Alaska Department of Fish and Game
Division of Wildlife Conservation
Federal Aid in Wildlife Restoration
Annual Performance Report of
Survey-Inventory Activities
1 July 1990 - 30 June 1991

BROWN BEAR

Susan M. Abbott, Editor
Vol. XXII, Part V
Project W-23-4, Study 4.0
December 1991

Project Title: **Southeast Brown Bear Population Management**

Project Location: Unit 1 (18,500 mi^2)
The southeast Alaska mainland from Dixon Entrance to Cape Fairweather and those islands lying east of Clarence Strait from Dixon Entrance to Camano Point and all islands in Stephens Passage and Lynn Canal north of Taku Inlet.

Project Objectives: Maintain an average age of harvested males of no less than 6.5 years with a male:female harvest ratio of at least 3:2. Reduce the number of bears killed because of garbage habituation.

Work Accomplished During the Project Segment Period: Data were collected during the mandatory sealing process. All successful hunters were required to present hides and skulls for sealing within 30 days of the harvest. Skulls were measured, and a rudimentary premolar tooth was extracted for age determination. Other harvest-related data and anecdotal information were collected at that time.

Progress Towards Meeting Project Objectives: At 79%, the percentage of males in the harvest was above the management goal of 60%. Age data was not available at this time. To maintain tighter controls on harvests and manage brown bears on a finer scale, a registration permit system has been in place for two years. Management quotas are being developed for discrete areas to meet the demands placed on individual populations as access increases, hunting and guiding patterns change, and resource development continues.

Project Location: GMU 4 (5,700 mi^2)
Admiralty, Baranof, Chichagof and adjacent islands

Project Objectives:

GMU 4 brown bear management objectives: Maintain an average age of harvested males of no less than 6.5 years with a male:female harvest ratio of at least 3:2. Reduce the number of bears killed because of garbage habituation.

GMU 4 brown bear management activities: Monitor the harvest, seal harvested bears, and analyze data; conduct aerial survey of sows and cubs on portions of alpine habitat on Admiralty, Baranof, and Chichagof islands; monitor use of the Pack Creek viewing area.

Work Accomplished During the Project Segment Period: Registration permits were issued to bear hunters. Measurements were taken of the length and width of the

skull, a premolar tooth extracted, the hide examined for evidence of sex, and other pertinent data were noted. Teeth were aged by counting cementum annuli. Reduction of brown bear loss to defense of life and property (DLP) incidents was attempted through public education and interagency agreements. Biologists and technicians contacted visitors at Pack Creek throughout July and August to explain regulations of the Pack Creek Cooperative Management Area, to prevent loss of bears to DLP, and to promote public safety.

Progress Towards Meeting Project Objectives: Data on the age of bears taken in the harvest were not available by report time. One-hundred-and-thirty bears were harvested this year, of which 97 were male and 33 female. The male:female ratio of 3:1 exceeded the minimum objective of 3:2. Four bears were killed in defense of life and property, fewer than in previous years. We are making progress toward reducing the number of garbage habituated bears killed.

Project Location: 5A and 5B (6,235 miles^2)
Cape Fairweather to Icy Bay, eastern gulf coast

Project Objectives and Activities:

GMU 5 brown bear management objectives: Maintain an average age of harvested males of no less than 6.5 years with a male:female harvest ratio of at least 3:2; reduce the number of bears killed because of garbage habituation.

GMU 5 brown bear management activities: Monitor the harvest, seal harvested bears, and analyze data. Bears were sealed in Yakutat and Anchorage. Harvest was analyzed from sealing certificates.

Progress Towards Meeting Project Objectives: Although age data was not available at the time of report preparation, the project objective of male:female kill ratio (3:2) was exceeded (3:1). The sport harvest of 33 bears was close to the 1985-1989 average of 29 and is within the range for that period. Nonresidents, Yakutat residents, and other Alaska residents took 85%, 12%, and 3% of the kill, respectively. A total of 159 days were expended for the successful hunters, an average of 4.8 days per hunter. One of the 33 kills came from GMU 5B, the remainder from 5A.

Segment Period Project Costs:

	Personnel	Operating	Total
Planned	$25.2	$13.2	$38.4
Actual	$25.2	$13.2	$38.4
Difference	0	0	0

Submitted by:

Bruce Dinneford
Regional Management Coordinator

Project Title: **Southcentral Brown Bear Population Management**

Project Locations: Unit 6 (10,150 mi^2)
Prince William Sound and north Gulf Coast

Units 7 and 15 (8,400 mi^2)
Kenai Peninsula

Unit 8 (5,100 mi^2)
Kodiak and adjacent islands

Units 9 and 10 (36,250 mi^2)
Alaska Peninsula and Unimak Island

Unit 11 (12,800 mi^2)
Wrangell Mountains

Units 13 (23,400 mi^2)
Nelchina Basin

Unit 14 (6,600 mi^2)
Upper Cook Inlet

Unit 16 (12,300 mi^2)
West side of Cook Inlet

Unit 17 (18,800 mi^2)
Northern Bristol Bay

Project Objectives:

Unit 6: Maintain a brown bear population that will sustain an annual harvest of 35 bears composed of at least 60% males with a minimum average male skull size of 23 inches.

Units 7 and 15: Maintain an estimated population of 250 brown bears with a sex and age structure that will sustain a harvest composed of at least 60% males.

Unit 8: Maintain a brown bear population that will sustain an annual harvest of 150 bears composed of at least 60% males.

Units 9 and 10: Maintain a high bear density (population is currently estimated at approximately 5,700 outside national parks) with a sex and age structure that will sustain a harvest composed of 60% males with at least 50 males (≥8 yrs old) taken during the combined fall and spring season.

Unit 11: Maintain a brown bear population that will sustain an annual harvest of 25 bears composed of at least 50% males.

Unit 13: Maintain an estimated brown bear population of 1,200 brown bears with a sex and age structure that will sustain a harvest composed of at least 50% males.

Unit 14: Maintain a population of at least 160 brown bears and a sex and age structure that will sustain a harvest composed of at least 60% males.

Unit 16: Maintain a brown bear population that will sustain an annual harvest of 50 bears composed of at least 50% males.

Unit 17: Maintain a brown bear population that will sustain an annual harvest of 50 bears composed of at least 50% males.

Work Accomplished During the Project Segment Period:

Unit 6: Twenty-five bears (10 males, 11 females, and 4 unknown sex) were harvested during autumn. The mean skull size for males taken in autumn was 20.4 inches (range = 17.6 - 25.0 in), and males comprised 48% of the harvest. An additional 25 bears (13 males,10 females, and 2 unknown sex) were sealed at Cordova during spring 1991. Males comprised 57% of the spring harvest. Final harvest numbers and statistics will be available during autumn 1991.

Units 7 and 15: Preliminary harvest reports indicate a reduction in annual harvest levels due, in part, to the reduction of the fall season. Six bears (4 males and 2 females) were harvested in the autumn. An additional 4 bears (2 males and 2 females) were sealed during spring 1991. Preliminary data suggest 6 males (60%) and 4 females were harvested during fiscal year 1991. Final harvest numbers and statistics will be available in November 1991.

An abandoned brown bear cub was recovered from Subunit 15C and later euthanized when a suitable home could not be located.

Unit 8: Permits were issued to 461 hunters and 417 reported going afield in 1990-91. During fall 1990, 178 permits were issued, 154 hunters went afield, and 51 bears (30 males, 21 females) were killed. In spring 1991, 283 permits were issued, 263 hunters went afield, and 98 bears (69 males, 29 females) were killed. Residents killed 57 bears (38%) and nonresidents killed 92 bears (62%). The mean skull size of males

was 25.3 inches (n = 97), and the mean skull size of females was 21.7 inches (n = 43). Seventeen males had skull sizes ≥ 28 inches.

Reported nonsport mortalities included 9 bears killed in defense of life or property, 2 bears killed illegally, and 3 bears that died of other causes. Two additional bear moralities were reported by reliable sources, but no specimens were recovered.

Aerial composition surveys were conducted along selected streams on the Kodiak National Refuge by USFWS personnel. Composition of the 1,036 bears observed during 9 replicate surveys was 44% singles, 17% maternal females, 12%, cubs < 1 year-old and 26% cubs > 1 year-old. A study of survival and productivity of female brown bears funded by the Kodiak Brown Bear Research and Habitat Maintenance Trust continued. A cooperative effort with the USFWS (i.e., reproduction study) is scheduled for completion in 1992. Sixty radio-collared females were monitored in December 1990. Another study of interactions between deer hunters and brown bears is being conducted by the USFWS on the Kodiak National Wildlife Refuge.

Units 9 and 10: The interagency Black Lake study continued with routine monitoring of radio-collared bears during this report period. In June 1991, 43 bears were captured and 39 new radio collars were put on adult females. Five replicate aerial surveys were conducted at the Black Lake study area from 3-7 August, 1990. A total of 927 bears was classified with 36% being single, independent bears. An average of 185 bears was seen per survey.

A census conducted along the coast of Katmai National Park, as part of the damage assessment of the Exxon Valdez oil spill revealed a density estimate of 550 bears per 1,000 km^2. This is the highest brown bear density yet reported.

The only brown bear hunting seasons in Unit 9 during this report period were the fall 1990 and spring 1991 Naknek registration hunts. Four males and 2 females were taken in fall and 3 males in spring. On Unimak Island, 5 males were killed during fall 1990, and 3 males were killed during spring 1991 permit hunts.

Unit 11: Preliminary harvest data for 1990-91 indicate that 9 brown bears were reported taken in Unit 11 during the 1990-91 season; similar to the prior 10-year average of 8 per year. One additional female was reported killed under the defense of life and property provision. The harvest total could increase as spring 1991 sealing certificates were still being processed. Non-local Alaska residents took 8 (89%) bears and a local resident killed 1 (11%) bear. The sex composition of the harvest was 5 (56%) males and 4 (44%) females. The mean skull size was 19.4 inches for males and 18.6 inches for females. Four successful hunters reportedly used aircraft as transportation, 3 used highway vehicles, and 1 used an off-road vehicle. Successful hunters reported spending an average of 3 days in the field.

Unit 13: Preliminary harvest data for the 1990-91 season indicated that 82 bears were taken by hunters and an additional 3 bears were killed in defense of life and property. This preliminary figure is 14 fewer bears than were taken in 1989-90 and well below the prior 5-year average kill of 106. Forty bears (65% males) were taken during the fall 1990 season and 45 (80% males) in spring 1991. The spring harvest total may increase as sealing certificates were still being processed. Males comprised 68% ($n = 58$) of the total harvest which included DLP kills. During the fall season, unit residents took 5 (14%) bears while other Alaskan residents and nonresidents each took 16 (43%) bears. Aircraft were the most popular method of transport for successful fall hunters (43%), followed by off-road vehicles (16%), highway vehicles (16%), and 4-wheelers (5%). Skull size and age data of harvested bears were not available for this report.

Unit 14: During 1990-91 a minimum of 12 bears, reported taken in Unit 14, were presented for sealing. Eight were taken in Unit 14A and 4 in 14B, all of which were males. One male was killed in defense of life or property and 2 females were hit and killed by a train. All but 1 bear was harvested during the fall season. Unit 14B was the only portion of Unit 14 with a spring season and 1 bear was reported harvested there in spring.

Unit 16: A minimum of 55 brown bears were harvested in Unit 16 during 1990-91; 32 (65%) were males. Ten were taken in Unit 16A and 45 in Unit 16B. Harvest during the spring season was 21 bears, comprised of 81% males, while the fall harvest was 34 bears, comprised of 59% males.

Unit 17: Preliminary data indicate a reported harvest of 52 brown bears, including 34 males (65%), 16 females (31%), and 2 of unknown sex during fiscal year 1991. Average skull size was 23.5 inches for males and 21.2 inches for females. Nonresident hunters reported killing 44 bears (85%), non-local residents killed 5 bears (10%), and unit residents killed 3 bears (6%). Most successful hunters used aircraft for access (96%). The average length of hunt for successful hunters was 5.3 days.

Thirty-four bears (18 males, 14 females, and 2 unknown) were killed during the fall 1990 season and 18 bears (16 males, 2 females) were killed during spring 1991. Two bears (2 females) were killed in Subunit 17A, 48 (33 males, 13 females, and 2 unknown) in Subunit 17B, and 2 (1 male, 1 female) in Subunit 17C.

Two subadult, male bears were found dead in the Dillingham landfill this report period. Both had been recently shot and left where they were killed. Unconfirmed reports suggest that at least 6 bears were killed illegally in the Dillingham vicinity. One bear (sex unknown) was killed in defense of life or property along the Stuyahok River in August 1990.

Progress Towards Meeting Project Objectives:

Unit 6: To meet management objectives it was necessary to reduce seasons in subunit 6D. The season on Montague Island was reduced from 270 days (1 September-31 May) to 45 days (1 April - 15 May). The fall season on Hinchinbrook Island was closed by Emergency Order.

Units 7 and 15: The brown bear harvest apparently declined slightly following the reduction in season length in 1989. At least 1 additional year is necessary to evaluate the harvest trend and formulate any recommended changes.

Unit 8: The 1990-91 harvest of 149 bears (66% males) met project objectives. The brown bear population trend appeared stable, and the harvest level was conservative. Population trend assessment was imprecise, requiring conservative harvest regime. Brown bear habitat in most of Unit 8 was relatively intact at this time however, logging, recreational and commercial development of remote lands, village expansion, and hydroelectric power projects pose threats to habitat integrity.

Project objectives should be made more specific and should include the objective of managing bear populations for all user groups. Research and management activities should be directed at minimizing bear-human conflicts, identifying and protecting important habitat, assessing population trend, and quantifying nonhunting mortality.

Units 9 and 10: The extrapolated population estimate for Unit 9 was 5,860 bears on 23,500 mi^2, excluding several national parks closed to hunting. This represented an overall density of a bear per 4.1 mi^2. Harvest age data was unavailable, but average male skull size for the spring 1986 and 1988 seasons was 25.4 inches, the highest since 1971. Stream survey results and harvest statistics indicate the population objectives were being met. However the trend of increasing harvests in Unit 9 was cause for concern, and the Board of Game eliminated the first week of the fall season for 1991. The annual allowable harvest was estimated at about 280 bears for Unit 9. The drawing permit hunt on Unimak Island continued to limit hunting effort and produce hunting opportunity under conditions that are aesthetic to many hunters.

Unit 11: Recent reported harvests in Unit 11 were much lower than the estimated sustainable yield level and are thought to have had no negative impact on the unitwide bear population. The proportion of males in the harvest meets the 50% minimum in the management objective for the unit. Although population abundance data were not collected, field observations of bears by Department staff and the general public suggest a relatively abundant and well distributed population of brown bears. The low harvests of the past 10 years were attributed to increased restrictions on access and sport hunting by the National Park Service when, in 1979, nearly the entire unit was placed in Wrangell-St. Elias National Park and Preserve. No changes in season dates and bag limits will be proposed as current objectives were being met.

Unit 13: Preliminary harvest data for the 1990-91 season suggested the brown bear kill in Unit 13 declined from 1989-90 and was well below the record high harvests of the mid-to-late 1980s. The percentage of males in the harvest increased to 68% and is well above the minimum 50% management objective for brown bear harvests in Unit 13. To reduce the number of females in the harvest, the 1990 fall season was shortened 10 days by delaying the opening to 10 September. Historically, females have comprised a high proportion of bears taken in early September by hunters primarily seeking moose and caribou. This change apparently accomplished the desired goal as the percentage of males in the fall harvest increased by 11%.

Spring harvests have increased over the past two years and now approach levels observed during the mid-1980s when overall record harvests were obtained. Although spring harvests were predominantly comprised of males, the total harvest in some areas has probably exceeded sustainable levels. Of particular concern was Unit 13E in which 44% (n = 20) of the total spring harvest occurred. This was the second consecutive year that the kill appeared to have exceeded allowable take in 13E because of large spring harvests, therefore, I recommend a reduction in season length. Because brown bears were more vulnerable in early spring, I recommend delaying the opening date for spring bear season in 13E to 25 April.

Unit 14: The Unit 14C brown bear population estimate was reevaluated based on observations of bears in the alpine; the revised estimate was 28-55 bears. The resulting, updated population estimate for all of Unit 14 was 172-277. A conservative annual allowable harvest was then estimated at 7-8 bears with no more than 3 females >3 years. The 1990-91 harvest exceeded the total allowable harvest but was within limits for females >3 years. Short spring and greatly reduced fall hunting seasons were deemed appropriate for maintaining a stable population.

Unit 16: The total kill of brown bears in Unit 16 met the harvest objective of 50 bears and exceeded the minimum composition objective of 50% males. However, portions of the unit brown bear population were thought to be declining based on indications that fall harvest had declined despite increased hunting effort. Reduced fall hunting seasons were recommended to reduce the harvest of females and to stabilize the population.

Unit 17: No objective data were available on the density of brown bears in Unit 17. There was also a paucity of information on bears shot in defense of life or property and illegal kills.

It was difficult to manage this population without adequate population or harvest data. A joint ADF&G/USFWS research project was proposed during spring 1991. The objectives of this project were to estimate bear densities, collect baseline population data, and to delineate habitat use patterns for brown bears in a portion

of the Togiak National Wildlife Refuge. The project was proposed to commence in 1992, and continue for 3.5 years.

In an effort to reduce nuisance bear complaints and illegal kills, a public education effort has been initiated in the unit.

Segment Period Project Costs:

	Personnel	Operating	Total
Planned	101.4	8.9	110.3
Actual	101.4	3.0	104.4
Difference	0	-5.9	-5.9

Submitted by:

John N. Trent and Kenneth W. Pitcher
Regional Management Coordinators

Project Title: **Interior Brown Bear Population Management**

Project Locations: Units 12, 19, 20, 21, 24, 25, 26B, and 26C

Unit 12

Project Objectives and Activities: Manage to effect temporary reductions in the grizzly bear population or in the extent of bear predation where bear predation is limiting moose population growth (e.g., fall calf:cow ratios ≤30:100); manage to sustain harvests of at least 25 bears unitwide. After moose populations increase to desired levels, reduce bear harvests to stop or reverse bear population declines.

Work Accomplished During the Project Segment Period: Sixteen grizzly bears were reported taken in Unit 12 this report period. Eight were males and 7 were females. Five bears were taken during the spring season, and 11 were taken during fall. This was slightly above the 5-year average of 16 bears since 1986.

Progress Toward Meeting Project Objectives: The management objective of sustaining a harvest of 25 bears unit-wide has not been met since 1985. Moose populations have shown some moderate increases in recent years, and bear regulations have been modified slightly to reduce harvest. The harvest objective for this unit should be modified as follows: manage the grizzly bear population at a level capable of sustaining a harvest of 25 bears annually.

Unit 19

Project Objectives and Activities: Manage grizzly bear populations to provide a mean annual harvest of 30 bears with a minimum of 50% males in the harvest. Increase legal harvests of grizzly bears in and around villages, fish camps, and other human habitations during open seasons to reduce human-bear conflicts during closed seasons. Monitor harvest, seal bears, and analyze harvest data.

Work Accomplished During the Project Segment Period: No data are available for the 1990-91 grizzly bear harvest in Unit 19. However, despite the increased season lengths, the harvest probably has not changed significantly from the previous 5-year period. The 1990-91 harvest is expected to be about 35 bears, with >50% males in the harvest.

Progress Toward Meeting Project Objectives: Monitoring the Unit 19 harvest by sealing harvested bears has continued. Efforts have continued in area villages to educate residents in an attempt to alleviate the chronic defense of life or property (DLP) problems in villages and around fish camps.

Subunits 20A, B, C, F, and 25C

Project Objectives and Activities:

Subunit 20A Mountains: Manage harvests to sustain a mean annual harvest rate of 10-15% of the estimated grizzly population older than 2 years of age until 1992.

Subunit 20B East: Provide a stable population with a mean annual harvest of no more than 8 grizzly bears and an average of at least 55% males in the harvest.

Subunit 20C within Denali National Park: Maintain a closed season on grizzly bears within Denali National Park. Encourage efforts by the National Park Service to develop visitor guidelines and garbage disposal practices that reduce the potential for human-grizzly conflicts.

Subunits 20 A Flats, 20B West, 20C, 20F, and 25C: Provide stable populations with a combined mean annual harvest of up to 30 bears, including a maximum harvest of 10 bears per subunit.

Work Accomplished During the Project Segment Period:

Subunit 20A Mountains: A harvest of 5 grizzly bears (3 males and 2 females) was reported in Subunit 20A during FY91. Three bears were taken during fall and 2 bears were taken during spring. No bears were taken in defense of life or property.

Subunit 20B East: Hunters reported taking 5 grizzly bears (3 males, and 2 females) during the FY90. In addition, one bear, a male, was killed illegally and seized by Fish and Wildlife Protection officers. Three of the sport-killed bears were taken during fall and 2 were taken in spring. No bears were reported taken in DLP incidents.

During the report period an estimate of grizzly population size and sustainable harvest was made based on densities determined from a study of grizzlies in the central portion of the Alaska Range. Those values were included in a management report submitted in 1991.

Subunit 20A Flats, 20B West, 20C, 20F, and 25C: Hunters reported taking 11 grizzly bears (7 males, and 4 females) in Subunits 20A Flats, 20B West, 20C, 20F, and 25C during FY90. Eight bears were taken during fall and 3 bears were taken during spring. The distribution of the harvest among subunits was as follows: 20A Flats, 0 bears; 20B West, 3 bears; 20C, 4 bears; 20F, 2 bears; and 25C, 2 bears. No bears were taken in defense of life or property.

Progress Toward Meeting Project Objectives:

Subunit 20A: The harvest of 5 grizzly bears in Subunit 20A was below the previous 3-year average annual harvest of 15 bears and represents approximately 5% of the current Subunit 20A population over 2 old. The management objective calls for an annual harvest of 10-15% of the population until 1992. Poor weather during the fall hunting season in FY90 resulted in low hunter effort for other big game species in the Alaska Range portion of 20A. This probably contributed to the lower than average harvest of bears.

Subunit 20B East: The legal harvest of 5 bears and the illegal harvest of a sixth bear during FY91 meets the harvest objective of less than 8 bears for the eastern portion of Subunit 20B. The percent males in the harvest for regulatory years 1988-90 was 64, which met the management objective of at least 55% males in the harvest.

During the report period an estimate of grizzly population size and sustainable harvest was made based on densities determined from a study of grizzly bears in the central portion of the Alaska Range and from studies in Subunit 20E. Based on these estimates, the annual harvest objectives were revised and included in a management report submitted in May 1991. A maximum annual mean human-caused grizzly mortality of no more than 6 bears is now recommended. That mean annual harvest is to be calculated by averaging the 3 most recent annual harvests.

Based on the revised population estimates and sustainable harvest estimates, the project objectives were revised as follows:

> Manage total human-caused grizzly mortality to provide a stable population with a mean annual harvest of no more than 6 bears older than 2 years of age, with an average of at least 55% males in the sport harvest.

Subunit 20A Flats, 20B West, 20C, 20F, and 25C: The reported harvest of 11 bears in the combined subunits fell within the project objective of 30 bears and no more than 10 bears per subunit during the last 3 regulatory years. Of 37 grizzly bears taken during the last 3 regulatory years in the combined subunits, 27 (73%) were males, which met the management objective for a minimum of 55% males in the harvest.

During the report period an estimate of grizzly bear population size and sustainable harvest was subjectively made based upon habitat distribution and known densities in adjacent areas of Subunits 20A, 20E, and 13E. Those values were included in a management report submitted in May 1991. Based on those revised estimates the project objectives were revised as follows:

Manage harvest to provide stable grizzly populations with a combined mean annual human-caused mortality of up to 26 bears over 2 years of age, provided that at least 55% of the sport harvest is male. Manage the 3-year mean annual harvests from individual subunits with the following quotas: 20A Flats, 3 bears; 20B West, 3 bears; 20C, 7 bears; 20F, 7 bears; and 25C, 6 bears.

Subunit 20D:

Project Objectives and Activities: In Subunit 20D south of the Tanana River, manage a stable bear population to provide a mean annual harvest not to exceed 5% of the estimated population >2 years old, with a minimum of 60% males in the kill. In Subunit 20D north of the Tanana River, liberalize the season and bag limit to increase the mean annual harvest of grizzly bears to 8-10% of the estimated population >2 years old, until moose calf survival increases to at least 30 calves:100 cows for 3 consecutive years in the Arctic. Monitor harvest, seal bears, and analyze harvest data.

Work Accomplished During the Project Segment Period: Nine grizzly bears were sealed during this report period. Seven bears were taken south of the Tanana River and consisted of 71% males (n = 5) and 29% females (n = 2). Six of these bears were taken during fall and one was taken during spring. Two grizzly bears were taken north of the Tanana River and both were males -- 1 killed in spring and 1 killed in fall.

Progress Toward Meeting Project Objectives: Bears were sealed and harvest data were analyzed. The harvest objective was met for southern Subunit 20D. Harvest continues to be below the objective for northern Subunit 20D. Attempts to increase harvest north of the Tanana River by liberalizing seasons and bag limits have been unsuccessful but will continue.

Subunit 20E:

Project Objectives and Activities: Manage to effect temporary reductions in the grizzly bear population or extent of bear predation where bear predation is limiting moose population growth (e.g., fall calf:cow ratios <30:100). Manage to sustain harvests of at least 25 bears unitwide. After moose populations increase to desired levels, reduce bear harvests to stop or reverse bear population declines.

Work Accomplished During the Project Segment Period: Fourteen grizzly bears were reported taken in Subunit 20E during this report period. Nine were males and 5

were females. Four were taken during spring and 10 were taken during fall. The average annual harvest since 1986 was 15.6.

Progress Toward Meeting Project Objectives: The harvest management objective of taking 25 bears annually from this subunit was never met. The highest recorded harvest occurred in 1984-85 when 23 grizzly bears were reported taken. This objective should be modified to state: Manage the grizzly bear population in this subunit at a level capable of sustaining a harvest of 25 bears annually.

Unit 21

Project Objectives and Activities: Manage a grizzly bear population which will sustain a minimum annual harvest of 10 bears. Reduce nuisance bears and the unreported harvest of those bears at fish camps during summer by increasing the legal harvest during the open season.

Work Accomplished During the Project Segment Period: Most of the grizzly harvest was by local residents. During the report period 2 males and 1 female were reported taken in Subunit 21D. However, reporting of bears taken in defense of life or property was poor, and 3-5 additional bears may have been taken.

Progress Toward Meeting Project Objectives: Management is based on harvest data. Minimal progress was made on changing the goals and objectives for the unit. No progress was made on reducing unreported harvest.

Unit 24

Project Objectives and Activities: Manage a grizzly population which will sustain a maximum annual harvest of 18 bears in the northern portion of the unit and a maximum harvest of 13 bears in the remainder of the unit. Reduce nuisance bear complaints, increase sealing compliance, and reduce the unreported harvest of bears in the unit. Work with U.S. National Park Service and U.S. Fish and Wildlife Service to determine bear density throughout the unit.

Work Accomplished During the Project Segment Period: During the report period 13 bears were harvested. Eight were males and 5 were females. Eight bears were taken in the northern portion of the unit and 5 in the remainder of the unit.

Progress Toward Meeting Project Objectives: Management is based on harvest data, and harvests are below unit objectives. Minimal progress was made in reducing unreported harvests or reducing bear complaints and no progress was made in determining bear density.

Subunits 25A, B, and D

Project Objectives and Activities: Maintain a mean annual harvest of less than 35 bears, while maintaining a minimum of 60% males in the harvest. Determine population size and composition in Subunit 25A by 1992.

Work Accomplished During the Project Segment Period: Harvest figures are unavailable for Subunits 25A, 25B, and 25D. Grizzly bear harvests have remained very stable in these units during the past 5 years, ranging from 5 to 8 bears annually.

Progress Toward Meeting Project Objectives: The population harvest objective has consistently been met during the past 5 years. No progress has been made on determining the population size and composition in Subunit 25A because of a vacancy in the area biologist position throughout most of this report period.

Subunits 26B and 26C

Project Objectives and Activities: Maintain a mean annual harvest of less than 25 bears, while maintaining a minimum of 60% males in the harvest. Monitor harvest, seal bears, and analyze harvest data.

Work Accomplished During the Project Segment Period: Current harvest figures are unavailable for Subunits 26B and 26C. Harvest levels increased substantially in alternate years beginning in 1987-88 in Subunit 26B when 13 were taken. The average annual harvest there from 1986-91 is 9.8. Annual harvests are substantially lower in Subunit 26C where the 1986-91 average annual reported harvest is 5.6 bears.

Progress Toward Meeting Project Objectives: Except for the 1990-91 season in Subunit 26B when the percent males in the harvest was 42.9, the objective of maintaining 60% males in the harvest has been consistently met in both subunits during the past 5 years. Reported annual harvests have never exceeded the objective of taking 25 bears or less in these subunits.

Segment Period Project Costs:

	Personnel	Operating	Total
Planned	32.2	1.0	33.2
Actual	36.3	0.1	36.4
Difference	-4.1	0.9	-3.2

Explanation: One month additional Wildlife Biologist II salary needed to monitor harvest.

Submitted by:

Kenton P. Taylor
Regional Management Coordinator

Project Title: **Arctic Brown Bear Survey and Inventory**

Project Location: Unit 18 (42,000 mi^2)
Yukon-Kuskokwim Delta

Project Objectives: Maintain brown bear populations at existing densities in Unit 18; monitor harvests through the sealing program and contacts with the public; improve compliance with bear harvest reporting requirements; minimize adverse interactions between bears and the public.

Work Accomplished During the Project Segment Period: Local residents were contacted by telephone, mail, radio and television announcements, and by newspaper articles about hunting season dates and bag limits, bear tag fees, sealing requirements, and other regulations pertaining to bear management regulations. Brown bear management was also discussed at public meetings with special emphasis on the need for better harvest reporting. Village leaders, hunters, and law enforcement personnel were contacted in an effort to minimize bear-human conflicts at camps and dumps. Public notices were posted at villages concerning different ways to reduce adverse encounters between bears and the public.

The sealing of bears often takes place at villages, at the Department office at Bethel, and at hunters' residences. One unguided resident took a bear in September along the Yukon River near Marshall. An additional bear taken along the Yukon River was a DLP kill. Estimates of the total unreported harvest are not available, but are believed substantial. However, 3 bears were reportedly taken by Kwethluk residents during September and October 1990 along the Kisaralik/Kasigluk River drainage.

Progress Towards Meeting Project Objectives: Public notices about bear/dump problems has improved public awareness of the need to clean up these areas in some villages. Only 1 DLP bear was reported this year even though some bears reportedly frequented dumps. Some villages are improving landfill areas by fencing in the areas and burying or burning trash. More people are seeing the need to keep fish and hunting camps clean of trash and garbage.

Public announcements, village meetings, and license vendor contacts aboutthe need to purchase resident bear tags has improved compliance in some villages. However, many subsistence hunters fail to purchase tags because they consider it a "trophy" fee not applicable to their type of hunting. The Division of Wildlife Conservation has initiated a comprehensive statewide review of grizzly bear regulations to try to make the regulations more acceptable in rural areas where many local hunters take bears for subsistence purposes. Weekly notices concerning the need for sealing were sent during April and May to villages which traditionally harvest bears. This has increased public awareness of the need for harvest information. However, until a significant

number of hunters begin purchasing resident bear tags, most harvested bears will probably not be sealed. The $25 bear tag is a significant "stumbling block" which discourages many local residents from reporting their harvest. Hunting season announcements have eliminated some of the problems with out-of-season and DLP kills.

Habitat protection of important areas used by bears is being achieved through comments provided to Habitat Division and to the U. S. Fish and Wildlife Service Refuge Management Planning Team.

Research on brown bear populations will probably become more important if harvests increase substantially or habitat disturbances become a problem. Improved harvest estimates are especially needed. Methods for assessing density and population status are needed as well. Investigations concerning the applicability of aerial stream surveys as a population assessment tool is currently being discussed with the U. S. Fish and Wildlife Service (FWS). A cooperative effort between the Department and FWS to initiate aerial stream surveys on specific drainage is currently being proposed.

Project Location: Unit 22 (23,000 mi^2)
Seward Peninsula and that portion of the Nulato Hills draining west into Norton Sound

Project Objectives: Maintain grizzly bear numbers at existing densities; assess harvest through the sealing program; collect specimens as needed from hunter-killed bears; improve compliance with bear harvest reporting. Minimize adverse interaction between bears and the public; assist the public in dealing with nuisance bear problems at camps, dumps, villages, industrial development sites, and among reindeer herds. Begin to develop a grizzly bear management plan in consultation with the public, interested local organizations, and other agencies.

Work Accomplished During the Project Segment Period: Known mortality during the report period was 48 bears (45 legal, 3 DLP) Of those bears legally taken, 32 were harvested in spring and the remaining 16 were taken in fall. Sex composition of the legal harvest was 31 males and 14 females. Bears taken by nonresidents accounted for 47% of the harvest. Ten bears were taken from Subunit 22A, 21 from Subunit 22B, 7 from Subunit 22C, and 7 from Subunit 22D.

At least 1 premolar was collected from all harvested bears. Tissues samples were collected from most of the bears for use in several different studies currently in progress.

The 3-year bear study was concluded with a census being conducted within a 2,080 km^2 portion of Unit 22. Preliminary data indicate a density estimate for bears of all ages at 29.56 bears per 1000 km^2 and for bears 2-years-of-age-or-greater at 17.9 bears per 1000 km^2.

Numerous meetings and impromptu discussions were held with unit residents and reindeer herders discussing possible ways to reduce bear/human interactions and predation by bears on reindeer.

A school program developed several years ago explaining the importance of wildlife management concepts, rules, and regulations was used extensively throughout Unit 22 schools. Several trips were made to villages explaining the need for regulations and harvest reporting as well as assisting license vendors. Considerable time was spent answering and making phone calls, writing newspaper articles, sending out mailings of regulation materials, and assisting the unit's license vendors.
Additional effort was expended sealing bears during the evening hours and on weekends, and depending on the circumstances, sealing bears in surrounding villages. A village sealer was also available in Unalakleet to seal harvested bears in the southeast portion of the unit.

Progress Towards Meeting Project Objectives: Limited progress has been made during past years in reducing confrontations between bears and the public. Some individuals who in the past have had problems with bears in camps have made an effort to keep cleaner camps to discourage bears. Discussions with the Unit's reindeer herders have resulted in some of them making attempts at reducing bear/reindeer interactions by spending more time with the reindeer, particularly at fawning time, and keeping reindeer in areas where bear densities appear to be lower.

It is suspected that unreported harvests of bears each year in Unit 22 are substantial. Many unit residents dislike grizzly bears and openly indicate their desire to have them eliminated completely. Efforts to inform the public of the importance of wildlife conservation and the need for regulations are starting to bear fruit in some communities as the number of individuals purchasing licenses and/or bear tags has increased. Additional contact with local residents, particularly village residents, needs to take place if more complete compliance with current bear regulations is to become a reality.

Actual development of a grizzly bear management plan has not taken place, although initial steps were taken this past year by communicating with unit residents and representatives of several governmental agencies. Data from the recently completed bear study and information reported by the general public and others will be used in producing a Unit 22 bear management plan.

Project Location: Unit 23 (43,000 mi^2)
Kotzebue Sound and western Brooks Range

Project Objectives: Maintain brown/grizzly bear populations at existing densities in Unit 23; monitor hunting and other mortality factors through harvest reporting and sealing, public contacts, and field observations; monitor population trends through field observations, results of various research projects, and analyses of sealing data; improve communication with the public to reduce the magnitude of illegal, unreported, and DLP kills. Minimize adverse conflicts between bears and the public; assist the public in dealing with nuisance bear problems at villages, camps, dumps, and industrial development sites. Develop updated population objectives in cooperation with the public and other agencies.

Work Accomplished During the Project Segment Period: Preliminary data gathered from sealing certificates indicate that 40 bears were harvested during 1990-91. We believe the actual harvest is substantially greater because many bears taken for subsistence purposes or in DLP by local residents were probably not reported.

Radio-collared bears in the Noatak River drainage were monitored by our staff at Kotzebue and by staff from the National Park Service. Particular attention was given to assessing impacts the Red Dog Mine Project may have had on the area's bear population. Impacts observed so far have been localized to the development site and road corridor.

Progress Toward Meeting Project Objectives: Research completed last year indicated that grizzly bears in the Noatak River drainage were being harvested at sustained yield limits. Most of the harvest in this area is attributable to guided nonresident and non-local resident hunters. Continued monitoring of this population and harvest is recommended.

Most knowledgeable local residents believe that bear populations are increasing in Unit 23, and they would like to see seasons and bag limits liberalized. Although relatively good population data are available for the Noatak River drainage, data for the remainder of the unit are poor or non-existent. Because many bears taken for subsistence purposes are not sealed, the age data obtained from bears that are sealed may not be representative of the entire harvest. Efforts to improve the quality of the harvest data are recommended. If harvests do increase in Unit 23, better quality population data will be needed to ensure that populations are not overharvested.

Many local residents who harvest bears for subsistence purposes believe that the regulations are excessively complicated and culturally inappropriate. Examples include the $25 resident tag fee and the bag limit of 1 bear every 4 regulatory years. These problems undoubtedly have contributed to the poor harvest reporting already

iscussed. Simplification of the regulations will be necessary if we desire local residents to participate more fully in the management process.

Project Location: Unit 26A (53,000 Mi^2)
Western North Slope

Project Objectives and Activities: Maintain brown bear populations at current levels; monitor the harvest through the statewide sealing program. Population status and composition counts have been conducted annually in Subunit 26A and are reported in Research Progress Reports.

Minimize adverse interactions between bears and the public.

Work Accomplished During the Project Segment Period: Twenty-three bears were reported harvested during 1990-91. One bear was killed in defense of life and property and the remainder were harvested by hunters. In Subunit 26A West (west of 159^0 W. longitude), 13 bears were killed, and in Subunit 26A East (east of 159^0 W. longitude) 10 bears were killed. Of the 16 sealing certificates turned in so far, 11 bears were males and 5 were females. The mean skull size for harvested males was 21.6 inches and 20.1 inches for females. Among nonresident hunters, 79% were successful. Five bears were harvested during September, 1 was harvested in April, and 10 were harvested in May. Aircraft were used for transportation by 11 hunters, boats by 3 hunters, and snow machines by 2 hunters.

The current population estimate for bears in Subunit 26A is 900-1,120 bears; 400 bears are estimated in Subunit 26A West and 500-720 are estimated in Subunit 26A East (Reynolds 1989). This is an increase from the pre-1987 population estimate of 645-780 bears.

Through the media, we distributed information describing safe camping practices regarding food and garbage as well as the correct handling of problem bears. Posters and pamphlets on bear safety were placed in public locations.

Progress Toward Meeting Project Objectives: If we assume that safe harvest limits should not exceed 4% of the population, the allowable sustained yield for Subunit 26A is approximately 36-47 bears. In 1990-91 the reported grizzly bear harvest of 23 bears in Subunit 26A was well within this limit. If Trent's (1989) estimate that the unreported harvest may be 38-54% of the reported harvest is accurate, an estimate of 32-35 bears harvested would result. This is still within allowable sustainable yield limits.

There were no serious adverse encounters between brown bears and people reported for Subunit 26A during 1990-91. The information distributed to the public on bear safety seemed to be well received.

Segment Period Project Costs:

	Personnel	Operating	Total
Planned	26.8	5.5	32.3
Actual	26.8	46.2	73.0
Difference	0	+40.7	+40.7

Explanation: A radiotelemetry study and a census of grizzly bears was completed in Unit 22 during the report period. Funds from a special legislative appropriation and other regional projects were used to supplement existing budgets to complete this project.

Literature Cited:

Reynolds, H. V. 1989. Unit 24-26 brown/grizzly bear survey-inventory progress report. Pages 174-184 in S. O. Morgan, ed. Annual report of survey-inventory activities, 1987. Vol. XIX, Part V. Alaska Dep. Fish and Game. Fed. Aid in Wildl. Rest. Prog. Rep. Proj. W-23-1, Study 4.0. Juneau. 189pp.

Trent, J. N. 1989. Subunit 26A brown/grizzly bear survey-inventory progress report. Pages 174-184 in S. O. Morgan, ed. Annual report of survey-inventory activities, 1987. Vol. XIX, Part V. Alaska Dep. Fish and Game. Fed. Aid in Wildl. Rest. Prog. Rep. Proj. W-23-1, Study 4.0. Juneau. 189 pp.

Submitted by:

Steven Machida
Regional Management Coordinator

Alaska Game Management Units

WILDLIFE RESTORATION