ALASKA DEPARTMENT OF FISH AND GAME
JUNEAU, ALASKA

STATE OF ALASKA
William A. Egan, Governor

DEPARTMENT OF FISH AND GAME
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DIVISION OF GAME
Frank Jones, Director

REPORT OF 1972 AND 1973 SURVEY-INVENTORY ACTIVITIES- LAND EVALUATION AND GAME LABORATORY

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Project Progress Report
Federal Aid in Wildlife Restoration
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JOB PROGRESS REPORT

State: Alaska

Project Nos.: W-17-3,4 & 5 Title: Land Evaluation

Section: Lands (Region II & III) Job No.: 21.0

Period Covered: July 1, 1971 to December 31, 1973

ABSTRACT

The Lands Section's activities in Region II and III for July 1971 through December 1973 are presented. There are extensive discussions of the Joint Federal-State Land Use Planning Commission and interrelationships with federal, state, local and private interests.

Activities and developments associated with Potter Point State Refuge and GAAB sewer project are presented. Development of, and information concerning, the Fairbanks Wildlife Management Area are discussed in detail.

Recommendations for improvement and greater efficiency in Region II Lands Project are presented.

PART I. LANDS ACTIVITIES REGION II

INTRODUCTION

This report covers the first half of 1971 through calendar year 1973. Pete Cizimich occupied the Lands Coordinator position during most of 1973. Michael C.T. Smith held the position in 1972. The Regional Lands Coordinator in Fairbanks was J. Scott Grundy. The Anchorage Habitat Biologist slot was held by Roger Smith in 1972 and Nathan P. Johnson in 1973.

During this report period there was a shift towards greater involvement in land use planning. The Habitat Section was committed to strong support of the efforts of the Alaska Joint State-Federal Land Use Planning Commission (LUPC) and its information gathering body, the Resource Planning Team (RPT).

Today, more than two years into application of the Alaska Native Claims Settlement Act (ANCSA), we are beginning to see the profound effects this law is having on Alaska. The state has passed a point of no return; the "good old days" are gone forever.

The past was marked by one dominant custodian of the lands of Alaska but ANCSA and the Statehood Act have decreed a future with three major landowners: Federal Government, State Government, and natives.

Coupled with changes in land ownership is the current boom in development of Alaska's mineral and energy resources. Increasing population and affluence of a booming economy are placing unprecedented pressures on Alaska's wildlife resources and the managers of these resources. Dealing with these pressures will involve more than setting seasons and bag limits; land ownership, transportation means, sociological pressures and a host of other factors demand consideration. Realistic land use planning can be the vehicle to bring the many and varied factions and factors together into a workable system.

PROJECT ACTIVITIES

Work with the Land Use Planning Commission involved supplying basic resource data to their Resource Planning Team, particiaption in planning decisions and review and comment on other agency planning proposals. Towards the end of the report period we initiated an easement identification program to provide the Commission with access recommendations pursuant to Section 17b (1) of ANCSA.

Our working relationships with federal agencies are changing because of the impacts of ANCSA. Vast changes in land ownership may necessitate alteration or rebuilding of past agreements and practices.

Work with state and local governments plus the private sector has continued much as in the past but some changes are beginning to show up here too. In the next few years ANCSA and the growing developments in Alaska are likely to cause some drastic changes in our activities with these groups.

Alaska Joint State-Federal Land Use Planning Commission

The Alaska Native Claims Settlement Act is one of the most complex and far reaching pieces of legislation to affect Alaska since statehood, perhaps even since its purchase. Some, who have been familiar with the Act since prior to its passage, still have difficulty interpreting various sections. Conflicts and ambiguities are coming to light as administration of its provisions proceeds. Resolution of these conflicts may require litigation or Congressional action. But whatever else occurs, one thing remains constant; ANCSA is law, and it is a law with very demanding time constraints.

ANCSA established the Land Use Planning Commission. It also gave the Secretary of the Interior authority (Sec. 17d(2)) to withdraw 80 million acres to study for possible inclusion in the four national systems (forests, refuges, parks and wild & scenic rivers). He was also authorized to withdraw large additional acreages (Sec. 17d(1)) as national interest lands to be studied for their public values. The latter authority was probably given the Secretary so he could protect the bulk of the lands remaining after the withdrawals for possible native and four systems selections from indiscriminate settling via a "land rush" situation.

In establishing the Commission, Congress recognized the growing importance and national interest in sound land use planning. The Commission also acts as a check against the four systems administering agencies' opportunities to indulge in empire building.

The Commission attacked its task by directing its core staff and Resource Planning Team to develop generalized land use plans based on hydrologic regions and subregions. The intent was to look at the land on an ecological unit basis and get away from a management system or agency basis. R.P.T. was assigned the awesome task of gathering thorough data on all resources in the entire State of Alaska. For us, this was immeasurably simplified by publication of the"blue book", Alaska's Wildlife and Habitat. Other agencies and resource disciplines unable to go to such a compact source found it impossible to complete their resource inventories in the time allowed by ANCSA for the Commission to make recommendations on the d-2 areas. Thus the R.P.T. was forced to examine the Secretary's d-2 areas on a piecemeal basis. In addition, the Commission sought full public participation in its analysis of the d-2 areas by holding public hearings. The R.P.T. produced brochures and "fact sheets" covering just the lands within the d-2 areas. For this we had to provide input into other disciplines such as live and dressed weights of different species for use by sociologists in subsistence computations. We provided species distribution and life history sketches to the team's ecologist for development of an ecosystems map.

The R.P.T. was directed to analyze the d-2 areas and recommend land uses to the Commission. Habitat staff members and Sterling Eide, Management Coordinator of the Region II Game Division, represented Fish and Game interests on the analysis teams and during presentations of the findings to the Commission. Many of the recommendations were adopted by the

Commission whose recommendations to the Secretary differed considerably from those of the four systems' agencies. In spite of the political influences exerted, Department personnel who participated in these exercises developed a better understanding and appreciation of the potential land use plans based on extensive resource data.

Following the d-2 analysis program the R.P.T. returned to the hydrologic region resource inventories (see Fig. 1). We adapted the "blue book" species accounts and game management unit summaries to fit the hydrologic regions, then supplied some of the harvest information in greater detail.

Another charge given the LUPC by ANCSA was review of existing federal land withdrawals in Alaska, it was to look at them and see if they were still serving the purpose for which they were created. Kenai Peninsula Borough and the Cook Inlet Native Association viewed the directive differently, seeing it as an opportunity to ask the Commission to sanction a request that about 500,000 acres be removed from the Kenai National Moose Range and made available for native and borough selections. The R.P.T. made an analysis of the effects of such a proposal and we participated with information on winter ranges, calving areas and moose seasonal distributions. The R.P.T. and L.U.P.C. core staff concluded that the Moose Range was still serving the purpose for which it was created but the issue of the borough and native association's requests was unresolved by close of the report period.

We attended many Commission meetings and part of a week-long planning seminar sponsored by the Commission.

FEDERAL AGENCIES

Bureau of Land Management

A lengthy, time consuming analysis of ANCSA was undertaken early in 1972. ANCSA is drastically changing the BLM's role in Alaska and it will affect our working relationship with them. The forthcoming changes in land ownership or jurisdiction will alter and possibly nullify past agreements.

During the report period we supplied information on game resources using the Campbell Military Reserve in Anchorage. The BLM developed a land use plan for about 5,000 acres the Army proposed to drop from the reserve. Review of the Trans-Alaska Pipeline Impact Statement was coordinated by the Lands Project. (Note: Impact Statement review has grown tremendously during the report period and appears to be still growing [see Appendix I for tabulation of statements reviewed].)

Numerous meetings were held with the Interagency Pipeline Coordinating Committee which reviewed construction sipulations and alignment plans. We also attended a presentation on BLM's planning work in the Chitina River area. BLM's ORV regulations were reviewed and comments submitted.

REGIONS AND SUBREGIONS

1. ARCTIC
   - 1.1 West Arctic
   - 1.2 Colville
   - 1.3 East Arctic

2. NORTHWEST
   - 2.1 Kotzebue Sound
   - 2.2 Norton Sound

3. YUKON
   - 3.1 Lower Yukon
   - 3.2 Central Yukon
   - 3.3 Koyukuk
   - 3.4 Upper Yukon
   - 3.5 Tanana
   - 3.6 Upper Yukon-Canada

4. SOUTHWEST
   - 4.1 Kuskokwim Bay
   - 4.2 Bristol Bay
   - 4.3 Aleutian

5. SOUTH-CENTRAL
   - 5.1 Kodiak-Shelikof
   - 5.2 Cook Inlet
   - 5.3 Gulf of Alaska

6. SOUTHEAST

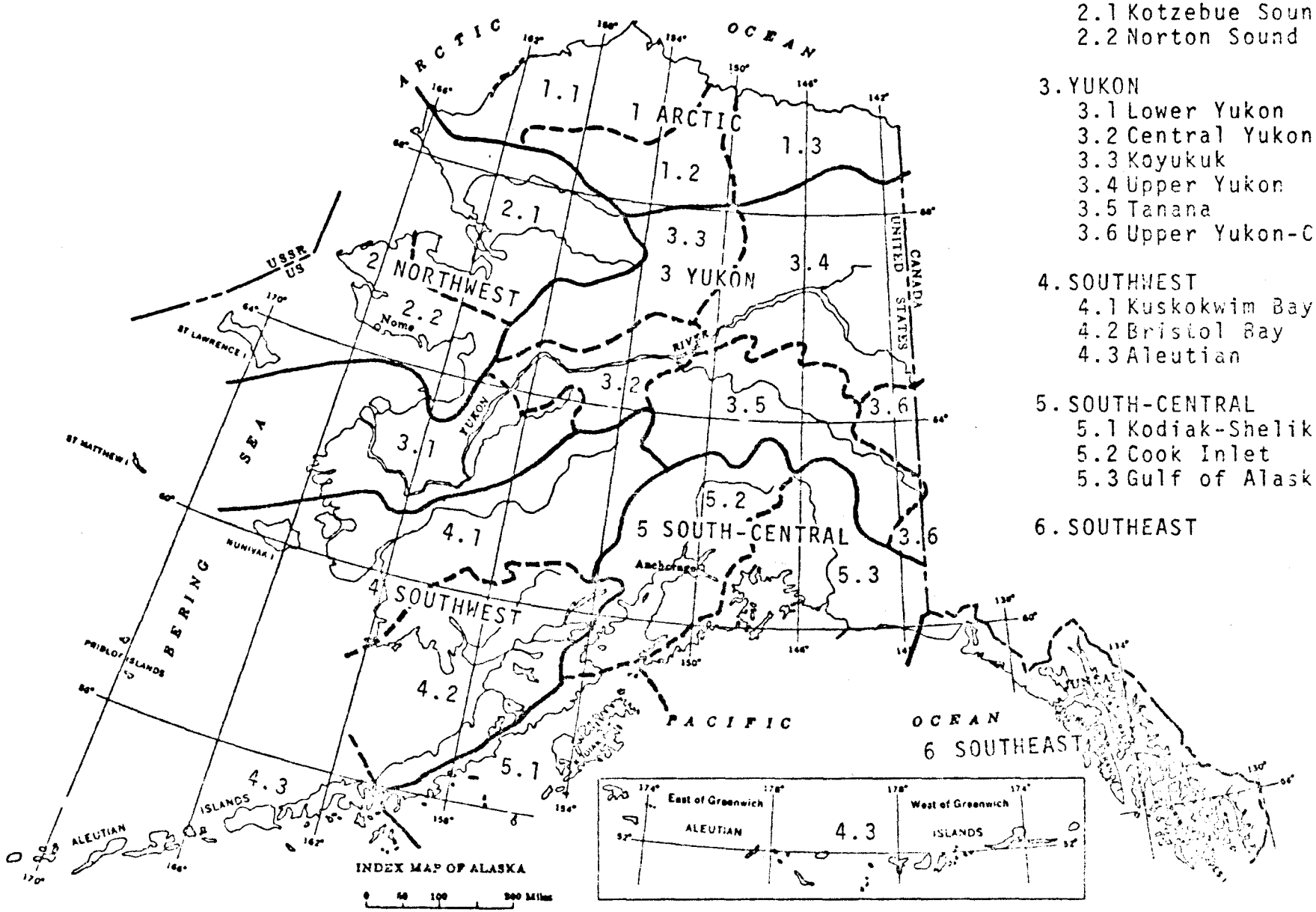


Fig. 1

Bureau of Outdoor Recreation

We participated in float trip studies of the Chitina, Nuyakuk, Copper, and Aniakchak Rivers sponsored by BOR to determine their suitability for classification in the Wild & Scenic Rivers System (see map, Fig. II). These float trips spanned the summers of 1972 and 1973.

In the fall of 1973 we participated in a BOR sponsored meeting with personnel from Parks, Canada. The Canadians reviewed their program of study for developing Wild, Scenic and Recreational River classifications. BOR went over the studies of the Fortymile, Sixty Mile, Tatonduk, Kandik, Porcupine, Firth and Canning Rivers. Two days were spent in overflights of these rivers and discussions with concerned agencies in Tok and Fairbanks.

Bureau of Sport Fisheries and Wildlife

We reviewed BSF&W's wilderness proposals for Kodiak, Semidi, Unimak, Clarence Rhode-Hazen Bay and the Aleutian Islands refuges. We disseminated the reports to appropriate area biologists and regional personnel, collected and organized their comments and forwarded the responses to the State Clearinghouse through the Commissioner's office.

Forest Service

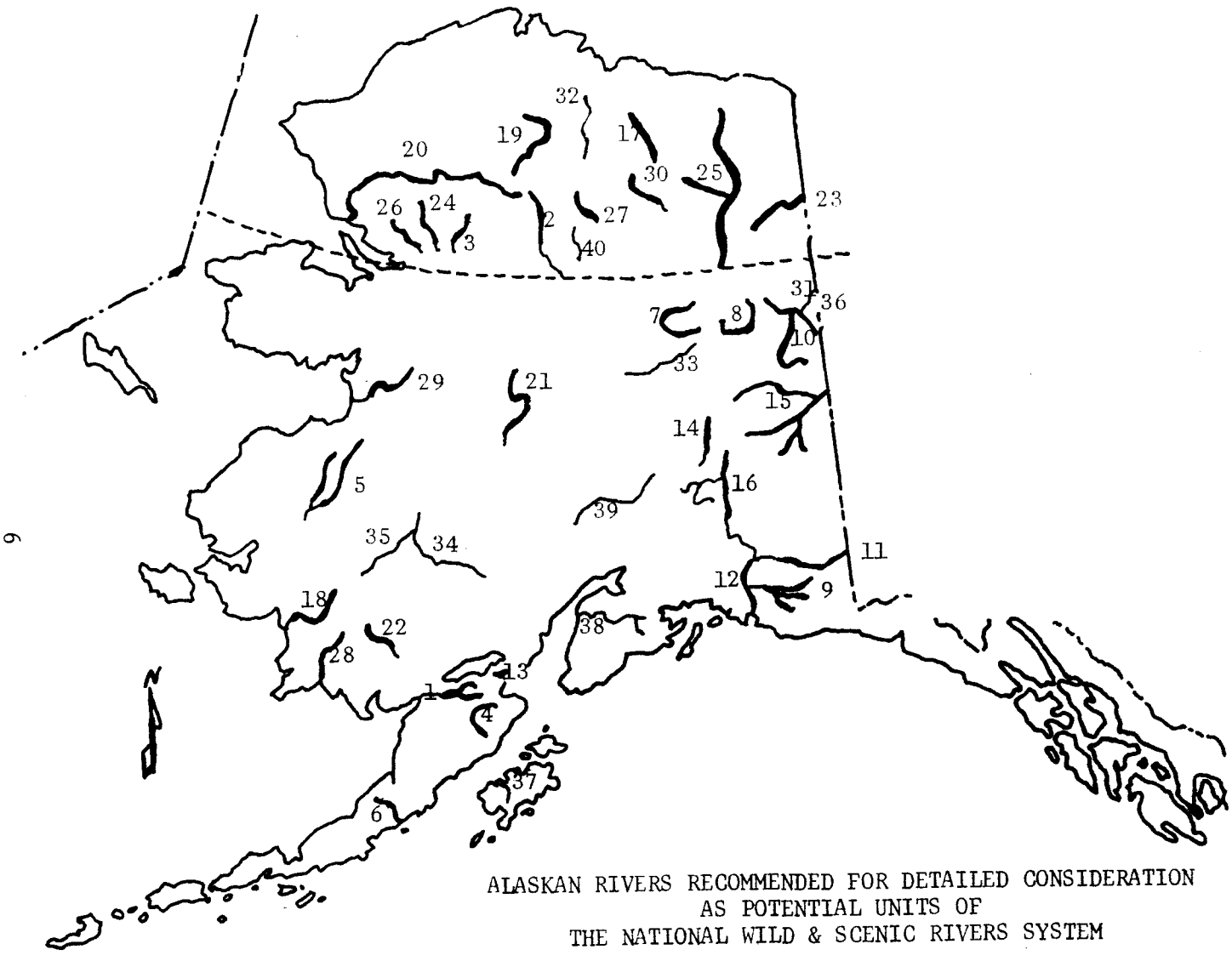
Projects reviewed were timber sales, wilderness studies and a proposed relocation of the Portage-Whittier Rail Terminal in Bear Valley. We attempted to provide information to the Forest Service in support of their protests of certification of questionable villages on Kodiak Island, the Kenai Peninsula and the Cordova area. B.I.A. has certified the villages as eligible for the benefits accorded by ANCSA. The certification is based on regulations that were written by the natives and their attorneys. U.S.F.S. claims the regulations are not backed by any provisions in ANCSA. By close of this report period the Forest Service was preparing an appeal to the Ad Hoc board provided for in the regulations.

We attended a U.S.F.S. meeting on logging practices and also had our annual Southcentral meeting with them.

STATE AGENCIES

Department of Environmental Conservation

We participated in an investigation of an oil spill in Cook Inlet allegedly from the Union Oil Company platform. A project to slow or prevent the drainage of significant waterfowl habitat at Stump Lake was abandoned, although the DEC approved, Department of Natural Resources did not.



ALASKAN RIVERS RECOMMENDED FOR DETAILED CONSIDERATION
AS POTENTIAL UNITS OF
THE NATIONAL WILD & SCENIC RIVERS SYSTEM

* All or substantial portions classified under 17(d)(2) of ANCSA.
\# Detailed studies have been initiated on segments shown in heavy line. Other rivers could be studied upon request by land manager.

*# 1. ALAGNAK
*# 2. ALATNA
*# 3. AMBLER
4. AMERICAN CREEK
5. ANDREAFSKY (2 FORKS)
*# 6. ANIAKCHAK
*# 7. BEAVER CREEK
*# 8. BIRCH CREEK
*# 9. BREMNER
*# 10. CHARLEY
*# 11. CHITINA
*# 12. COPPER
*# 13. COPPER (ILIAMNA)
14. DELTA
*# 15. FORTYMILE (SYSTEM)
16. GULKANA
*# 17. IVISHAK
18. KANEKTOK
*# 19. KILLIK
*# 20. NOATAK
*# 21. NOWITNA
*# 22. NUYAKUK
*# 23. PORCUPINE
24. SALMON
*# 25. SHEENJEK-KONESS
26. SQUIRREL
*# 27. TINAYGUK
*# 28. TOGIAK
*# 29. UNALAKLEET
*# 30. WIND
*# 31. YUKON

32. ANAKTUVUK
33. CHATANIKA
34. HOHOLITNA
35. HOLITNA
36. KANDIK
37. KARLUK
38. KENAI-RUSSIAN, SWANSON - SWAN LK
39. SUSITNA
40. WILD

Fig. II

Department of Highways

Many Highway's projects were reviewed during the report period: Newhalen-Nondalton Highway, Kodiak-Bruhn Pt. Highway, Whittier-Portage access, Kenai Bridge, Copper River Highway, an unauthorized crossing at Lakina River, Kenai River R/W, Kodiak NAS Road and Port Lions Road. The Copper River Highway EIS was reviewed and partially rewritten. This was a particularly frustrating project for those involved because the Highway Department was using maintenence funds to turn the Old Cordova-McCarthy railroad grade into a road even as the impact statement was being written.

Department of Natural Resources

Division of Lands

Reviews were completed and comments submitted on land sales on the Kenai Peninsula, in the east Matanuska Valley, and the Buffalo Mine area.

Seven state timber sales were commented on by the Region II staff. Comments were submitted for the State Selection applications filed early in 1972.

An ILMT for five acres in the McArthur River Management Area was processed and submitted.

Division of Oil and Gas

Oil and gas lease sales were reviewed and comments submitted. A controversy developed over the Katchemak Bay lease because of the high fisheries value and local opposition to oil development. The lease auction was held in spite of the protests.

Critical waterfowl habitat maps for the Susitna Flats were developed for the Division of Oil and Gas to use in their sale planning.

Comments were submitted on a proposed coal prospecting permit in the area west of Cook Inlet near Beluga Lake.

A field inspection of seismic work on the Kenai Peninsula demonstrated the lesser environmental impact of an air-born operation as opposed to tracked vehicles.

Division of Parks and Recreation

A joint field trip to the Wood River-Tikchik Lakes area was made as part of the park planning study. Plans for Chugach, Katchemak, Hatcher Pass and Lake Louise Parks were reviewed.

LOCAL GOVERNMENT

Greater Anchorage Area Borough

Administration of Potter Point State Game Refuge required considerable effort during the report period. This narrow band of saltwater marsh, unique for its comparatively pristine character at the edge of Anchorage's growing suburbs, remains largely intact despite continuing demands on it for other land uses.

Activities began in February 1972 with a meeting concerning future development of the refuge attend by representatives of the Greater Anchorage Area Borough, U.S. Fish and Wildlife Service, and the Alaska Department of Fish and Game. The fact that much of the refuge is privately owned or currently under Greater Anchorage Area Borough selection makes it less than an attractive cooperative interagency management venture. The Borough's representatives stated that they could not furnish any development monies for the refuge in the immediate future. The Department of Fish and Game is clearly the only potential motive agency for managing the refuge. The land status picture is still clouded by the Borough's pending selection as the State Division of Lands retains under advisement the Borough's pending request to withdraw the selection, a matter which may take several years to settle. The refuge was recommended as a possible seaplane base by consultants to the Division of Aviation, but such use is considered unsuitable by both borough and ADF&G representatives.

The Greater Anchorage Area Borough's application for an easement to construct a sewer trunk line precipitated the latest in a continuing series of utility corridor vs. wildlife habitat confrontations in the refuge. The sewer line was planned to be constructed within a 105-foot wide right-of-way along the tide flat from Oceanview Subdivision to the mouth of Campbell Creek, some 2.2 miles. Preliminary evaluation indicated that the line would transect considerable nesting and feeding habitat for waterfowl, resulting in both temporary and permanent damage. Under authority of Alaska Statute 16.20.060 governing use of refuge lands, the Borough was requested to furnish complete plans for the construction. After a complete review of plans, a series of field inspections and meetings with the Greater Anchorage Area Borough Department of Public Works representatives, it was recommended that an alternate route, either an upland or further seaward location, be considered. It was felt that much less permanent habitat loss would be involved in these routes. The tidal flat location was considered preferable from an economic standpoint for these reasons:

1. Inexpensive easements were available.

2. Fewer technical problems in construction.

3. Permit gravity flow without need for additional lift stations.

Four alternate alignments, two tidal and two upland, were then subjected to an environmental impact-economic cost analysis. The bluff routes were considered unfeasible as they necessitated excessively deep trenching and addition of a lift station. The seaward alignment was rejected because of possible damage from tidal action.

Final agreement on the alignment was reached in August 1972 at a meeting attended by representatives of Division of Lands, Department of Environmental Conservation, Greater Anchorage Area Borough and Department of Fish and Game. The combined weight of increased construction costs involved in a major realignment of the line and the imminent approach of a federal deadline for providing primary sewage treatment for the Greater Anchorage Area heavily favored the original placement on the tidal flat. We presented a proposal involving minor realignment, skirting much of the timber-pothole vegetation complex near the bulff, as well as construction of a system of berms and ponds within part of the right-of-way in an attempt to compensate for waterfowl habitat loss along the entire route by improving habitat in a localized area.

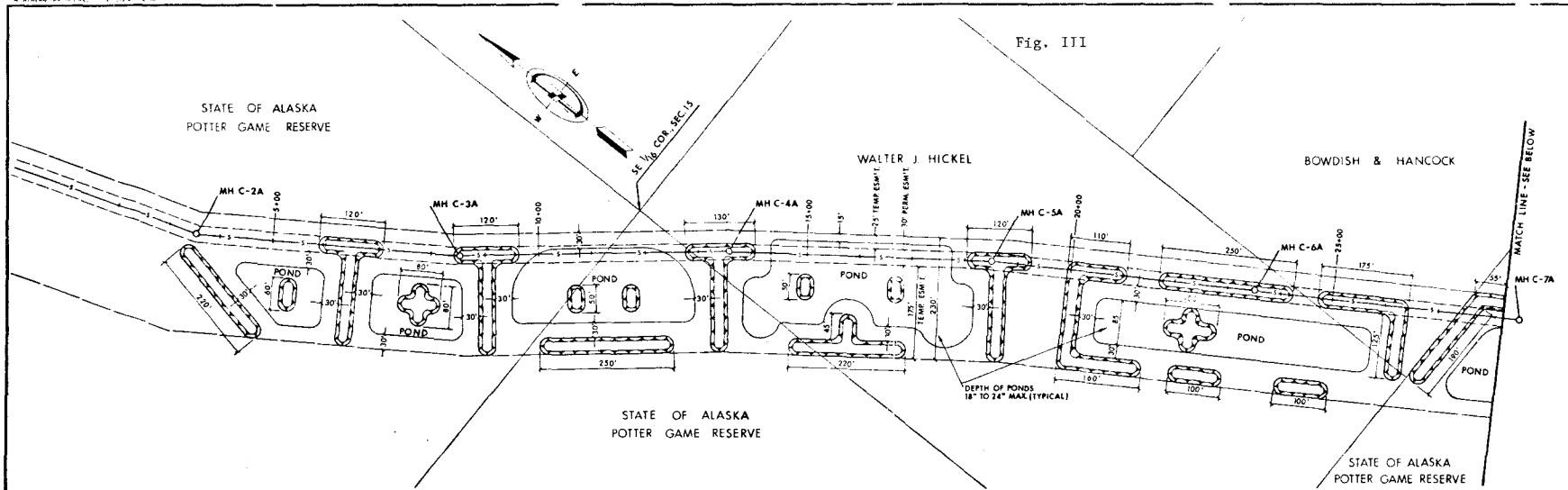
It was agreed that concurrent with line construction, a system of berms and ponds would be built and revegetated with a 200-foot wide right-of-way approximately 5,000 feet long. It was further agreed that an effort would be directed toward obtaining appropriations for purchasing additional lands within the refuge to prevent possible future degredation of habitat by private landholders.

Construction plans and specifications for the pond-berm complex were drawn up by the Borough's consulting engineer, Dickinson-Oswald and Partners, using conceptual plans and recommendations furnished by the Department of Fish and Game (Fig. III). Various spatial arrangements, sizes and shapes of berms and ponds were designed within the constraints of matching pond excavation volumes with berm volumes. Topsoil was placed on some of the berms. Some berms were fertilized and seeded with a mixture of grasses.

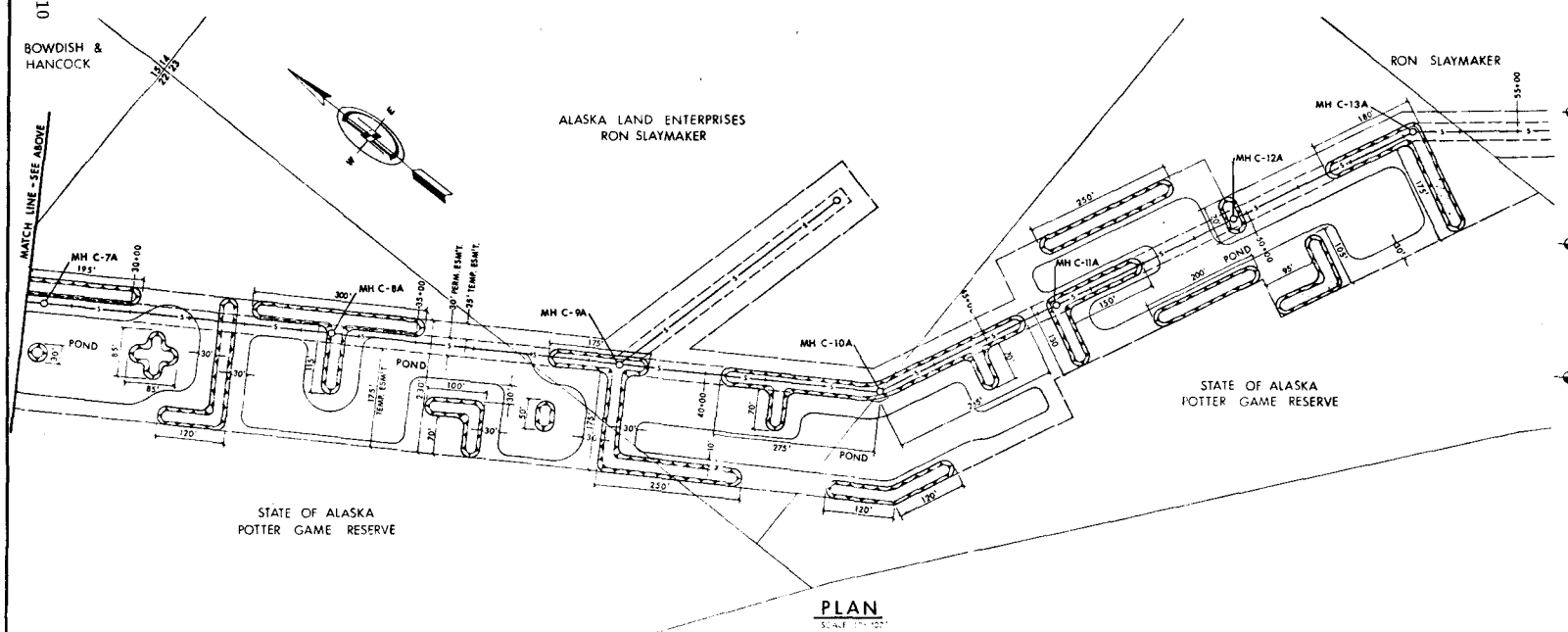
The project will be inspected periodically to determine condition of berms and ponds, extent of revegetation and use by waterfowl (see area biologist report Appendix II). Information obtained from this project will be applicable to future ventures in waterfowl habitat manipulation in saltwater marshes in the state.

Increasing pressures to utilize marshlands for utility and transporataion corridors, as well as other detrimental land uses, make prominent the need for protection and planned development of the refuge. While the impact of the present sewer line construction project has been mitigated somewhat by partial realignment and pond-berm construction, an additional sewer line is planned for the refuge in the near future. Implementation of a management plan, purchase of additional lands within the refuge and favorable borough zoning for tidal marshlands are definitely needed to assure the integrity of the refuge. Moreover, there is a great need for inclusive state coastal zone protective legislation requiring extensive review for planned developments along coastlines.

Fig. III



PLAN
SCALE 1" = 100'



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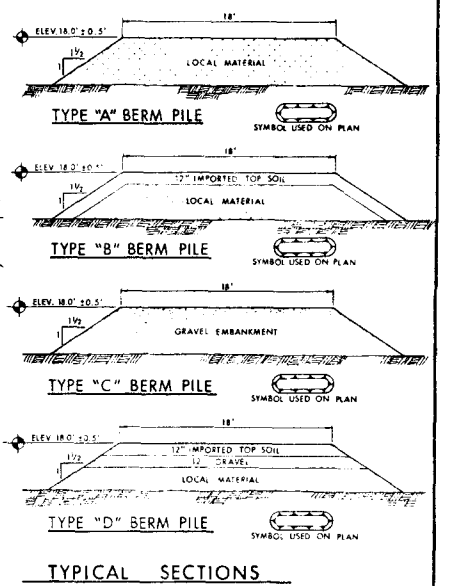

TYPICAL SECTIONS
SCALE 1" = 5'

DATE DESIGNED / DRAWN / CHECKED / APPROVED	BY / DATE / BY	DICKINSON-OSWALD & PARTNERS CONSULTING ENGINEERS 800 COLDOVA STREET ANCHORAGE, ALASKA	DEPARTMENT OF PUBLIC WORKS GREATER ANCHORAGE AREA BOROUGH APPROVED	POTTER GAME RESERVE PONDS & BERM PILE LAYOUT & DETAILS	SCALE Horiz. / Vert. / DATUM / FILE NO.	SHEET OF

Other borough activities involved review of subdivision plats and attendance of several assembly meetings.

GENERAL MULTI-AGENCY ACTIVITIES

Permits, sanctions or authorizations were given for the following:

Pipeline and water use by Glacier Bay Seafoods, gravel removal at Afognak Bay, mining on the Andreafsky River, a gas line crossing on Campbell Creek, Meadow Creek water use, offal dumping in the Naknek River and Usibelli coal strip mining.

Pollution of Campbell Creek by an Anchorage sand and gravel firm was investigated. Studies participated in or concluded were the Bristol Bay Study (Appendix III), cataloging of Alaska Peninsula bush airstrips for possible public dedication, sea otter surveys, possible development of a docksite access at Goose Bay and issue analyses of the lands and critical habitat programs.

A one-day aerial photography project produced pictures of dredging on Campbell and Ship Creeks, the possible Sheep Creek Valley dam site, Cottonwood Creek Bridge, Hunter Creek Road, Swan Lake's agricultural drainage, Goose Bay boat launch site, Whittier-Portage access and the Chickaloon Flats.

The Susitna Flats Management Plan was the subject of a meeting with the State Department of Natural Resources and Mat-Su Borough. Later in the report period the plan was reviewed and maps were prepared.

Comments were submitted to the consultants Dames and Moor on a Kenai Peninsula gas pipeline. An inquiry from the International Association of Game, Fish and Conservation Commissioners regarding energy and wildlife was handled. The relationship is an extremely complex one in Alaska.

The Lands Project supplied physiographic information to the Game Division for Alaska's Wildlife and Habitat.

Finally, moving the office to new quarters consumed considerable time and energy.

MEETINGS ATTENDED

Alaska Rural Development Council-Understanding ANCSA
Alaska Parks and Recreation Council
Alaska Environmental Institute-Statewide Trail Study
Greater Anchorage Area Borough Assembly
Mat-Su Borough Assembly
Alaska Conservation Society
Sierra Club
Interagency Pipeline Committee
Fish and Game Board Meetings
Game Division Annual Meetings
Land Use Planning Commission Sessions

DISCUSSION

The past two years in Alaska have been a time of turmoil and upheaval. ANCSA, oil development and obligations of state land interests have created a hyper-excited atmosphere of near panic. The word "crisis" is commonly applied where the words "situation" and "problem" used to apply. The current energy crisis, whether real or contrived, has aggravated an already over-stimulated situation.

Within the Department we seem to be participating in a process of reactive or "catch up" management. As problems arise we attempt to handle them but cannot seem to get on top of the situation. Admittedly this is better than wishing them away, but it may be obscuring more serious problems that pose a far more lethal threat.

Secretary Morton's legislative proposal for the d-2 lands contains, at the very least, seeds for complete management of fish and game resources by the administering federal agencies. In some instances, the usurpation is clearly spelled out. The native groups have indicated publicly that they feel they should have total management authority over the lands they select. Although the Marine Mammals Protection Act provides for return of management authority to the state, this has not yet been accomplished nor does there appear to be any real impetus on the part of the Federal Government to accomplish the task. While we scurry about reacting to threats to resources here and there, we are being distracted from seeing that we may someday be in a position of having no resources to manage, not because the resources have disappeared, but because we have no authority over them on more than half of the lands within the state.

Our best chance of preventing this from happening is by getting involved in and pushing for sound land use planning as a basis for all actions within the state. In its purest form, land use planning works irrespective of land ownership or agency responsibility. Its foundation is the resources, the natural, human, economic, social, political and you name it resources of the state. Though we would no longer be making decisions based solely on what should be done for the fish and game resources, we would not have them made without their consideration either.

This is not to say we should neglect all other obligations and have everybody jump into planning. That would be the other extreme It is saying we must become much more actively involved than we have in the past.

RECOMMENDATIONS

1. There should be established within the Habitat section a position of Planning Coordinator. His duties should include active participation in the Land Use Planning Commission's programs.

PART II. LANDS ACTIVTIES REGION III

INTRODUCTION

Objectives:

The major objectives of the Region III Habitat and Lands Program are:

1. To assure that wildlife values are considered in all development projects, land use and land classification activities.

2. To submit recommendations to the appropriate federal, state or local government agency for purchase or classification of lands important for wildlife habitat protection, public access and public use.

Procedures:

It is unrealistic to attempt to establish a percentage breakdown of program activities because of changes in program emphasis from year to year by our Department and other state and federal agencies. Major program activities include:

1. To design, plan and budget for Habitat Section activities and studies in Region III.

2. To assist in designing, planning and budgeting for statewide Habitat Section studies.

3. To supervise and evaluate the performance of assigned personnel.

4. To compile biological and related data for the purpose of making recommendations concerning land use and access. Specifically, this involves evaluation of all development projects and environmental impact statements in Region III to assure protection of wildlife values.

5. To maintain close liaison with all land use or managing agencies such as the Bureau of Land Management, U.S. Forest Service, U.S. Bureau of Sport Fisheries and Wildlife, U.S. Park Service, State Department of Natural Resources, State Department of Environmental Conservation and the political subdivisions in order:

    a. To evaluate state and federal land classifications, land sales, timber sales and material sales to assure consideration of wildlife values.

    b. To review proposed seismic, drilling, water use, mining permits and other permits to assure consideration of wildlife values.

c. To issue anadromous fish stream permits as outlined in Alaska Statute Title 16 under the authority vested in the position by the Commissioner of Fish and Game.

d. To review and/or develop environmental impact statements in accordance with the National Environmental Policy Act of 1969 (PL 91-190).

6. To maintain close liaison with major land users such as the Alaska Miner's Association, native groups, conservation groups, etc. and often act as Department spokesman to these groups.

7. To develop and implement a land use program for Department owned property in Region III.

8. To acquire and supply necessary data as requested by the divisions of the Department of Fish and Game and participate in their programs as time allows.

PROJECT ACTIVITIES

FEDERAL AGENCIES

Bureau of Land Management

I coordinated the 1972 annual meeting with the Fairbanks District of the Bureau of Land Management in accordance with the Memorandum of Understanding established between our agencies several years ago. BLM agreed to assist in protection of critical habitat areas such as mineral licks, seabird cliffs and raptor aeries by withdrawing them from the mining and settlement laws. BLM indicated they were formulating new fire suppression objectives on an area by area basis and agreed to coordinate the formulation of these objectives to be as compatible as possible with the game management objectives of our Department. BLM also agreed not to issue any permits for material sources in or near a watercourse without a letter of approval from our Department. Similar agreements were developed at the 1973 session.

BLM indicated at the 1972 meeting they would assist our Department and the Alaska Division of Lands by providing necessary fire suppression equipment and manpower if required at the prescribed burn slated for the summer of 1973 in the Delta Junction area. However, in the summer of 1973 BLM indicated they had "no authority to expend federal funds on state lands."

Our Department agreed to give BLM as much advance notice as possible of proposed introduction or re-introduction of wildlife onto BLM administered lands. To avoid any potential conflict with BLM's land management policies, we also agreed to notify BLM of any proposed limited access or special use hunting areas.

BLM requested fish or game information several times during the report period and the Habitat Section either provided the information or coordinated the response.

Of interest was the evaluation of BLM's proposed implementation of Executive Order 11644 regarding use of off-road vehicles (ORV's) on public lands. We pointed out that exclusion of ORV's used in connection with mineral or oil and gas geophysical exploration presented a serious loophole and provisions for permitting such explorations and other possible exceptions should be developed. Detailed recommendations were also submitted to the Department of the Army regarding implementation of this Order on lands withdrawn for military purposes in Region III.

During the report period I attended several meetings regarding Alyeska's proposed Trans-Alaska Pipeline project. As a member of the Wildlife Section of the Interagency Fish and Wildlife Team coordinated by the BLM Pipeline Section, I submitted numerous recommendations regarding material source locations, sportsmen access and big game trail overpass locations, pipeline construction modes, etc.

The Bureau of Outdoor Recreation

The Bureau of Outdoor Recreation is one of the four agencies authorized by Congress to study and establish recommendations for d-2 lands as authorized by Section 17d (2) of the Alaska Native Calims Settlement Act (ANCSA) of December 1971. BOR established 31 priority rivers in Alaska for possible inclusion in the National Rivers System, 17 of these are in Region III. I attended several meetings and supplied information as requested regarding fish and wildlife resources and their utilization in the drainages. I represented the Department as a member of the Charley River study team during the second week of September 1972. I coordinated the participation of Game Division personnel in field investigations of the various rivers during 1973 and personally participated in investigations of the Charley and Ivishak Rivers.

Corps of Engineers

Actions in or about a navigable waterway which might affect its navigability require a permit from the U.S. Army Corps of Engineers prior to project execution. I coordinated comments from various divisions of our Department on this subject and responded either directly to the Corps or the Chief of Habitat.

The above procedure was also followed regarding projects proposed by the Corps of Engineers. The major Corps project was the proposed Chena Lakes flood control project for the Chena River Basin. I attended several meetings both in Anchorage and Fairbanks regarding the project and coordinated evaluation of General Design Memoranda three and five on this project. Our major concerns regarding the project were

changes in temperature and quality of Chena River water downstream from the dam, resulting from the proposed shallow impoundments. Reduction in stream flow downstream from the impoundments would adversely affect the fishery resources, hinder naviagation and cause the river to aggrade. We were also concerned that the proposed fish ladder at the Chena River outlet could not operate year-round and possibly not pass grayling because the reaction of grayling to fish ladders in unknown. Because of the shallowness of the impoundments, we also questioned the publicized recreational benefits.

Finally on July 24, 1973 the Corps directed a letter to the Commissioner of Fish and Game indicating they "now anticipate no water storage and no recreation pool behind the Moose Creek Dam across the Chena River. The dam will serve to divert flood flows into the Tanana River whenever flows in the Chena exceed approximately 9,000 cfs at the dam. The dam outlet structure will be designed to pass river boats and salmon through the open gates when flows are less than approximately 9,000 cfs." At the end of the report period the Corps' attention was directed toward designing a fish ladder that would provide for passage of both sport and anadromous fishes during periods of impoundment or when the outflow from the dam exceeds 2.5 fps.

Environmental Protection Agency and U.S. Coast Guard

The above agencies were contacted in regard to potential or actual oil spills in Region III and recommendations for rectification or prevention were made.

Several requests from the Coast Guard regarding actions which might affect navigation were handled during 1973.

U.S. Fish and Wildlife Service

Evaluation of proposed construction projects, mining operations, environmental impact statements and material source requests, etc. often required exchange of information between the Fish and Wildlife Service and our Department. Donald B. Thurston, Fisheries Biologist, Alaska River Basin Studies, and I spent nearly a week on the Seward Peninsula during 1972 evaluating active and proposed mining claims and past and proposed highway projects.

During 1972 I coordinated all responses regarding proposed establishment of wilderness areas on Fish and Wildlife refuges located in Region III.

The Alaska Department of Highways is proposing to construct a highway on the west shore of Lynn Canal. I substituted for the Region I Habitat Section biologist and spent eight days during April 1972 aboard the Fish and Wildlife Service vessel "The Surfbird" locating and marking bald eagle nesting trees in the area. It is essential these valuable trees be protected because the smallest nesting tree located was a hemlock *(Tsuga heterophylla)* measuring 2 feet d.b.h. and was determined to be about 440 years old. Fortunately, a 1940 Congressional act protects these essentially irreplaceable trees. We located 32 eagle nesting trees and observed 52 adult and 9 sub-adult bald eagles along the proposed highway right-of-way.

In mid-February, 1972, I attended a USBSF&W Federal Aid-Realty workshop in Portland, Oregon. One of the major topics of the session was evaluation of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (PL 91-646). The basis for formulation of this act was to protect the uninformed landowner or tenant, however, the act also provides for more than just compensation. This situation is causing a hardship on the land acquisition programs of our sister states. I do not believe the act will significantly affect our Department if we continue to provide public access prior to private ownership or development of the lands.

U.S. Forest Service

To date the Forest Service has not played as important a role in Region III as elsewhere in the state, because the majority of merchantable timber areas economically feasible for harvest are controlled by the State of Alaska. However, the enactment of the Alaska Native Claims Settlement Act of December 1971 will likely change the present situation significantly because the Forest Service has indicated a strong interest in obtaining management jurisdiction over several million acres of d-2 lands withdrawn by the Act.

STATE AGENCIES

Department of Environmental Conservation

An excellent working relationship was developed with this new state agency. Situations such as proposed use of pesticides and herbicides; loss of petroleum products to the environment; or introduction of untreated sewage, excess sitlation, etc. to a watercourse, thought to be in violation of the State Water Quality Standards as published in the Alaska Administrative Code (Title 18, Chapter 70), brought me in contact with this agency.

Department of Highways

I coordinated all comments from the various divisions of our Department regarding proposed Department of Highways projects.

Considerable effort was expended assisting the Department of Highways in formulating and subsequently critiquing environmental impact statements for their proposed projects.

During the reporting period the Department of Highways began approaching our Department with proposed projects at the conceptual stage. This procedure is extremely beneficial as it avoids potential conflicts and, therefore, saves both time and money for all concerned.

Department of Law

Situations requiring litigation brought me in contact with this Department. In May of 1972 the City of Fairbanks once again commenced bailing gravel from the Chena River without benefit of necessary state and federal permits. A court injunction prohibiting further removal of material was requested through the Department of Law but was withdrawn when it was learned the Alaska Division of Lands had filed a previous request.

During August of 1972 we requested the Department of Law to correspond with the attorney representing the Usibelli Coal Mine, Inc., located in the vicinity of Healy, Alaska, to inquire why sportsmen were prohibited use of the mine haul road. We thought that because construction of the road was subsidized with public monies the public should be allowed use of the road when heavy mine equipment was not operating on the roadway. A response was not received by the end of the report period.

Department of Natural Resources

Division of Lands

Considerable dialogue regarding gravel, timber and requests for access occurred during the reporting period.

The State Division of Lands established an interagency and public meeting in Fairbanks on June 21, 1972, to solicit opinions regarding the bailing of gravel from the Chena River. ADL stated that they had no objection to removal of gravel from the river, however, agencies responsible for water quality, other water oriented resource management agencies, conservation groups and the Fairbanks North Star Borough were opposed to removal of material from the Chena River. Our Department spearheaded the opposition because of the importance of the Chena River to anadromous and sport fishes and because of the availability of materials from the glacial, silt-laden Tanana River. The meeting concluded with the establishment of a committee to settle differences of opinion. After two committee meetings, the Department of Environmental Conservation swung the pendulum and the decision was made to prohibit extraction of materials from the Chena River and its tributaries in the Fairbanks vicinity.

Several critical access locations on State lands were applied for from ADL. Ralph Brown, a Habitat Section fisheries and access biologist from Anchorage, assisted me in Fairbanks the last two weeks of June 1972, and did an excellent job of inundating ADL with requests for sportsmen access.

Late in 1972 a vacant access position was transferred to Fairbanks. This needed position was filled by Donald L. Bill, Jr., fisheries biologist, in February 1973. Report of his activities can be found in the Dingle-Johnson annual report for Project F-9-5.

Division of Parks

A close relationship was continued with this new division. Their present program is predominately one of maintenance of existing facilities and those new facilities created or proposed are of massive magnitude. Unfortunately, these areas are generally more attractive to the nonresident visitor than to resident sportsmen. I continued to identify areas where facilities should be developed along the highway system of Interior Alaska to meet the needs of sportsmen; hopefully, these areas will be included in their future programs.

After a series of meetings the Division of Parks agreed to close the Chena River Recreation Area (mile post 35.1 - 53.5 Chena Hot Springs Road) to the discharge of firearms during the period from March 1 through August 19 of each year. This policy will, of course, be altered as specific areas are developed in the Recreation Area. Sport hunting is popular in the area and both agencies are pleased with the compromise.

LOCAL GOVERNMENT

Fairbanks North Star Borough

Review of proposed zoning, pollution control ordinances, proposed gravel management regulations and assisting the Borough Recreation Planner brought me in contact with the Borough.

A land use plan was developed in 1973 for the entire Fairbanks North Star Borough by the Anchorage consulting firm of Tryck, Nyman and Hayes. We reviewed the plan and communicated that our Department was extremely disappointed with the consulting firm's recommendation that roadways eventually be constructed through the Fairbanks Wildlife Management Area (FWMA). We pointed out that the Department owned or controlled over 1,700 acres of land which contained many representative types of vegetation typical to Interior Alaska, and therefore, hosted many species of wildlife. We outlined the interest and value in maintaining such an area close to town for recreational purposes. Needless to say, we were extremely pleased to receive a letter three days later

stating the Borough Planning Commission was not recommending retention of the proposed roadways and was forwarding the plan to the consulting firm to be redrafted. This does not assure roadways will not be constructed on the FWMA, as the Department of Highways has been unwilling to legally delete their section line rights-of-way through the area, however, the process was certainly a step in the right direction.

PRIVATE LANDS

The only acreage privately owned by the Department of Fish and Game is the Fairbanks Wildlife Management Area (FWMA). An informal maintenance plan for the area was developed and is used in addition to the development plan completed during 1970 and submitted to the Federal Aid in Wildlife Restoration office in Portland, Oregon.

About 1,850 feet of split rail cedar fencing material was acquired in 1972 and erected during 1973. This fencing material is necessary to control access to a portion of the eastern field area, especially when waterfowl are feeding and resting there.

During years of late breakup tremendous concentrations of waterfowl congregate on the Fairbanks Wildlife Management Area and throughout the Tanana Valley. Spring came late during 1972 and the fields supported a seething mass of waterfowl for a period of about five days (May 1 - May 5) but birds were available for viewing from about April 22 through May 20 (29 days).

I was assisted during 1972 by high school student Mike Robinson and we tallied public use of the Department of Highways' scenic parking lot adjacent to the major FWMA field. We observed 596 vehicles using the parking area between the hours of 6:30 a.m. and 9:00 p.m. on May 5, 1972. These vehicles contained 1,317 persons who used the parking area for a total of 91 man-hours. The total estimated use of the parking lot was conservatively estimated to be 910 man-hours. Estimated and known waterfowl observation man-hours for the 1972 spring are as follows:

Total estimated parking lot use	910 hours
Total school children use	1,485 hours
Alaska Children's Museum personnel (Guided above school children)	170 hours
Fairbanks Bird Watcher's Club	134 hours
	2,699 man-hours

Table 1 provides a list of arrival dates of migratory avifauna at the Fairbanks Wildlife Management Area and Fairbanks vicinity during the spring of 1973.

Table 1. Arrival dates of migratory avifauna at FWMA and Fairbanks vicinity, spring 1973.

Date	Location	Species	ADF&G Observer
4/15/73	Over Int'l Airport	7 Canada geese	LeResche
4/16/73	FWMA	1 pair pintail ducks	Bishop
4/16/73	FWMA	7 Canada geese	Simpson
4/18/73	FWMA	3 pintail ducks	Neiland
4/20/73	FWMA	7 Canada geese	Griffin
4/20/73	FWMA	100 pintail and mallard ducks	Griffin
4/21/73	Tanana Flats - Ponds along Dry Creek	9 trumpeter swans	Bishop
4/23/73	FWMA	6 pair white-fronted geese	Grundy
4/23/73	FWMA	1 male marsh hawk	Grundy
4/24/73	FWMA	1 male Am. Widgeon	Grundy
4/26/73	FWMA	2 blue geese	Bill
4/30/73	Fairbanks	heard 1 robin	Bill
5/01/73	U of A Experimental Farm	3 male, 2 female shoveler ducks	Grundy & Bill
5/02/73	6 mile Steese Highway	slate colored junco	Grundy
5/02/73	FWMA	3 pair canvas-back ducks	Trent
5/07/73	FWMA	2 sandhill cranes	Johnston

The 1973 spring birds arrived early. We normally do not expect Canada geese to arrive at the FWMA prior to April 21 or 22, but they were observed in the vicinity on April 15. During such years of early breakup, large concentrations of waterfowl are not expected at the FWMA because the birds continue their northward migration to the breeding grounds and do not accumulate in the Tanana Valley. There were so few birds present during the 1973 spring that the Alaska Children's Museum (a local group which normally had several thousand grade school children on bird identification tours through the area) conducted almost no tours in the area.

To assess the amount of public use of the FWMA parking lot, Fredrick B. Gray, a University of Alaska wildlife student, operated Department of Highway traffic counters on the parking lot during the second week waterfowl were present.

Monday, April 23, 1973	146 vehicles
Tuesday, April 24, 1973	254 vehicles
Wednesday, April 25, 1973	584 vehicles
Thursday, April 26, 1973	195 vehicles
Friday and Saturday, April 27 and 28, 1973	359 vehicles
Total	1,538 vehicles

The striking variation in use was largely caused by weather. For instance, Wednesday the 25th was a bright, sunny day and Thursday the 26th was extremely cold, snowy and visibility was poor.

As stated above, we had fewer birds at the FWMA during 1973 than 1972 and as a result a correspondingly lower amount of human use. Using figures obtained during the 1972 spring of 2.2 persons per vehicle and 4.1 minutes spent by each person utilizing the FWMA parking lot, this year's recorded use during the above period was probably 90 man-hours. Total 1973 use was likely two to three times this figure.

An advisory committee to provide additional guidance for management and development of the FWMA was established in December 1973. The Department will establish the topics, issue notices and chair the meetings. This committee will meet as often as necessary. Rather than establish a fixed committee membership, it was decided any interested individual or representative of a use group, management or educational agency, etc. could attend sessions of interest. The establishment of this group will hopefully assure the Department will manage and develop the FWMA to reflect, as much as possible, the desires and needs of the Fairbanks community.

Two contracts for agricultural services performed during the summer of 1973 were established. One contract was established with the University of Alaska, Institute of Agricultural Sciences and the other with a local farmer who has performed services for us in the past.

OTHER

Several weeks were occupied during the first half of 1972 compiling and illustrating data for the Department of Fish and Game publication Alaska's Wildlife and Habitat.

Two trips were made to the oil-rich North Slope of the Brooks Range during 1972. On July 14, 1972 I flew to the North Slope with George Hollett of the Alaska Division of Lands and Jerome Hok of the Department of Environmental Conservation to view gravel removal areas and the effect of the low p.s.i. tundra vehicles (Rolligons) upon the vegetative surface. In general, we concluded the Rolligon was not causing much damage to the drier tundra areas although they were flattening some of the smaller tussocks (less than 6"). However, in the wetter areas the vehicles were causing some damage apparently because the tires were spun to obtain greater traction. In general, I concluded the summer Rolligon activity was causing about the same damage as a poor winter seismic operation.

During the later part of August 1972, Robert Wienhold, Habitat Section fisheries biologist, and I spent three days viewing past and potential material source locations on the Sagavanirktok River. We also went aboard the Geophysical Serivces seismic boat the "Arctic Sun, Seattle" which was attempting to operate in the Harrison Bay area utilizing air guns as its energy source.

I wrote the annual report to the Governor for the Habitat Section in December 1973.

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APPENDIX I

ENVIRONMENTAL IMPACT STATEMENTS REVIEWED

Date	Description	I.D. Number
9/13/73	Bremner & Togiak - Wild & Scenic River	
8/2/73	Aniakchak, Alagnak & Branch Rivers & American Creek - Wild & Scenic River	
6/14/73	Clarence Rhode - Hazen Bay National Wildlife Refuge Wilderness Study Report	
5/30/73	Aleutian Island Proposed Wilderness Study	
5/11/73	Campbell Creek Greenbelt	73043001
5/9/73	Draft Katmai National Monument Environmental Impact Statement	
4/12/73	U.S.F.S. Wilderness Area Site Studies	73032101
11/7/72	Lazy Mt. Ski Area	72102001
9/25/72	Houston-Susitna Camper Park	72090502
9/22/72	Development Prospecters Denali Park	72091401
9/5/72	Silver King Wayside	72082807
9/5/72	Dry Creek Wayside	72082805
9/5/72	Bear Creek Wayside	72082804
9/5/72	Chugach State Park	72082802
8/29/72	Nancy Lake Park	72082801
9/5/72	Denali Park Trail	72082803
8/24/72	Butte Park	72082202
7/28/72	Byers Lake	72072101
7/25/72	Bentzen Lake	72071703
7/25/72	Burston Park	72071703
7/25/72	Shady Burch	72071705
7/25/72	Muldoon Park	72071706
7/25/72	Scenic Park	72071707
7/25/72	Sandy Beach Rec. Area	72071701

APPENDIX I. (continued)

Date	Description	I.D. Number
7/25/72	Evergreen Bowl	72071702
5/22/72	Kenai Park Improvements	
4/19/72	Title X Land Development	
4/3/72	Chester Creek and Cook Inlet Overlook Parks	72122201

APPENDIX II

Potter Point State Game Refuge

The refuge consists of approximately 1,212 state-owned acres, 35 GAAB owned acres and 744 privately owned acres totalling approximately 1,991 acres above mean high tide.

This highly productive brackish water marsh gets spring time bird migrations of thousands of waterfowl including ducks, geese, swans, sand hill cranes, snipes and loons. Most of these birds use the refuge as a staging area while feeding and resting in anticipation of the larger nesting areas opening up, such as the Yukon/Kuskokwim flats.

In that portion of the refuge located south of Rabbit Creek and between the two Seward Highways, the Department of Fish and Game through its concept of time and space management zoning policies, has increased Canada goose production from less than 20 young to approximately 150 and duck production from less than 50 to approximately 400.

In May of 1972, the GAAB requested a sewer line easement across the central portion of the refuge. In February of 1973, to offset the loss of waterfowl habitat incurred during the construction of this line, the Borough developed a 3000' x 200' complex of ponds and berms at a cost of $118,470.

Several hundred waterfowl have already utilized the newly created nesting habitat, and use is expected to increase dramatically in the next three years as the vegetative cover develops.

The thousands of birds found here during the spring and fall months are the main attraction to the citizens of the Greater Anchorage Area Borough. Approximately 3,000 students and teachers from two colleges, eight high schools, six junior high schools and at least ten elementary schools have enjoyed the opportunity to watch, photograph and scientifically describe this marsh wildlife and habitat.

In 1972, 1,100 people representing the Audubon Society, Boy Scouts of America, Girl Scouts, Ornithology Society, Nunaka Elementary, Chinook Elementary, AMU, West and Diamond Schools visited the refuge an average of 4.7 times. In 1973 use by these organizations increased, and members from the following additional organizations enjoyed the wildlife and habitat the refuge provides.

Alaska Retriever Club	Horsemen's Association
Conservation Society	Isaac Walton League
Wildlife Society	Camp Fire Girls
SPCA	Boys Club of Alaska
Sierra Club	Rainbow Girls
Upland Bird Dog Club	Parent Teachers Association
Photographers Association	Photogrametry Society
Visitors Association	Knik Canoers
Nordic Ski Club	4-H Club
Snowmobile Association (limited)	Sled Dog and Racing Association

In 1971, 502 ducks were harvested providing 536 hunter-days of recreation. In 1972, 917 ducks were harvested providing 416 hunter-days of recreation. Many additional hunting days were spent pursuing Canada geese, snipe and sandhill cranes.

Potter Point State Game Refuge is one of the last feeding and resting areas of Cook Inlet for fall migrating ducks where total numbers of birds passing through exceeded 20,000 and at a given time could reach 5,000 birds.

The wildlife populations and production levels now existing on the refuge are small when compared to the potential levels that could be realized through habitat reclamation programs. Through intensive management and rehabilitation all phases of recreation and populations of waterfowl could be increased 10-15 times.

APPENDIX III

BRISTOL BAY STUDY

GENERAL RECOMMENDATIONS

(Royce Perkins and Roger B. Smith)

In making recommendations for land use planning of the Bristol Bay area, as of all the undeveloped portions of Alaska, one must first ask: How shall I deal with Section 1, Article VIII of the Constitution of the State of Alaska? This article states, "It is the policy of the State to encourage settlement of its land and the development of its natural resources by making them available for maximum use consistent with the public interest" (emphasis added).

It seems that the only elasticity in this mandate can be found in the words "consistent with the public interest." Apparently the drafters of this article placed a great deal of confidence in land-planners' abilities to know just what this "public interest" is.

To do this one must first define "public". Does it consist only of people in Alaska today? in the nation today? Ten years from now? Fifty?

If the answer to the first question is affirmative the problem is much simpler. One can usually be fairly satisfied that he is in tune with interests of people currently living in Alaska through open hearings, petitions and of course, through our elected representatives.

However, if one decided to take a broader definition of "public," as I believe one should, one which includes people yet to come, he must make a clean break from the political milieu. Vote-seekers are notoriously myopic. Short term concern and provincialistic philosophies are out of date.

I feel, that in the long-range best interest of peoples living in Alaska today and in the next decade or so, the entire Bristol Bay drainage should be managed to maintain the existing near primitive conditions.

The proposed Alaska Peninsula Highway should not be built. Highways encourage development of a nature which would detract immensely from the quality of this area. The inestimable value of the wilderness; of the salmon spawning and rearing grounds; of the clean air, water and land; of the integrated wholeness of the estuarine system should not be compromised.

Access to Bristol Bay should remain as it is, by air or water, for the forseeable future. Each water system within the drainage should be managed according to its peculiar properties. (See summaries for each of the systems surveyed in 1971.)

MULCHATNA RIVER TRIP
(Sept. 25 - Oct. 7, 1971)

General Description

The Mulchatna River is some 225 miles long from its source at Tourquoise Lake, approximately 25 miles north of Lake Clark, to its confluence with Nushagak River. Below Turquoise Lake for some 50 miles, the river is extremely rocky and contains a gorge which, from the air, appears to be impossible to safely descend. The remainder of the river is very floatable. In the upper portion there is one stretch that is quite rocky, calling for attention.

The Mulchatna doubles in size at its confluence with the Chilakadrotna River. Below this point the river becomes increasingly large and more braided. The upper portion winds through a broad spruce-covered plain backed mostly by treeless hills. Along the lower portion of the Mulchatna, the flood plain becomes enormous and the surrounding country is quite flat and heavily forested with spruce. From approximately midpoint down, many "sweepers" and piles of debris left by floods are apparent.

Big Game Observations*

Brown/grizzly bear

Signs were observed on nearly every sand bar and creek bank. No brown/grizzly bear were sighted.

Caribou

Tracks were found on nearly every bar along the upper river. At one spot, caribou tracks were mixed with wolf tracks in a milling pattern.

Moose

In some locations along the upper river we found some of the most heavily browsed patches of willow seen all summer. However, these were very narrow strips and apparently moose browse only along the immediate river banks in most instances. We found almost no sign of winter use of browse plants more than fifty feet from the river or feeder creeks.

We saw six adults (4 females), three yearling bulls, and one unidentified moose. In addition, we heard one moose "blowing" at us and one bull raking alders. These animals all appeared to be in excellent condition.

From the tracks and well used trails there appears to be fairly heavy summer and early fall use of the Mulchatna river drainage, along the immediate river at least.

* Due to icing river, fogged binoculars (both pair), and high winds our assessment of animal populations on the Mulchatna are of limited value.

Natives from New Stuyahok apparently do most of their moose hunting on the lower reaches of the Mulchatna.

Wolf

We observed tracks of three wolves, two at one location, one at another. Both of these were on the upper river.

Small Game and Furbearer Observations

Spruce grouse

At the confluence of the Mulchatna and Nushagak Rivers we saw the only spruce grouse of the entire summer.

Ground squirrel

No signs of ground squirrel were observed.

Red squirrel

We saw two red squirrels.

Beaver

According to cache counts beaver populations are apparently increasing along the Mulchatna. Severe flooding with resulting "freezing out" seems to be a significant factor determining numbers (information from trappers).

Coyote - One set of tracks.

Mink - Fair amount of sign considering conditions (ice, etc.).

Muskrat - A few signs.

Otter - A few signs.

Waterfowl Observations

Mallard - One drake was seen on the lake we landed on. His size indicated to us he may have been reared on a farm somewhere. We also observed a lone hen plus six of unidentified sex.

Greater Scaup - Approximately 20 on the lake we landed on.

Unidentified scoters - 2 on the lake we landed on.

Unidentified merganser - about 15.

Unidentified swan - 2 on lake we landed on.

Green-winged Teal - saw one immature.

Sandhill crane - heard one flock overhead at night on 9/25.
Snipe - one

Non-Game Bird Observations

Unidentified gulls - 4 immature
Black Turnstone - 6
Goshawk - one male being chased by a Gray Jay
Bald Eagle - 6 adult, 1 immature
Unidentified hawk - one large, light colored hawk
Common Loon - heard one calling on Half-Cabin Lake
Bohemian Waxwing - about 8
Raven - about 10
Gray Jay - about 20
Red Poll - about 30
Rusty Blackbird - about 5
Black-capped Chickadee - about 5
Great Horned Owl - herd one calling

Fish and Fishing

Little information on sport fishing on the Mulchatna River was gathered. We neither caught nor observed any salmon or rainbow trout. During the first three days we observed grayling rising above the surface in several locations but were able to catch only a very few. On September 29, at the mouth of Summit Creek, grayling fishing was good. The fish were not large, however, running from 10 to 14 inches in length. All grayling were caught on white rubber imitation grubs.

Man-Use

Apparently the upper reaches of the Mulchatna river are presently little used by man except for some trapping. From about midpoint down, signs of men increase. Here we found about seven cabins, four of which are likely in current winter use. One of these belonging to Dick Armstrong of Dillingham has been in use as a trapping headquarters for many years.

The cabin near the mouth of Chilakadrotna River is apparently owned by someone from Nondalton. It and Armstrong's cabin, were badly flooded in August.* On the north bank, near Red Bluffs, there are remains of a homestead, built according to Dick Armstrong in the early 1930's by Mr. Red Vail and Mr. Richard Murphy. The cabin at Ethel Creek is built into the north bank of a small channel. Apparently this was a permanent dwelling at one time. It is still standing but in poor shape. The other cabins appear to be temporary shelters for trapping and/or fishing (a salmon gill net was seen near one on the south bank).

Note of Interest: An extensive area of the Mulchatna drainage was hit by severe flooding in August 1971. Only a few bush pilots were aware of this as the inhabited portion of the island was not affected.

Recommendations

The Mulchatna River is one Alaska's largest wilderness rivers. There are no highways or "improvements" anywhere near it. I believe it should remain a wilderness. Perhaps a wilderness corridor would be good, as provided for under the Wild Rivers classification.

Power craft should be prohibited above the Stuyahok River. Neither landing nor low level flight should be permitted between Stuyahok River and the group of feeder lakes just south of Whitefish Lake. (One of these was our landing site.)

This drainage should be free from mechanized travel in winter months also. We must not compromise for special interest groups in wilderness areas.

ONGIVINUK RIVER-TOGIAK RIVER TRIP
(June 10-15, 1971)

Big Game Observations

Bear

We saw no sign of bear. Carl Branham, the Protection Officer who flew us in to Ongivinuk Lake, did report seeing fresh tracks in snow near the lake on 6/10/71.

People at Togiak village told us bears are not plentiful in this drainage.*

Moose

We saw no signs of moose on this trip; not even browsing. People at Togiak told us, "The moose are all killed off."

Caribou

No evidence that caribou range into Togiak Valley.

Small Game and Furbearer Observations

Snowshoe hare - found one fecal pellet at Ongivinuk Lake.

Beaver - Beaver sign seen along our entire route but not in great abundance.

observed - 2 adult.

heard - One.

lodges - 2 very large, 3 smaller.

signs - fair amount on lower half of Ongivinuk River.

Otter - Saw one adult plus some slides along lower half of Ongivnuk River.

Other furbearers - No sign, water was very high due to break-up conditions.

Miscellaneous Small Mammal Observations

Saw one small bat at Ongivinuk Lake. *(Myotis)*

Standard mouse traps were set for a total of 84 trap-hours with no results.

* Two cubs-of-year along with a sow were killed this spring near Togiak Village.

Waterfowl Observations

Pintail - 1
White-fronted Goose - about 50
Green-winged Teal - about 80
Emperor Goose - about 18
Mallard - 15-18 pr.
Unidentified swan - about 5
Red-brested Merganser - about 12
Greater Scaup - about 30
Common Goldeneye - 3
Harlequin - about 350
Common Scoter - 2 (1 pr.)
Common Merganser - about 20
Unidentified - about 50

Other Game Bird Observations

Willow Ptarmigan

Large numbers were mating along the upper 30 miles of the Ongivinuk River. Saw/heard 100, observed down Togiak River to Kashiak River.

Wilson's Snipe

Found breeding in good numbers near Ongivinuk Lake.

Non-Game Bird Observations

Bonepart's Gull - 1 (lower Togiak R.)
Arctic Tern - numerous
Wandering Tattler - 4
Greater Yellowlegs - about 1o
Red-tailed Hawk - 1
Bald Eagle nests - 1
Raven - 1
Golden-crowned Sparrow - common
Bank Swallow - common
Yellow Warbler - quite common
Varied Thrush - 3
Glaucous Winged Gull - about 25
Northern Phalarope - 1 pair
Spotted Sandpiper - about 10
Golden Eagle - 1
Bald Eagle - 4 adults
Dipper - 3
Song Sparrow - about 10
Tree Swallow - common (observed 1 pair mating)
Rusty Blackbird - 1 pair
Wilson's Warbler - 1
Northern Gray-cheeked Thrush about 7

Fish and Fishing

June 10, Ongivinuk Lake still 90 percent ice-bound, landed on floats.

Three hours of spin fishing at the outlet in the evening produced eight arctic char (determined by phyloric caecae count*) and two grayling. Average length of the char was 18 inches, the grayling 14 inches. One char was caught on a #3 Mepps spinner and the remainder on a red and silver Hot Rod lure. One grayling hit a white rubber grub, the other took the Hot Rod. All fish appeared fat and healthy although tapeworms were found in most. Stomach samples were collected. Snails were the most apparent food item.

* Phyloric caecae = 60, gill rakers = 22, vomerine teeth rows = 3, dorsal fin rays = 11, anal fin rays = 9.

June 11 - Four more hours of fishing produced twelve arctic char at the outlet (south) end of the lake. The largest char was 24 inches long, they averaged about 18 inches.

The Onigibinuk River was fished intensively for the first half-mile downstream with no results. Fish had likely not moved into the river to any extent yet. The river was flooding its banks but very clear in the upper part. Skeletal parts of red salmon were seen along the lake shore.

While floating the remainder of the Ongivinuk, fishing was attempted in several likely looking spots with negative results.

On June 13 we traveled down the Togiak River (in which we caught no fish) to its confluence with the Kashiak River. This latter river was also flooding over its banks and was remarkably clear. Two hours of fishing at its mouth produced six grayling. The largest was 20 inches; average length was approximately 18 1/2 inches. Five were caught on a white rubber grub and the sixth on a rubber minnow-spinner lure. Fishing one-mile upstream with a Hot Rod lure (flashing spoon) produced no strikes.

Upon examination of the stomach contents of these grayling we found many salmon fry about 1 inch long. The white rubber grub lure resembled these fry. Although grayling were rising frequently we received a strike only at 15-20 minute intervals.

Another one-half hour of fishing at 11:00 p.m. produced no fish.

On June 14 we rafted down the Togiak River to the mouth of the Pungokepuk River. Here we experienced very fast grayling fishing. These fish, although not as large as in the Kashiak River, averaged approximately 19 inches in length. Egg development in these fish appeared to be less advanced than in the Kashiak fish (i.e. smaller in size).

Fishing at selected locations along the remainder of the Togiak River produced no strikes.

Of added interest, it is noted that Dillingham bush pilot Leon (surname unrecorded) tells of catching several lake trout (largest, 27 lbs.) in a small pond about one-half mile east of Ongivinuk Lake. This supposedly took place on July 4, 1971. We explored this small pond (more of a pot hole). It certainly didn't look like lake trout habitat, but since it was still mostly icebound at that time we could be mistaken.

From several reports it is apparent that later in summer some trophy size tainbow trout are being taken in the Togiak drainage. At least one pilot-guide, Jay Stovall of Dillingham, is operating here. We were not able to determine where this "hot" rainbow fishing is, however.

Recreational Potential

Due to the early date of our trip and extremely high water, it is difficult to judge general desirability of the Ongivinuk River as a canoe route. The country on both sides is very scenic. Rugged crags can be seen to the east. The river was free of "sweepers" and debris and very pleasant to travel. Ongivinuk Lake affords easy access to float planes. Our guess is that fishing would be excellent over much of our route if the trip was made later in summer.

Recommendations

Since the Togiak drainage contains very little timber and certainly no merchantable timber, apparently is not rich in valuable minerals, and is virtually unmarred by man, the entire drainage should probably remain wilderness. Power boats should be allowed only on the Togiak River itself. This would, of course, eliminate the main Togiak River from the true "wilderness", but since natives of the area apparently have long established use of power boats for subsistence fishing and waterfowl hunting, it would probably be unwise to eliminate such use at this time.

Aircraft should be allowed to land only on the Togiak River and at designated locations on upper reaches of various feeder rivers. On the Ongivinuk River for example, the aircraft landing area should be at Ongivinuk Lake.

Further investigations should be made to determine where uppermost suitable landing sites are on each of the other rivers in this drainage.

Hunting and trapping potentials do not appear to be great but until evidence to the contrary appears, should be allowed to develop.

This particular study should be continued in the Togiak drainage. The larger feeder rivers and streams should be floated at varying times of the year to determine: 1) most suitable landing areas, 2) critical habitat areas, 3) sport fishing potential, 4) present man-use, 5) waterfowl use and 6) floatability and other aspects of recreational potential.

WOOD RIVER LAKES TRIP
(August 13 - September 7, 1971)

Big Game Observations

Brown/grizzly bear

We noted some bear sign at every salmon stream, much of it very fresh. We saw two lone adults, one sow with cub-of-year and one group of three (most likely a sow with two yearlings). I feel brown bears are fairly numerous in the Wood River Lakes area.

People at Golden Horn Lodge tell of bears coming to feed nightly at their dump. I predict trouble and loss of some bears there.

Moose

Except for some localized spots, we observed very little sign of winter browsing. We saw six adults but no calves. We did find a considerable amount of fresh sign, showing some summer usage, but apparently moose are not plentiful in the Wood River area.

Wolf

We found tracks in two locations along Kulik Lake.

Small Game and Furbearer Observations

Hare - Tracks were observed in two locations along Kulik Lake and Lake Nerka.

Porcupine - Saw one immature at the east end of Lake Nerka, also 1 cave with fresh droppings on Kulik Lake.

Ground squirrel - 4

Red squirrel - 3

Small mammals - 492 trap-hours yielded one red-backed vole.

Beaver

We were told by people at Golden Horn Lodge on Mikchalk Lake that due to recent severe flooding and freezing the beaver population in the area is low but "on its way back." We were also told that "there are mink in spots but no otter at all."

We saw 5 beavers and noted 7 apparently active and 5 apparently inactive lodges.

A fair amount of sign was observed (cache cutting, etc.) along creeks on Lake Beverly's north shore, but in general we would guess that beavers are not plentiful in Wood River Lakes.

Fox

Tracks at the west end of Kulik Lake appeared to be fox.

Coyote

One quite positive track, one possible coyote track.

Mink

We observed only one set of mink tracks and no other sign. On Kulik Lake a large mink swam out to our kyaks in response to a predator call.

Short-tailed weasel

One adult weasel was seen at the east end of Kulik Lake. Tracks were noted at Moose Creek on Lake Beverly.

Waterfowl Observations

I would rate Wood River Lakes as fairly important to waterfowl, especially the eastern portions. In the shallows and creek out-washes we found dabblers on quite lush feed (sedges, grasses, pond weeds) and on the lakes proper, several divers were seen. Geese and swans were found in some bays and creek mouths. Some grass stands showed heavy feeding by geese.

Pintail - 17 adults w/11 young
Green-winged Teal - 8 adults w/14 young
Mallard - 83 adults w/7 young
American Widgeon - 1 adult
European Widgeon - 4 adults
Unidentified dabblers - about 30
Unidentified swan - 13 adult, 4 cygnets
Sandhill Crane - 8
7 adults w/42 young
Snipe - 5 adult w/2 young
White-fronted Goose - about 100
Greater Scaup - about 50 adult w/50 young
Barrow's Goldeneye - 2 hens w/ 9 young
Common Goldeneye - 30 adults w/30 young
White-winged Scoter - 5 adults
Surf Scoter - 6 adults w/21 young
Common Scoter - 3 adults w/3 young
Unidentified scoter - 3 adults w/11 young
Red-brested Merganser - 3 adults w/12 young
Unidentified merganser -
Red-necked Grebe - 2
Horned Grebe - 2

Non-Game Bird Observations

Bonepart's Gull - 1 adult, 10 immature
Glaucous-winged Gull - about 200
Arctic Tern - 6
Western Sandpiper - 1
Wandering Tattler - 2
Greater Yellowlegs - about 15
Spotted Sandpiper - 3
Semi-palmated Plover - 2
Kingfisher - 1
Golden Eagle - 1
Bald Eagle - 9 adults, 3 immature
Osprey - 5 adults, 3 immature
Common Loon - about 25
Arctic Loon - 6
Red-throated Loon - 7
Pigeon Hawk - 1 or 2 (one may have been a Sharp-shinned Hawk)*

* This raptor was seen near an aerie at the west end of Kulik Lake.

Dipper - 1 adult, 1 immature
Raven - about 15
Gray Jay - 4
Redpoll - about 5
Robin - 1 adult, 1 immature
Savannah Sparrow - 2
Rusty Blackbird - about 50
Unidentified woodpecker - heard 1
Black-capped Chickadee - 2
Grinnell's Northern Waterthrush - about 10
Yellow Warbler - 1
Wilson's Warbler - about 5
Arctic Warbler - 2
Varied Thrush - 2
Song Sparrow - 2
Water Pipit - 2
Boreal Chickadee - about 15
Unidentified large owl - 1
Northern Gray-cheeked Thrush - 2

NONVIANUK RIVER-ALAGNAK RIVER TRIP
(June 25 - July 4, 1971)

General Description

The Alagnak River (more popularly called Branch River) drains a large and important watershed. Its principal headwaters are Kukaklek and Nonvianuk Lakes which lie approximately fifteen miles south of Lake Iliamna. The outlets of these two lakes join some ten to fifteen miles downstream to form the main Alagnak River. Both branches are large, clear and fast-moving. The northern branch from Kukaklek Lake has some precipitous rapids which reportedly are too dangerous for boating.

The Alagnak River is extremely braided, especially the lower portions. Some separated channels wind for miles through thick spruce, willow and alder before they rejoin the main river. Many small and large willow-covered islands are found on or nearby the river.

Tidal influence can be noted for some six to ten miles upriver from the Alagnak's mouth at Kvichak Bay. High mud banks indicate considerable tidal magnitude

Mechanics

On June 25 Fred Pitzman and I were flown from Dillingham to Nonvianuk Lake by Charlie Allen of Anchorage in his Cessna 185. We started down the Nonvianuk branch on June 28 in an inflatable Avon 12 foot raft. Tidewater was reached some six days later. A Johnson 3 H.P. outboard engine, which had been left at the river's mouth on the flight in, was picked up and mounted. A full day's travel down Kvichak Bay brought us to Naknek on the afternoon of July 4. That same evening we motored up the Naknek River to King Salmon. The next day our gear was sent to Dillingham and we returned to Anchorage on Wien Airlines.

Big Game Observations

Brown/grizzly bear

We observed only one bear along Alagnak River during the flight in. However, there are extensive bear trails and many salmon skeletons along the upper river, evidence of heavy bear use during salmon runs. We also saw and measured tracks of a spring visitor, apparently an adult animal.

Moose

The Alagnak River drainage appears to be one of the most important moose habitats in the Bristol Bay watershed. *Salix pulchra* and *Salix alexensis* stands are abundant. Useage varied from about 5 to 8 percent

of annual growth on much of the upper river. Often these browsed patches were not extensive, pointing to the likelihood of small wintering groups. No areas appeared to be over-browsed. *Salix pulchra* showed much more sign of browsing than any other species.

The many islands formed by the braided lower river afford ideal moose calving areas. We saw five cows with single calves in this area as well as four adult bulls, two unidentified adults and one lone cow.

Small Game and Furbearer Observations

The only sign of upland or small game seen was one pile of ptarmigan feces near Nonvianuk Lake. Near-flood conditions on much of the river made it very difficult to observe furbearer signs. We saw only two (apparently unused) beaver lodges. A possible coyote track and two old, bleached wolverine skeletons by a trapper's cabin were the only other evidence of furbearers.

We tried mouse traps for a total of 72 trap-hours with no results.

Some holes in the sand were noted which appeared to have been made by ground squirrels, but no animals were seen.

Waterfowl Observations

Due to very high water, waterfowl information obtained was limited.

Pintail

A few hens were seen along the lower part of the river, but no nests could be found (even though their behavior sometines indicated they were nesting).

Green-winged Teal

Two pairs and two or three singles were noted.

Mallard - about 20
Greater Scaup - 2
White-winged Scoter - about 5
Common Merganser - many
Whistling Swan - 1 pair
Sandhill Crane - 2 passing flocks
American Widgeon - 2 males
Harlequin - 2 pair, 4 females
Common Scoter - 2 pair
Red-brested Merganser - many
Unidentified swan - 1 pair
Snipe - fairly common

Non-Game Bird Observations

Glaucous-winged Gull - fairly common
Mew Gull - 2
Short-billed Dowitcher - 1
Boneparte's Gull - very common
Arctic Tern - very common
Long-billed Dowitcher - 2

Greater Yellowlegs - fairly common
Golden Eagle - 1 (adult)
Osprey - 4 (may have been repeats)
Arctic Loon - 3
Black-billed Magpie - 2
Lapland Longspur - 1
Golden-crowned Sparrow - about 5
Tree Swallow - very common
Rusty Blackbird - fairly common
Blackpoll Warbler - 1
Northern Gray-cheeked Thrush - about 10
Long-tailed Jaeger - 1*
Bald Eagle - 2 (adults)
Common Loon - about 4
Unidentified loon - about 6
Song Sparrow - 1
Tree Sparrow - 3
White-crowned Sparrow - 1
Bank Swallow - very common (in bank areas)
Yellow Warbler - fairly common
Robin - about 5
Red-throated Loon - 1

Fish and Fishing

Nonvianuk Lake, at the outlet, produced the finest rainbow and lake trout fishing of our entire summer. These fish, mostly between 17 and 22 inches in length, were feeding on salmon fry. Fishing with spinning lures (Crocodile, Hot Rod, etc.) was very fast at the peak of feeding sprees.

During these feeding times, most apparent in evenings, several lake trout would pursue the fry in a frenzied fashion. These spurts came approximately at 20 minute intervals and lasted only about 10 minutes each.

Rainbows struck lures much more frequently in these peaks, but they did not show above water nor did they appear to be schooling as did the lakers.

While we were at Nonvianuk Lake two chartered float planes brought a total of nine fishermen in. Both guides were from Anchorage. These people nearly all took their limits of five rainbow each in a very short time. A few lake trout were killed and taken also, but rainbow were definetly the prized species. Egg clusters and flashing spinning lures were the most successful. Those using flies caught a few fish, however, on gray ghost and coachman patterns. A "muddler minnow" brought no strikes.

After leaving the lake, fishing slowed dramatically down-river but was still fairly good. We caught several rainbow and grayling plus one lake trout before reaching the confluence of the Alagnak branch. Spinning lures were once again more effective than flies. One rainbow was taken on a "muddler minnow", however. From this point down, the river became increasingly flooded and turbid, reducing fishing success greatly. About half-way down-river we encountered a large population of grayling feeding on what appeared to be salmon fry. We couldn't entice any of them to take a lure however, so we are not certain of their prey.

In the most likely looking locations over many miles we tried a few casts with no success. Had the water been lower, we feel certain fishing would have been good in many of these places.

* Many jaegers were seen in Kvichak Bay. Also seen in Kvichak Bay were two shearwaters - likely sooty *(Puffinus griseus)*.

On July 1 we did manage to catch two rainbow and one grayling at the mouth of a creek. These fish were approximately 17 inches long. The were taken on a white rubber grub-like lure and a "crocodile" lure.

Approximately 15 miles up-river from the mouth we came upon the first king salmon. This was on July 2. We took one for food and caught and released a few more. These fish, ranging from 4 pound "jacks" up to 40 pounds, were excellent fighters. They readily hit our flashing spinning lures. From this point down we saw several king salmon roll above the surface but no more fishing was tried.

At several cabins salmon gill nets and drying racks were noted. At a settlement natives were drying and smoking salmon. We did not, however, see any nets in the water until we got well down Kvichak Bay.

Vegetation

Ground cover near the outlet of Nonvianuk Lake is mainly Labrador tea *(Ledum)*, dwarf birch *(Betula nana)*, willow (*Salix* spp.), mosses and lichens. Spruce and paper birch are present but scattered. Approximately one and one-half miles downriver spruce stands become thicker and remain so for some 20 miles. At this point, one comes to an extensive burn on both sides of the river. This fire, which reportedly occurred in 1936 burned miles of spruce of mixed density. The gray remains of many of these trees are still standing. Willow, birch and poplar now thrive in the area.

Below this burn, willow, alder, poplar and scattered spruce follow the river to its mouth. Willow and alder compete to cover the numerous islands.

Plant Species List

Labrador tea - *Ledum* spp.
Spruce, black - *Picea mariana*
Birch, dwarf - *Betula nana*
Alder - *Alnus* sp.
Cloudberry - *Rubus chamaemoris*
Bog cranberry - *Oxycoccus microcarpus*
Lowbush cranberry - *Vaccinium vitis-idaea* L.
Blueberry - *Vaccinium* sp.
Raspberry - *Rubus* sp.
Fireweed - *Epilobium* spp.
Lousewort - *Pedicularis* sp.
Chickweed - *Stellaria laeta*
Polemonium acutiflorum
Spruce, white - *Picea glauca*
Birch, paper - *Betula papyrifera*
Aspen - *Populus balsamifera*
Willow - *Salix* spp.
Horsetail - *Equisetum* sp.
Bog-rosemary - *Andromeda polifolia*
Bog candle - *Limnorchis dilatata*
Twin-flower - *Linnea borealis*
Violet - *Viola* sp.
Cottongrass - *Eriophorum* sp.

Man-use

At the outlet of Nonvianuk Lake there are several buildings, some of which belong to Wien Consolidated Airlines. These are used by sport fishermen. There are a couple of older log buildings which appear to have

been a permanent home at one time.

Down-river about three miles a cabin was started several years ago out of small logs. It was never finished.

The next building we saw was at the confluence of the Alagnak and Nonvianuk branches. This small cabin appears to belong to a trapper and is in good repair.

Further down, on June 29, we came to the finest cabin seen anywhere in the Bristol Bay wilds. It stands on the north bank. This cabin (also probably a trapper's) is of log with a hewn floor and inside walls, and has a beautiful moose hide bed. Unlike many buildings below on the river which are more accessible, this one was unlocked and unvandalized.

The following day, and for the remainder of the trip, we passed an increasing number of cabins and homes. Most of these are probably used as subsistence fishing and trapping camps. Alaska Department of Fish and Game has a cabin and salmon counting tower well down-river.

There are three native settlements on the Alagnak River. One of them on the south bank appears to be permanently occupied by several families and many dogs. However, this perhaps is only in use seasonally. A second, smaller, cluster of houses lies on the north bank and probably is used as a fish camp although at one time it was likely used year-round. The third group of buildings is at the mouth on the north bank. This is the site of the village of Branch River, abandoned several years ago. Four or five large frame houses now stand deteriorating.

As for sport fishing, apparently only the uppermost portions of the river get much traffic. According to guides we met, this river just as it drops from Nonvianuk Lake is one of the most popular spots in the area for rainbow fishermen and gets very heavy use through the summer.

We could not ascertain the amount of trapping and hunting that is done in the Alagnak drainage.

Recommendations

The Alagnak River system is large and offers great potential for diversified use. The Nonvianuk branch is an excellent piece of water for canoe or kyak. It is swift and exciting but not dangerous, at least not at the time of our trip. Perhaps a lower water level would expose dangerous rocks. This branch is wild and heavily timbered and offers fine rainbow fishing. Power boats should be excluded. Aircraft should not land or fly below 3,000 feet over this extraordinary stretch of river during ice-free months. Landings can be made on Nonvianuk Lake. Power boats and aircraft should be allowed on the main Alagnak river with the exception of the upper 15-20 miles. This portion should be

protected along with the Nonvianuk branch. Perhaps this protection can best be met by inclusion into the National Wilderness Waterway System.

On the lower Alagnak, where the heavier spruce-type vegetation gives way to several types, further investigations should be made to determine moose population status. Further waterfowl, fur animal and trapping information must be known before specific recommendations can be made.

Until such information is gathered, the southern routes* of the proposed Alaska Peninsula Crossing should not be sanctioned.

Due to the apparently very heavy traffic of sport fishermen at the outlet of Nonvianuk Lake, I would suggest the placement of a man here during the summer. In the two days we were there I gave four citations for violations.

This temporary person, as well as doing enforcement and public relations work, would have an opportunity to collect scale samples and data from a great number of large rainbow trout.

* Alaska Peninsula Crossing - A socio-Economic Study. State of Alaska, Department of Highways.

MUKLUNG RIVER TRIP
(June 9 - 23, 1971)

General Description

The Muklung River, more a stream than a river, begins near the north end of the Muklung Hills approximately 20 miles north of Dillingham and meanders for some 40 miles through sparse spruce and willow out onto a grassy flood plain and into Wood River. The upper and lower reaches are slow-moving whereas the central portion is a mixture of riffles and pools.

Recreational Potential

This river makes a very enjoyable float trip and is excellent for those wishing a short, relatively safe float through quiet wild country. the "deadwater" areas in the upper reaches afford access for light, float equipped aircraft. Fishing is quite good in spots and apparently (according to word-of-mouth reports) there are some moose available in fall for hunting. Scenery is not spectacular but the unspoiled countryside is beautiful and rewarding in its own way.

Mechanics

On June 18, assistant Fred Pitzman and Royce Perkins were flown to the headwaters of the Muklung River by Protection Officer Carl Branham in a Department Supercub. Near midnight on June 21 we floated up to the shore near Dillingham.

On this trip we used a 12 foot Avon inflatable boat, the Sierra Designs mountain tent and the Drawtite tent.

Big Game Observations

Black bear

We made no observations of this species, but Carl Branham, Dillingham Protection Officer, told of seeing a black bear near the mouth about two years ago which was the closest to Dillingham he'd seen one.

Brown/grizzly bear

We observed one blonde bear near tidewater which appeared to be two to three years old.

Moose

We found only one patch of willow (*Salix pulchra)* which showed signs of winter use. It was about half-way downstream and was about one-mile long by 200-300 feet wide. About 40-60 percent of last annual growth had been removed.

The upper Muklung area appears to be a fairly important calving/summering area. We saw only one cow (with two calves) but observed considerable signs of cows with calves.

Small Game and Furbearer Observations

Beaver

We saw only one adult beaver and very little sign.

Muskrat

We watched one "rat" feeding and saw several "haul-outs."

Otter

On the lower river we saw five or six in a group.

Poucupine - 1 adult - nearly white, on lower river.

Ground squirrel - 2

Frogs - heard "croaking" on upper river.

Mice, moles, etc. - Standard mouse traps were set for a total of 50 trap-hours with no results.

Waterfowl Observations

Pintail - 1 female
Red-brested Merganser - about 5
Harlequin - 10 pair
Swan, female on nest - 1
Unidentified merganser - about 5
Mallard - 8 pair (1 female with 6 tiny young)
Green-winged Teal - about 20 pair
Greater Scaup - 4 pair
Unidentified swan - about 8
Snipe - common
White-fronted Goose - 1 pair

Non-Game Bird Observations

Arctic Tern - fairly common
Least Sandpiper - about 4
several pairs (nesting)
Whimbrel - 1
Pomarine Jaeger - 1
Savannah Sparrow - 1
Golden-crowned Sparrow - 1
Yellow Warbler - common
common
Northern Phalarope - 1 pair
Long-billed Dowitcher -

Greater Yellowlegs - 3
Black-billed Magpie - 1
Tree Sparrow - 1
Tree Swallow - common
Northern Gray-cheeked Thrush -

Fish and Fishing

The Muklung River is very fishable, its miles of riffles and pools afford easy fly or spin casting. As the river makes its many turns it cuts under the banks, making ideal cover for rainbows. Nearly every rainbow we caught was from one to these areas. Grayling were found in these "cuts" as well as in riffle areas.

We tried both fly and spin fishing in the first few miles of floating but had no success and surmised that the fish had not yet reached the headwaters from their wintering sites. Ice conditions would most likely preclude wintering in these upper shallow reaches.

We started catching fish just below the confluence with a creek drainage and a sizeable lake to the west. The first cut-bank pool contained many fish. It was deep and swift with a gravel bottom. A white rubber grub-like jig was the most productive lure, and in a few hours we caught eight rainbow up to 19 inches in length and approximately a dozen grayling each averaging 16 inches in length. Most of the rainbow that we kept contained sculpin in their stomachs, one specimen being 5 inches long.

From this point down to tidewater, grayling fishing was very good in most areas. Rainbow "holes" were much fewer, however, and only six more fish were taken.

Management Recommendations

This small river, owing to its proximity to Dillingham, its floatibility and fine fishing, is a valuable resource. Aircraft can presently carry sportsmen to the headwaters at a very reasonable cost. Landings can be made on a few stretches further downriver.

Managed on a limited access basis, the Muklung River will continue to provide a low cost quality experience for the fisherman, canoeist and hunter. Unlimited access, the kind provided by a highway, would quickly alter this beautiful drainage to its detriment. It simply is not a high yield hunting and fishing area.

Project Recommendations

The Muklung probably should be floated in July, August or September some year to better evaluate sport fishing potentials during and after salmon runs.

Further investigations on the moose population should be made (e.g. aerial surveys as soon as possible after fall snow comes).

KOKTULI RIVER TRIP
(July 13 - 24, 1971)

General Description

The Koktuli River begins in the open country just north of Lake Iliamna. It flows more-or-less westward for about 75 twisting miles before it reaches the Mulchatna River. For its first 30 miles or so, the Koktuli is a tiny creek winding through extremely dense willow growth. In some stretches it is completely canopied by these willows. In several places the willow stands are several miles wide.

Below this area, the Koktuli gradually increases in size and becomes a full-fledged river. For the remainder of its length, until it empties into the Mulchatna River, it wanders through heavy spruce forest. Many large trees lying out over the water sweep the surface. Several huge log jams clog portions of the river although the main channel is rarely blocked.

Mechanics

On July 13 a Widgeon from Western Alaska Airlines carried assistant Fred Pitzman and me to the headwaters of Koktuli River. We landed on a small shallow lake on the south branch. When the plane came to a stop, it was resting on the mud bottom. We removed the Avon 12 foot raft, inflated it and floated our gear to the shore. The lightened aircraft was able to take off without trouble.

We started downrstream on July 15. For the first ten miles or so the river was so shallow that the raft would barely float. We had to stumble along on foot over most of this. Gradually the river increased in size.

We arrived at Swan River on July 20 and at the Mulchatna River the following day. On July 23 we were on the Nushagak River. We pulled up to the village of New Stuyahok the next afternoon. Dick Armstrong flew us to Dillingham on the 24th.

Big Game Observations

Brown/grizzly bear

The Koktuli River drainage, especially its upper reaches, appears to be a very important brown bear area. In our brief visit we saw one mating pair plus seven other adult bears (two of which may have been the mating pair). Tracks were observed on nearly every gravel bar along the Koktuli and Mulchatna Rivers.

Caribou

Our pilot, the manager of Western Alaska Airlines, told of seeing a herd of about 1,500 caribou just out of sight from where he had left us at the head of Koktuli River. That evening we spotted about 200 caribou heading westward, perhaps part of the larger group.

Lichen cover is not extensive in this area, but we noted considerable caribou trails. Sawed off antlers by our landing site are evidence of some hunting.

Moose

From signs of browsing, the Koktuli River does not seem to be an important moose wintering area. Some patches of *Salix pulchra* had 5-20 percent of annual growth removed.

We saw only one bull and two cows. The natives along the Nushagak told us they do most of their moose hunting below the Koktuli River.

There were moose tracks on most gravel bars below the half-way point on the river.

Wolf

We saw one gray wolf on July 14 about one mile northwest of our landing site. He was trotting along a steep slope heading northwest.

We also observed tracks of two adult wolves about midway on the Koktuli River.

Upland and Small Game Observations

Ptarmigan

We observed a hen with five or six flying chicks near the headwaters. Nearby was another hen which appeared to have a nest or young. Downriver four days later we flushed one cock.

Porcupine

One adult was observed on the lower river.

Ground squirrel

There were considerable numbers of holes on the hillsides above our landing site. Some holes had been dug up by bears.

Small mammals

A total of 216 trap-hours yielded no results (standard mouse traps).

Waterfowl Observations

Some small ponds near the headwaters of the Koktuli River offer nesting habitat for a few dabblers and divers. Some of these ponds are backed up by beaver dams.

Pintail - 1 hen with 5 young (approximately 5 days old)
Green-winged Teal - 8 adults w/12 young
Harlequin - 4
Common Merganser - 1
Whistling Swan - 3
Common Scoter - 4 (1 female flushed off nest near beaver pond)
Greater Scaup - 13
Oldsquaw - 3
Red-brested Merganser - 50
Snipe - 1

Non-Game Bird Observations

Glaucous Winged Gull - about 20
Mew Gull - about 10
Arctic Tern - increasingly common downriver
Whimbrel - 1 (appeared to defend nest)
Greater Yellowlegs - about 15
Golden Plover - 2
Semi-palmated Plover - about 30
Long-tailed Jaeger - 1
Osprey - 3 (1 pair near nest)
Red-throated Loon - about 25
Song Sparrow - about 10
Golden-crowned Sparrow - about 10
White-crowned Sparrow - about 20
Tree Swallow - noticeably few
Rusty Blackbird - about 15
Yellow Warbler - common
Northern Gray-cheeked Thrush - 1
Herring Gull - about 10
Northern Phalarope - 2
Least Sandpiper - about 10
Wandering Tattler - about 5
Surfbird - 1 (apparently nesting in area)
Black-bellied Plover - 2
Golden Eagle - 2
Bald Eagle - about 15
Marsh Hawk - 3
Raven - about 10
Common Redpoll - 1
Tree Sparrow - about 5
Lapland Longspur - 1 pair
Bank Swallow - very few
Water Pipit - 2
Robin - 3

Fish and Fishing

Fishing on the Koktuli River trip was generally poor. Once again, according to bush pilots we talked with, the poor fishing could likely be due to high water especially on the lower part of the river.

The small lake on which we landed, at the head of the south branch of the Koktuli, offers excellent pike fishing. Strikes came with nearly every cast at the lower end of the lake. The largest pike caught was 35 inches long and heavy-bodied.

Below this shallow lake the river is very small for several miles and fishing is almost nonexistent. We were forced to walk the boat downstream through this portion. We did see a few fish about 12 inches long that appeared to be suckers and grayling. We also scared up some fish approximately 8 inches long that looked very much like red salmon. We were unable to collect any of these fish.

It was not until our third day on the river, July 18, that we caught the first rainbow and grayling. Fishing was never fast, but we managed to catch several of both species from 16 to 18 inches long in this portion of the river. A red and sliver Hotrod lure and a white rubber imitation grub proved most effective.

On July 19 we observed the first king salmon. We counted approximately 20 of these dark red fish in five miles of river. On this same day we caught five rainbow trout 17 to 18 inches in length. One of these was caught on salmon eggs, the others were caught on spinning lures (Daredevil, Hotrod, Crocodile, etc.).

Approximately ten miles above the confluence with Swan River, on July 20, we observed two fish that appeared to be sockeye salmon jumping from the water. They were very bright and about 22 inches long. In this portion of the river we caught several grayling but no rainbow. A few more king salmon were seen here. In the straight stretch of water below Swan River we hooked four species of fish: rainbow, grayling, northern pike and king salmon. A fifth species, apparently sockeye salmon, was also observed. Here we caught two rainbow about 17 inches long and one pike 28 inches long. This particular location is reportedly a favorite spot for rainbow. Float planes can land here easily.

Along the remainder of the Koktuli and along the Mulchatna River we tried fishing at most of the feeder streams but the water level was very high and we had no success.

Plant Species List

White spruce
Black spruce
Paper birch
Dwarf birch
Alder
Aspen
Cottonwood
Willow
Dogwood
Fireweed
Rose-root sedum
Blueberry
Bearberry
Crowberry
Spirea
Cow parsnip
Jacob's ladder
Dock
Highbush cranberry
Nagoonberry
Labrador tea
Bog-rosemary
Bog violet
Lowbush cranberry
Lousewort
Mountain azalea
Twin-flower
False hellebore
Arnica
Mountain avens
Scammon's oxytrope
Bitterwort
Forget-me-not
Monkshood
Wild rose
Bluebell
Aster

Man-use

The Koktuli River is nearly free from signs of men. It was the last day of the trip before we found the slightest trace: a lean-to shelter, some rusty cans and old clothing (apparently a trapper's overnighting place).

Below this, at the confluence with Swan River, an old cabin stands in ruin. Eskimo men in New Stuyahok told us of using this while trapping the lower Koktuli years ago.

Apparently natives from the Nushagak River rarely get up the Koktuli. A cartridge box and sawed off caribou antlers near the lake on which we landed attest to some use. I would suspect that people from Nondalton travel and trap the upper Koktuli area.

Trapping intensity on the lower river apparently varies proportionate to fur prices. According to a trapper from New Stuyahok with whom we talked, prices of late have not inspired people to go that far upriver.

The same man told us that nearly all travel in winter is by snow vehicle.

Recommendations

The Koktuli is an absolutely beautiful river. Its pools and riffles are classic, it quiet stretches through cool spruce stands are unforgettable. Other than for the problem of access, this is a nearly perfect river for canoeing or kyaking.

Access points on the upper river were not determined. The lake we landed on is marginal. According to bush pilot Dick Armstrong, it is usually too shallow for float planes. He tells of landing a couple of years ago on a lake somewhat below this one, a tributary of the Koktuli.

There may be lakes of sufficient size for landings on the north branch. We were not able to determine this. There is a possibility that a plane with large tundra tires could land along the upper river in certain locations.

One can float for days on the Koktuli before he sees a sign of man. It is true wilderness country and I feel it should remain so. This important tributary of the Mulchatna should be given Wilderness Waterway calssification or something comparable. Further investigation is necessary to determine safe access by aircraft to the headwaters. Highways to the area should be opposed.

JOB PROGRESS REPORT

State: Alaska

Project Nos: W-17-4&W-17-5 Title: Laboratory Services

Section: Game Laboratory Services (Region II)

Period Covered: July 1, 1971 to June 30, 1973

Introduction and Objectives

This report describes the activities of the Region II Laboratory Section of the Division of Game in Fiscal Years 1972 and 1973. As in previous years, most specimen work and related jobs originated in Region II (Southcentral Alaska including Bristol Bay and Kodiak Island, the Alaska Peninsula and the Aleutian Islands). Substantial numbers of specimens and requests for laboratory services originated in Region III and Region I.

The principal objective of the Region II Laboratory Section is to support game Survey and Inventory and Research activities in pursuit of regional and statewide goals. Since its inception in 1969 the Anchorage laboratory has performed service functions in response to game management needs.

The realization of game management objectives has required sharing of laboratory manpower with other elements of the Division and support of higher priority programs through timely scheduling of work.

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Procedures

The State of Alaska approved in 1972 a three-year, renewable lease for occupancy of a Fish and Game facility at 333 Raspberry Road, Anchorage. This action resulted in the construction of a new laboratory in a one-story extension of the main two-story wood frame building. The new facility gave local personnel of the Division of Game and other users a laboratory designed for game specimen work. The provision of modern laboratory cabinets, equipment and work space by state/federal funding was designed to improve the efficiency and safety of specimen work at the Anchorage office and to provide better support for game studies in Region II.

The Anchorage Game Laboratory occupies approximately 2,115 square feet of floor area including space occupied by a walk-in freezer and other stationary objects. A fisheries laboratory is part of the complex but the total square footage given is that portion of the laboratory designed for Division of Game work. The laboratory rooms and their respective areas are:

L-1	darkroom-laboratory (mini-laboratory C)	118 sq. ft.
L-2	microscope room	115 sq. ft.
L-3	records and storage	130 sq. ft.
L-4	lavatory-shower	40 sq. ft.
L-5	controlled substances locker	25 sq. ft.
L-6	main laboratory room	854 sq. ft.
L-6	mini-laboratories A and B, each w/area of 114 sq. ft., total area	228 sq. ft.
L-7	autopsy and freezer room	605 sq. ft.
	Total floor area	2,115 sq. ft.

L-8 combined Divisions of Commercial Fish and Sport Fish laboratory and scale-reading room, dimensions about 8 ft. by 13 1/2 ft.

An incinerator outbuilding was built for laboratory use. A 10' X 12' flammables storage building in the service yeard is used for storage of hazardous chemicals and gasoline.

All rooms of the laboratory except L-7 lie in a compact group rectangular in outline, oriented on an east-west axis adjoining on the east the two story north-south office portion, and adjoining on the west the one story warehouse and laboratory autopsy room (L-7). An east-west corridor bisects the laboratory and serves the warehouse, a northward extension of the corridor gives access to the autopsy room, Commercial Fish-Sport Fish Laboratory and the outside. The suspended ceilings in the laboratory work areas are of standard height with flush lighting panels. The autopsy room has a higher, 12 foot ceiling with overhead steel beam and moveable chain lift for hoisting game carcasses. These rooms were planned to meet Division of Game Laboratory needs projected for three to five years, or through 1977. Anchorage area and visiting game biologists of the Division use these facilities.

Planning for the new laboratory began years ago. Actual construction of the offices-laboratory-warehouse complex began in the spring of 1972. The move to the new quarters was accomplished in October 1972. The laboratory was the last portion of the main building to be finished. The builder and his subcontractors did not adhere to bid specifications and proper construction standards, necessitating piecemeal rewiring of electrical circuits and alterations of the laboratory lighting and heating systems. Satisfactory correction of most building defects with the exception of heating and filtered fresh air supply was accomplished by the builder on or before June 30, 1973. The lesson: require conclusive evidence of architectural competence in specialized designs before construction is begun, also, more closely supervise all stages of construction. Future legal arrangements for purchase or lease of new or remodeled structures by the State of Alaska should include a detailed, explicit signed agreement with provision for frequent on-site inspection by the using agency or its consultants to supplement the efforts of the Department of Administration. Hire of a competent, independent consulting architect to insure design integrity is a necessary step that must be taken to secure economical, functional design and operation of specialized state facilities. We, in state government, need to take a forceful and consistent stand in these matters at all levels of decision making.

Work Performed

Regional and Statewide Laboratory Functions

A detailed breakdown of specimen work with regions of origin appears in Tables 1-4. Time devoted to nonspecimen support activities for personnel of Regions I and III is included in Region II time. One-fourth or more of Region II Laboratory Section effort is expended to satisfy statewide needs of the Division. The greater part of such assistance is given Region III personnel through processing and aging of teeth. Assistance from outside Region II has come from the Region III Laboratory Section at Fairbanks where polar and brown/grizzly bear skulls have been cleaned.

Table 1. Work Performed, Region II Laboratory Section Jan. 1, 1972 through June 30, 1973.

Specimen Work

Species	Explanation	Region	Man-Days
Caribou	S&I, teeth	II	100.9
Caribou	S&I, teeth	III	39.8
Caribou	Research, marrows	II	2.4
Subtotal			143.1
Brown/grizzly Bear	S&I, teeth	II	64.1
Brown/grizzly Bear	S&I, teeth	III	16.1
Brown/grizzly Bear	S&I, teeth	I	4.1
Brown/grizzly Bear	Research, teeth & blood	II	26.8
Brown/grizzly Bear	Management	II	17.1
Subtotal			128.2
Moose	S&I, teeth	II	12.9
Moose	S&I, teeth	I	0.2
Moose	S&I/Research, marrows	II	22.4
Moose	Research, teeth,blood & hair	II	37.3
Moose	Research, teeth & blood	III	0.7
Subtotal			73.5
Polar Bear	S&I, teeth	III	23.9
Polar Bear	Research, teeth	III	18.9
Subtotal			42.8
Disease - Parasites	S&I, public relations	II	12.0
Subtotal			12.0
Sheep	S&I	II	1.0
Sheep	Research	II	4.9
Subtotal			5.9
Miscellaneous Species			
Marine Mammals	S&I, lab and fieldwork	II	14.7
Species unidentified by work records		II	2.9
Musk Ox	Research, Cooperative Wildlife Unit	III	1.0
Black Bear	S&I	II	0.7
Wolf	Research	II	1.0
Cougar	Research	out of state	0.5
Deer	S&I	II	0.2
Subtotal			21.0
Wildlife Specimen Techinques Manual		Statewide	3.7
Total			433.9

Work by Region of Origin

Region II	325.0
Region III	100.4
Region I	4.3
Statewide, cannot be classified otherwise	3.7
Out of state	0.5
Total	433.9

Table 1. (Cont)

Support Activities

Description		Man-Days
New building, moving and accomodation		82.9
Administration and miscellaneous		108.8
Orders and supplies, local and regional		63.4
Employee training, interviews and hire		39.2
Meetings and conferences		53.5
Reports		39.2
Planning		12.9
Management and public relations		6.6
Alcohol and drug administration		3.4
	Total	409.9

Employee Leave

Annual		41.3
Holidays		41.0
Sick		43.0
Leave without pay		3.0
Total Leave Time		128.3
	Grand Total	972.1

Table 2. Wildlife Teeth Processed for Aging by Region II Laboratory Section, January 1, 1972-June 30, 1973.

Species	Section	Herd or area of Origin	Fish and Game Region	Number
Caribou	S&I	Nelchina	II	1,124
Caribou	S&I	Adak Island	II	73
Caribou	S&I	Steese-Fortymile (Taylor Hwy.)	III	442
Caribou	Research	Western Arctic Herd	III	15
Subtotal				1,654*
Brown/grizzly Bear	S&I		II	561
Brown/grizzly Bear	S&I		III	122
Brown/grizzly Bear	S&I		I	96
Brown/grizzly Bear	Research		II	115
Brown/grizzly Bear	Research (recut teeth)		II	26
Subtotal				920
Moose	Research	Moose Research Center, Kenai Peninsula	II	422
Moose	Research	Alaska Peninsula and Alaska Range	II & III	20
Subtotal				442
Polar Bear	S&I & Research	Western and Northern Alaska	III	438
Polar Bear	Research	Bureau of Sport Fisheries & Wildlife	III	40
Subtotal				478
Deer	S&I	Southeastern Alaska (reaged)	I	5*
Subtotal				5
Musk Ox	Research	Nunivak Island	III	2
Subtotal				2
Cougar		Out of state		1
Subtotal				1
			Total	3,502

Numbers of teeth by Administrative Region

Region II	2,335
Region III	1,065
Region I	101
Out of State	1
Grand Total	3,502

* Teeth were aged by Region II Laboratory Section personnel.

Table 3. Specimens sent from Region II Laboratory Section to Private and Public Laboratories. January 1, 1972 through June 30, 1973

Category	Species	Origin	Individual Animals
Blood chemistry, genetic studies (sera, solids)	Brown/grizzly Bear	Alaska Peninsula; except 1 ea. on Kodiak I.	115
Milk, nutritional and chemical analysis	Brown/grizzly Bear	Alaska Peninsula (11 ea., individuals included in above entry)	
Blood chemistry, nutritional status (?)	Moose	Ft. Richardson, Anchorage area	44
Blood chemistry, nutritional status (?)	Moose	Salchaket Slough, Region III	22
Blood chemistry, genetic studies	Brown/grizzly Bear	McNeil River, Alaska Peninsula	15
Blood chemistry, genetic studies	Brown/grizzly Bear	King Salmon area, Alaska Peninsula	4
Nutritional status (?) marrows	Moose	Moose Research Center, Kenai Peninsula	6
Nutritional status, marrows	Caribou	Arctic Herd	33
Nutritional status, hair	Moose	Anchorage area	45
Nutritional analysis, sedges	---	---	
Prey species and vegetation analysis, scats	Wolf	Mt. Sanford region, Copper River Basin	1
Disease (reportedly abnormal liver)	Brown bear cub	---	1
Disease (skeletal muscle pus pocket)	Caribou #7442	Mile 140, Glenn Hwy., Nelchina area	1
Disease (rabies test)	Red Fox	Slana-Tok Hwy.	1
Disease (rabies test)	Wolf	Pilot Point, Alaska Peninsula	1
Disease (rabies test)	Red Fox #7445	King Salmon, Alaska Peninsula	1
Disease (rabies test)	Coyote	Lower Trail Lake, Kenai Peninsula	1
Disease (rabies test)	Fox	Northway area	1
Disease (rabies test)	Coyote	Glennallen	1
Disease (rabies test)	Red Fox #7449	Jack Lake, Nabesna Road	1
Parasitism	Caribou	---	1
Parasitism	Lynx, numbered series	Southcentral Alaska, areas unknown	12
Parasitisim (entrails)	Goldeneye Duck #7448	Cordova area	1
Fibroma	Wolf # 7450	Knik River, GMU 14A	1
Natural mortality	Wolf #7451	Chitina River, Copper River	1
TOTAL			310

Summary, test results reported to Laboratory Section

Disease (suspected liver abnormality)	1 normal, brown bear cub
Disease (rabies test)	1 positive, red fox #7445, by Communicable Disease Center, Atlanta, Gerogia
Disease (rabies test)	6 negative
Disease (fibrocystis)	1 occurrence, caribou
Disease (organism *Corynebacterium* sp.)	1 caribou #7442, cultured and identified by Don Barrett, USDA, Palmer, Alaska

Table 3. Cont.

Tumor	1 benign fibroma (skin), wolf
Natural mortality	1 starvation, wolf autopsy by Harry Reynolds
parasitism (tapeworm, *Schistocephalus solidus*)	1 goldeneye duck #7448, identified by Kenneth A. Neiland, ADF&G
Total individual animals	13

Explanation: Numbers of recorded and actual specimens were down sharply in 1972 as compared to 1971, perhaps owing to the disruption caused by dismantling of the old laboratory, some MRC moose blood was not recorded in laboratory transactions. Lowered caribou kills and absence of late antlerless moose hunts in 1972 also reduced the number of specimens sent to cooperating laboratories.

Table 4. Bone Marrows, Region II

Species	Period Collected	Location	Suspected Cause of Death	Quantity
Moose	Late 1971 through spring 1972	Nelchina Basin	Winter kill	37
Moose	Late 1971 through spring 1972	Nelchina Basin	Suspected wolf predation	32
Moose	Late 1971 through spring 1972	Nelchina Basin	Illegal hunting	2
Moose	Late 1971 through spring 1972	Nelchina Basin	Road kill	1
Moose	Late 1971 through spring 1972	Nelchina Basin	Disease (lung infection)	1
Moose	Early Feb. through late March 1973	Nelchina Basin	Wolf predation	8
Subtotal				81
Moose	Winter 1971 and spring 1972	Kenai Peninsula	Winter kill	66
Moose	Winter 1971 and spring 1972	Kenai Peninsula	Road kill	10
Moose	Winter 1971 and spring 1972	Kenai Peninsula	Accident	2
Moose	Winter 1971 and spring 1972	Kenai Peninsula	Unknown	1
Moose	Late Feb. through late March 1973	Kenai Peninsula	Unknown	16
Moose	Late March 1973	Kenai Peninsula	Starvation	3
Moose	Late March 1973	Kenai Peninsula	Predation	2
Moose	Late December 1972	Kenai Peninsula	Disease	1
Subtotal				101*
Moose	Late 1971 through spring 1972	MRC, Kenai Penn.	Winter kill	17
Subtotal				17
Moose Total				199
Bison	Late 1971 through spring 1972	Copper R. drainage	Winter kill	4
Bison Total				4
Dall Sheep	Late 1971 through spring 1972	Kenai Peninsula	Winter kill	2
Dall Sheep	Late 1971 through spring 1972	Kenai Peninsula	Illegal hunting	1
Dall Sheep Total				3
Caribou	Late 1971 through spring 1972	Nelchina Basin	Suspected wolf predation	3
Caribou	Early March 1973	Nelchina Basin	Predation	1
Caribou	Mid-March 1973	Nelchina Basin	Poaching	1
Caribou	Early March 1973	Nelchina Basin	Starvation	1
Caribou Total				6
All Species Total				212

* Includes one animal from west shore of Cook Inlet; excludes Moose Research Center specimens from Kenai Peninsula

Causes of Death Summarized.

Moose: Winter kill, 120; suspected wolf kill, 32; road kill, 11; illegal hunting, 2; accidents, 2; disease, 1; unknown, 1. Total Moose, 169.

Bison: Winter kill, 4. Total Bison, 4. Dall Sheep: Winter kill, 2; illegal hunting, 1. Total Dall Sheep, 3.

Caribou: Suspected wolf predation, 3. Total Caribou, 3.

Caribou, Regions II and III, 1971-72 season

Region II, Nelchina Herd. Of 1,002 caribou teeth representing individual caribou killed by hunters during the 1971-72 season in the Nelchina area, 834 were aged by Charles Lucier of this laboratory while the remainder (168), were aged by dentition eruption/wear by personnel at the Glennallen area office.

The caribou teeth that were aged in the laboratory were embedded and cross sectioned at 195-200 microns and slide mounted, then aged by counts of fluorescing cementum annuli in ultraviolet light or mixed ultraviolet/incandescent light. The teeth were examined under 60 or 100 power magnification.

The preparation and aging of hunter harvested Nelchina caribou first incisors in 1972 cost 86.9 man-days, or 652 man-hours. The laboratory time investment per animal aged was 39 minutes.

Time required and cost of aging caribou teeth by the ultraviolet fluorescence method are roughly the same as for decalcification, microsectioning and staining of brown/grizzly bear teeth in similar quantities. Costs in aging tend to equalize, allowing for variations in productivity and temperaments of workers. The staining method is defintely more costly when numerous duplicate slide mounts are required. Both methods require specialized but durable equipment with some maintenance costs. Efforts to minimize costs are bound to be frustrated for simple, very human, reasons. Increases in worker skills are offset by increasing perfectionism. Although specimen processing is not an element in game management of cost comparable to public relations or aircraft charter outlays, it is a substantial cost requiring at present, the full time salaries of several persons in Region II and part time work by other middle range personnel. These costs, if they must be lowered, can be lowered substantially only by: 1) a decision by policy makers that microscopic examination and analysis of wildlife specimens are unnecessary or 2) hire of disinterested persons in low pay ranges who put emphasis on speed of production rather than on the quality of specimen processing. The contracting of tooth processing remains a possibility.

Region II, Nelchina Basin Herd, Research. The laboratory aged teeth from three caribou carcasses identified as wolf utilized.

Region II, Adak Island Herd. Twenty-eight caribou taken by hunters in the fall 1972 season were aged.

Caribou, Regions II and III, 1972-73 Season

Region II, Nelchina Basin Herd, Survey and Inventory. A reduced hunter harvest of Nelchina herd caribou in the shortened season of August 10 through September 20, 1972 resulted in a reported kill of 555. Of this number, only 122 jaws were sent to the Anchorage laboratory for

aging in 1973. Some calf and yearling caribou jaws were aged by eruption at the Glennallen office by resident game biologists. The jaws which were not received from hunters may represent a tendency of aircraft and off-road vehicle borne hunters to leave jaws at the remote kill sites. Whatever the explanation, the jaws of half or fewer of caribou killed by hunters in the Nelchina and adjacent areas of Southcentral Alaska in the fall of 1972 were received for aging.

Region II, Adak Island and Other Herds. Of 99 Adak Island caribou believed to have been killed by hunters in the August 10, 1972 through March 31, 1973 season, 45 were aged at Anchorage. No caribou from the Alaska Peninsula or Mulchatna herds were aged at Anchorage in the first half of 1973.

Region III, Steese-Fortymile and Arctic Herds. Region III caribou teeth processed at the Anchorage laboratory in the first half of 1973 included 20 from the 1971-72 hunter harvest and a research selected representative sample of 422 from the fall 1972 Taylor Highway hunter harvest. About one-half of the latter collection were actually aged in the report period ending June 30, 1973. Fifteen caribou teeth taken by division personnel for scientific purposes in the spring of 1969 at Noluck Lake (western Arctic slope province) were also aged.

We anticipate reductions in caribou aging work in the years immediately ahead as a direct result of low caribou harvests in Southcentral Alaska.

Brown/grizzly Bear, Statewide

Specimen Acquisition and Routing. The Anchorage laboratory prepares slide mounted microsections of brown/grizzly bear teeth, usually first premolars, for aging by counts of stained tooth cementum annuli. The extracted bear teeth are sent from throughout the state to Leo Miller, Game Technician V, who records vital specimen information and organizes the specimens prior to their receipt by the laboratory. The specimens are processed in batches usually according to the Game Management Unit of origin and the finished, permanently mounted and stained sagittal tooth sections are aged by Leo Miller. Leland Glenn, Game Biologist III in charge of brown/grizzly bear research in Region II, also ages the tooth mounts of brown/grizzly bears from Game Management Unit 9. Brown/grizzly bear teeth collected by research come from Mr. Glenn. Teeth from animals killed by persons in defense of life and property and miscellaneous bear teeth usually come from Mr. Miller. This system has worked smoothly for a number of years and hinges on good cooperation between the technician, biologists, Public Safety officers and cooperating hunters.

Tooth Processing and Quality Control. The laboratory staff is in frequent contact with Leo Miller and Leland Glenn of the Anchorage office during the tooth processing seasons. The laboratory staff maintains control of specimen quality by examining stained specimens carefully during the stages of processing and reviewing the completed slide mounted tooth sections for readability prior to their submission to Misters

Miller and Glenn. When there is a serious question about readability of slide mounted tooth sections, either in the laboratory or when the tooth sections are being aged, a new slide mount is made from extra microsections or new sections are cut from the tooth.

Occassional mistakes in tooth processing do occur. A mishap at the Anchorage laboratory in mid-1972, involving about two dozen brown/grizzly bear teeth, emphasizes the need to avoid immersion of decalcified teeth in plain water for extended periods. In this instance, a number of brown/grizzly bear teeth were left in rinse water, rather than a preservative, for many days. As a result, the unpreserved teeth molded.

Slide mounts of the sections from the moldy teeth were found to have absorbed stain poorly and were unreadable or barely readable using ordinary incandescent light microscopy. This was a hindrance to the work of the biologist though not a complete loss.

Failure of the spoiled teeth to accept stain properly is presumed to be a result of their exposure to molds. The mechanism that prevents the contrast dyeing of mold degraded tooth cementum is unknown to this reporter.

In an attempt to salvage age data from the moldy brown/grizzly bear teeth, Anchorage laboratory personnel mounted decalcified sections of eight relatively readable teeth. The tooth section mounts were examined using ultraviolet fluorescense microscopy. The readability of the eight slide mounted teeth was poor or fair at best as shown below.

Brown/grizzly Bear Specimen Numbers	Fluorescing Cementum Annuli Counts
19	5
23	15
24	4-5
730	4
764B	7-8
842	3
854	14

Although readability of tooth sections was generally poor they could be aged using mixed ultraviolet and incandescent light. Number 23 had a cementum annuli count that indicated an age one-year older than assigned by counts of stained cementum annuli, while number 730 had a cementum annuli count that yielded the same age as that derived from examination of the stained sections from this tooth. The remaining six teeth could not be read with sufficient accuracy by counts of stained tooth cementum annuli to allow a comparison of ages obtained by microscopic examination of stained sections versus counts of fluorescing tooth cementum annuli.

Results of aging the mold degraded brown/grizzly bear teeth by the ultraviolet fluorescence method suggest: 1) decalcified brown/ grizzly bear tooth cementum will fluoresce weakly in ultraviolet light; 2) some

mold degraded teeth may be aged by use of ultraviolet fluorescence microscopy; 3) systematic comparison of the ultraviolet versus decalcification/staining methods of aging teeth is needed to develop alternate means of aging difficult to read stained tooth cementum annuli of brown/grizzly bear and other game species.

Bear Tooth Specimen Production in 1972 and January through June 1973

The decalcification, microsectioning, dehydration, staining and slide mounting of brown/grizzly bear teeth was one of the most important specimen jobs of 1972. As of December 31, processed, research derived teeth totaled 104 and survey and inventory teeth totaled 232. Eventually 920 brown/grizzly bear teeth from the year 1972 were processed at Anchorage. These figures represent teeth cut on the freezer microtome. The number of individual bears represented is slightly lower.

A comparison of time required to produce Research derived brown/grizzly bear tooth slide mounts for the year 1972 shows that 104 "research" teeth cost 85.2 man-hours (11.4 man-days) or 49 minutes per specimen, the 232 "survey and inventory" teeth cost 176.2 man-hours (23.5 man-days) or 46 minutes per specimen. The total of 816 "survey and inventory" teeth eventually processed cost 649.0 man-hours (86.5 man-days) or 48 minutes per specimen. The loss of efficiency indicated by the comparison of three years' output of completed brown/grizzly bear tooth mounts may or may not be actual since the comparisons are based on different worker's daily work records.

Three Years' Output of Brown/grizzly Bear Tooth Slide Mounts

Year	Brown/grizzly Bear Teeth	Man-days	Minutes to Produce One Slide
1970	440	34.0	35
1971	773	48.1	29
1972	920	97.9	48

Brown/grizzly Bear Tooth Specimen Techniques

The laboratory continues to use a technique for tooth preparation described in an in-house publication, Preparation of Brown Bear Teeth for Aging by Counts of Cementum Annuli, by Nick Steen and Carl McIlroy, July 1971, 2pp. This method involves the decalcification, microsectioning, dehydration, staining using hematoxylin stain (Harris Hematoxylin modified for Pananicolaou staining, PS1291, Paragon C & C Co., Inc.) and permanent mounting on a glass slide with Permount® mounting medium and coverslip. Results are satisfactory. This seems to be as good a method as is now available for this purpose, though the ultraviolet fluorescence or other methods may prove useful for aging of difficult to stain teeth.

Polar Bear, Statewide

Polar bear teeth obtained from hunter harvested and tagged animals originating in Northern and Northwestern Alaska were prepared for aging by the decalcification/staining method at the Anchorage laboratory.

Specimen preparation was done by David Harkness with the assistance of Larry Johnson. The laboratory prepared sections of 478 polar bear teeth in 1972 including both hunter harvested and tagged bears. The completion of the slide mounts for aging cost 42.8 man-days or 321 hours; time expended per polar bear tooth mount was 40 minutes. Time for aging must be added to obtain an estimate of the total cost of this process.

About 3.7 laboratory man-days were expended for polar bear tooth work on behalf of the U.S. Fish and Wildlife Service. This is an example of a contribution by the State of Alaska to federal wildlife programs.

The 40 polar bear tooth slide mounts made for the U.S. Fish and Wildlife Service and tooth mounts derived from division activities were aged by Jack Lentfer, formerly of the Department of Fish and Game and now an employee of the U.S. Fish and Wildlife Service. The 40 polar bear teeth derived from federal research activities were also examined by James W. Brooks, then of the U.S. Fish and Wildlife Service, and now Commissioner of the Department of Fish and Game.

The 1972 polar bear tooth work may be the last performed by this division with the possible exception of aging teeth collected from Alaska Native killed bears. The impact of the Marine Mammals Protection Act of 1972 is not altogether clear, but its provisions exclude all sport killing of bears by nonnatives in Alaska and all specimen collecting of polar bears for scientific purposes unless administrative procedures to allow these activities are implemented by the Secretary of the Interior. The end of sport killing of polar bears inevitably means the end of large scale tooth collecting and, among other things, a drop in our comprehension of the age composition of polar bear populations in the seas off Alaska and the Chukchi Peninsula of Siberia.

Deer, Region I

Five slide mounted first incisors from Southeastern Alaska deer were reaged using mixed incandescent and ultraviolet light microscopy. The teeth were selected by the area biologist in Sitka as a futher check on the reliability of this method of aging versus the dentition eruption and wear method. The area biologist concluded that ultraviolet fluorescence was not a reliable method for aging of Southeastern Alaska deer teeth.

A thorough study of the feasibility of accurately aging Southeastern Alaska deer teeth should be initiated when biologists determine that accurate age determinations are needed for better management of these game populations.

Moose, Region II, Survey and Inventory and Research

First incisors extracted from hunter harvested moose in 1972 were aged by area biologists and their assistants using the wet grinder in the area offices as well as in the Anchorage laboratory.

A permit moose hunt supervised by survey and inventory personnel was held January 22-26 at Fort Richardson and resulted in a hunter take of 50 animals. The moose first incisors were wet ground and aged by regional biologist Dimitri Bader.

The 422 research related teeth obtained from personnel of the Moose Research Center, Kenai Peninsula, were ground and aged by Anchorage laboratory personnel. In addition, outfitter Ottokar Skal contributed for research twenty additional moose teeth from guided hunter trophy kills on the Alaska Peninsula and Alaska Range.

Laboratory workers David Harkness, Harry Reynolds and Donald Calkins aged the moose teeth. Charles Lucier aged some of the teeth in order to check ages.

The wet grinding technique used to prepare moose teeth for aging has the advantages of speed (10 minutes or less) and simplicity, the drawback is that one saggital section of highly variable readability can only be ground from a tooth. Other means are required when we are aging especially valuable or difficult to read moose teeth. The wet grinding method is economical and does serve sufficiently well to age most moose.

Animal Condition and Genetic Studies

Blood Chemistry, Region II

The origins of 134 brown/grizzly bear blood samples handled by the Anchorage laboratory are enumerated in Table 2. Some of these samples were centrifuged to separate serum and solid components. Other blood samples were merely cataloged, stored and later shipped to cooperating laboratories.

Bone Marrow, Region II

Table 4 is a summary of the bone marrows processed at this laboratory from January 1, 1972 through the spring of 1973.

The bone marrows were collected in Southcentral Alaska during the winter of 1971-72 and spring of 1973 largely in conjunction with ground and aerial surveys of moose mortality. Practically all of the marrow samples (except some wolf associated) came from apparently "winter killed" moose.

Biologists at the Glennallen and Soldotna offices and the Moose Research Center have reveived reports giving wet weights, stable dry weights and the percentage of fat of marrow specimens processed by the Anchorage laboratory.

Disease and Parasite Specimens

Specimens of actual and suspected diseased and parasitized wildlife handled by the Anchorage laboratory are listed and results summarized in Table 3.

Equipment Usage and Productivity

Cryostat (freezer microtome). Use of the cryostat in 1972 amounted to 132.4 hours distributed throughout all months except September and October when the laboratory move stopped normal operations. A breakdown of cryostat usage is given in Table 5.

Polar bear tooth sectioning was the predominant use of the cryostat, requiring 65.1 hours. Brown/grizzly bear tooth sectioning required 43.4 hours. Moose teeth were cut in 21.4 hours and caribou teeth were cut in 2.5 hours. Minor use of the machine may have occurred after work hours without notation.

Normally, the predominant use of the cryostat is for brown/ grizzly bear tooth sectioning. This work was slowed until early 1973.

The teeth cut and processed for slide mounts in 1972 using the decalcification/staining technique were produced at a cost only slightly higher than those produced in 1971 because the operator's salaries remained virtually constant. Although commodity costs were higher, labor is the predominant cost factor.

The Zeiss Standard RA microscope with mercury burner was used 222 hours in 1972 and the first half of 1973. Caribou teeth aged for survey and inventory used all of this time except 9.5 hours. Caribou teeth were aged on the Zeiss microscope at an average rate of 7.4 per hour.

A surplus electric steam heated cauldron cooker was acquired and installed in the new laboratory. The cooker will be used mainly for cleaning flesh from large mammal skulls.

Personnel and Planning

Anchorage Game Laboratory personnel spend most of their time preparing specimens, ordering, assembling and collecting supplies and communicating specimen information (Table 6). In 1972 they also spent 40.5 man-days or roughly 7 percent of on the job time on field assignments. In the months of January-June 1973, field time totaled 34.5 man-days, about 12 percent of on the job time.

Continued participation by laboratory trainees in field work and "front office" duties is a desirable objective which will increase lab workers's experience and help to maintain their motivation through contact with their prime interests, wild game animals, human/game animal relations and habitat. Maintenance of a full and effective staff in the laboratory is an important duty.

Table 5. Equipment Usage and Productivity, Cryostat (Freezer Microtome), 1972.

Month	Species	Number of Specimens	Time	Average Specimens per Hour
January	Brown/Grizzly Bear	12	1.3 hours	9.2
January	Moose	17	3.4 hours	5.0
February	Moose	46	13.5 hours	3.4
March	Moose	15	4.5 hours	3.3
March	Polar Bear	49	6.5 hours	7.5
April	Polar Bear	165	23.1 hours	7.1
April	Caribou	14	2.0 hours	7.0
May	Caribou	5	0.5 hours	10.0
May	Polar Bear	74	12.7 hours	5.8
June	Polar Bear	179	22.8 hours	7.9
July	Brown/Grizzly Bear	20	2.5 hours	8.0
August	Brown/Grizzly Bear	84	11.6 hours	7.2
November	Brown/Grizzly Bear	87	11.5 hours	7.6
December	Brown/Grizzly Bear	145	16.5 hours	8.8
Total		912	132.4 hours	

467 polar bear teeth cut = average of 7.2 cut per hour.
348 brown/grizzly bear teeth cut = average of 8.0 cut per hour.
78 moose teeth cut = average of 3.6 cut per hour.
19 caribou teeth cut = average of 7.6 cut per hour.

Teeth of all species except moose in 1972 averaged 7.6 cut per hour; moose teeth are large and seemingly ill suited to fast production on the cryostat.

Table 6. Anchorage Game Laboratory Manpower Summary, 1972.

Specimen Work	433.9 man-days = 1.6 man-years
Support Activities	409.9 man-days = 1.6 man-years
Leave and Holidays	128.3 man-days = 0.5 man years
Grand Total	972.1 man-days = 3.7 man-years*

* A man-day is 7.5 hours; a man-year is 264 man-days.

Region II laboratory section personnel in 1972 and 1973 through June 30 are listed with dates of service (Table 7). With the exception of the coordinator, these persons filled training positions, their immediate objectives being two-fold: production of high quality prepared specimens and reliable data, and general familiarization with specimen preparation procedures and records to enhance their understanding of this aspect of Game work.

Mr Irvine transferred to Regional Operations and Training at Anchorage. Mr. Johnson resigned to return to the teaching profession out of state. Mr. Harkness joined the survey and inventory staff in Anchorage.

In addition to the regular staff, one job trainee, Sharon Kinckiner, worked temporarily in the laboratory under the auspices of a state/federal program for job training. Mrs. Kinckiner eventually obtained permanent employment as a dental technician in the Anchorage area.

Use of trainees in two of the three Anchorage laboratory positions has the advantage of providing a source of manpower of known ability for advancement or temporary reassignment. The most obvious disadvantages of the use of trainees are the difficulties posed by frequent changes of personnel, the transmission of laboratory "arts" and the maintenance of laboratory users confidence when workers are new to the job.

As a compromise the retention of one training position and the establishment of one laboratory assistant position in addition to the coordinator's position is worth trying provided the current climate of funding and program uncertainties will permit new approaches to manpower use. The coordinator and a laboratory assistant "permanently" assigned to the laboratory should be subject to call for temporary assignment to other sections.

Recommendations

The Region II Laboratory Section staff should be comprised of three persons, one coordinator, one assistant and one Game Biologist Trainee. These persons should be available to other sections and should receive assistance from other sections as required by program priorities established by the Director's Office, the Regional Supervisor, and indirectly, the Program Review Committee.

The laboratory should emphasize good service functions as well as serve as a training ground for entrance level game biologists. Greater attention to continuity in laboratory staffing is needed to consistently maintain high quality work.

Renewed efforts should be made to rationalize all specimen operations.

Table 7. Laboratory Personnel, January 1, 1972 through June 30, 1973.

Name	Title	Service Dates	Action
Charles Lucier	Game Biologist II, Coordinator	Jan. 1 1972-June 30, 1973	---
David Harkness	Game Biologist I	Jan. 1-May 14, 1972	Promotion
	Game Biologist II	May 15, 1972-Feb. 22, 1973	Transfer
Charles Irvine	Game Biologist I	Jan. 1-Feb. 14, 1972	Transfer, promotion
Larry Johnson	Game Biologist I	Apr. 16-June 19	Hired
		June 20-Aug. 15	Non-lab. assigned
		Aug. 16, 1972	Resigned
Harry Reynolds	Game Biologist I (temp.)	Sept. 28-Nov. 6	Hired
	Game Biologist I (permanent)	Nov.7, 1972-Feb. 1973	Rehired, transferred to Region III
Donald Calkins	Game Biologist I	Mar. 12-June 30, 1973	Hired

The role of the Laboratory Coordinator should be expanded to obtain more familiarity with and contributions to nonlaboratory functions. The coordinator's pay should be raised from Range 16 to Range 17 or 18 to provide a modest pay separation between the coordinator and the assistants.

Greater attention should be given to the reduction of administrative duties to increase efficiency. Such efforts must be tempered by the realization that the Department of Administration lacks specialized knowledge of laboratory supply and operational needs.

PREPARED AND SUBMITTED BY:

Charles Lucier
Game Biologist

APPROVED BY:

Director, Division of Game

Research Chief, Division of Game

JOB PROGRESS REPORT

State: Alaska

Project No.: W-17-4 Title: Laboratory Services

Section: Game Laboratory Services (Region III)

Period Covered: July 1, 1971 to June 30, 1972

INTRODUCTION AND OBJECTIVES

The lab services operations are designed to support survey-inventory and research activities in Region III. The primary function and objective of the laboratory is assistance to biologists for routine specimen processing as well as providing expertise in specialized areas of game biology. Routine work is mainly comprised of specimen preparation and preservation, boiling skeletal material, necropsies, age determination, and providing laboratory supplies to area and research biologists. Collaboration with biologists and specialized research in the field of wildlife diseases and parasitology were carried out by personnel of the laboratory. The laboratory is the Alaskan correspondent for the Wildlife Disease Association's wildlife disease surveillance project which accumulates yearly statistics on disease in North American wildlife.

Laboratory facilities were expanded in February 1972 when the Region III headquarters moved into the new facilities which contains a lab designed for our wildlife studies.

A close working relationship has continued between the laboratory and Arctic Health Research Center, Institute of Arctic Biology, University of Alaska; Department of Veterinary Science, University of Wisconsin; and other scientific institutions with mutual interests.

PROCEDURES

The laboratory facility in Fairbanks and its cooperators serve a statewide function by providing the following routine services among others:

1. Age determination of specimens collected during Divisional studies, or from the annual harvest by hunters - primarily tooth sectioning procedures.

2. Routine and experimental analyses of reproductive organs - macro- or micro-histological procedures.

3. Routine chemical analyses - dry-weight marrow fat procedure, etc.

4. Identification of, and routine serological tests for, potential pathogens - taxonomic descriptions of new and known forms, preliminary isolation of pathogens, serological surveys for prevalence of specific pathogens, etc.

5. Necropsies - examination of carcasses for pathogens, pathological conditions or selected tissue samples.

6. Serological analyses as indicators of physiological condition of animals - routine clinical hematology.

7. Preparation of skeletal materials for morphological studies - cleaning and measuring, etc.

8. Supply regional biologists with specialized laboratory-field supplies.

9. Assist or carry out field operations as required.

10. Preparation, presentation or editing of various technical materials for the Department's bimonthly magazine, technical journals and other media.

11. Collection of special technical reference materials - reference texts, reprints, etc.

12. Technical assistance to cooperating agencies, members of the public, etc.

13. Compilation of yearly Alaskan wildlife disease statistics submitted by Alaskan agencies for the Wildlife Disease Association.

14. Preparation of photo-macro-and micrographs of tissue sections, pathological materials, etc.

15. Miscellaneous assistance as required - slide preparation, etc.

WORK PERFORMED

Brief summaries of work performed are presented under the appropriate procedural categories cited in the following sections.

Age Determination

Approximately 200 moose teeth were ground and ages determined by counting cementum rings. Incisors from moose came primarily from hunters and some were collected by game biologists in Region III. Age determination from moose teeth in Region III is carried out by the lab in Fairbanks for the most part, only a few teeth are examined by area biologists.

Approximately 400 lynx teeth were sectioned with a cryostat, stained, and cementum annuli counted to determine age.

Analysis of Reproductive Organs

Ovaries of 93 lynx were hand-sectioned and *corpora albancantia* were counted. Lynx were brought in primarily by trappers who received $5.00 per carcass as an incentive.

Chemical Analyses

Lipid content of 15 moose marrow samples were determined by the dry weight method described by Neiland (1970, J. Wildl. Manage. 34(4):904-907).

Identification of Pathogens

Serum samples were collected from 101 Dall sheep, 5 caribou, 2 moose, 17 brown bears, 12 wolves, 1 fox and 49 hares for serological studies on brucellosis. The presence or absence of lump jaw was recorded on 110 Dall sheep trapped at the mineral lick on Dry Creek, Alaska Range. Various other parasitic and/or infected materials were collected and submitted to cooperating laboratories for diagnosis.

Necropsies

Necropsies were performed on 15 Dall sheep, 11 moose, 8 bison, 1 fox, 2 hawk owls, and 3 waterfowl. In addition, certain organs or parasitological specimens were examined for 6 Dall sheep, 2 caribou, 5 moose, 1 bison, 1 deer, 1 brown bear, 1 seal, 6 hares, 6 raptors, 1 goose, 70 upland game birds, and 1 pike.

Clinical Hematology

No samples processed.

Skeletal Preparations

Selected skeletal materials, particularly skulls, were prepared from the following species: 1 whole skeleton of moose, 1 moose skull, 1 moose leg, 1 bison skull, 1 muskox skull, 40 polar bear skulls, 5 black bear skulls, 93 lynx skulls, 200 beaver skulls, 15 sheep jaws, 20 wolf skulls, 1 wolverine skull, 5 sheep skulls, 25 grizzly bear skulls, 3 red fox skulls, 100 marten skulls and 2 seal skulls.

Collecting Supplies

The laboratory orders, maintains an inventory of, and distributes collecting supplies, chemicals and preservatives to regional biologists.

Field Operations

Laboratory personnel took part in the collection of caribou on the North Slope in May while studying brucellosis and arboviruses. Specimens for moose parasite and disease studies were collected in conjunction with moose nutrition studies in the Tanana Flats.

I & E Services

Several activities of this kind were performed by laboratory personnel during the past year.

A lecture on common diseases and pathogens of wildlife was presented as a part of the yearly military conservation indoctrination course at the University.

An article on camp cookery was prepared for the Department's bimonthly magazine, Fish Tales and Game Trails.

Four articles were written on hunting, fishing and conservation-related topics for the local paper.

Students and interested members of the public were shown the laboratory facilities, wildlife disease work was explained and questions were answered.

Technical References

The world literature on parasitic diseases presented in the Heminthological Abstracts and Veterinary Bulletin, and infectious diseases and nutritional physiology in the latter journal was reviewed for pertinent information which was included in the laboratory card files.

Other appropriate reference materials including reference texts, reprints and technical bulletins and journals were added to the laboratory collection. Relevant items were called to the attention of Departmental biologists or loaned to them at their request.

Technical Assistance

Appropriate assistance was rendered upon request to other Departmental divisions, and other state or federal institutions. Questions from hunters concerning disease conditions in harvested fish and game palatability of meat were answered.

Wildlife Disease Association Activities

Statistics on the occurrence of diseases in Alaskan wildlife were solicited from all appropriate Alaskan agencies and compiled for the Wildlife Disease Association's nation-wide Surveillance Reporting Committee.

Photographic Services

Photographs of pathological material were taken for use by Department personnel and publications.

Miscellaneous Activities

The balance of the time of laboratory personnel was devoted to the following activities:

1. Weekly, monthly, and annual report writing.
2. Laboratory maintenance.
3. Administrative meetings.
4. Storage and inventory of Departmental materials in the walk-in freezer warehouse and laboratory.

PERSONNEL

During the fiscal year the following personnel were assigned to the laboratory:

1. Mr. Kenneth A. Neiland, Laboratory Coordinator. GB III, 3 months.

2. Mr. David Harkness, GB I, 4 months, transferred in October.

3. Mr. George Harper, GB I, probational, 5 months, transferred to lab in December, terminated in April.

4. Miss Carol Ericson, GB I, temporary, 4 1/2 months; probational 4 1/2 months.

5. Mr. Edward Kootuk, Fish and Game Technician IV, 12 months.

6. Miss Bea Faber, GB I, temporary, 2 months.

7. Mrs. Georganna Ranglack, GB I, temporary, 5 3/4 months.

PREPARED AND SUBMITTED BY:

Kenneth Neiland
Game Biologist

APPROVED BY:

Frank Jones
Director, Division of Game

Donald E McKnight
Research Chief, Division of Game

JOB PROGRESS REPORT

State: Alaska

Project No.: W-17-5 Title: Laboratory Services

Section: Game Laboratory Services (Region III)

Period Covered: July 1, 1972 to June 30, 1973

INTRODUCTION AND OBJECTIVES

The primary objective of the laboratory is to provide the special laboratory assistance and materials required by management and research biologists in the conservation of the wildlife resources of Alaska. A subsidiary objective of the laboratory is to carry out research and/or survey-inventory studies on wildlife disease, nutrition, and closely related topics.

CONTENTS

PROCEDURES

The laboratory facility in Fairbanks provides the following routine services among others:

1. Age determination of specimens collected during Divisional studies, or from the annual harvest by hunters--primarily tooth sectioning procedures.

2. Routine and experimental analyses of reproductive organs--macro- or micro-histological procedures.

3. Routine chemical analyses--dry-weight marrow fat procedure, etc.

4. Identification of, and routine serological tests for, potential pathogens--taxonomic descriptions of new and known forms, preliminary isolation of pathogens, serological surveys for prevalence of specific pathogens, etc.

5. Necropsies--examination of carcasses for pathogens, pathological conditions or selected tissue samples.

6. Preparation of skeletal materials for morphological studies--cleaning and measuring, etc.

7. Supply regional biologists with specialized laboratory-field supplies.

8. Assist or carry out field operations as required.

9. Preparation, presentation or editing of various technical materials for the Department's bimonthly magazine, technical journals and other media.

10. Collection of special technical reference materials--reference texts, reprints, etc.

11. Technical assistance to cooperating agencies, members of the public, etc.

12. Preparation of photo-macro- and micrographs of tissue sections, pathological materials, etc.

13. Miscellaneous assistance as required--slide preparation, etc.

WORK PERFORMED

Brief summaries of the work performed are presented in the following section under the appropriate procedural categories cited in the preceding section.

1. Age determinations: Teeth from approximately 250 moose, 20 wolves, 200 beaver, 24 bison, and 200 lynx were prepared for age determinations by counts of annuli.

Cross sections of moose teeth have been found to produce consistently clearer annuli patterns than longitudinal sections.

2. Analysis of reproductive organs: Approximately 50 seal testicals and epididymides were weighed, and measured.

3. Chemical analyses: Marrow samples from 10 moose were analyzed for fat content by the dry weight procedure.

4. Identification of pathogens: Sixty-seven serum samples from sled dogs, caribou, grizzly bears and moose were collected and submitted to a cooperator for serological studies on brucellosis, leptospirosis, and various arbovirus disease entities.

Sheep jaws from 94 animals were examined for lump jaw.

Various parasitic and/or infectious materials derived from Divisional activities were identified or submitted to cooperating laboratories for diagnosis.

5. Necropsies: Specimens from 196 animals were collected: 114 ungulates (15 moose, 13 caribou, 67 Dall sheep, 16 bison, 3 deer), 62 carnivores (3 bears, 8 wolves, 1 fox, 1 lynx, 49 domestic dogs), 5 rodents and lagomorphs (2 hares, 1 flying squirrel, 1 beaver, 1 muskrat), 1 bat, 10 raptors (9 owls, 1 eagle), 3 waterfowl and 1 whitefish. Of these, 32 were entire necropsies, 12 were single organ exams only, 67 were serum samples only, 50 were lump jaw exams (Dall sheep), 2 were ectoparasite collections only, and 20 were collected whole animals which remain to be necropsied.

Hunters or trappers killed 83 of the 196 animals from which we collected specimens (52 sheep, 2 moose, 16 bison, 7 caribou, 1 deer, 1 lynx, 1 beaver, 1 flying squirrel and 2 geese), and 5 of these hunters brought in parts of their animals for specific information on palatability, etc.

6. Skeletal preparations: Selected skeletal materials, particularly skulls, were prepared from the following species. The number of each species is shown in parentheses. Brown-grizzly bear (39), black bear (22), lynx (297), wolf (44), caribou jaws (800), fox (1), wolverine (2), marten (100), moose (3), Dall sheep (14), polar bear (9), Arctic hares (67), and seal (20).

7. Collecting supplies: Approximately 30 man-days were spent on ordering and distributing collecting supplies, etc., to regional personnel and on inventory.

8. Field operations: Laboratory personnel participated in a variety of field operations totaling 90 person days. These include collecting serum at Old Crow and Arctic Village, moose collections in the Tanana Flats and Kenai Peninsula, sheep collections in Dry Creek and Granite Mountains, sheep lick observations in the White Mountains, caribou composition counts of the Delta Herd, disease and production studies on the Nelchina Herd, check stations on the Taylor Highway, reindeer-pipeline crossing studies and BOR wild river study. In addition moose antlers were measured in the field and in the laboratory, and assistance in sealing wolves, wolverine and bears was provided.

9. Publications and I & E services:

Department publication

Laboratory Personnel, Game Division, Alaska Dept. Fish and Game. 1973. Procedures for preserving and mailing wildlife specimen materials. Fairbanks. 18pp.

Publication

Ericson, C. A. In press. Some preliminary observations on specific acoustic communication of semi-domestic reindeer, with emphasis on the mother-calf relationship. Proc. First Int. Reindeer/Caribou Symp. 9-11 August 1972, Univ. Alaska, Fairbanks. 22pp.

Gasaway, W. C., and J. W. Coady. 1972. Volatile fatty acid production in moose of interior Alaska. Proc. First Int. Reindeer/Caribou Symp. 9-11 August 1972, (Satellite Symposium), Univ. Alaska, Fairbanks. (Unpublished.)

_____, and _____. In press. Review of energy requirements and rumen fermentation in moose and other ruminants. Proc. Int. Symp. on Moose Ecology. Quebec, Canada. March 25-30, 1973. Le Naturaliste Canadien.

Translated from Russian

Knorre, E. P. 1959. Selections from "Ecology of the moose." Trans. Pechora-Ilych State Nature Preserve, No. VII, pp. 5-47.

_____, and E. K. Knorre. 1959. Some data on the blood morphology of moose. Trans. Pechora-Ilych State Nature Preserve, No. VII, pp. 164-167.

_____. In press. Changes in the behavior of moose with age and during the process of domestication. Proc. Int. Symp. on Moose Ecology, Quebec, Canada, 25-30 March, 1973. Le Naturaliste Canadien. 10pp.

Timofeeva, E. K. 1967. On the behavior of moose, based on observations made in the northeastern Leningrad oblast'. Vestnik Leningradshogo Universiteta, No. 15. 13pp.

Vorontsov, N. N., and E. A. Liapunova. 1972. Cytogenetic evidence for the existence of trans-Caucaus-Sonoran disjunctions in the ranges of certain mammals. Zoologicheskiy Zhurnal LI (11):1697-1704.

Editorial assistance was provided on two papers by Dr. D. McKnight and W. Gasaway and J. Coady.

10. Technical references: The world literature on parasitic diseases presented in the Heminthological Abstracts and Veterinary Bulletin, and infectious diseases and nutritional physiology in the latter journal were reviews for pertinent information which was included in the laboratory card files.

Other appropriate reference materials including reference texts, reprints and technical bulletins and journals were addded to the laboratory collection. Appropriate items were called to the attention of Departmental biologists or loaned to them at their request.

11. Technical assistance: Appropriate assistance was rendered upon request to other Departmental divisions, and other state or federal institutions. Requests from hunters concerning disease conditions in harvested fish and game palatability of meat were handled. The lab provided two moose skulls to the Hokkaido University Museum, Japan.

12. Photographic services: Photo-macro- or micrographs of selected tissue sections (e.g. teeth) and various pathological materials (e.g. parasitic specimens) were prepared for Divisional projects.

13. Miscellaneous activities: The balance of the time of laboratory personnel was devoted to the following miscellaneous activities:

a. weekly, monthly and yearly reports;

b. preparation of slides of various materials for microscopic study;

c. laboratory maintenance;

d. administrative meetings;

e. storage and inventory of Departmental materials (e.g. scientific specimens, evidence, etc.) in the walk-in freezer, or other sites.

PERSONNEL

1. Mr. Kenneth A. Neiland, Laboratory Coordinator, GB III, 3 months.

2. Mr. William Gasaway, GB II, 12 months.

3. Mrs. Carol Nielsen, GB II, 12 months.

4. Mr. Edward Kootuk, Fish and Game Technician IV, 12 months.

PREPARED AND SUBMITTED BY:

Kenneth Neiland
Game Biologist

APPROVED BY:

Director, Division of Game

Research Chief, Division of Game