APPENDICES

APPENDIX A: GLOSSARY OF TERMS

Adaptive Management: A natural resource management framework that emphasizes simultaneously managing and learning about natural resources. Learning in adaptive management is accomplished through monitoring and awareness in the practice of management itself, with adjustments to strategy as more information is gathered. Often, this framework is presented as a cyclical process, with distinct phases of identifying stakeholders, goals, management alternatives, and monitoring practices; followed by implementation, monitoring, and assessment. The insights developed during monitoring and assessment of a practice are then used to refine or adjust the planning stages in future decision-making (Williams, 2011).

Adverse grade: The uphill gradient in the direction of travel of a loaded log truck.

Age class: 1. One of the intervals into which the age range of trees is divided for classification or use. 2. A distinct aggregation of trees originating from a single natural event or regeneration activity, or a grouping of trees, e.g., 10-year age class, as used in inventory or management (Society of American Foresters, 1998).

Allowable cut: The volume of timber that may be cut from a forest under optimum sustained yield management (Stoddard and Stoddard, 1987).

Anadromous Water Body: The portion of a freshwater body that is catalogued under AS 16.05.871 as important for anadromous fish or if not catalogued has been determined by ADF&G to support anadromous fish in which event the anadromous extent of the water body extends up to the first point of physical blockage (paraphrased from AS 41.17.950).

Area control (area regulation): An indirect method of controlling (and roughly determining) the amount of forest produce to be harvested, annually or periodically, on the basis of stocked area (Society of American Foresters, 1998).

Basal area (BA): 1. The cross-sectional area of a single stem, including the bark, measured at breast height (4.5 feet or 1.37 meters above the ground). 2. The cross-sectional area of all stems of a species or all stems in a stand measured at breast height and expressed per unit of land area (Society of American Foresters, 1998).

Biological diversity: The variety and abundance of species, their genetic composition, and communities, ecosystems and landscapes in which they occur. It also refers to ecological structures, functions, and processes at all these levels. Biological diversity occurs at spatial scales that range from local through regional to global. (Society of American Foresters Task Force, 1991.)

Board Feet: A unit of wood volume measuring 12 inches by 12 inches by 1 inches or 144 cubic inches.

Breast height: A standard height from ground level, generally 4.5 feet, for recording diameter, circumference (girth), or basal area of a tree. The measurement is usually taken on the uphill side of the tree (Society of American Foresters, 1998). See also diameter at breast height.

Broadcast burn: A prescribed fire allowed to burn over a designated area within well-defined boundaries to achieve some land management objective (Society of American Foresters, 1998).

Carbon Offset Credit: a financial instrument representing a reduction or removal of one metric ton of carbon dioxide (CO2) or its equivalent in other greenhouse gases from the atmosphere. These credits are used by

companies or other entities to compensate for their own carbon emissions by investing in environmental projects that reduce or remove greenhouse gasses.

Carbon Offset Project: A project designed to reduce greenhouse gas (GHG) emissions or capture and store carbon from the atmosphere to compensate for emissions made elsewhere. These projects help businesses, governments, and other entities achieve carbon neutrality or reduced carbon footprints through the purchase of carbon offsets.

Cable yarding: Taking logs from the stump area to a landing using an overhead system of winch-driven cables to which logs are attached with chokers. (Society of American Foresters, 1998).

Clearcutting: The cutting of essentially all trees, producing a fully exposed microclimate for the development of a new age class (Society of American Foresters, 1998).

Commercial forest land (CFL): Land declared suitable for producing timber crops and not withdrawn from timber production by statute or administrative regulation (Society of American Foresters, 1998).

Commercial Lease: Commercial leasing permits are issued and managed by the Alaska Division of Mining, Lands, and Water (DMLW). State land can be leased for commercial surface use under Alaska Statute (AS) 38.05.070, AS 38.05.073, and AS 38.05.075. Leases can be issued for almost any commercial, industrial, agricultural, grazing, and some private uses; The state does not typically lease land for residential use. More information is available through the State of Alaksa's Regional DMLW offices.

Consultation: Under existing statutes, regulations and procedures, the Department of Natural Resources informs other groups of its intention to take specific action(s) and seeks their advice or assistance. Consultation is not intended to be binding on a decision; it is a means of informing affected organizations and individuals about forthcoming decisions and getting the benefit of their expertise.

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Cubic Feet: A unit of wood volume measuring 12 inches by 12 inches by 12 inches or 17,728 cubic inches.

Culmination of mean annual increment (CMAI): The age in the growth cycle of a tree or stand at which the mean annual increment (MAI) for height, diameter, basal area, or volume is at a maximum (Society of American Foresters, 1998).

Decking: The piling of logs.

Department: The Alaska Department of Natural Resources

Diameter at breast height (DBH): The diameter of the stem of a tree measured at breast height (4.5 feet) from the ground. On sloping ground, the measurement is taken from the uphill side (Society of American Foresters, 1998).

Division: The Division of Forestry and Fire Protection in the Alaska Department of Natural Resources.

Ecosystem: All the interacting populations of plants, animals, and microorganisms occupying an area, plus their physical environment. (Hunter, 1990)

Ecosystem management: An ecological approach to forest resources management. It attempts to maintain the complex processes, pathways and interdependencies of forest ecosystems and keep them functioning well over long periods of time, providing resilience to short-term stress and adaptation to long-term change. Thus, the condition of the forest landscape is the dominant focus, and the sustained yield of products and services is provided within this context. Humans are also a part of the ecosystem. Thus, ecosystem management must maintain our social and political systems as well as meet our need for both consumptive and non-consumptive uses of the forest. Ecosystem management of forests includes products as an essential part of the mix, including intensive management. Ecosystem management is the strategy by which, in aggregate, the full array of forest values and functions is maintained at the landscape level. Coordinated management at the landscape level, including across ownerships, is an essential component (Society of American Foresters, 1993).

Favorable grade: The downhill gradient in the direction of travel of a loaded log truck.

Felling: The process of cutting down trees.

Feasible: The term "feasible" is defined in the forest practices regulations as “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, technical, and safety factors” (11 AAC 95.900(29)).

Feasible and prudent means consistent with sound engineering practice and not causing environmental, social, or economic problems that outweigh the public benefit to be derived from compliance with the standard modified from a proposed action (YTAP, 2014).

Finding of incompatibility: If the commissioner [of natural resources] finds that a permitted use [described in AS 38.05.112(c)] is incompatible with one or more other uses in a portion of a State Forest, the commissioner shall affirmatively state in the management plan that finding of incompatibility for the specific area where the incompatibility is anticipated to exist and the time period when the incompatibility is anticipated to exist together with the reasons and benefits for each finding. [AS 41.17.230(a)]

Fire management: All activities required for the protection of burnable wildland values from fire and the use of fire to meet land management goals and objectives (Society of American Foresters, 1998).

Fish and wildlife: Any species of aquatic fish, invertebrates and amphibians, in any stage of their life cycle, and all species of birds and mammals, including feral domestic animals, found or that may be introduced in Alaska, except domestic birds and mammals. NOTE: The term “area(s)” in association with the term "fish and wildlife" refers to both harvest and habitat area. The term "value(s)" in association with the term "fish and wildlife" refers to the relative importance of a harvest area or habitat and its vulnerability to development impacts. (An operational definition of the Alaska Department of Fish and Game derived from the definition of ‘fish’ in AS 16.05.940 (12) and ‘game’ in AS 16.05.940 (18)).

Floodplain: Flat land bordering a stream or river onto which a flood will spread. The underlying materials are typically unconsolidated and derived from past stream transportation activity. The extent of the floodplain varies according to the volume of water and is thus defined by a specified flood size (e.g., a fifty-year-old floodplain would be defined by the largest flood that would, on average, occur once within a fifty-year period, estimated from historic stream flow records) (Dunster and Dunster, 1996).

Forest land: Land stocked or having been stocked with forest trees of any size and not currently developed for nonforest use, regardless of whether presently available or accessible for commercial purposes (AS 41.17.950 (5)). Regarding land classification, land classified “forest land” is land that is or has been forested and is suited for forest management because of its physical, climatic, and vegetative conditions (11 AAC 55.070).

Forest regulation: The technical (in contrast to administrative and business) aspects of controlling stocking, harvests, growth, and yields to meet management objectives including sustained yield (Society of American Foresters, 1998). See also the definition for "area control."

Goal: A general statement of intent, usually neither quantifiable nor having a specified date of completion. Goals identify desired long-range conditions.

Guideline: A specific course of action that must be followed when a resource manager permits, leases, or otherwise authorizes use of state lands. Some guidelines state the intent that must be followed and allow flexibility in achieving it. Guidelines also range from giving general guidance for decision-making or identifying factors that need to be considered to setting detailed standards for on-the-ground decisions. (Adapted from the Tanana Basin Area Plan for State Lands, Alaska Department of Natural Resources, 1991.)

Harvest System: the method by which trees are felled, skidded, processed and loaded onto a truck for transportation.

High Value Resident Fish: Resident (non-anadromous) fish populations that are used for recreational, personal use, commercial, or subsistence purposes (paraphrased from AS 41.17.950).

Grub (grubbing): To remove stumps or shrubs from the ground by hand or machine, typically prior to road building or regeneration (Society of American Foresters, 1998).

Ice bridge: A bridge of ice across a lake, river, or stream, either natural or constructed to a specified thickness to safely accommodate specified vehicle loads.

Important habitat

1. A natural environment that promotes reproduction and survival (i.e. fitness) of species listed in this management plan or those incorporated in the 2015 Alaska Wildlife Action Plan as Species of Greatest Conservation Need.
2. A natural environment that promotes the best interest of the economy and general well-being of state residents with respect to wildlife resources.

Increment

1. Increase in circumference (girth), diameter, basal area, height, volume, quality, or value of individual trees or crops.
2. The rate of increment, i.e., increase during a given period (Society of American Foresters, 1998).

Ingrowth: Number of trees, or volume of trees that have grown past a predetermined threshold in a set period. Typically used to refer to the dividing line between seedling to sapling or, sapling to pole stage, or a specific diameter class or merchantability class. Once past the sapling stage, the tree is counted into volume calculations, hence ingrowth can make a very significant difference in the assessment of stand condition. It is also called recruitment (Dunster and Dunster, 1996).

Landing: A cleared area in the forest to which logs are yarded or skidded for loading onto trucks for transport (Society of American Foresters, 1998).

Land classification: The designation of land according to its primary use, and in a manner that will provide maximum benefit to the people of Alaska (11 AAC 55.280 (1)). 11 AAC 55.010 clarifies that although a classification identifies a primary use, all classifications are intended for multiple use.

Management guideline: Specific management standards or procedures to be followed in carrying out goals. Guidelines are intended to be sufficiently detailed to guide on-the-ground decisions, such as road construction. Guidelines are applied frequently in day-to-day management decisions.

Mature: Pertaining to a tree or stand that is capable of sexual reproduction (other than precocious reproduction), has attained most of its potential height growth, or has reached merchantability standards. Within uneven-aged stands, individual trees may become mature but the stand itself consists of trees of diverse ages and stages of development. (Society of American Foresters, 1998)

M.B.F.: 1,000 board foot measure (synonymous with MBF: 1,000 board feet).

Mean annual increment (MAI): The total increment of a tree or stand (standing crops plus thinnings) up to a given age divided by that age (Society of American Foresters, 1998).

Merchantable:

1. Of trees, crops, or stands, having the size, quality, and condition suitable for marketing under a given economic condition, even if not immediately accessible for logging.
2. Of a bole or stem, the part(s) suitable for sale (Society of American Foresters, 1998).

Minimize: To limit to the extent feasible and does not include the requirement of improving naturally existing conditions (11 AAC 95.900 (49)).

Multiple use: The term "multiple use" as defined in the Alaska Forest Resources and Practices Act means:

1. The management of all the various resources of forest land so that they are used in the combination that will best meet the needs of the citizens of the state, making the most judicious use of the land for some or all of these resources or related values, benefits, and services over areas large enough to provide sufficient latitude for periodic adjustment in use to conform to changing needs and conditions;
2. That some land will be used for less than all of the resources; and
3. Harmonious and coordinated management of the various resources, each with the other, without significant impairment of the productivity of the land and water, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output (AS 41.17.950 (8)).

Non-commercial forest land (NCFL): Land incapable of yielding a specified volume of wood per unit area of commercial species, or land only capable of producing noncommercial tree species (Dunster and Dunster, 1996).

Objective: an outcome that is measurable and completed within a specified timeframe.

Ordinary high water mark: The mark along the bank or shore up to which the presence and action of the tidal or nontidal water are so common and usual, and so long continued in all ordinary years, as to leave a natural line impressed on the bank or shore and indicated by erosion, shelving, changes in soil characteristics, destruction of terrestrial vegetation, or other distinctive physical characteristics (11 AAC 95.900(53)).

Overmature

1. A tree or even-aged stand that has reached that stage of development when it is declining in vigor and health and reaching the end of its natural life span.
2. A tree or even-aged stand that has begun to lessen in commercial value because of size, age, decay, or other factors. The term has little applicability to uneven-aged stands, which consist of trees of diverse ages and stages of development (Society of American Foresters, 1998).

Policy: An intended course of action or a principle for guiding actions. In this plan, DNR policies for land and resource management include goals, management intent statements, management guidelines, planned activities, implementation plans and procedures, and various other statements of DNR's intentions.

Pole Timber: a tree with a diameter at breast height between 4 and 9 inches, and that is too small to be a saw timber.

Policy: An intended course of action or a principle for guiding actions. In this plan, DNR policies for land and resource management include goals, management intent statements, management guidelines, planned activities, implementation plans and procedures, and various other statements of DNR's intentions. (Adapted from the Tanana Basin Area Plan for State Lands, Alaska Department of Natural Resources, 1991.)

Prescribed fire: To deliberately burn wildland fuels in either their natural or their modified state and under specified environmental conditions, which allows the fire to be confined to a predetermined area and produces the fire line intensity and rate of spread required to attain planned resource management objectives (Society of American Foresters, 1998).

Primary all-season road: Regarding timber access, an all-season road which generally provides access to within five miles of timber resources. Built to a higher standard than secondary all-season roads.

Primary winter road: Regarding timber access, a road built and used during the winter. Built to a higher standard than secondary winter roads. See also 'winter road'.

Prohibited use: A use which is not allowed without an amendment to the plan.

Put-to-bed: A process to stabilize and terminate the use of a logging road, trail, or other means of ingress and egress. See 11 AAC 95.320 for specific guidelines for closure.

Recruitment: The additional trees moving from one size class to another (Society of American Foresters, 1998). Generally, the addition to a population from all causes (Dunster and Dunster, 1996). In silviculture, often referred to as ingrowth.

Reduction factor: A numerical reduction from the allowable cut to compensate for unknown, on-the-ground situations where timber harvest may not be feasible or appropriate, and to ensure that the allowable cut is not exceeded due to multiple use considerations. Reduction factors are not allocated to any particular area through the planning process and do not designate specific sites for management for primarily non-timber purposes (TVSF Planning Team, 2000).

Regeneration: Seedlings or saplings within a forest stand.

Riparian Area: Areas subject to riparian protection standards in AS 41.17.116(c) on private land in Region III and the area out to 100 feet from the bank of an anadromous or high value resident fish water body on state land managed by the department and on other public land in Region III (paraphrased from AS 41.17.950).

Type III-A (Region III) Water Body: *A nonglacial high value resident fish water body greater than three feet in width at the ordinary high-water mark; nonglacial anadromous water body; or backwater slough (paraphrased from AS 41.17.950).*

Type III-B (Region III) Water Body: *A glacial high value resident fish water body or glacial anadromous fish water body that does not include a glacial backwater slough (paraphrased from AS 41.17.950).*

Type III-C (Region III) Water Body: *A nonglacial high value resident fish water body that is less than or equal to three feet in width at the ordinary high-water mark and that does not contain anadromous fish (paraphrased from AS 41.17.950).*

Rotation: In even-aged systems, the period between regeneration establishment and final cutting. Rotation may be based on many criteria including mean size, age, culmination of mean annual increment, attainment of particular minimum physical or value growth rate, and biological condition (Society of American Foresters, 1998).

Salvage cutting: The removal of dead trees or trees damaged or dying because of injurious agents other than competition, to recover economic value that would otherwise be lost (Society of American Foresters, 1998).

Sawtimber: Trees that will yield logs suitable in size and quality for the production of lumber. Spruce must be at least 9 inches and hardwoods 11 inches diameter at breast height.

Scarification

1. Mechanical removal of competing vegetation or interfering debris, or disturbance of the soil surface, to enhance reforestation.
2. Chemical, mechanical, heat, or moisture treatment of seeds to make the seed coat permeable and improve germination (Society of American Foresters, 1998).

Secondary all-season road: Regarding timber access, an all-season road which generally provides access to within ¼ mile of timber resources. Built to a lesser standard than primary all-season roads, but to a higher standard than spur roads.

Secondary winter road: Regarding timber access, a road built and used during the winter. Built to a lesser standard than primary winter roads. See also 'winter road'.

Selection method: An uneven-aged regeneration method used to regenerate and maintain a multi-aged structure by removing some trees in all size classes either singly, in small groups, or in strips (Society of American Foresters, 1998).

Selective cutting: A cutting that removes only a portion of the trees in a stand (Society of American Foresters, 1998).

Shall: Requires a course of action or set of conditions to be achieved. A guideline modified by the word 'shall' must be followed by resource managers or users. If such a guideline is not complied with, a written decision justifying the noncompliance is required (see Appendix B, Finding of Incompatibility).

Should: States intent for a course of action or set of conditions to be achieved. A guideline modified by the word 'should' states the plan's intent and allows a resource manager to use discretion in deciding the specific means for best achieving the intent or whether particular circumstances justify deviation from the intended action or set of conditions. A guideline may include criteria for deciding if such a deviation is justified.

Shrub: A woody, perennial plant differing from a perennial herb in its persistent and woody stem, and less definitely from a tree in its lower stature and the general absence of a well-defined main stem (Society of American Foresters, 1998).

Shrub-land: A non-forest vegetation type containing brush and shrub vegetation that does not produce commercial timber (Crimp, et al., 1997).

Silvics: The study of the life history and general characteristics of forest trees and stands, with particular reference to environmental factors, as a basis for the practice of silviculture (Society of American Foresters, 1998).

Silviculture: The art of producing and tending a forest, the application of the knowledge of silvics in the treatment of a forest, and the theory and practice of controlling and managing forest establishment, composition, and growth (AS 41.17.950 (15)).

Skid: To haul a log from the stump to a collection point (landing) by a skidder (Society of American Foresters, 1998).

Skid trail: A route used by tracked or wheeled skidders to move logs to a landing or road (11 AAC 95.900 (74)).

Slash: The residue, e.g., treetops and branches, left on the ground after logging or accumulating as a result of storm, fire, girdling, or delimbing (Society of American Foresters, 1998).

Snags: 1. A standing, generally unmerchantable dead tree from which the leaves and most of the branches have fallen. 2. A standing section of the stem of a tree, broken off usually below the crown (Society of American Foresters, 1998).

Special Management Zone (SMZ): An area near a stream or lake that will be managed primarily to protect or enhance recreational values, significant fish and wildlife habitat and human uses, and water quality. Special management zones include side channels, sloughs, and backwaters.

Spur road: A short, low-standard road that supports a low level of traffic such as serving one or two landings (Society of American Foresters, 1998). Spur roads are generally built within harvest units.

Stand: A contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit (Society of American Foresters, 1998).

State forest: An area designated by the legislature and retained in state ownership in order to a) provide a base for sustained yield management of renewable resources; and b) permit a variety of beneficial uses (AS 41.17.950 (16)).

State lands: All lands, including shore, tide and submerged lands, or resources belonging to or acquired by the state (AS 38.05.965 (20)).

Sustained yield: The achievement and maintenance in perpetuity of a high level annual or regular periodic output of the various renewable resources of forest land and water without significant impairment of the productivity of the land and water, but does not require that timber be harvested in a non-declining yield basis over a rotation period (AS 41.17.950 (17)). Another definition of sustained yield is in AS 38.04.910 (12) and should be applied in the context of AS 38.04 authorities and requirements.

Thermokarst: A topographic feature, similar in form to karst, produced in a permafrost region by the local melting of ground ice, followed by settling of the ground (Dunster and Dunster, 1996).

Timber: A tree, log, pole, bolt, or other wood product (11 AAC 71.910 (17)). Also, merchantable trees, standing or down, or a commercial tree species (11 AAC 95.900 (84)).

Timber land: State land chiefly valuable for timber and other forest products (AS 38.05.965(23)).

Tree: A woody perennial plant, typically large and with a well-defined stem or stems carrying a more or less definite crown (Society of American Foresters, 1998).

Upland: Land that generally has a higher elevation than the adjacent alluvial plain or low stream terrace, or land above the footslope zone on a hillslope continuum (Dunster and Dunster, 1996).

Water bar: A shallow channel or raised barrier of soil or other material laid diagonally across the surface of a road or skid trail to lead water off the road and prevent soil erosion (Society of American Foresters, 1998). Often used to put a road to bed.

Wildlife: non-domesticated animal life, especially mammals, birds, fishes and higher invertebrates.

Will: Same as 'shall' (above), however, when the word 'will' refers to a planned management activity by DNR or another agency, the carrying out of this activity is contingent on available funding.

Winter road: A road that can normally support regular logging vehicle traffic only during winter months that has a load-bearing capacity derived from a combination of frost, snow, or ice (11AAC 95.900(90)).

Yarding: To convey logs or trees to a landing, particularly by cable, balloon, or helicopter logging systems (Society of American Foresters, 1998)

AGENCY ACRONYMS

ADFG – Alaska Department of Fish and Game

AHRS - Alaska Heritage Resources Survey

AWFCG – Alaska Wildland Fire Coordinating Group

BIF – Best Interest Finding

BLM – Bureau of Land Management

CAC – Citizens Advisory Committee

CWPP – Community Wildfire Protection Plan

DEC – Department of Environmental Conservation

DGGS - Alaska Division of Geological & Geophysical Surveys

DNR – Alaska Department of the Natural Resources

DOD – Department of Defense

DOF – Alaska Division of Forestry and Fire Protection

DPOR – Alaska Division of Parks and Outdoor Recreation

DWSP - Drinking Water Source Protection

FLUP – Forest Land Use Plan

FNSB – Fairbanks North Star Borough

FYSTS – Five-Year Schedule of Timber Sales

OHA – Office of History and Archeology

RNA - Research Natural Area

SGCN – Species of Greatest Conservation Needs

SMZ – Special Management Zone

TMDL - Total Maximum Daily Load

TVSF – Tanana Valley State Forest

USACE – U.S. Army Corp of Engineers

USDA – United States Department of Agriculture

USFWS – United States Fish and Wildlife Service

APPENDIX B: FINDING OF INCOMPATIBILITY

There are a number of uses within the Tanana Valley State Forest that are not compatible on the same piece of ground at the same time. In accordance with AS 41.17.230(a), following is a list of those activities that are planned for the Tanana Valley State Forest and those uses that will not be permitted for the same location and time.

Research Natural Areas (RNAs), 11,141 acres - RNAs are intended to provide sites within which baseline ecological research and education can be conducted. It is intended that these areas be maintained in their natural state as much as possible. Activities that result in significant disturbance that is unnatural will typically not be authorized unless they are found to be consistent with the management intent for the area. These activities include timber harvest, material extraction, and developed recreation. Please see the Scientific Resources section of Chapter 2 for a complete list.

Leasehold location is an appropriate measure to allow mineral development with minimal impacts on these research areas. Within research natural areas, mineral exploration or development will be restricted if it conflicts with the overriding scientific values. Within the RNAs, rights to locatable minerals may be acquired only under the leasehold location system, AS 38.05.205, and may not be acquired by locating a mining claim under AS 38.05.195. The stipulations used in approving plans of operations per Leasehold Location Order #24 will also be included in any miscellaneous land use permits issued for exploration activities within the RNAs.

Currently, DOF does not expect incidental individual activities to impair research natural areas. However, if Generally Allowed Uses (11 AAC 96) threaten the integrity of a research natural area, DNR may establish a Special Use Land designation (under 11 AAC 96.010) in the future to regulate individuals' activities within RNAs. The Special Use Land designation is consistent with the TVSF Management Plan and may be established without an amendment to this plan.

See the Scientific Resources section of Chapter 2 for examples of activities that may be regulated.

A Research Natural Area shall not block access to or use of other resources outside the RNA. When access through a Research Natural Area is necessary (if there is no other feasible and prudent access route to resources beyond the RNA), roads will be designed and located to protect the features for which the RNA was designated, as much as possible. Activities such as mineral exploration and development will be permitted provided they can be made compatible with the intended use of RNAs, to the extent feasible and prudent. These restrictions will be in effect for the period this plan is in effect or until the RNAs are withdrawn. These restrictions apply to six RNAs totaling 11,141 acres. They are listed in Table 5

Bonanza Creek Experimental Forest (BCEF), 13,852 acres from lease - The BCEF (subunit 5B) is leased to USDA Forest Service, Pacific Northwest Research Station, for fifty-five years for the expressed purpose of forest research. Management authority is shared between the Pacific Northwest Research Station and DNR. The BCEF is open to mineral entry and mineral leasing. The BCEF is only available for those public uses the U.S. Forest Service's Boreal Ecology Cooperative Research Unit deems compatible with the intended research use. The lease of the BCEF will remain in effect until 2018.

Campgrounds, 280 acres - Improved campgrounds are intended for the enjoyment of the public. Loss of use of campgrounds due to other surface uses is not in the best interest of the general public, therefore, existing and planned campgrounds will be closed to mineral entry, grazing, timber harvest, and hunting for the duration of the period the State of Alaska operates and maintains the campgrounds. These restrictions apply to the Eagle Trail State Recreation Site campground, in Unit 14 (280 acres).

Trail and Stream Corridors, 96,200 acres - Trails listed as being of regional or statewide significance and streams protected by Special Management Zones (See Chapter 3 for lists of these streams in each unit) have particular value for recreation, transportation and/or wildlife habitat. Because of the significance of these corridors, commercial timber harvest and other permitted activities will be allowed only when it can be shown to be consistent with the intent of the trails and stream corridors. This restriction will remain in effect for the duration that this plan is in effect for those trails listed in Table 11 and those streams listed in Table 4.

Mining and Material Extraction - Mining and material extraction are subsurface and surface activities, respectively, that disrupt other surface uses for the period that the mining and material extraction is going on. For that period that these activities are permitted other surface uses requiring issuance of a DNR permit on the mining and material extraction permitted site will be permitted only when they can be shown to be compatible with the mining or material extraction.

Timber Harvest - Timber harvest activities that are a result of a contract between the DNR and a timber purchaser may be incompatible with other uses within the timber harvest area boundaries. Therefore, for that period starting when the DNR and the timber purchaser sign the contract, and until the termination of that contract, activities requiring issuance of a permit by the DNR will be restricted to those that can be shown to be compatible with the timber harvest. In addition, for this same period the area described in the contract for timber harvest will be closed to mineral entry and will be open for leasehold location only.

Remote Cabin Permits - Privately-owned residences and recreation cabins are not compatible with the intent of the Tanana Valley State Forest and will not be permitted within the State Forest for the duration this plan is in effect.

APPENDIX C: MINERAL ORDERS

Mineral Orders (MOs) are issued by the Alaska Division of Mining, Lands, and Water (DMLW) to close or open specific parcels of State-owned land to mineral entry. These MO's are addressed in DMLW Area Plans and generally created or updated within the Area Plan revision process. DMLW Area Plans and DOF State Forest Management Plans use different conventions to delineate and describe management units. In addition, plan boundaries or management intent on a specific site for either agency is subject to change. To avoid confusion, MOs are listed in this plan by their DMLW-assigned File Number, which can be searched in SOA Lands Office records for more detail. Table 5.1 shows all MOs within the TVSF boundaries as of 2024, according to the DMLW internal GIS database. This list is subject to change before the next revision of this management plan. No new MOs were created during the 2024 revision of this plan. Consulting DMLW data is the best way to assure a fully updated list of MOs within TVSF.

Table 5.1 Documented Mineral Orders within Tanana Valley State Forest boundaries

File Number	*File Type*[5]	*Case Status*	*Land Status*
141	MCO	EFFECTIVE	CLOSED
55	MCO	CLOSED	SUPERCEDED
184	MCO	VERIFIED	CLOSED
202	MCO	EFFECTIVE	CLOSED
429	MCO	EFFECTIVE	CLOSED
764	MCO	EFFECTIVE	CLOSED
67	MCO	CLOSED	CLOSED
271	MCO	EFFECTIVE	CLOSED
1162A01	MO	EFFECTIVE	CLOSED
1162A01	MO	EFFECTIVE	CLOSED
202	MCO	EFFECTIVE	REOPEND
67	MCO	CLOSED	CLOSED
1162A01	MO	EFFECTIVE	CLOSED
178A01	MCO	EFFECTIVE	CLOSED
230	MCO	EFFECTIVE	CLOSED
223	MCO	EFFECTIVE	CLOSED
529A01	MCO	CLOSED	CLOSED
109	MCO	EFFECTIVE	CLOSED
1162	MO	CLOSED	CLOSED
202	MCO	EFFECTIVE	CLOSED
510	MCO	EFFECTIVE	CLOSED

[5] MCO is an abbreviation for Mineral Closing Order, a management tool no longer in use by DMLW. MO refers to Mineral Order, an action that can result in closing or opening land for mineral entry.

File Number	*File Type*[5]	*Case Status*	*Land Status*
67A03	MCO	EFFECTIVE	CLOSED
1045	MO	EFFECTIVE	SUPERCEDED
67	MCO	CLOSED	CLOSED
529	MCO	CLOSED	CLOSED
185	MCO	EFFECTIVE	SUPERCEDED
510	MCO	EFFECTIVE	CLOSED
1101	MO	EFFECTIVE	CLOSED
383	MCO	EFFECTIVE	CLOSED
67	MCO	CLOSED	CLOSED
67	MCO	CLOSED	CLOSED
67	MCO	CLOSED	CLOSED
1045	MO	EFFECTIVE	CLOSED
202	MCO	EFFECTIVE	CLOSED
262	MCO	EFFECTIVE	CLOSED
202	MCO	EFFECTIVE	REOPEND
510	MCO	EFFECTIVE	CLOSED
239	MCO	EFFECTIVE	CLOSED
229	MCO	EFFECTIVE	CLOSED
112	MCO	VERIFIED	SUPERSEDED
294	MCO	EFFECTIVE	CLOSED
265	MCO	EFFECTIVE	CLOSED
529	MCO	CLOSED	CLOSED
67	MCO	CLOSED	CLOSED
761	MCO	EFFECTIVE	CLOSED
55	MCO	CLOSED	SUPERCEDED
367	MCO	EFFECTIVE	CLOSED
1162A01	MO	EFFECTIVE	CLOSED
1045	MO	EFFECTIVE	SUPERCEDED
1162A01	MO	EFFECTIVE	CLOSED
1150	MO	EFFECTIVE	REOPEND
510	MCO	EFFECTIVE	CLOSED
239	MCO	EFFECTIVE	CLOSED
202	MCO	EFFECTIVE	CLOSED
601	MCO	EFFECTIVE	CLOSED
73	MCO	EFFECTIVE	CLOSED

File Number	*File Type*[5]	*Case Status*	*Land Status*
235	MCO	EFFECTIVE	CLOSED
112	MCO	VERIFIED	CLOSED
67	MCO	CLOSED	CLOSED
239	MCO	EFFECTIVE	CLOSED
67A03	MCO	EFFECTIVE	CLOSED
262	MCO	EFFECTIVE	CLOSED
204	MCO	EFFECTIVE	CLOSED
1162A01	MO	EFFECTIVE	CLOSED
239	MCO	EFFECTIVE	CLOSED
375	MCO	CLOSED	CLOSED
1162A03	MO	EFFECTIVE	CLOSED
262	MCO	EFFECTIVE	CLOSED
176	MCO	EFFECTIVE	CLOSED
1097	MO	EFFECTIVE	CLOSED
239	MCO	EFFECTIVE	CLOSED
239	MCO	EFFECTIVE	CLOSED
204A01	MCO	EFFECTIVE	CLOSED
67A03	MCO	EFFECTIVE	CLOSED
177A01	MCO	VERIFIED	CLOSED
1118	MO	EFFECTIVE	REOPEND
67	MCO	CLOSED	CLOSED
239	MCO	EFFECTIVE	CLOSED
510	MCO	EFFECTIVE	CLOSED
1147	MO	EFFECTIVE	CLOSED
380	MCO	EFFECTIVE	CLOSED
510	MCO	EFFECTIVE	CLOSED
262	MCO	EFFECTIVE	CLOSED
239	MCO	EFFECTIVE	CLOSED
375	MCO	CLOSED	CLOSED
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1023	MO	EFFECTIVE	CLOSED
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67	MCO	CLOSED	CLOSED

File Number	*File Type*[5]	*Case Status*	*Land Status*
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140	MCO	EFFECTIVE	CLOSED
112	MCO	VERIFIED	CLOSED
510	MCO	EFFECTIVE	CLOSED
1162A01	MO	EFFECTIVE	CLOSED
239	MCO	EFFECTIVE	CLOSED
262	MCO	EFFECTIVE	CLOSED
1162A01	MO	EFFECTIVE	CLOSED
358	MCO	EFFECTIVE	CLOSED
383	MCO	EFFECTIVE	CLOSED
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262	MCO	EFFECTIVE	CLOSED
1047	MO	EFFECTIVE	CLOSED
204	MCO	EFFECTIVE	CLOSED
1024	MO	EFFECTIVE	CLOSED
1101	MO	EFFECTIVE	CLOSED
67	MCO	CLOSED	CLOSED
510	MCO	EFFECTIVE	CLOSED
510	MCO	EFFECTIVE	CLOSED
1162A01	MO	EFFECTIVE	CLOSED

1

APPENDIX D: LEASEHOLD LOCATION ORDER 24

The land within Research Natural Areas (RNAs) and the Bonanza Creek Experimental Forest (BCEF) is subject to Leasehold Location Order 24 (LLO 24). Rights to locatable minerals in the land covered by LLO 24 may be acquired only under the leasehold location system, AS 38.05.205, and may not be acquired by locating a mining claim under AS 38.05.195.

The Findings and determinations of LLO 24 state that the lands within the TVSF RNAs and BCEF are subject to potential use conflicts requiring mining be allowed only under written lease issued under AS 38.05.205. These potential uses include, but are not limited to:

Research Natural Areas (RNAs), 11,141 acres - RNAs are intended to provide sites within which baseline ecological research and education can be conducted. It is intended that these areas be maintained in their natural state as much as possible. Activities that result in significant disturbance that is unnatural will typically not be authorized unless they are found to be consistent with the management intent for the area. These activities include timber harvest, material extraction, and developed recreation. Please see the Scientific Resources section of Chapter 2 for a complete list.

Leasehold location is an appropriate measure to allow mineral development with minimal impacts on these research areas. Within research natural areas, mineral exploration or development will be restricted if it conflicts with the overriding scientific values. Within the RNAs, rights to locatable minerals may be acquired only under the leasehold location system, AS 38.05.205, and may not be acquired by locating a mining claim under AS 38.05.195. The stipulations used in approving plans of operations per Leasehold Location Order #24 will also be included in any miscellaneous land use permits issued for exploration activities within the RNAs.

The Bonanza Creek Experimental Forest is leased to the USDA Forest Service's Boreal Ecology Cooperative Research Unit, Pacific Northwest Research Station, for fifty years for the purpose of forest research (ADL 21408). Management authority is shared between the Pacific Northwest Research Station and DNR. Rights to locatable minerals within the BCEF may be acquired only under the leasehold location system. The BCEF is only available for those public uses the Pacific Northwest Research Station deems compatible with the intended research use. The lease of the BCEF will remain in effect until 2018. Activities such as mineral exploration and development will be permitted provided they can be made compatible with the intended use of the BCEF, to the extent feasible and prudent.

The associated Finding of Incompatibility is found in this draft of the TVSF Plan, in Appendix B.

For more information about the background of RNAs, see Appendix E, Research Natural Area Report.

No new LLOs were proposed in the 2024 revision of this plan.

APPENDIX E: RESEARCH NATURAL AREA REPORT

For more information, or for data collected in some of the Research Natural Areas, contact:

Glenn Juday
Associate Professor of Forest Ecology
University of Alaska Fairbanks Forest Sciences Department
P.O. Box 757200
Fairbanks, Alaska 99775-7200
e-mail gjuday@lter.uaf.edu

Research Natural Area	Subunit	Acres
Oblique Lake	2B	2,990
Caribou Crossing	2C	1,251
Rosa-Keystone	8B	2,337
Shaw Creek Tamarack	9B	1,887
Volkmar Bluffs	10B	1,638
Johnson Slough Bluffs	10D	1,038
	Total	**11,141**

SUBUNIT 2B, OBLIQUE LAKE RNA. ACRES: 2,990

Rationale:

This area is located approximately 100 miles due west of Fairbanks on the Tanana River. It was chosen to include a small watershed unit dominated by productive white spruce old-growth, and includes associated ecosystems (bottomland mosaic, hardwood, and hill prairie), as well as occurrences of old-growth-dependent wildlife, especially the flying squirrel, brown creeper, mountain bluebird, goshawk, and possibly the tree swallow and sharp-shinned hawk. The presence of the flying squirrel and goshawk have been confirmed. Although verification of the presence of the mountain bluebird and brown creeper is not yet available, habitat appears excellent.

This RNA should support several kinds of forest studies as a "satellite" to the Bonanza Creek Experimental Forest, and is well-situated to confirm or invalidate hypotheses made on the basis of studies at a single site near Fairbanks. It will also serve as an area of significant habitat for animals that inhabit older forests as stands in the western portion of the State Forest are harvested. It appears to be located at the western margin of some species' ranges.

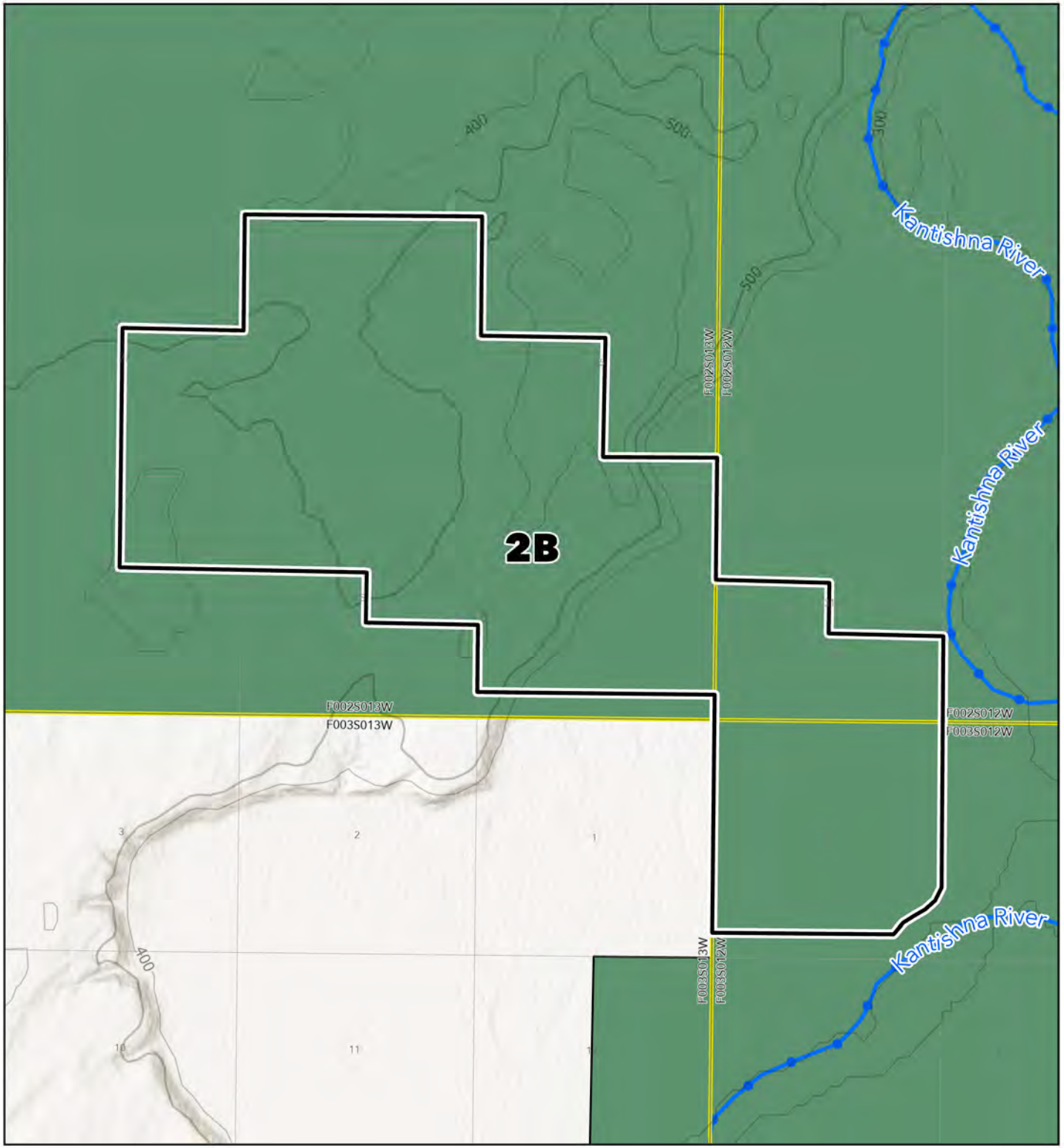
Description:

The RNA is characterized by extensive upland mature white spruce with occasional old aspen. Some 200- to 300-year old trees are present, but 10 dominant white spruce sample trees ranged in age from 120 to 170 years. A fire-remnant population of large white spruce occurs at very thin stocking levels in some portions of the upland stand; those trees may be 50 to 100 years older. The western portion of the area

supports a species-rich hill prairie. Three vascular plant species range extensions were noted from the site work: *Carex rossii*, *Carex lasiocarpa*, and *Cystopteris fragilis* subsp. *dickieana*.

Some site work was conducted June 29-July 2, 1986, including sampling soils and establishing and marking permanent forest plots totaling ½ hectare. In general, the stand showed the same age relationships as Bonanza Creek Experimental Forest, but was somewhat smaller and not quite as productive. However, the upland stand is in the upper range of volume and productivity for the Tanana Valley State Forest.

Management Unit: 2B
Oblique (Tschute) Lake



State Forest Boundary
- Unit Boundary
- Tanana Valley State Forest

Land Ownership
- State Lands
- University of Alaska
- AK DNR-Mental Health Trust
- Private Land
- Federal
- Municipal
- ANCSA

Hydrology
- Anadromous Waters
- Streams

Roads
- Highway
- Primary
- Secondary
- Spur
- Winter

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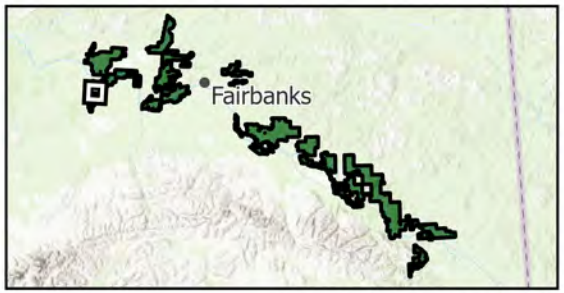
Miles

N W E S



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SUBUNIT 2C, CARIBOU CROSSING RNA. ACRES: 1,251

Rationale:

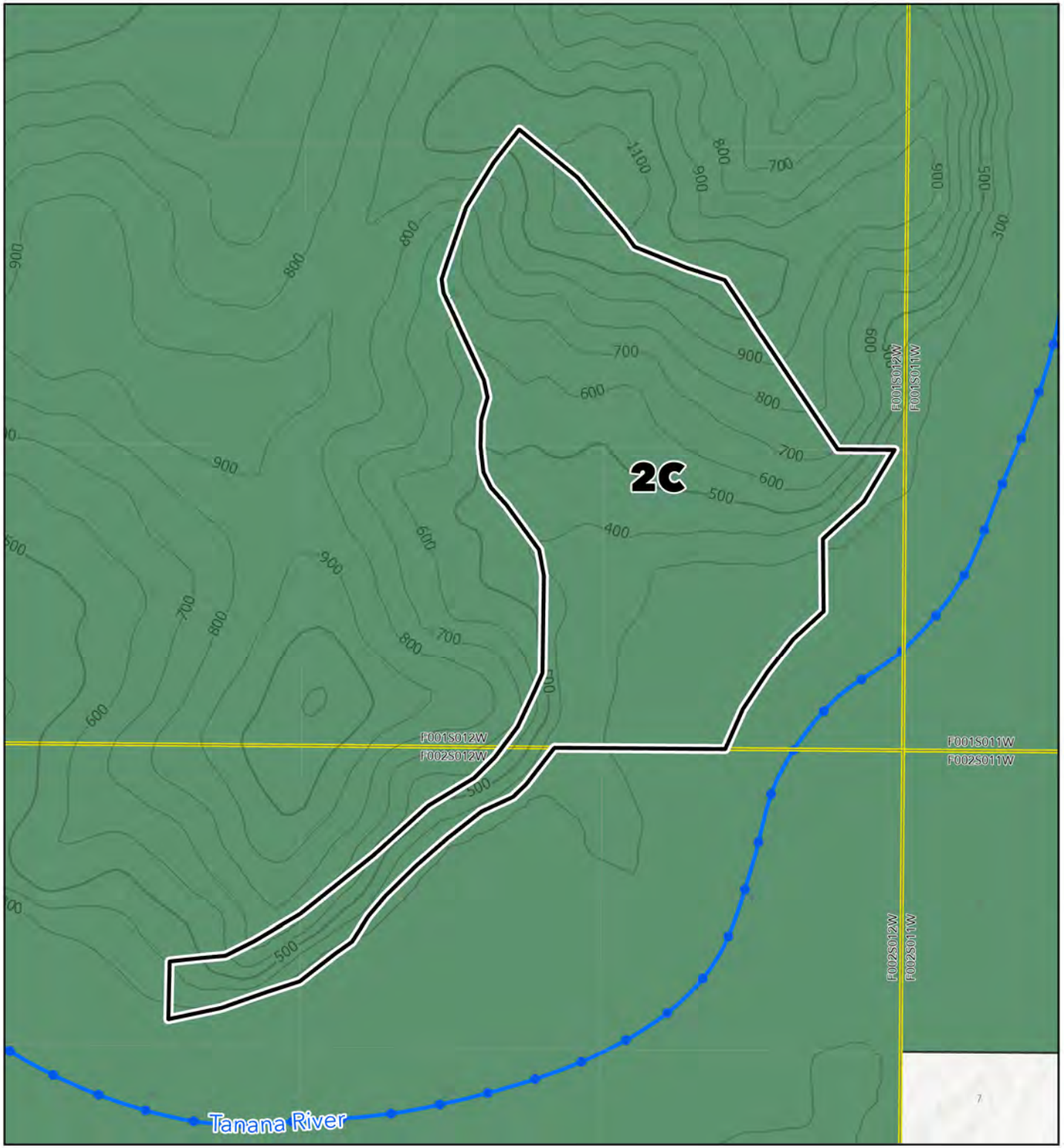
This area offers two contrasting lake types: an upland dune lake lying oblique to the dune-building wind direction, and a bottomland oxbow lake near the Kantishna River. There is good potential for the occurrence of some uncommon aquatic plant species. South-facing sand bluffs support open meadows, which may be a special habitat for uncommon plants. Outlines of old parabola dunes can be found in the area.

Description:

Float planes can land on Oblique Lake. The landscape is an aeolian dune system with a light, variable silt cap. Oblique Lake was named for a nearby oblique dune. Erosion of the soft sediment by the low-gradient lower section of the Kantishna River has produced oxbow lakes, which are a contrasting aquatic system to the dune lake. This area has large, continuous expanses of forest not broken up by wetland and permafrost openings. The level of Oblique Lake rises and falls, and there are actually two separate lakes when the water is low. Trumpeter swans nest on Oblique Lake. The driest, south-facing bluffs support a Pumpelly brome grass community. There are many giant ant colonies in the sand, and the vegetation is very much affected by ants. Forest research plots include Middle Point West, an old white spruce stand on sand, and Little Oblique Lake, a maturing birch forest.

1

Management Unit: 2C
Caribou Crossing



State Forest Boundary
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- Tanana Valley State Forest

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- Private Land
- Federal
- Municipal
- ANCSA

Hydrology
- Anadromous Waters
- Streams

Roads
- Highway
- Primary
- Secondary
- Spur
- Winter

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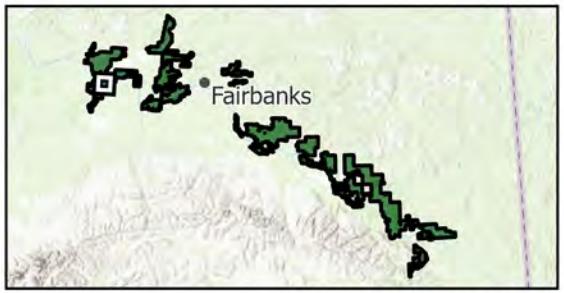
Miles



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SUBUNIT 8B, ROSA KEYSTONE DUNES RNA. ACRES: 2,337

Rationale:

This area represents a spectacular series of dunes and dune hollow basins built up over at least the last two Ice Ages and probably more (as much as 500,000 years). The dune-building winds were an unusual southeasterly direction. Buried wind-polished rocks and other ventifacts, along with Ice Age animal remains, are of interest to scientists and have been recovered nearby. Cold air appears to collect in the undrained basins, probably producing ultra-cold temperatures. Trees are unable to survive on the floors of the basins, which are interesting and species-rich meadows. A lake formed by a stream dammed by the dunes occupies the center of the area. There are signs of wolf use, and the area may be used as a denning site.

Description:

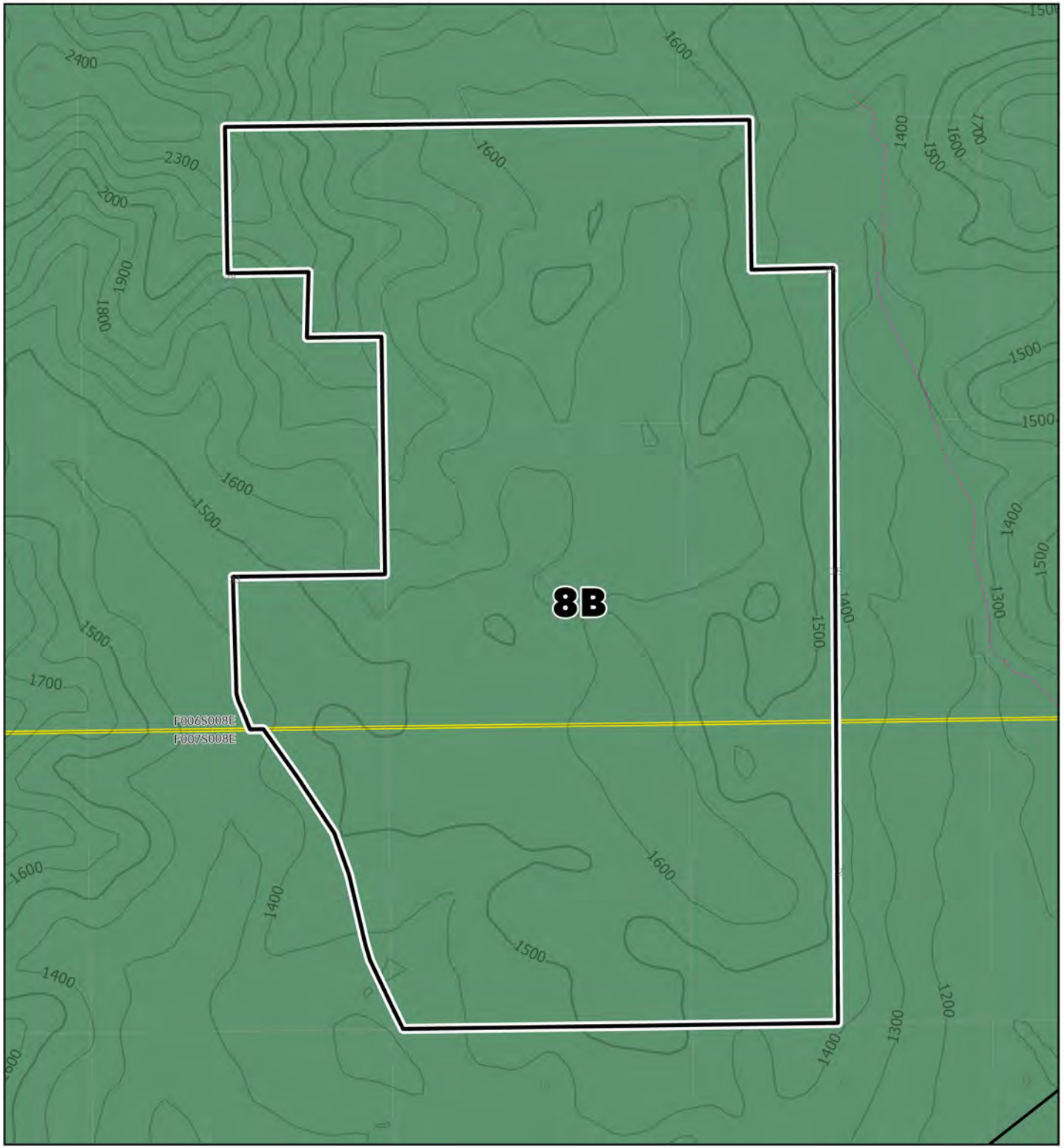
At least 66 vascular plant species were collected and cataloged from the Rosa-Keystone Dunes area. Several are mountain species found in the cold air drainage basins. Major dune waves are ¼ mile wide and ½ to 1 mile long. They terminate in steep slip slopes as tall as 200 feet. There is a second set of smaller dunes superimposed on the larger ones. The smaller dunes are only 10 to 20 feet tall and are one-third to one-tenth the size of the larger ones in width and length.

The tops of elongate linear dunes are covered with a forest of mixed poor aspen and excellent black spruce growth. Fire frequency appears to be very high in that type. Some moderately good birch forest growth is achieved on the crests and south-facing slopes above the tall slip slopes. Basins are meadows bordered with a shrub-dominated treeline. Some small trees below ½ meter tall are present in the basin meadows, but portions sticking above the snowline are apparently killed in the winter. Some white spruce forest is present on a south-facing dune surface at the low southeast corner of the area, as well as on residual “normal” soils offers the opportunity for studies to contrast these very different soils and the forests they support. The dune-dammed lake is a special feature of the area.

Very heavy wildlife use in the area has left an excellent system of trails on the straight, elongate axes of the dune crests. South-facing slopes above the inversion layer are apparently warmer sites which support prairie-like vegetation. Signs of wolf kills around at least one basin suggest the presence of a den on one of the warmer sand slopes.

1

Management Unit: 8B
Rosa-Keystone Dunes



State Forest Boundary
- Unit Boundary
- Tanana Valley State Forest

Land Ownership
- State Lands
- University of Alaska
- AK DNR-Mental Health Trust
- Private Land
- Federal
- Municipal
- ANCSA

Hydrology
- Anadromous Waters
- Streams

Roads
- Highway
- Primary
- Secondary
- Spur
- Winter

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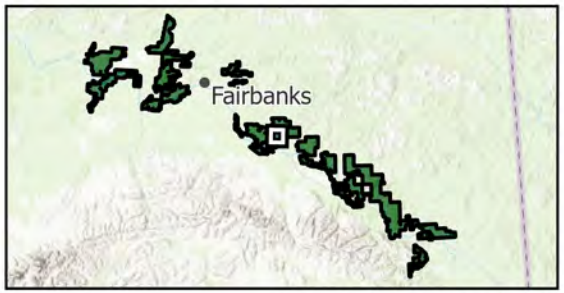
Miles



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SUBUNIT 9B, SHAW CREEK TAMARACK RNA. ACRES: 1,887

Rationale:

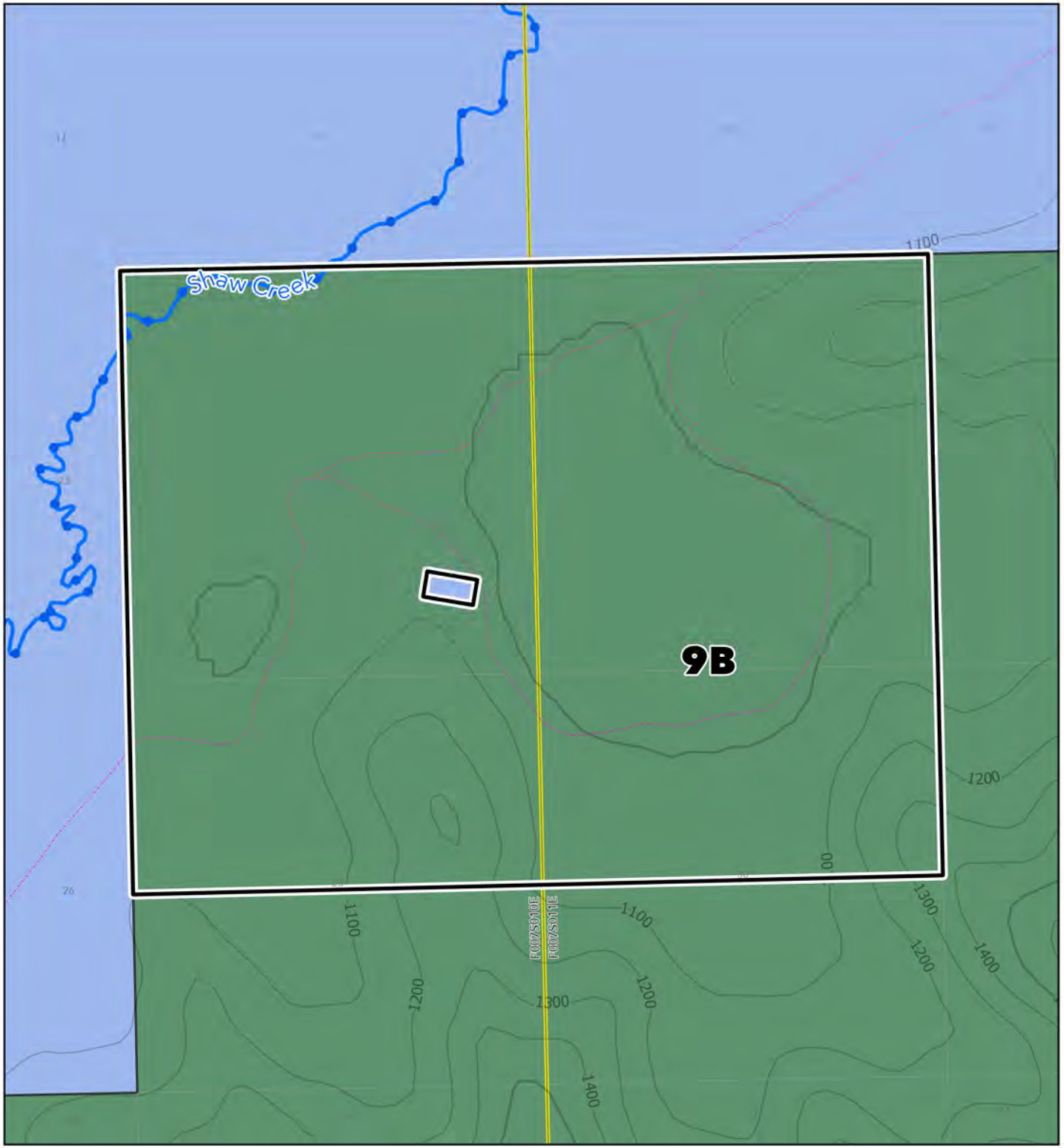
This area includes a major lake and its shoreline, as well as upland and bottomland sites with good growth of tamarack. The Shaw Creek Flats are known as one of the best areas for the growth and development of tamarack, which is apparently favored by the extensive fen (non-acid peaty) surfaces. There are few lakes of this size (approximately 300 acres) in the TVSF without shoreline developments. Peaty wetlands apparently support palsa mounds, a unique permafrost feature.

Description:

A small sample of representative diameters was taken in a larch-dominated, raised sand ridge on the Shaw Creek Flats. Diameters of larch ranged from 6 to 12 cm. Soil samples were taken from two sand exposures. Sand probably underlies much, if not all, of the flats. Upland stands with a considerable larch component are present near the west shore of the lake. A mosaic of upland forests occurs with at least three fire-origin age classes present. A fire approximately 35 years old partially burned a south-facing slope northeast of the lake and in the southern portion of the RNA. A fire-access trail of similar age rims the lake. It is impassible in the summer and has undergone thaw subsidence into the permafrost. The hardwood and pole-sized white spruce stand on the slope west of the lake probably originated 70 to 75 years ago. Older forest remnants occupy the northwest portion of the area. At least one species of aquatic plant collected here represents a range extension: *Carex chordorrhiza*.

The lake is a particularly significant wildlife habitat feature. Birds seen included red-necked phalarope, snipe, yellowlegs, alder flycatcher, Wilson's warbler, yellow-rumped warbler, red- tailed hawk, trumpeter swan, white-winged scoter, surf scoter, mew gulls, and canvasback. Three moose were also seen feeding together in the lake.

1



Management Unit: 9B
Shaw Creek Tamarack

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- Streams

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- Highway
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- Secondary
- Spur
- Winter

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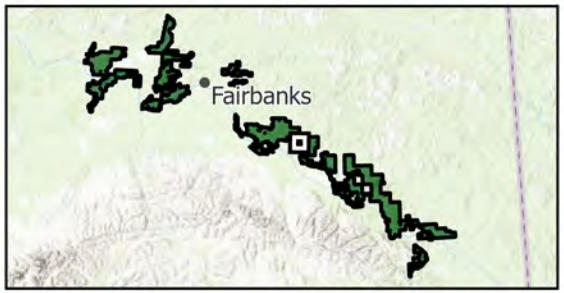
Miles



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SUBUNIT 10B, VOLKMAR BLUFFS. ACRES: 1,638

Rationale:

Volkmar Bluffs are probably the largest contiguous hill prairie in the Tanana Valley State Forest if not central Interior Alaska. They have experienced some encroachment from woody vegetation recently, but they are still large. They are also unusual in that they are on especially gentle slopes, as low as 18 degree slopes, and that the Tanana River is not now actively carving the toe of the slope to over-steepen the bluff. The bluffs support several uncommon plant species, only some of which occur at Johnson Slough bluffs. The bluffs may be maintained on such a gentle slope in a non-forested condition by 1) thin, rocky soils, 2) extreme rain shadow effect and low annual precipitation, and 3) active and relatively recent fire history.

The area is designed to also encompass a much more typical small hill prairie bluff along the active channel of the Tanana River in the southern portion of the area for contrasting studies.

Description:

Volkmar Bluffs is probably the best example of the low elevation hill prairie, and the associated vegetation complex, available for inclusion in a system of research sites. This site is more typical of the central Interior hill prairie type, and lacks the alpine element found at Johnson Slough Bluffs. During site documentation work, four transects of 20 stations at one meter intervals were marked and sampled in four different meadows at the site. Soil samples were collected. All the northern meadows were similar enough to be considered one system. Bees and other pollinators which may have evolved to endemic species were collected. Identification is still pending. Results were presented at the Alaska Science Conference, and plans are being developed to publish information about this and other hill prairies of Interior Alaska.

Noteworthy plant records include the following species on the “type needs” submitted at the time of the RNA planning criteria: *Silene williamsii* and *Erigeron caespitosus*. Two other hill prairie species found at the site are relatively uncommon in this region: *Artemisia laciniata* and *Agropyron spicatum*. Further work needs to be done in documenting the forest types and structure of the ridge.

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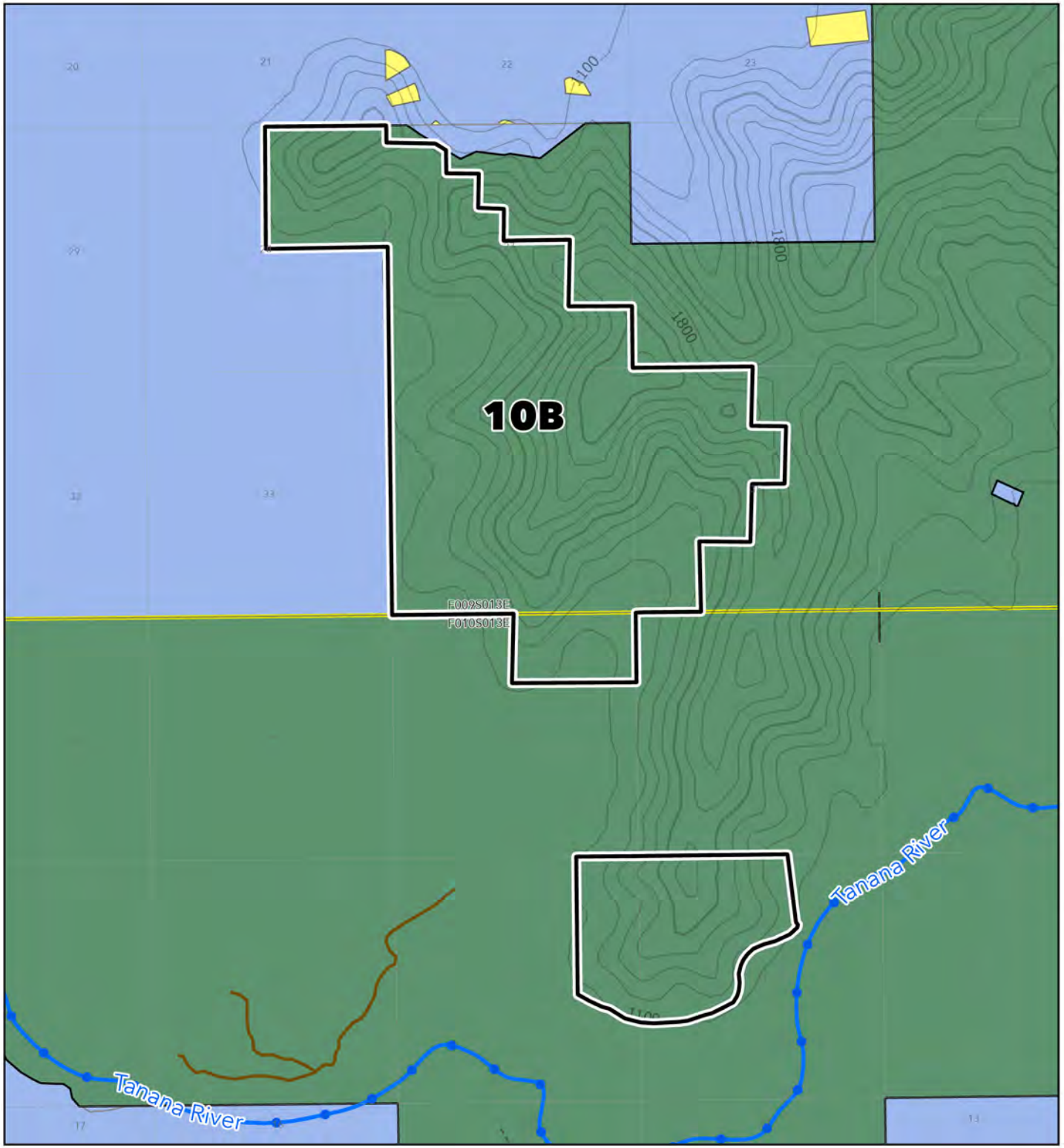
Management Unit: 10B
Volkmar Bluffs



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- Spur
- Winter

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Miles

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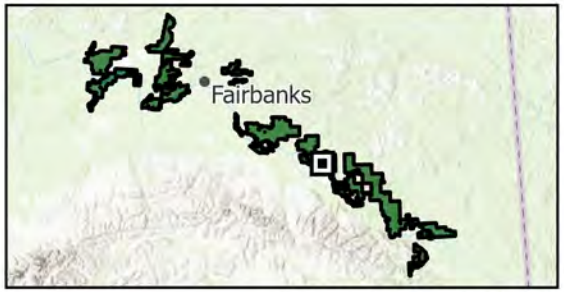

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SUBUNIT 10D, JOHNSON SLOUGH BLUFFS. ACRES: 1,038

Rationale

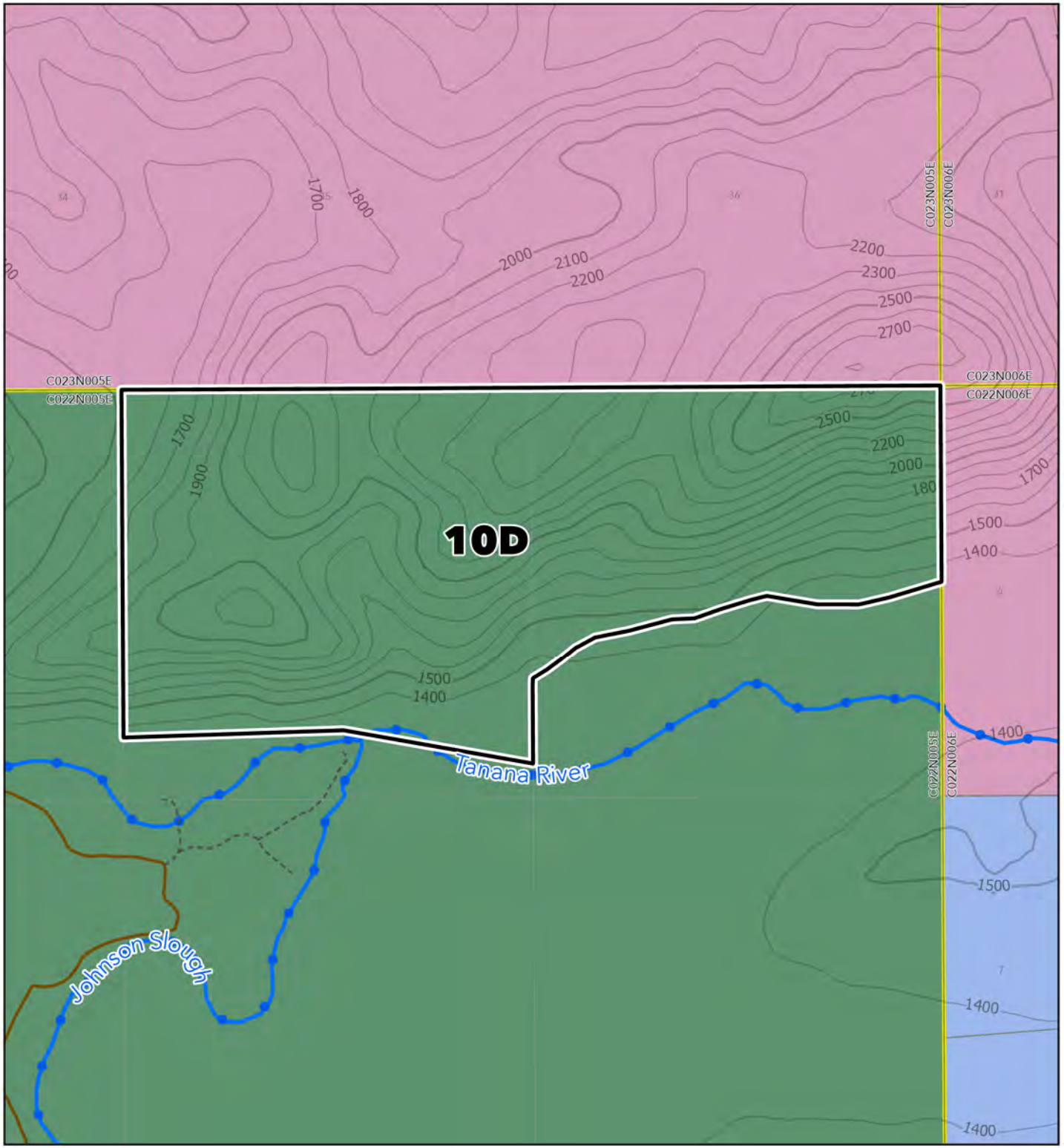
This RNA is located approximately 55 miles southeast of Delta Junction, and is three miles north of the Alaska Highway on a steep slope on the north bank of the Tanana River. It was chosen to include an exceptionally well-developed hill prairie on an over-steepened bluff which is being actively carved by the Tanana River. It includes several uncommon plants largely restricted to hill prairie sites, and is located at an apparent boundary between lower elevation hill prairies to the west, and an alpine-influenced set of bluff meadows of eastern Interior Alaska. Wildlife, especially moose, apparently use the area heavily in the late winter or very early spring. The bluff meadows of the area are of interest also because they may provide information about the kind of vegetation that was dominant over Interior Alaska during the Ice Age, and clues to how the modern vegetation developed.

Description

The RNA is approximately 50% non-forested. It makes up a slope system rising steeply from the north bank of the Tanana River. A dry ravine in the center of the area has its headwaters within ¾ mile of the Tanana River. A peak on the northern boundary reaches 246 feet in elevation, while the Tanana River elevation is about 1350 feet on the southern border. The site was documented in July of 1985, and four permanent transects of 20 locations one meter apart were established on the hill prairies. Collections were made and deposited in the University of Alaska Herbarium of at least 57 herbaceous hill prairie plants. At least four species collected were range extensions: *Agropyron spicatum*, *Castilleja elegans*, *Minuartia yukonensis*, and *Oxytropis splendens*. Three other relatively rare hill prairie species were also found: *Artemisia laciniata*, *Dodecatheon puchellum*, and *Plantago cane.*

1

Management Unit: 10D
Johnson Slough Bluffs



State Forest Boundary
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Land Ownership
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- AK DNR-Mental Health Trust
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- ANCSA

Hydrology
- Anadromous Waters
- Streams

Roads
- Highway
- Primary
- Secondary
- Spur
- Winter

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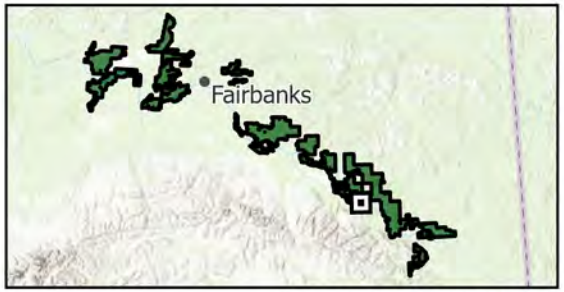
Miles

N W E S



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APPENDIX F: COMMERCIAL FOREST TYPES OF THE TANANA VALLEY STATE FOREST

UPLAND FORESTS

Upland forests include birch and aspen forests, mixed hardwood-white spruce, and white spruce forests on relatively well-drained, warm sites. Under natural conditions fire is common. Fire frequency cycles are estimated to be 100-150 years. Fires occur in a wide range of sizes, often creating openings of hundreds to many thousands of acres. A variety of other disturbances can also occur, resulting in large or small stand openings. These can include storm events, such as stem breakage and windthrow, and insect outbreaks. Tree diseases are also important disturbance agents, with root rot and stem decay being the principal cause of canopy-opening events attributable to pathogenic factors. Hardwood stands are usually the first forest cover type to develop following fire, with spruce developing more slowly until mixed stands occur. Stands dominated by white spruce are the oldest and least common upland forest type, generally growing only where no severe natural disturbance has occurred for 100 years or more.

The Tanana Valley has a long history of human activity, including periods of intense timber harvest as well as fire suppression treatment (Roessler and Packee 2000, Todd and Jewkes 2006, Wurtz et al. 2006). Natural disturbance also plays a significant role in the succession of the area. Recent inventory suggests that ages of sampled stands within the Tanana Valley range from 29 to 374 years, indicating a mature, relatively unmanaged forest. The average stand age in this study, weighted by vegetation strata area, was 100 years (Hanson 2013). It is important to maintain younger stands for wildlife habitat benefits and to provide a recruitment pool for the poletimber and sawtimber age classes. (See Appendix A. for recruitment and age class definitions.). Older stands may be more susceptible to insect and disease damage, and older stands with deep organic soil may be susceptible to severe fire effects during periods of drought or prolonged fire residence. More species and age diversity will result from the careful application of fire management techniques and harvest activities.

In areas where timber harvest is not likely to maintain a mix of stand types and ages, consideration of allowing wildfires to burn is encouraged. DNR will design management activities to maintain a mix of native forest types (including aspen, birch, mixed hardwood-spruce, and white spruce types) and stand ages. The effects of harvesting and fire are not identical. However, harvests will be located and designed to provide some of the key benefits of natural disturbances, particularly fire. These benefits may include warmer soils, increased sunlight, a mosaic of vegetation patterns, fuel reduction, and some wood biomass left on site, such as snags, logs, wildlife forage and diseased trees. Specific sales will be designed to achieve site-by-site objectives.

Examples of practices include:

1. Clumping sales to produce larger aggregate openings over time with patches of residual trees.
2. Using irregular shapes; following stand type boundaries in sale layout.
3. Removing or killing all species in harvested areas (e.g., white spruce and hardwoodsrather than just white spruce).
4. Designing harvests to increase disturbance and early successional forests. However, in certain

areas, salvage harvests will continue to be allowed to achieve other objectives, such as reforestation in high-demand areas, or to limit the spread of major infestations.
5. Tailoring reforestation techniques to ensure seedbed availability and adequate regeneration of a range of native upland forest types.
6. Where feasible, allowing wildland fire in areas where harvest is unlikely to maintain a mix of stand types and ages.
7. Using prescribed fire where feasible for site preparation, habitat management, and fuels management.
8. Experimenting with a variety of silvicultural systems to reflect non-fire disturbances and documenting the results.

FLOODPLAIN FORESTS

Floodplain forests include balsam poplar, mixed balsam poplar and white spruce, and white spruce stands. Mixed birch and spruce stands also occur, especially on older floodplain sites. Occasionally, pure stands of white birch occur on floodplain sites. These floodplains can be active or inactive and can best be described as "flat land bordering a stream or river." (See Appendix A.) The floodplain is a complex continuum of landforms called floodplain terraces. These terraces represent different time periods in the development of the landform and are created through accretion and erosion events. Frequently, only a one- or two-foot difference in elevation will separate terraces of different ages. Subsequently, these terraces exhibit different vegetation types both in species composition and age.

Floodplain sites are subject to a variety of natural disturbances: erosion, flooding, and ice damage near active river channels; fire; insects and disease; windthrow; and thermokarsting. From about 1900 to 1940, extensive harvesting occurred in floodplain sites, especially along the lower Tanana River. Mining also disturbed floodplain forests. These disturbances were typically smaller-scale than the large upland fires, and they created a complex mosaic of stand types and ages. Hardwoods are usually the first forest cover to develop, followed by mixed hardwood-spruce stands, and finally white spruce.

As in the uplands, stands composed primarily of white spruce are frequently the oldest commercial forest type. These stands develop over a longer period of time in the absence of stand replacement disturbance. Overall, stand-replacement disturbance is less frequent in floodplains than uplands, as evidenced by the presence of older stands with a greater range of stand ages, including stands greater than 180 years old.

DNR will manage floodplain forests to maintain a mosaic of floodplain forest types (balsam poplar, mixed spruce-poplar and spruce-birch, and white spruce stands), and a range of stand ages, including some older stands to maintain structural diversity.

Examples of silvicultural practices in floodplain forests include:

1. Using a variety of harvest systems with variable levels of canopy removal to emulate diverse natural disturbances.
2. Dispersing harvest openings.
3. Using irregular and/or meandering borders for harvest units.
4. Maintaining a mixture of white spruce and hardwoods when reforesting harvest sites.

Hardwoods usually reproduce aggressively by natural means,such as sprouting or seeding. White spruce will frequently be planted.

5. On cold soils in areas susceptible to fire under natural conditions, such as sites adjacent to upland areas or black and white spruce forest types, using mechanical site preparation or prescribed fire to warm soils on harvested floodplain sites.
6. Not planting naturally eroding harvest sites but providing seedbeds and seedsources and monitoring for adequate reforestation.
7. Considering harvest of actively eroding sites. Consistent with riparian management guidelines developed under the Forest Resources Practices Actfor Region III, consider harvest of actively eroding sites.
8. Where feasible, allowing wildland fire in areas where harvest is unlikely tomaintain a mix of stand types and ages.

APPENDIX G: TVSF LAND BASE HISTORY

The 2001 revision of the TVSF management plan contained a detailed list of land parcels recommended for addition to, or removal from the TVSF. Most of these recommended changes were realized in 2008 when SB 229, Tanana Valley State Forest/Minto Flats State Game Refuge Boundary Adjustment, was enacted, adding approximately 101,610 acres to the TVSF, deleting approximately 66,218 acres, and redesignating approximately 4,298 acres as part of the Minto Flats State Game Refuge. The recommendations made in 2001 are included in this appendix for reference, with annotations indicating which recommended parcels were successfully added or removed in 2008 with the enactment of SB 229.

Proposed Additions and Removals from the 2001 TVSF MP and their Outcomes

"Alaska Statutes Chapter 17, Article 3, (State Forest System) Section 41.17.210 states that State Forest proposals shall consist "primarily of commercially valuable forest land determined by the governor to be necessary for retention in state ownership for management under the principles of multiple use and sustained yield..." On the basis of these criteria, DNR recommends that the following additions and deletions be made to the Tanana Valley State Forest. The TVSF Management Plan Forestwide Map shows recommended additions and withdrawals. The recommended additions all contain commercial forest land and are adjacent to the State Forest. Prior to including them in the State Forest, DNR reviewed the management intent for each unit (currently in the Tanana Basin Area Plan) to be sure it was compatible with the intent of the State Forest. The recommended withdrawals are not commercially valuable forest land and do not otherwise contribute overall to the management goals of the forest. This plan shall be amended if any legislative changes are made in State Forest boundaries.

The following list defines abbreviations that are used in this section.

- TBAP: Tanana Basin Area Plan. Dept. Natural Resources, 1991.

Classifications

- Agricultural Land: agr
- Forestry Land: for
- Mineral Resources Land: min
- Public Recreation Land: pur
- Resource Management Land: rmg
- Settlement Land: stl
- Water Resources Land: wrs
- Wildlife Habitat Land: whb

TBAP unit numbers and classifications are shown in brackets in the list below. Examples: [Unit 2I4 for], [Unit 4K1 for, pur]. Descriptions of these units can be found in TBAP.

Recommended additions to the Tanana Valley State Forest

a. Subunit: C2J 4,480 acres.
   Classification: TBAP [Unit 2I4 for]

Legal Description: All state lands within:

Township 1 North, Range 6 West, Fairbanks Meridian

Section 1 *[Added in 2008]*

Sections 12 – 13 *[Added in 2008]*

Sections 24 – 25 *[Added in 2008]*

Sections 35 – 36 *[Added in 2008]*

This strip of land, located between Minto Flats and the adjacent State Forest, contains productive upland forests of white spruce and hardwoods. The unit is presently accessed by the Dunbar-Livengood winter trail and will be accessed by an all-season forest road. Management intent will be the same as for Subunit 4C.

b. Subunit: ClA, ClB 14,568 acres

Classification: - TBAP

Legal Description: All state lands within:

Township 2 South, Range 4 West, Fairbanks Meridian

Section 4, E1/2 , SW1/4 [Unit 1B3 for, pur, whb] *[Added in 2008]*

Section 8, those portions of S1/2 NE1/4, SE1/4, E1/2 SW1/4, SW1/4SW1/4, which lie North of the Parks Highway [Unit 1B3 for, pur, whb] *[Added in 2008]*

Section 9, North of Parks Highway [Unit 1B3 for, pur, wbh] *[Added in 2008]*

Sections 17 - 19, North of Parks Highway [Unit 1B3 for, pur, whb] *[Added in 2008]*

Township 2 South, Range 5 West, Fairbanks Meridian

State-owned lands within Sections 24 - 27, South of Parks Highway 1A1 for, pur, whb] *[Added in 2008]*

Sections 31 - 36 [Unit 1A1 for, pur, whb] *[Added in 2008]*

Township 3 South, Range 5 West, Fairbanks Meridian

Sections 2 – 10 [Unit 1A1 for, pur, whb] *[Added in 2008]*

State-owned lands within Sections 17 – 18 [Unit 1A1 for, pur, whb] *[Added in 2008]*

These units are on Nenana Ridge, border the State Forest, and have similar values. They are highly productive, easily accessible, upland forests. Adding these units to the State Forest will consolidate the state's highest value forest lands under a single management authority and plan.

c. Classification: TBAP, all state-selected land. 1,080 acres

Township 4 South, Range 8 West, Fairbanks Meridian

Section 12 [for, pur]. This parcel is adjacent to the TVSF.

Section 11, South ½ [for, pur]. This parcel will be adjacent to TVSF if Section 12 is added.

Section 15, E ½ NW ¼, W ½ NE ¼ West of the Tanana River [for]. This parcel will be within ¼ mile of the TVSF if Section 11 is added.

Three small state-selected parcels near Nenana adjacent to the TVSF are recommended for addition to the TVSF if they are conveyed to the State. These parcels are near Nenana and have a high potential for timber management. Highly productive spruce stands grow along the

Tanana River. The area is easily accessible in winter, and logging commonly occurred there in the past. The area would be managed for personal use and commercial timber production while protecting public use values of the Tanana River.

d. Subunit: C8B, 21,829 acres

Classification: TBAP

Legal Description:

Township 7 South, Range 7 East, Fairbanks Meridian

State-owned lands north of the Richardson Highway within Sections 19 – 21 [Unit 1Q3 for whb] *[Added in 2008]*

State-owned lands north of the Richardson Highway within Section 27 [Forestry classification: not within TBAP]

Township 7 South, Range 8 East, Fairbanks Meridian

Section 22, W1/2 [Unit 7A2 for, pur, whb] *[Added in 2008]*

State lands within Section 27, W1/2 [Unit 7A1 pur, whb] *[Added in 2008]*

Township 8 South, Range 5 East, Fairbanks Meridian

Section 1, S ½ SW1/4 [Unit 7G1 for whb] *[Added in 2008]*

Section 2, S1/2 N of military boundary, S1/2 NW1/4, SW1/4 NE1/4 *[Added in 2008]*

Section 3, SE1/4 NE1/4, NE1/4 SE1/4 N of military boundary *[Added in 2008]*

Section 11 - 13, North of the military reservation [Unit 7G1 for whb] *[Added in 2008]*

Township 8 South, Range 6 East, Fairbanks Meridian

Section 1, S1/2 SW1/4, SW1/4 SE1/4 *[Added in 2008]*

Sections 2 – 3, S1/2S1/2 [Unit 7G1 for whb] *[Added in 2008]*

Sections 7-16 [Unit 7G1 for whb] *[Added in 2008]*

Sections 17 - 18, North of the military reservation [Unit 7G1 for whb] *[Added in 2008]*

Sections 20 - 21, North of the military reservation[Unit 7G1 for whb] *[Added in 2008]*

Sections 22 – 26 [Unit 7G1 for whb] *[Added in 2008]*

Sections 27 - 28, North of the military reservation [Unit 7G1 for whb] *[Added in 2008]*

Township 8 South, Range 7 East, Fairbanks Meridian

Section 13, W1/2, SE1/4, SW1/4NE1/4 [Unit 7G1 for whb] *[Added in 2008]*

Section 14, W1/2 SW1/4, E1/2 NE1/4 *[Added in 2008]*

Section 15, S1/2, NW1/4, S1/2 NE1/4 *[Added in 2008]*

Sections 16 – 17 [Unit 7G1 for whb] *[Added in 2008]*

Section 19, SE1/4SE1/4 [Unit 7G1 for whb] *[Added in 2008]*

Sections 20 – 22 [Unit 7G1 for whb] *[Added in 2008]*

Section 23, NW1/4, N1/2 SW1/4, NE1/4NE1/4, W1/2 NE1/4 [Unit 7G1 for whb] *[Added in 2008]*

Section 24, N1/2 NW1/4 [Unit 7G1 for whb] *[Added in 2008]*

Section 27, W1/2 , NW1/4NE1/4 [Unit 7G1 for whb] *[Added in 2008]*

Section 28, NE1/4SE1/4, North of the Delta River [Unit 7G1 for whb] *[Added in 2008]*

Section 29 [Unit 7G1 for whb] *[Added in 2008]*

Section 30, NE1/4NE1/4 [Unit 7G1 for whb] *[Added in 2008]*

Section 34, NW1/4NW1/4 [Unit 7G1 for whb] *[Added in 2008]*

Township 8 South, Range 8 East, Fairbanks Meridian

Section 18, SW1/4SE1/4, S1/2 SW1/4, NW1/4SW1/4 [Unit 7G1 for whb] *[Added in 2008]*

Section 19, N1/2 , N1/2 SE1/4 [Unit 7G1 for whb] *[Added in 2008]*

Section 20, SW1/4NW1/4, NW1/4SW1/4 [Unit 7G1 for whb] *[Added in 2008]*

This unit comprises the bulk of the timberland occurring between Fort Greely and the Tanana River. The timber consists of productive white spruce stands along the Tanana River and mixed white spruce/hardwood stands on uplands to the South. Management goals would emphasize the area's wildlife, recreation, and timber resources. Because of habitat values in the floodplain, the recommended additions to the State Forest are south of the 1000-foot contour line from the Tanana River.

e. Subunit: 7D5, 160 acres. This Subunit was created by the 2001 Amendment to TBAP, from the original Subunit 7D4.

Township 9 South, Range 13 East, Fairbanks Meridian

Section 28, NE ¼ [Unit 7D5 (formerly 7D4) pur, whb] *[Added in 2008]*

This new subunit lies adjacent to the Tanana Valley State Forest Subunit 10B, the Volkmar Bluffs Research Natural Area. This quarter-section of land within the Tanana Basin planning area encompasses a large prairie feature that appears to be part of the prairie system in the adjacent Tanana Valley State Forest research natural area. This amendment is designed to expand the research natural area to include the remainder of that prairie system.

f. Subunit: C6F, 9,600 acres

Classification: TBAP

Legal Description:

Township 21 North, Range 8 East, Copper River Meridian

Sections 1 – 5 [Unit 6F2 for, pur, whb] *[Added in 2008]*

Township 22 North, Range 8 East, Copper River Meridian

Sections 6 – 7 [Unit 6F2 for, pur, whb] *[Added in 2008]*

Section 19 [Unit 6F2 for, pur, whb] *[Added in 2008]*

Sections 25 – 26 [Unit 6F2 for, pur, whb] *[Added in 2008]*

Section 33 [Unit 6F2 for, pur, whb] *[Added in 2008]*

Township 23 North, Range 6 East, Copper River Meridian

Section 13 [Unit 6F2 for, pur, whb] *[Added in 2008]*

Sections 24 – 25 [Unit 6F2 for, pur, whb] *[Added in 2008]*

Township 23 North, Range 7 East, Copper River Meridian

Section 36 [Unit 6F2 for, pur, whb] *[Added in 2008]*

This unit consists of several small parcels of land that were not included in the State Forest because of questionable land status. The primary purpose of adding these to the State Forest is to consolidate land management in the area. Management intent for most of this area would be the same as that for Subunit 12B.

g. Subunit: C6I, C6H. 25, 319 acres
Classification: TBAP
Legal Description:

Township 18 North, Range 13 East, Copper River Meridian
Section 3, W1/2 [Unit 6H1 rmg]
Section 4 – 6 [Sec. 4: Unit 6H1 rmg] [Sec. 5: Unit 6H4 for min whb] [Sec. 6: Unit 6D2 for] *[Sections 4-5 added in 2008]*
Section 7[Unit 6D2 for]

Township 19 North, Range 12 East, Copper River Meridian
Sections1 – 3 [Unit 6H4 for min whb] *[Added in 2008]*
Section 10 [Unit 6H4 for min whb] *[Added in 2008]*
Section 11, excl. F14438 Par B. [Unit 6H4 for min whb] *[Added in 2008]*
Section 12 [Unit 6H4 for min whb] *[Added in 2008]*
Section 13, excl. F14471 Par B. [Unit 6I1 for pur whb] *[Added in 2008]*
Section 14 [Unit 6I1 for, pur, whb] *[Added in 2008]*
Section 15, 16 E ½ [Unit 6H4 for, min, whb] *[Added in 2008]*
Section 17, S ½ [Unit 6I1 rmg and Unit 6H4 for, min, whb] *[Added in 2008]*
Section 19 [Unit 6I1 for, pur, whb and Unit 6H4 for, min, whb] *[Added in 2008]*
Section 20, S ½ and NE ¼ , excl. USS6011 F024775 Par.E. [Unit 6H4 for, min, whb] *[Added in 2008]*
Sections 21 – 36 [Unit 6H4 for, min, whb] *[Added in 2008]*

Township 19 North, Range 13 East, Copper River Meridian
Section 17, Southwest of the right bank of the Tanana River [Unit 6I1 for, pur, whb] *[Added in 2008]*
Section 18, South of the right bank of the Tanana River [Unit 6I1 for, pur, whb] *[Added in 2008]*
Section 19 [Unit 6I1 for, pur, whb] *[Added in 2008]*
Sections 20 - 21, West of the right bank of the Tanana River [Unit 6I1 for, pur, whb] *[Added in 2008]*
Sections 28 - 29, South of the right bank of the Tanana River [Unit 6I1 for, pur, whb] *[Added in 2008]*
Sections 30 – 32 [Unit 6I1 for, pur, whb]
Sections 33 - 35, Southwest of the right bank of the Tanana River [Unit 6I1 for, pur, whb] *[Added in 2008]*

These units are located along the Tanana River near Tok between Native lands and the State Forest. The units contain commercial timber, have good access, and would be valuable additions to the State Forest.

h. TBAP Subunit 6F3 and 6F2. 5,600 acres.
Township 21 North, Range 8 East, Copper River Meridian:

Section 6 [Unit 6F3 pur whb] *[Added in 2008]*
Township 23 North, Range 6 East, Copper River Meridian:
Sections 2 - 4 [Unit 6F2 for pur whb] *[Added in 2008]*
Section 18 [Unit 6F2 for pur whb] *[Added in 2008]*
Section 19 [Unit 6F2 for pur whb] *[Added in 2008]*
Township 23 North, Range 7 East, Copper River Meridian:
Section 34, NE1/4, S1/2 [Unit 6F2 for pur whb] *[Added in 2008]*
Section 35 [Unit 6F2 for pur whb] *[Added in 2008]*
Township 24 North, Range 7 East, Copper River Meridian:
Section 31 [Unit 6F3 pur whb] *[Added in 2008]*

These isolated units of TBAP lands are located near Dot Lake between Native lands and the State Forest. Their addition to the State Forest will consolidate management authority.

i. Subunit: C6G, 23,040 acres
Classification: Forestry, Wildlife Habitat TBAP
Legal Description:

Township 25 North, Range 7 East, Copper River Meridian [Unit 6G1 for, whb] *[Added in 2008]*

This township was apparently left out of the TVSF legislation by a mistake in a legal description that substituted a wrong township. Although the unit is currently inaccessible, including it in the State Forest as originally proposed would offer some management efficiency because it shares common access and similar resource values with adjoining State Forest lands to the west and south. The unit would be included in Unit 11 and managed for multiple use.

j. The following two parcels were excluded in the legal description of the TVSF because of federal interests. However, the federal interests are no longer valid. One of the two federal applications is closed and the other was discovered by BLM to have an incorrect legal description and is actually in another township outside the forest boundary. The legal descriptions of the two parcels follow.

- Parcel 1. 1,794 acres. Sections 5, 6 and 7, T19N, R13E, CRM. F028758 should now be included in the TVSF. *[Added in 2008]*
- Parcel 2. Section 17, T20N, R11E, CRM. F12548 should now be included in the TVSF. *[Added in 2008]*

Recommended Withdrawals from the Tanana Valley State Forest

a. Subunit 1C 1,898 acres
Legal Description:
Township 1 North, Range 11 West, Fairbanks Meridian
Section 18, 19, and 30, Those portions east of the Tolovana River *[Withdrawn in 2008]*

Township 2 North, Range 10 west, Fairbanks Meridian
Section 7, S1/2 *[Withdrawn in 2008]*
Township 2 North, Range 11 West, Fairbanks Meridian
Section 10, S1/2 *[Withdrawn in 2008]*
Section 11, S1/2 *[Withdrawn in 2008]*
Section 12, S1/2 *[Withdrawn in 2008]*

These are the portions of Minto Flats along the Tolovana River which are recommended for withdrawal so as to consolidate most wetlands in Minto Flats under a single management intent. The areas are highly productive wildlife habitat but contain very little timberland. The area borders the Minto Flats State Game Refuge and is recommended as an addition to the Refuge.

b. Subunit 3B 2,400 acres

Legal Description:

Township 4 North, Range 7 West, Fairbanks Meridian
Sections 27, 28, 29 *[Withdrawn in 2008]*
Sections 32, N1/2, SW1/4 *[Withdrawn in 2008]*

This area consists of wetlands bordering the Minto Flats State Game Refuge and is recommended as an addition to the Refuge.

c. Subunit 4B 2,400 acres

Legal Description:

Township 3 North, Range 3 West, Fairbanks Meridian
Section 25, S1/2 *[Withdrawn in 2008]*
Section 31, SE1/4 *[Withdrawn in 2008]*
Section 32-35, S1/2 *[Withdrawn in 2008]*
Section 36 *[Withdrawn in 2008]*

This is the eastern portion of Subunit 4B which is recommended as a TVSF withdrawal so that it is available for designation as part of the Chatanika State Recreation River corridor (see the "Management Guidelines and Activities" part of the Unit 4 section of Chapter 3). The area is comprised mostly of poorly drained wetlands along the Chatanika River and contains little timberland. Include in TBAP Unit 1E1 until a legislative designation is made.

d. Subunit 12A 19,200 acres

Legal Description:

Township 21 North. Range 10 East, Copper River Meridian
Sections 1-22
Sections 27-34 *[Withdrawn except sections 27 and 34]*

This township contains a low relief and swampy noncommercial forest. It was not included in the administration proposal. The unit's inclusion in the State Forest does not offer any management advantages for adjacent State Forest lands. Include in TBAP Unit 6G1 until a legislative designation is made.

e. Subunit 12A 19,200 acres

Legal Description:

Township 25 North, Range 8 East, Copper River Meridian

Sections 1-5 *[Withdrawn in 2008]*

Sections 8-17 *[Withdrawn in 2008]*

Sections 20-30 *[Withdrawn in 2008]*

Sections 33-36 *[Withdrawn in 2008]*

This township was apparently included in the State Forest because of a mistake made in the range. This unit is generally at a high elevation with few significant resources appropriate for the State Forest system. Include in TBAP Unit 6G2 until a legislative designation is made.

f. Subunit 13A, 13B 21,120 acres

Legal Description:

Township 20 North, Range 13 East, Copper River Meridian

Sections 1-18 *[Withdrawn in 2008]*

Township 19 North, Range 15 East, Copper River Meridian

Sections 1-15 *[Withdrawn in 2008]*

These areas were not part of the original administration proposal. They are underlain entirely by permafrost and forested with noncommercial black spruce. They have no other important resource values or advantages for inclusion in the State Forest. Include in TBAP Unit 6J3 until a legislative designation is made."

APPENDIX H: BIBLIOGRAPHY

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