 1990s despite increases in area of limited suppression to meet resource needs and contain suppression costs. In the Interior, DWC worked with partners to implement three large prescribed burns in spruce forest during 1998-99 near Tok and several smaller prescribed burns in mature aspen during 1998-2006 near Fairbanks (Haggstrom and Paragi 2002). Large wildland fires since 2001 have reduced the impetus to plan landscape-scale prescribed burns for moose in the Interior. Two large prescribed burns for moose were done in the Alphabet Hills of Southcentral in 2003 and 2004, and burn plans for moose habitat are approved for Little Granite Creek near Palmer and a second area near the Alphabet Hills. Plains bison, an introduced grazing species, are the only other big game for which prescribed fire has been planned. DWC has used fire to maintain the Delta bison range (see Section V, Activity 4). Farewell bison abundance and distribution have responded to periodic large wildland fires, and we monitor its range disturbance history to know when prescribed fire may be beneficial (Seavoy 2014). However, a continued lack of resources and staff dedicated to prescribed burning means that suppression resources must be available to conduct prescribed burns.

In the 1990s, DWC began evaluating the cost effectiveness of prescribed fire and mechanical treatments to enhance woody deciduous habitat for moose (browse and security cover) and gallinaceous birds (woody buds and security cover for fledging). This research occurred in the Matanuska and Susitna Valleys (Collins 1996) and in the Tanana Valley (Paragi and Haggstrom 2005). In addition, passerine bird abundance and diversity at Nenana Ridge were found to be greater in areas where mature aspen was treated with prescribed fire and felling to increase diversity of stand age and vertical structure compared with nearby undisturbed mature aspen (Walker 2002). Landscape-scale fire with aerial ignition is generally less costly per unit area than hand firing or mechanical treatments at the stand scale due to economy of scale and fixed costs for mobilizing operations (Paragi and Haggstrom 2005). Staff time for planning large burns (research on legal ownership, private inholding contacts, etc.) has been shared more in the past with suppression agencies but has shifted to DWC as staffing cuts have occurred in DOF. This can substantially increase the DWC cost burden for fire planning.

Since the early 2000s there have been a few years when, despite suppression activities, large wildland fires have occurred on or near the highway system, creating large blocks of early-seral habitat. DWC has used dozer shearblading in Delta (2008) and roller chopping near Tok (2015) to maintain a patchwork of early seral habitat in two large blocks of maturing habitat 20-25 years post-fire. These types of post-fire treatments can be designed to maintain tactical fuel breaks, especially if spruce is regenerating.

III. APPROACHES USED AND FINDINGS RELATED TO THE OBJECTIVES AND TO PROBLEM OR NEED

See section V.

IV. MANAGEMENT IMPLICATIONS

Where large burns occur near the highway system, maintaining deciduous tree and willow-dominated shrub communities in early seral stage by periodic and precisely-located mechanical treatments such as crushing or shearing will maintain wildlife habitat and fragmentation of hazardous fuels. These post-fire treatments are typically less expensive and create smaller and less persistent debris than felling or shearing mature aspen, which has low potential for salvage as fuel wood. Where hazardous fuels exist in mixed stands of deciduous and coniferous trees, planning can identify potential for mechanical type conversion through reduction of spruce and stimulation of deciduous woody species. The increase in resolution of spatial information on vegetation type and existence of fire risk (flammability) models provide the tools to engage diverse stakeholders in planning fuel breaks. When communities have fuel breaks that provide tactical suppression options, the opportunity to allow wildland fires in adjacent areas can further serve to fragment fuels and provide wildlife habitat and other ecosystem services, such as berries, in relatively close proximity to settlements.

Although the complexity and workload of prescribed fire planning has increased, it remains a tool for certain ecological objectives or specific locations, such as the Delta Junction Bison Range. More regular application of prescribed fire to maintain early seral grassland and forest will maintain skills of fire line personnel and build public confidence, particularly where transient citizens with a lack of familiarity have heightened concerns. Further efforts to secure dedicated resources for prescribed fire implementation should continue.

The scientific literature has documented an increase in burned area of Alaska since 2001 driven by years with fire weather and low fuel moisture conducive to prolonged burning (Kasischke et al. 2010, Calef et al. 2015), including holdover fires from the prior year that re-ignite in spring. Examination of fire perimeters maintained by the Alaska Fire Service show that burning extent varies annually among portions of the Interior (e.g., western, central, eastern) depending on weather patterns, lightning incidence, etc. Climate forecast scenarios suggest that years of substantial wildland fire will likely continue in Alaska (Veraverbeke et al. 2017, Young et al. 2017), at least until spruce-dominated landscapes transition to less-flammable fuels such as deciduous trees (Johnstone et al. 2010). Thus, adaptation to changing fire risk and response to large fires will continue to be required. Expansion of the wildland-urban interface and potential for human-caused fires in Southcentral continues because of growth in population, dispersed settlement, and wildland access. Fuels management treatments on public lands require stakeholder consultation to address concerns and avoid strong opposition that could prevent implementation. Positive outcomes beyond reduction in fire risk may offset visual concerns with mechanical treatments. Emerging issues that warrant monitoring for

habitat implications in Region V are the spread of flammable shrubs into tundra and increasing occurrence of lightning-caused tundra fires.

We recommend a transition of this project from Region III funding to statewide program funding and a more even emphasis between Southcentral (Regions II and IV) and Northern (Regions III and V). Sue Rodman was hired as a statewide program coordinator for landscape ecology in 2011, bringing fire management and forestry expertise to DWC in southcentral Alaska. She became co-lead on fire planning with Tom Paragi in 2014 and will assume project lead for 24.0 beginning in FY2018, remain the agency representative on the AWFCG, and remain the primary staff contact for fire issues in Southcentral. Paragi will continue as the agency alternate on AWFCG and primary staff contact for fire issues in northern Alaska. In FY 2018 they will draft a new project statement for FYs 2019-23 to reflect a greater focus on fuels management and issues related to the wildland-urban interface, as complementary components to managing wildlife habitat. In Regions II and IV, a continuing issue that warrants further monitoring and action is access to limited wildlife habitat. The expansion of development along with concerns of smoke related to wildland and prescribed fire challenge fire management at both the landscape and small-scale levels while placing increasing pressure to mitigate fire risk and hazard near communities and infrastructure. This occurs simultaneously with increased hunting pressure in accessible areas adjacent to the road system where habitat management is in high demand.

V. SUMMARY OF WORK COMPLETED ON JOBS

ACTIVITY 1: Represent the department on the Alaska Wildland Fire Coordinating Group (AWFCG) and related Committees and Task Groups.

Accomplishments: Tom Paragi in Fairbanks participated by phone and email with AWFCG business as the agency representative until 2013 but did not attend quarterly meetings in person because of time constraints. He has served on the Fire Research and geographic information system (GIS) committees for AWFCG and the Fire Effects Task Group, primarily by phone and email. Sue Rodman in Anchorage began serving as the department representative to the AWFCG in 2014 as vice chair and became chair in 2015. She is the coordinating group liaison to the Wildland Fire Prevention and Education Committee. Since 2014 Paragi has served as the alternate representative on AWFCG and coordinated with Rodman on Interior fire issues. Additionally, Mike Taras, Education Associate in Region in Fairbanks, serves as the agency lead on the Wildland Fire Prevention and Education Committee. The Fire Research committee conducted annual fall reviews of research proposals to the Joint Fire Science Program (JFSP; federal funding) and wrote endorsement letters for selected proposals. For the 2015 calendar year when Rodman served as chair of the AWFCG, she wrote endorsement letters to the JFSP Board of Governors for those proposals.

ACTIVITY 2: Participate in the two annual fall fire reviews sponsored by the AWFCG and the Alaska Department of Natural Resources, Division of Forestry (DOF), respectively.

Accomplishments: Paragi attended only selected sessions of the fall fire reviews during 2011-13 because of time constraints. Rodman has attended the state and interagency fall fire reviews and

spring operations meetings since 2014 (except when travel restrictions were in effect) and chaired the interagency fall fire review in 2015.

ACTIVITY 3: Annually evaluate and comment on the selection of fire management options (Critical, Full, Modified, and Limited) under the Alaska Interagency Wildland Fire Management Plan and recommend changes.

Accomplishments: ADF&G staff had a request to change options in Game Management Unit 16 for the 2016 fire season; Norm McDonald (Fire Management Officer, State Forestry) completed that request to convert an area near Kashwitna Creek from Full to Limited. Rodman and Paragi participated in the 2016 review and update to the AIWFMP. Changes to fire management options for the Kenai Peninsula are under consideration at the interagency level concerning GMU 15. Further changes are being considered for GMU 16. DOF and ADF&G staff concur that more participation and involvement from ADF&G can support additional fire management changes. Because of the high work load to communicate and justify changes to direct and adjacent land owners, requesting changes to DOF may not be honored if their staff capacity is limited.

ACTIVITY 4: Meet with federal, state and local level administrators to discuss fire-related policies, procedures or issues. Review and comment on state and federal fire-related policies and procedures. Develop and promote department policies and positions relative to fire management

Accomplishments: In 2015 Rodman participated in several interagency teleconferences reviewing the Alaska Interagency Wildland Fire Management Plan (AIWFMP) for revision of the 2010 version. She compiled input from Paragi and submitted comments on behalf of ADF&G to the Alaska Fire Service coordinator. She secured the signature of ADF&G Commissioner Cotten for the 2016 plan revision. She annually participates in teleconferences to review changes to the interagency Annual Operating Plan and the AIWFMP. She secured updated language for water withdrawals, non-anadromous stream crossings, and invasive species on behalf of the ADF&G Division of Habitat. Through the end of her chairmanship of the AWFCG (January 2016), Rodman participated in the monthly teleconferences of the national Coordinating Group Advisory Council. Policy issues were often addressed at these meetings, and Rodman provided comments on behalf of AWFCG and the State as appropriate.

Rodman and Paragi continued planning of wildland fire management and prescribed fire to maintain or enhance forage for free-ranging plains bison and moose near Delta Junction. Two main issues were identified: a habitat management plan for bison (for which ADF&G would have the lead role) is required by the Bureau of Land Management to justify operational involvement of Alaska Fire Service personnel in prescribed fire, and using the Community Wildfire Protection Plan (CWPP) for the greater Delta area as a conduit for public engagement on use of fire to manage habitat. There may be an opportunity to coordinate with State Forestry on updating the CWPP in its next iteration. Rodman and Paragi worked on multiple drafts of the prescribed burn plan and coordinated with State Forestry staff to establish an ignition plan. Additional plan revision occurred after the DOF required use of a new template in 2016 to meet federal planning and notification requirements, which are a prerequisite for use of staff and resources from the federal Alaska Fire Service. Including federal staff increases the potential

24.0 Fire Planning for Wildlife Habitat FY2017 5-year Performance Report

that sufficient qualified personnel are available in the event that DOF is not fully staffed early in the fire season or is responding to a wildland fire in their primary suppression zone.

The prescribed fire burn plan was completed and approved for the cleared margins of the Bison Range. DOF and BLM supported implementation of the burn which took place April 22-23, 2017. The crew burned 800 acres; Rodman participated in the operations in addition to preparing the Incident Action Plan (IAP), securing burn plan approvals and the DEC burn permit prior to the burn, and post burn review. Staff involved with the operation from all three agencies contributed to the post burn review to enhance operations in the future.

Rodman coordinated with DOF to implement the Little Granite prescribed fire near Sutton by conducting all pre-burn notifications, preparing the IAP, attaining burn plan approvals, and securing the DEC burn permit. DOF cancelled this burn 3 days prior to implementation.

Rodman coordinated with the federal Bureau of Land Management (BLM) to continue preparing the Alphabet Hills prescribed fire with respect to moose habitat. BLM completed their archeological review, which allowed ADF&G to continue working on our tasks of completing the burn plan updates and in the fall of 2017, requesting the cultural resource request from the U.S. Fish and Wildlife Service. State Forestry is a primary partner in this burn because the majority of the project area is on state land. This project is planned for implementation in spring of 2019.

Rodman participated in the two biannual All Lands All Hands meeting on the Kenai Peninsula in October and February of 2015, 2016 and 2017. In fall 2015, she met with the Kenai National Wildlife Refuge Manager and fire management staff, along with DOF staff, to confirm the agency support for enhancing habitat in Game Management Unit 15A through the coordinated effort of the many agencies and local entities involved in mitigating the risk and hazard of wildland fire on the Kenai Peninsula. ADF&G involvement serves both fire management and wildlife habitat enhancement. Interagency collaboration will provide the Refuge with opportunities to use prescribed and wildland fire in the future. This project is being coordinated with Chugachmiut Inc.

The Kenai Peninsula Fuel Break working group completed the first phase of the Sterling Fuel Break on the east and north perimeters of that community. Additional communications commenced with Kenai Natives Association and Salamatof to consider treating portions of their property. The next phase of fuel break construction was designed by staff from DOF and Kenai NWR and Rodman on the west side of the Refuge in GMU 15A.

The East Fork fire that burned in this area in June 2017 consumed approximately 1,100 acres; agencies expect hardwood regeneration to benefit moose habitat. Suppression activities conducted by DOF during this fire provided a basis for ADF&G to better understand the decision-making process: the fire took place in the limited fire management area, but DOF applied direct initial attack on the south and west flanks to limit spread. ADF&G inquired about these actions as allowing the fire to burn seemed better aligned with the objectives of all agencies within the limited option. Additional follow up is expected to maintain communications across the agencies to continue to allow the use of fire where applicable to benefit habitat.

ACTIVITY 5: Facilitate department staff involvement in fire-related issues

Accomplishments: We continue to assist Delta Area DWC staff with operational guidance on the Bison Range to support prescribed fire implementation in the coming years. The coordinated effort between DWC and DOF is to expand prescribed fire operations to about 6% (6,500 acres) of the legislatively-designated Delta Junction Bison Range. For example, brush management through mechanical treatment is required for prescribed burning to reduce the woody biomass on site for subsequent tilling and planting to graminoids for bison forage. The prescribed fire burn plan referenced above will be modified to address lessons learned from the 2017 burn operation. The purpose is to reduce shrub and forest succession and encroachment in cleared portions and restore forbs and grasses as bison forage. Additionally, Rodman wrote an interim letter to State Forestry, BLM and the Army requesting that a non-standard response for wildland fires be considered on the full bison range until a prescribed fire plan is formalized; this allows a natural ignition to burn for resource objectives in where initial attack is zoned as the standard response.

We have sent an email each spring to supervisors and staff regarding fire management, how to change options, and contact information for suppression (protecting) agencies. We encouraged area staff to maintain personal contact with the local fire suppression staff and land management agencies to facilitate awareness of public concerns on fire risk and opportunities for converting fire management options to Modified or Limited. Rodman also briefed DWC leadership on the opportunity to have staff participate in fire management through the Resource Ordering and Status System and Incident Qualification System. She also made a short presentation to Commissioner Cotten in this regard, securing the approval to expand opportunities for department staff, provided they have allowable time, capacity, and supervisor support.

During the reporting period we have periodically provided requested comments on active fires to the Division of Habitat (primary contact for ADF&G) to inform the Wildland Fire Decision Support System regarding potential effects of fires or suppression activities on wildlife habitat. Again in 2017, we continued to improve coordination between fire managers and the Division of Habitat with respect to proper notification for water withdrawals, retardant drops, and stream crossings.

Rodman coordinated with Region IV staff to attend S-130/190 and attain Red Cards for several staff members.

ACTIVITY 6: Identify and review appropriate literature to maintain expertise on fire management issues.

Accomplishments: Paragi and Rodman continued periodic literature downloads on fire and forest ecology and management pertinent to Alaska ecosystems. Rodman continued reading literature on fire management with respect to community involvement and fire science. Rodman serves on the advisory board of the Alaska Fire Science Consortium, attended its October 2016 workshop in Anchorage, participated in a board meeting via teleconference in February 2017, and attended the March 2017 workshop in Fairbanks. Rodman attended the 2016 Alaska Society of American Foresters annual meeting at Sheep Creek where she participated in a discussion and field tour of the 2015 Sockeye Fire near Willow. She also conducted a limited field review of

24.0 Fire Planning for Wildlife Habitat FY2017
5-year Performance Report

vegetation on selected state lands in the Sockeye Fire with Region IV staff to gain an understanding of 1st year growth response of moose browse after the fire.

ACTIVITY 7: Prepare and disseminate information (e.g., news releases, guest editorials, brochures and video) on fire-related issues. Interact with broadcast media on fire-related issues.

Accomplishments: Rodman coordinated with Region III staff to write a news story for the Delta Wind newspaper to discuss prescribed fire plans for the Bison Range. On behalf of Region IV, she attended the 20th Anniversary of the 1996 Miller's Reach Fire at Big Lake on June 11, 2016. She promoted the role of fire on the landscape while maintaining defensible space and homeowner preparedness for residents living in the wildlands and at the urban interface. She discussed wildlife habitat with respect to forest succession and fire ecology. Rodman also provided an interview to KTVA in Anchorage for the AWFCG and fire management in January 2016.

Mike Taras assisted the U.S. Fish and Wildlife Service with content and layout in updating an interagency brochure about fire effects on furbearing species in 2013 and helped Rodman prepare outreach materials in 2017 for the Delta Junction bison range prescribed fire and the Little Granite prescribed fire.

ACTIVITY 8: Prepare an annual budget, work plan, and documents needed to satisfy Federal Aid and other reporting requirements.

Paragi and Rodman have collaborated on producing annual budgets, submitting work plans, and providing annual reports during FYs 2013-17 and this 5-year summary report in 2017.

VI. PUBLICATIONS

None this period.

VII. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT

Work on three additional Federal Aid projects complement fire planning: project AKW-5 (Habitat Enhancement for Wildlife; statewide; Rodman), AKW-16 (Moose Habitat Enhancement for the Kenai Peninsula; Rodman), and 25.0 (Alaska Wildlife Habitat Monitoring and Enhancement; Region III; Paragi), as noted below.

We established pre-burn vegetation plots on the Delta Junction Bison Range in 2015 (Phase I section, grassland) and 2016 (Phase II section, forested islands) to be able to monitor vegetative response with respect to resource objectives in the burn plan. Phase I of the burn was conducted in April 2017.

Paragi worked with a graduate student and professor at UAF to calculate area burned and fire cycle (time required for a defined area to burn) to revise an earlier analysis of fire

regime (Gabriel and Tande 1983) using the Alaska Large Fire Database. A report was drafted and is being revised after comments from a university fire scientist.

In 2015 Paragi was invited to discuss research opportunities on ecosystem services (game harvest, berry picking) from fuel breaks with faculty in the program for Long Term Ecological Monitoring at the University of Alaska-Fairbanks (UAF). In 2016 he led the faculty in a field trip to visit DWC aspen treatments at Nenana Ridge that are due for a second phase of monitoring for successional response. In 2017 they are scoping potential for graduate student research on game species response and harvest in fuel treatments near Fairbanks.

VIII. LITERATURE CITED

Calef, M.P., A. Varvak, A.D. McGuire, F.S. Chapin III, and K.B. Reinhold. 2015. Recent changes in annual area burned in interior Alaska: The impact of fire management. *Earth Interactions*, Volume 19, Paper No. 5.

Collins, W.B. 1996. Wildlife habitat enhancement in the spruce-hardwood forest of the Matanuska and Susitna River Valleys. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration. Final research report. Grants W-23-5, W-24-1, W-24-2, W-24-3. Study 1.44. Juneau, Alaska.

Gabriel, H.W., and G.F. Tande. 1983. A regional approach to fire history in Alaska. U.S. Department of the Interior, Bureau of Land Management, Alaska Technical Report BLM/AK/TR-83/09. 34 p.

Haggstrom, D.A., and T.F. Paragi. 2002. Identifying and evaluating techniques for wildlife habitat management in Interior Alaska. Alaska Department of Fish and Game, Federal Aid annual research performance report, 1 July 2001-30 June 2002, Grant W-27-5, Project 5.0., Juneau.

Johnstone, J.F., Teresa N. Hollingsworth, F.S. Chapin, III, and M.C. Mack. 2010. Changes in fire regime break the legacy lock on successional trajectories in Alaskan boreal forest. *Global Change Biology* 16:1281-1295.

Kasischke, E.S., D.L. Verbyla, T.S. Rupp, A.D. McGuire, K.A. Murphy, R. Jandt, J.L. Barnes, E.E. Hoy, P.A. Duffy, M. Calef, and M.R. Turetsky. 2010. Alaska's changing fire regime -- implications for the vulnerability of its boreal forests. *Canadian Journal of Forest Research* 40:1313-1324.

Paragi, T. F. and D. A. Haggstrom. 2005. Identifying and evaluating techniques for wildlife habitat management in Interior Alaska. Alaska Department of Fish and Game, Division of Wildlife Conservation, Federal Aid Research Final Performance Report 1 July 2004-30 June 2005, Federal Aid in Wildlife Restoration Project 5.0, Juneau.

24.0 Fire Planning for Wildlife Habitat FY2017
5-year Performance Report

Seavoy, R. J. 2014. Unit 19 bison. Pages 17–29 *in* P. Harper and L. A. McCarthy, editors. Bison management report of survey and inventory activities 1 July 2011–30 June 2013, Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2014-2, Juneau.

Veraverbeke, S., B.M. Rogers, M.L. Goulden, R. R. Jandt, C.E. Miller, E.B. Wiggins, and J.T. Randerson. 2017. Lightning as a major driver of recent large fire years in North American boreal forests. *Nature Climate Change*. DOI: 10.1038/NCLIMATE3329 (online).

Walker, T.R. 2002. Distribution and abundance of landbirds in interior Alaska forests: Progress Report, September, 2002. Unpublished report, Alaska Bird Observatory, Fairbanks, Alaska. (available from T. Paragi, ADF&G, Fairbanks).

Young, A.M., P.E. Higuera, P.A. Duffy, and F.S. Hu. 2017. Climatic thresholds shape northern high-latitude fire regimes and imply vulnerability to future climate change. *Ecography* 40:606–617.

PREPARED BY: Thomas F. Paragi and Susanne U. Rodman

DATE: 24 August 2017