STATUS OF BROWN BEARS AND OTHER NATURAL RESOURCES IN THE McNEIL RIVER STATE GAME SANCTUARY AND REFUGE IN 2001

ANNUAL REPORT TO THE ALASKA STATE LEGISLATURE

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January 2002

EXECUTIVE SUMMARY

The McNeil River State Game Sanctuary and State Game Refuge were created by the Alaska State Legislature in 1967 and 1991, respectively. The *sanctuary* was established primarily to provide permanent protection for brown bears and other fish and wildlife populations and their habitats and to maintain and enhance the unique bear viewing opportunities within the sanctuary. The *refuge* was established for similar reasons and human use in the refuge is managed to maintain and enhance the bear viewing opportunities within the adjoining sanctuary. The sanctuary supports the largest gathering of brown bears in the world as they congregate to feed on migrating salmon. The Alaska Department of Fish and Game operates a world-renowned bear viewing and photography program in the sanctuary at McNeil River.

As many as 144 individual bears have been observed along McNeil River during summer and as many as 70 bears have been seen at one time at McNeil River Falls, the primary bear gathering and viewing location. However, the number of bears at McNeil River has declined significantly since 1998 and has dropped below the level identified by sanctuary managers as the minimum needed to maintain a quality bear viewing program. The reason for the decline is likely related to the low returns of chum salmon to McNeil River, which have failed to meet escapement goals for 10 of the past 12 years. The decline in bears using McNeil River may be partly attributed to 1) bears being drawn to other streams in the region that have supported high fish returns, and 2) the record number of bears harvested in legal hunts surrounding the sanctuary and refuge.

The sex and age composition of bears at McNeil River has changed in the past several years and relatively few subadult bears and maternal sows were observed in 2001. This is typically observed when food resources are limited and these bears are displaced by the more dominant bears.

Relatively few commercial fishing activities were conducted in the sanctuary due to low salmon escapements. Approximately 17,000 chum salmon entered McNeil River and the commercial fishery was not opened as this system failed to reach its escapement goal of 20,000 - 40,000 fish. The Mikfik Creek fishery harvested only 300 sockeye salmon while approximately 5,350 fish entered this system, which has an escapement goal of 5,000 - 7,000 fish. A demonstration project using a remote video camera to estimate escapement was operated for the fourth season on Mikfik Creek. The Paint River fisheries enhancement project has not been active since the fish-stocking program was suspended in 1997 and there are no current plans to resume stocking. The fish ladder has not operated since it was constructed in 1992.

Sport fishing lodges continue to increase the number of guides operating jetboats on the Kamishak River in the sanctuary and adjoining Katmai National Park. Approximately 700 people visited this area in 2001 and engaged in sport fishing and wildlife viewing activities. Concerns of overcrowding, boating safety, and impacts to the fisheries, bears and other resources have been expressed and use-limitations have been suggested.

A land status assessment conducted as part of the federal Wildlife Conservation and Restoration Program (WCRP) reviewed several land ownership issues, identified an approximately 150-acre parcel of federally owned land in the refuge, and clarified the marine boundaries of the sanctuary and refuge. A proposed 10-acre private lease of federally owned land subject to state selection has been denied and the trespass improvements are scheduled to be removed in September 2002. A remote camera installed at McNeil River Falls concluded a three-year demonstration project of transmitting real-time images of bears to the Pratt Museum in Homer and to the Internet.

The bear-viewing program at McNeil River continues to be popular. Approximately 1,300 applications were received for the 185 regular permits and 57 standby permits which are selected by lottery. During 2001, 186 people participated in the sanctuary's bear-viewing program, which included the lottery winners and individuals provided the 15 permits issued at the discretion of the Commissioner.

The Alaska State Legislature established the McNeil River State Game <u>Sanctuary</u> in 1967 to: (1) provide permanent protection for brown bears and other fish and wildlife populations and their habitats so that these resources may be preserved for scientific, aesthetic, and educational purposes; (2) manage human use and activities in a way that is compatible with the permanent protection of brown bears and other purposes described in (1) and to maintain and enhance the unique bear viewing opportunities within the sanctuary; and (3) provide opportunities that are compatible with (1) for wildlife viewing, fisheries enhancement, fishing, temporary safe anchorage, and other activities (AS 16.20.162(a)). Hunting, trapping and mineral entry are prohibited in the sanctuary.

The sanctuary was expanded and the adjoining McNeil River State Game <u>Refuge</u> was created in 1991; however, implementation of this legislation was delayed until January 1993 when, the Commissioner of the Department of Fish and Game certified the Paint River fish ladder as operational. The refuge was created for purposes similar to those of the sanctuary; however, hunting and trapping were allowed to continue in the refuge at the discretion of the Board of Game (AS 16.20.041). Additionally, human use in the refuge is managed to maintain and enhance the unique bear viewing opportunities within the adjoining sanctuary and mineral entry in the refuge is permitted.

The Alaska Department of Fish and Game (the Department) manages both the sanctuary and refuge, the former of which contains the world's largest concentration of brown bears. The Department administers a world-renowned bear viewing and photography program at this site along McNeil River.

This report is submitted annually to the Alaska State Legislature by the Commissioner of the Department as required by the statutes establishing the sanctuary and refuge (AS 16.20.041(f) and AS 16.20.162(f), respectively). This report provides a summary of the status of brown bears and other fish and wildlife resources within the sanctuary and refuge, the effects of fishing and fishery enhancement activities on these resources, land status and management issues, and known public use.

I. STATUS OF BROWN BEARS

Population Monitoring

<u>Index Counts--</u> The number of bears at McNeil River Falls fluctuates daily and annually and likely results from several factors, including the regional bear population level, food availability, and strength and timing of salmon runs in McNeil River and in surrounding systems. A public advisory committee assisted the Department with the development of the sanctuary and refuge management plans in 1993 and concluded that managers needed a consistent and reliable method for monitoring the fluctuations in the number of bears at McNeil River Falls. This information allows for the proper management of the sanctuary in accordance with its legislative purposes. A monitoring program that detects large, short-term declines or gradual, long-term declines in the average number of bears was established. Additionally, a "bear threshold criterion" was identified and represents a statistically significant decrease in the observed number of bears. A decline below the "criterion" may result in adverse impacts to the purposes for which the sanctuary was established and would initiate an assessment of the possible causes.

The monitoring program involves the hourly counting of bears at McNeil River Falls from July 15 through August 5 and during the viewing period of approximately 11a.m. to 7 p.m. The annual medians of the seven highest daily counts of bears at the falls from 1983 to 1992 were averaged to establish a standard of 48.6 bears as the benchmark for maintaining bear numbers and quality viewing opportunities in the sanctuary (Figure 1). The "bear threshold criterion" (40.8 bears) represents the lower limit of these medians. These daily counts were taken opportunistically throughout the day rather than hourly, as the current monitoring method utilizes.

The 2001 mean of the seven highest hourly counts (the count index) was 39.1 bears, up slightly from 2000 (35.7 bears) but still below the threshold criterion of 40.8 bears (Table 1). This year marks the third year in a row that the number of bears observed at McNeil River Falls is below the threshold criterion and indicates a declining trend in the number of bears at the falls. The highest count indices were 61.0 bears in 1990, 58.0 bears in 1997, and 57.0 bears in 1985.

The hourly counts conducted in 2001 equaled or exceeded 40 bears on only four of the 22 days monitored. In comparison, the hourly counts exceeded 40 bears on 11 days in 1997 and 1998 when as many as 66 bears were observed at one time. The highest numbers of bears ever seen at one time at the falls was 70 in 1997. The unprecedented low number of bears at the falls during the first five days of August 2001, when only one to seven bears were observed, is another indication that the low number of bears has impacted the sanctuary's viewing program.

<u>Individual Counts--</u> An additional method of monitoring the sanctuary's bear population and the quality of the bear viewing program is by counting the number of individual bears observed by sanctuary staff (Table 2). Using unique identifying marks such as scars, coat color, sex and behavior, each bear visiting the sanctuary has been documented nearly every year since 1976. While this monitoring method only records the presence of an individual bear and not the frequency or amount of time it spends at McNeil River, it provides an additional index in evaluating the overall bear population and the quality of the bear viewing program.

As observed in the monitoring method using hourly counts discussed above, the number of individual bears at McNeil River in 2001 diminished significantly from previous years and is comparable to counts from the early 1980s. Only 87 individuals were documented in 2001, down from a peak of 144 identified individuals in 1997.

Sex and Age Composition

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Changes in the sex and age composition of a wildlife population can be indicative of other changes in the species' habitat and environment. The sex and age ratios of bears using McNeil River and the falls have changed dramatically in the last several years (Table 2). As recently as 1993, the proportion of bears at the falls in late July was close to 50% males and 50% females (including maternal sows); however, during the 2000 and 2001 seasons, the proportion of males at the falls was more than 90% through the entire season. In addition to the composition of bears shifting to primarily males, the number of subadult bears (both sexes) has decreased, and during 2001 it was the lowest since 1979. While the percentage of subadult bears at the falls has ranged from approximately 10-25% since initiation of intensive data collection in 1976, it was only 7.8% in 2001.

In addition to the actual number and proportion of subadults bears at McNeil River declining in recent years, the number of maternal sows and the total number of cubs has decreased significantly and was the lowest ever recorded at the sanctuary. In 2001, there were only five maternal sows observed on the river, down from a peak of 20 in 1996. Likewise, the total number of cubs (yearlings and cubs-of-the-year) on the river in 2001 was 11, down from a peak of 43 in 1997.

Hunting

The sanctuary is closed to brown bear hunting by statute (AS 16.20.162(b)), and in October 1995, the Board of Game closed the refuge to brown bear hunting effective July 1996. However, areas surrounding the sanctuary and refuge are open to hunting and experienced higher-than-average harvests in 1999 and 2000. Preliminary data indicate the fall 2001 harvest was also higher than average. The increase in harvest is likely due, in part, to the liberalized bear hunting seasons adopted by the Board of Game in an effort to bolster the size of the northern Alaska Peninsula caribou herd. The next scheduled bear hunt in this area is during spring of 2002.

The brown bear harvest in the areas immediately adjacent to the sanctuary and refuge was 117 during the 1999 regulatory year (fall 1999 and spring 2000 hunts, Figure 2). This represents a 58% increase in harvest from the previous peak harvest level of 74 bears in 1987 and a 76% increase in the average harvest from the previous decade. Likewise, the entire Game Management Units (GMUs) in the northern Alaska Peninsula and Lake Iliamna region (GMUs 9A, 9B and 9C), which includes the McNeil sanctuary and refuge area, experienced record harvests. In GMU 9B (Illiamna Lake drainages) alone, 90 bears were harvested in fall 2000, which represents more than twice the historic peak harvest and is a four-fold increase in the previous 10-year average. Additionally, the fall 1999 and spring 2000 harvest (27 and 35 bears, respectively) in GMU 9A (Cook Inlet drainages immediately north of the sanctuary and refuge) were higher than average harvests, with the fall harvest the highest since 1961.

<u>Use Patterns</u>

As discussed above, the "index count" and "individual count" monitoring programs at McNeil River have identified a declining trend in the number of bears and a significant shift in the sex and age composition, all of which have resulted in a diminished quality in the bear-viewing program at McNeil River. These trends over the past three years are likely associated with the long-term failure to meet chum salmon escapement returns to the sanctuary, as discussed in more detail below. The established escapement goals include some fish ultimately removed from the system by bears and do not spawn. Observations from the sanctuary indicate low salmon returns will result in a short-term increase in bear use as they expend more effort and time catching enough fish to meet their nutritional requirements. However, long-term fish shortages will alter established use patterns as bears seek alternative sources for salmon or other sources of food. These long-term changes in use patterns appear to have started in 1999 and have continued to date.

In addition to the size of the salmon run, the type of run appears to also influence the number of bears utilizing McNeil River. An evenly distributed run will generally attract more bears to the falls while a similarly sized run that arrives in a relatively short period will not afford a larger number of bears the opportunity to catch fish, thus they seek food elsewhere.

Observations at McNeil River also indicate that during periods of prolonged salmon shortages, the most dominant bears (generally larger boars) occupy the most successful fishing spots and preclude use by less dominant bears. The least dominant bears (subadults and maternal sows) typically fish in the less desirable locations downstream of the falls. In this area, they frequently consume partially eaten fish or fish scraps discarded by the more satiated bears upstream. During periods of diminished runs, overall fishing effort is less successful, particularly in the less desirable locations. Additionally, the dominant bears occupying the desired locations consume the entire fish, as they are not reaching satiation, leaving no opportunity for scavenging bears downstream. This is likely the reason for the unusually low number of subadults, maternal sows and cubs observed on McNeil River during the past several years.

Large chum salmon returns throughout lower Cook Inlet in the past two years (with the unique exception of the McNeil River system) and large sockeye salmon returns to some nearby Bristol Bay drainages may also be contributing to the decline in bear numbers by attracting bears away from McNeil River. Additionally, higher-than-average bear harvests in the area surrounding the sanctuary in recent years may be contributing to the decline.

Department staff from are currently assessing the declines in bear numbers, changes in bear sex and age composition, and the low chum salmon escapement at McNeil River. Various management actions and additional informational needs that will allow sanctuary managers to better respond to these issues are being considered.

II. INCIDENTAL WILDLIFE OBSERVATIONS

Notable wildlife sightings from the 2001 season include three observations of wolverine, including one that came to within 30 feet of visitors on the McNeil Cove spit, and the first ever sighting of a trumpeter swan that flew over lower Mikfik Creek.

III. FISHERIES

Commercial Fisheries

The cumulative McNeil River chum salmon escapement was estimated at 16,997 fish while the Mikfik Creek sockeye escapement index was 5,350 fish. There was minimal commercial fishing effort targeting sockeyes in McNeil River Subdistrict this season, with a resulting harvest of less than 300 fish. The subdistrict was subsequently closed for the duration of the chum return, and as a result, no harvest occurred and the entire McNeil River chum return entered the drainage to spawn.

The Mikfik Creek escapement goal was set at 5,000 – 7,000 sockeye salmon but was increased to 6,300 - 12,150 fish under the recently enacted Escapement Goal Policy. This season marked the thirteenth straight year the McNeil River chum salmon run has failed to produce a significant harvestable surplus, while the escapement failed to reach the lower end of the biological escapement goal range of 20,000 - 40,000 fish for the tenth time in the past twelve seasons (Figure 3). This contrasted sharply with other Kamishak Bay systems, especially the nearby Big and Little Kamishak Rivers, where chum salmon returns were strong for the second consecutive year. Chum salmon escapements to more northerly systems (Iniskin and Bruin Bay Rivers and Cottonwood and Ursus Lagoon Creeks) also were achieved for the second straight year. For the second time in as many seasons, significant commercial fishing effort directed at chum salmon occurred in the Kamishak Bay District, specifically in the Kamishak and Douglas River Subdistricts, where the harvest totaled approximately 73,000 and 10,000 fish, respectively, the highest since 1988.

The number of spawning chum salmon observed above McNeil River Falls this season was once again disappointing, with a peak count of 180 fish made on July 7. One other survey this season detected fish above the falls, albeit in relatively small numbers.

The post-season evaluation indicates run timing was normal for both the Mikfik Creek sockeye salmon and McNeil River chum salmon. The three different methods used to derive the total McNeil River chum salmon escapement index yielded mixed results: 1) the historic mean run timing curve, used to extrapolate the "tail" of the run after the August 10 survey, produced a cumulative total of 22,074 fish; 2) the preferred method which calculates area under the curve assuming a 17.5-day stream life factor, and

now used to estimate escapements for most other streams in Lower Cook Inlet, resulted in a cumulative estimate of 16,997 fish; 3) simple accumulation of counts from each survey after the first observed peak on July 17 produced a total of 23,340 fish. The second method has been adopted as the standard methodology for generating escapement indices and is considered the most precise estimate of escapement. The Mikfik Creek sockeye salmon escapement was based on the count from a peak aerial survey. Another method for estimating escapements, using a video camera and videocassette recorder (see below), was used at Mikfik Creek/Lake this season. The preliminary escapement figure from this method was 3,289 fish.

Mikfik Creek Video Research

Deployment of the remote video escapement recorder (RVER) at the outlet of Mikfik Lake occurred for the fourth consecutive season. Continuation of this project is expected to demonstrate that remote video and time-lapse recording technology is capable of producing salmon escapement estimates similar in accuracy to weirs, which are presently considered the most accurate escapement-monitoring tool available. As the program is refined and continues to mature, remote video may be able to supplant aerial surveys as a means for collecting escapement data on small clear streams that do not warrant the expense of weirs or sonar.

The RVER system at Mikfik Creek once again consisted of a remote camera suspended directly above the stream pointing downwards at an angle, with its field of view encompassing the entire width of the stream. Images of fish swimming past the site were recorded onto a time-lapse VCR. By programming the VCR to capture a single frame every 1.5 seconds, a standard 160-minute VHS tape could theoretically last up to 12 days. The entire system was powered by four 12-volt batteries, which in turn were kept charged by the combination of a wind generator and a solar panel. Tapes were periodically retrieved during routine aerial survey flights. As time permits, the tapes are subsequently reviewed using a standard TV monitor to estimate escapement.

Experience gained from the previous three seasons led to slight modifications of the RVER configuration, such as readjusting the substrate panel to facilitate upstream movement of fish and incorporating a new higher resolution black and white zoom camera re-oriented to reduce glare. The resulting images produced from RVER continued to improve, thus aiding the tape review process.

Reliability of the system's power source once again remained solid. The wind generator, in conjunction with a re-oriented solar panel, allowed the system to function continuously for the entire season with all the original batteries in place.

Although the video data collected this season has been reviewed for a preliminary escapement estimate, the tapes should be re-read if time allows to verify the original estimate. For this reason, and to remain consistent with the historical Mikfik Creek database, aerial survey data were once again chosen to generate this season's spawning escapement index. The improvements to, and experience gained from, the video project this season demonstrated that this relatively new technology should provide data that are more precise in future years.

Sport Fishing

Limited sport fishing occurs in McNeil Lagoon and Chenik Creek but is incidental to bear viewing activities. The only area in the sanctuary that attracts significant sport fishing interest is on the Kamishak River and, to a lesser extent, the Little Kamishak River and its tributary, Strike Creek. Due to low sampling effort and questionnaire returns, the annual survey of sport anglers conducted by the Division of Sport Fish does not accurately portray angler effort in this area. Seven Bristol Bay area lodges

operated in the area during August and September 2001 and, as a condition of their access permits, are required to report their sport fishing activities (Table 3).

Lodges visiting the Kamishak River catered to 678 clients, 85% of whom were sport anglers; however, wildlife viewing, primarily brown bears, is a significant part of their activities. These anglers caught 8,140 fish, primarily coho salmon and Dolly Varden (the latter being mainly a catch-and-release fishery). Chum and pink salmon were also reported in their catches but were likely caught incidental to the other fisheries.

Fisheries Enhancement

Fisheries enhancement continues to play a major role in Lower Cook Inlet salmon production. The results of enhancement and rehabilitation of the Kamishak District sockeye stocks have made significant contributions to commercial salmon harvests. However, sockeye salmon returns to the Paint River enhancement project in 2001 were negligible as stocking to the Paint River Lakes was discontinued in 1997.

The Paint River Lakes were first stocked with sockeye salmon fry in 1986 in an effort to develop a new sockeye salmon return to the drainage, which is blocked to upstream salmon migration by a steep waterfall at tidewater. From 1991 to 1996, approximately 600,000-750,000 sockeye salmon fry were stocked annually in the Paint River Lakes. Although construction of the Paint River fish ladder was completed in October 1991, the number of returning adult sockeye salmon has only ranged from 30 (in 2000) to 1,870 (in 1998). Consequently, the structure has never been opened to allow fish passage upstream through the ladder system.

With suspension of the sockeye salmon stocking program beginning in 1997, Cook Inlet Aquaculture Association has not announced plans to resume stocking of the Paint River lake system. Prior to resumption of future ladder operations, several issues need to be addressed: (1) the construction site has not revegetated and is subject to erosion; (2) water levels at the upstream exit to the ladder are very shallow and bears would likely be attracted to salmon as they emerge from the ladder making them vulnerable to being swept over the 40-foot waterfall; and (3) the fence installed along the lower portion of the ladder has been destroyed by high water, potentially allowing bears to gain access to the uncovered portions of the ladder.

IV. LAND STATUS/USE

An assessment of the land status within the sanctuary and refuge was recently completed by the Habitat and Restoration Division as part of the federal Wildlife Conservation and Restoration Program (WCRP). These efforts confirmed that all lands within the boundary of the sanctuary are state patented with the exception of certain lands in Akumwarvik Bay, including the mouths of the Kamishak and Little Kamishak Rivers. These parcels are "Tentatively Approved" state-selected lands and are managed as state land pending final conveyance from the federal Bureau of Land Management. Likewise, most lands within the boundary of the refuge are "Tentatively Approved" state lands awaiting final conveyance from the Bureau of Land Management and are also managed as state-owned lands; however, the refuge contains two parcels not managed by the state.

The land status assessment revealed approximately 150 acres of land in the extreme southwestern corner of the refuge is federal land managed by the Bureau of Land Management. The Department plans to investigate the potential of acquiring this parcel. The second parcel includes 14 sections of "state selected" land along the coast in the eastern portion of the refuge, which encompasses Chenik Lake and

Chenik Head. The State will assume ownership from the Bureau of Land Management once all encumbrances to these lands have been addressed and the land conveyance process is completed. A long-standing issue regarding the commercial use of a site near Chenik Head has been resolved by the Bureau of Land Management and the State of Alaska (Departments of Natural Resources and Fish and Game). A commercial operator constructed multiple buildings that served as the headquarters for a bear watching and wilderness retreat enterprise and attempted to obtain a lease for approximately 10 acres of land in the Chenik Head area. The State submitted a letter of non-concurrence to the Bureau of Land Management concerning the issuance of the Chenik Head lease and the lease was subsequently denied. The applicant appealed the lease denial and this appeal was rejected by the BLM. The BLM has notified the applicant that any remaining structures at the site will be removed or burned after September 15, 2002. However, the applicant will be allowed to store items on site until June 15, 2003, should weather conditions prevent their removal before the September 2002 deadline. The BLM is also developing a restoration and revegetation plan for the site.

The land status assessment also revealed an RS2477 right-of-way (ROW) within the sanctuary and refuge. The "Paint River Trail" is approximately 15 miles long and encompasses 190 acres of land. The ROW extends from McNeil Cove, west through the sanctuary and into the refuge, terminating in the headwaters of the Paint River near its confluence with Crevice Creek. This trail originates from copper and gold mining activity by Charlie McNeil and others during the first two decades of the 1900s.

The land status assessment also clarified the marine boundaries of the sanctuary and refuge, which include all islands and tidelands, with the exception of Nordyke Island and its tidelands.

Land Use Permitting

Eight lodges in the Bristol Bay region operate sport fishing and wildlife viewing operations on the Kamishak River within the sanctuary and adjacent Katmai National Park; however, one lodge did not operate with clients in 2001. These lodges store their riverboats on the lower reaches of the river and three of the lodges operate a guide camp at this location. These activities are managed through Special Area Permits issued by the Habitat and Restoration Division, Access Permits issued by the Division of Wildlife Conservation, and Land Use Permits issued by the Department of Natural Resources (DNR). This area is also part of the Kamishak Special Use Area, which is managed by DNR.

These lodges typically base their activities within the sanctuary and travel upstream into the national park to sport fish and observe wildlife, primarily bears. Permit stipulations assure these operations are conducted in a manner compatible with sanctuary guidelines and have been developed in coordination between the state agencies and the National Park Service for consistency in requirements. However, recent compliance and law enforcement efforts have documented multiple violations potentially impacting management of bears in the area. The Habitat and Restoration Division and DNR have issued several notices of violations to these operators and put them on notice that the future of their guide camp is being reviewed for possible closure. The area should continue to be monitored for compliance and identification of possible impacts. The primary management concern is the food-conditioning of Kamishak River bears, which also visit Mikfik Creek and McNeil River. This condition would not be consistent with the purposes for which the sanctuary was established and would jeopardize the bearviewing program at McNeil River. Additionally, concerns have been expressed about overcrowding; boating safety; and impacts to the fisheries, bears and other resources on the Kamishak River, and uselimitations have been suggested by several of the operators and guides. One operator reported a boat, which was moored in the sanctuary, was damaged by an unknown individual who shot several holes in the boat.

V. SANCTUARY MANAGEMENT

<u>Staff</u>

Sanctuary Manager Larry Aumiller logged his 26th season at McNeil River. Tom Griffin Wildlife Technician III, and Samantha Wilson, Student Intern from the University of Alaska, Fairbanks returned for their second seasons at the sanctuary. All plan to return for the 2002 season.

Volunteers

A community-based volunteer work party assisted sanctuary staff for the ninth season in 2001. This program creates an opportunity for volunteers to assist with camp preparations and maintenance before the beginning of the bear-viewing program. This program continues to be a very successful cooperative venture, and in 2001 the volunteers cleared trails to McNeil River Falls and Mikfik Creek, collected and cut firewood, prepared boats, painted facilities, hauled gravel for trail and campground hardening and relocated the outhouses. Sanctuary staff also conducted routine maintenance of all sanctuary facilities.

Remote Camera Project

The 2001 season was the last year of a three-year project to transmit real-time images of bear activity at McNeil River Falls to the Pratt Museum in Homer. The museum used the images in educational programs and displays on bears and the sanctuary. The video images also were broadcast on the local cable television system and were available on the Internet. During select periods, Internet users also were given the opportunity to directly control the camera.

The camera provided a good opportunity for public exposure and education to the sanctuary and bear conservation. Few problems were experienced at the sanctuary with the cameras and other equipment, although bears occasionally damaged equipment. The camera housing occupies a desirable portion of the McNeil River Falls viewing pad. The future of the camera project is under review.

VII. PUBLIC USE

McNeil Falls/Mikfik Creek

Public use and access into the sanctuary, with the exception of McNeil Cove spit and beach, requires a permit from the ADF&G (5 AAC 92.065). Since 1973, bear viewing at established sites on McNeil River and nearby Mikfik Creek has been limited to ten people daily between June 7 and August 25, and permits for these viewing periods are issued by lottery. Currently, 185 regular permits and 57 standby permits are issued in the lottery. An additional 15 regular permits are issued as Special Permits at the Commissioner's discretion for scientific, educational and other purposes. Ten regular and three standby permits (or seven regular, three special and three standby permits) are issued for each of the established four-day permit periods.

The number of people who visited the sanctuary has declined in recent years to 186 people in 2001, the lowest number since 1984 (Table 5). This decline was desirable partly because it reduced campground overcrowding. It is likely attributable to several factors including the streamlining of the permit system, limits placed on campground capacity, limits placed on the number of nights each individual is allowed to stay in the sanctuary, and more recently, the reduction in the number of standby permits issued. Likewise, the average number of permits used each day at the sanctuary (8.0 in 2001, out of a maximum of 10.0) remains below the long-term average permit use rate of 8.5 per day (Table 4). However, this

represents a slight increase over the two previous years and may have initially declined in 1999 when sanctuary staffing levels were reduced and late-arriving visitors were not able to visit the viewing areas on the first day of their permit.

In 2001, 1,329 applications were received for the 185 regular and 57 standby permits (Table 5). This represents a slight increase in the number of applicants from the previous two years and is below the previous 10-year average of 1,508 applicants and well below the 2,150 record number of applicants in 1993. While the number of applicants fluctuates, likely in response to media coverage of the sanctuary, the general decline in applicants starting in 1993 may have been a result of the Board of Game regulation adopted that year that established a four-year waiting period for permit winners. This regulation may have prevented some applicants from applying more frequently. The Board of Game modified this regulation in 1999 to require only a one-year waiting period for successful applicants and may account for the slight increases in the number of applicants since then.

A goal of the sanctuary bear-viewing program is to maximize the number of people visiting the viewing sites along McNeil River and Mikfik Creek within the regulatory requirements (i.e. 10 visitors per day). While regular permits are issued for all viewing time periods, and standby permits are issued for onsite vacancies, the numbers of visitors at the viewing area is not always maximized. This is primarily due to the occasional periods of bad weather that prevent floatplane access or diminish the visitor's desire to venture to the viewing areas. Bear viewing is also less reliable early and late in the season and some vacancies occur when visitors cancel their visits to the sanctuary. Contributing to the number of vacancies is that some visitors arrive at the sanctuary after the viewing group has departed the camp on the first day of their permit.

Nine applications from 16 individuals were received for the Commissioner's scientific/educational permits available at the sanctuary and included representatives of state and federal agencies, a local school district, the American Bear Society, a commercial photographer, individuals, and three universities (North Carolina, Canada and Germany). Using evaluation criteria developed by the Department for issuing these permits, approval for the agency personnel, the school district and the bear society was granted. Additionally, four Commissioner's Permits were issued to several individuals and a member of the Bear Management Citizens Advisory Committee from Juneau.

Kamishak River

The seven Bristol Bay area lodges that operated on the Kamishak River in 2001 brought 678 visitors to the sanctuary and adjacent Katmai National Park (Table 6). Of these visitors, 85% engaged in sport fishing activities in addition to wildlife viewing and caught 8,140 fish, primarily coho salmon and Dolly Varden, the latter being primarily a catch-and-release fishery.

Bear-Human Conflicts

There were no known adverse interactions between bears and people in the sanctuary or refuge during the 2001 field season.

VIII. ACKNOWLEDGEMENTS

Sanctuary Manager Larry Aumiller and his staff (Tom Griffin and Samantha Wilson) gathered data on bear use and visitor activities. Earl Becker provided information on the bear-monitoring program, Mark Dickson provided the narrative on commercial fishing activities, Josh Peirce conducted the land status review and Bruce Bartley edited a draft copy of this report.





Figure 2 Brown Bear Harvest From Areas Surrounding the McNeil River State Game Sanctuary and Refuge 1960 - 2000 (Harvest from GMU/UCUs: 9A/201, 301, 401, 501; 9B/301; and 9C/201, 301, 601, 702, 703)





Figure 3 McNeil River Chum Salmon Escapement McNeil River State Game Sanctuary 1959 - 2001

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Table 1

Highest Hourly Counts Of Brown Bears Seen At One Time At McNeil Falls (includes cubs)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	9 yea
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	highest	highe								
	hourly	hour								
	count	coun								
15 July	-	-	-	38	40	47*	28	37*	25	36
16	-	-	-	46*	32	42	28	31	39*	36
17	-	-	-	29	47	46	35	31	41*	38*
18	37*	30	29	44*	43	47*	26	32*	40*	36
19	58*	50*	33*	54*	66*	57*	36	36*	35*	47*
20	55*	37*	40*	40*	52*	32	37*	23	37*	39*
21	46*	43*	28	47*	50*	10	35	28	40*	36
22	54*	26	48*	49*	44	18	38*	37*	32	38*
23	49*	43*	29	47*	63*	35	42*	36*	30	42*
24	30	52*	31	33	52*	43	32	36*	42*	39*
25	18	18	39*	40*	51*	46	29	36*	33	34
26	28	37*	30	31	54*	63*	35	32*	24	37*
27	34*	44*	39*	37	49	50*	31	23	29	37*
28	24	33	28	33	27	51*	37*	23	23	31
28	28	32	12	21	30	48*	36	24	20	28
30	21	25	32*	29	27	39	41*	28	15	29
31	19	20	35*	26	15	34	42*	19	11	25
1 August	13	16	23	22	17	35	42*	15	7	21
2	7	16	16	18	24	31	29	20	5	18
3	-	-	-	18	21	23	27	25	3	20
4	-	-	-	11	11	12	16	14	3	11
5	-	-	-	10	-	18	23	4	1	11
x of 7 high days	48	44	38	47	55	52	40	36	39	40

Highest hourly count is the number of bears counted in view on the hour from the viewing pad at the McNeil Falls.

- = counts were not made
* = 7 high daily counts for the season or 9 year average

				A	ACN SE	X Al EIL	ND A	MGE ER	CON	APO TE C	Table SIT) SAM	2 ION E SA	OF B NCT	ROV	VN BI V: 19	EAR 176-2	S 001									
	92,	<i>LL</i> ,	8 <i>L</i> ,	62,	[%] 0	18,	.82	68,	.84	. 85	. 98	87	88,	68,	06,	16,	26,	66,	.94	.95	96,	, 16	98	5 5 5	0, 0(_
Total Females w/cubs	6	10	×	6	9	8	٢	7	6	16	14	14	14	19	16	15	16	11	11	14	20	19	15	11	7 5	
Single Adult Females	ŝ	8	9	~	œ	10	6	15	16	12	П	13	13	14	16	12	19	19	15	12	14	61	19			
Single Adult Males	16	18	18	19	23	26	20	22	22	27	31.	34	34	42	37	41	39	48	45	49	46	55	54	•	, ''	
Adult Sex Unknown	-	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Total Adults	31	36	32	36	38	44	36	44	47	55	56	61	19	75	69	68	74	78	71	75	80	93	88	,		_
SubAdult Females	4	ę	4	3	9	6	11	6	×	5	7	7	6	4	5	9	9	~	6	ŝ	9	S	9		4	
SubAdult Males	0	S	4	C	0	-	-	4	5	10	7	80	90	S	s	4	2	4	÷	s		3	÷			
SubAdult Sex Unknown	3	4	5	۳	4	s		_	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	,		
Total Sub-Adults+	L	12	13	\$	10	15	15	14	13	12	14	15	17	6	10	10	8	12	12	~	7	~	6			
Total Adults and Sub-Adults *	38	48	45	41	48	59	51	58	60	67	70	76	78	84	79	78	82	90	83	83	87	10	16	·	-	
Total Cubs	20	21	20	17	12	14	16	12	17	28	26	30	31	42	34	30	31	24	22	25	35	43	31	20 1	s	
Total Bears	58	69	65	58	60	73	67	70	77	95	96	106	109	126	113	108	113	114	105	08	22	44 1	28	,	òc	
 * defined as 5.5 years o * Only the bears that are - not counted 	recogr	youngt iizable	r from as indi	1977 tl viduals	hrough and gi	the pre ven nai	sent nes are	include	ed. Hei	nce the	se figu	res repr	sent mi	nimum 1	number (f bears	present	at the	anctuar	ż						

McNeil RIVER STATE GAME SANCTUARY ANNUAL REPORT FOR GUIDES, TRANSPORTERS AND LODGES IN 2001 Kamishak River **TABLE 3**

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				COHOS	ALMON	CHUM S	SALMON	PINK S	ALMON	DOLLY	/ARDEN
LODGE	# OF ANGLERS	#OF NON-ANGLERS	# DAYS GUIDED	Kept	Released	Kept	Released	Kept	Released	Kept	Released
Alaska Rainbow Lodge	56	o	15	ъ	14	0	0	0	0	38	1,030
Alaska Sportman's Lodge	28	4	4	45	153	0	0	0	0	0	63
Bristol Bay Sportfishing Inc.	91	0	21	67	133	0	11	0	S	٥	276
lliaska Lodge	82	0	25	31	132	2	192	0	32	0	419
Kulik Lodge/Katmai Air	126		27	184	681	0	703	0	-	0	107
Newhalen Lodge	88	4	24	117	182	o	Ş	0	5 S	63	2,340
Rainbow King Lodge	103	45	12	234	0	0	385	o	0	0	345
Rainbow River Lodge	0	o	0	0	0	٥	0	0	0	o	o
TOTAL	574	104	131	713	1295	7	1371	o	43	101	4,610

VISITOR USE AT MCNEIL RIVER STATE GAME SANCTUARY Table 4

	1993	1994	1995	1996	1997	1998	1999	2000 ^C	2001	9yr Average
June 7-august 25 (80 days) — X permits used daily % with regular permit % with standby permit	9.0 74 26	8.4 76 24	8.7 82 18	9.3 85 15	9.0 83 17	9.2 81 19	7.4 ^B 86 14	7.8 ^B 88 12	8.0 ^B 88 12	
$\overline{\mathbf{X}}$ daily visitors in the sanctuary ^A	14.1	13.6	13.4	14.5	15	13.7	14.	13.1	12.7	

8.5 82 18

 A = Includes all visitors (those who flew out as well as those who stayed overnight) B = 1999 through 2001 (unlike 1993-1998) use figures are lower due to lack of a second staff person to bring late arrivals to the viewing area. C = The number of Standby Permits dropped from 5 to 3 per period (95 to 57 annually)

Year	Footnotes	Number of Applicants	Number of Visitors	Total User Days in Sanctuary	Total Permit days for July/Aug (560 possible)	Comments on Season Length
1984	A,F) 992	159	574	377	6/5 - 8/27
1985	Α	832	216	816	449	6/10 - 8/25
1986	А	806	255	967	430	6/9 - 8/25
1987	A,G	1,757	252	1,054	473	6/9 - 8/23
1988	Α	1,094	304	1,328	498	6/1 - 8/29
1989	Α	1,306	264	1,183	488	5/22 - 8/26
1990	А	1,481	299	1,435	524	6/8 - 8/25
1991	B,E	1,818	249	1,415	526	6/1 - 8/27
1992	C,E,H	1,672	245	1,210	478	6/1 - 8/25
1993	D	2,150	225	1,128	516	6/7 - 8/25
1994	D,I	1,766	228	1,086	484	6/7 - 8/25
1995	D	1,486	212	1,074	475	6/7 - 8/25
1996	D	1,502	219	1,158	494	6/7 - 8/25
1997	D	1,474	228	1,197	489	6/7 – 8/25
1998	D	1,159	219	1,096	504	6/7 – 8/25
1999	D,J	1,223	208	1,122	398	6/7 - 8/25
2000	D,J,K,L,M	1,322	198	1,051	424	6/7-8/25
2001	D,J,K,L,M	1,329	186	1,012	437	6/7-8/25

 Table 5

 Visitor Use of McNeil River State Game Sanctuary (MRSGS)

Footnotes Table:

A = No limit on standby or camp numbers

 $B = 1^{st}$ come, 1^{st} served for standby w/no camp limit

 $C = 1^{st}$ come, 1^{st} served for standby w/camp limit of 15

D = All permits (regular & standby) by lottery including June

E = Unlimited permits prior to June 15 then 10/day

F =\$5 application fee instituted in 1983

G =\$10 application fee and \$40 user fee instituted

H =\$20 application fee and new user fees (\$100 Resident/\$250 Non-resident) instituted

I = Visitors to the sanctuary must wait four years to re-apply

J = Lower staffing levels prevented late or early arriving visitors from joining the group

K = \$25 application fee and new use fees (\$150 Resident/\$350 Non-resident) instituted

L = Number of Standby permits drop from 5 to 3 per period (95 to 57 annually)

M = Visitors to the sanctuary must wait one year to re-apply