

Grizzly Bear Hunting: Frequently Asked Questions

Fish, Wildlife and Habitat Management Branch

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British Columbians have widely varying views on the ethics and ecology of Grizzly Bear hunting in the province. This document is not intended to address differences in ethical viewpoints. Instead, it provides answers to some of the most common questions we receive from the public and stakeholders regarding the sustainability of BC's Grizzly Bear hunt. It also explains the Ministry's science-based harvest management practices that are designed to ensure that BC continues to be home to some of the healthiest Grizzly Bear populations in the world.

1) What is the history of the Grizzly Bear hunt in British Columbia?

Other than a brief moratorium in the spring of 2001, Grizzly Bears have been hunted in British Columbia since before European settlement. Prior to modern wildlife management, when Grizzly Bears were not considered a game species, bounties were paid for their hides. Non-resident hunting of Grizzly Bears in British Columbia has a long history with several notable hunter naturalists, such as Sheldon, Edwards, and Hornaday recording their hunting experiences in well known books. The Grizzly Bear was identified as a game species in the mid-1900s, and since then management programs have been put in place to ensure that the hunt is sustainable. Today, the Grizzly Bear hunt is the most rigidly and conservatively controlled hunt in the province.

Prior to Limited Entry Hunting (LEH: a lottery system where a controlled and limited number of hunting authorizations are available), Grizzly Bear hunting for residents and non-residents was managed through General Open Seasons (GOS) where the harvest was controlled through season dates and restrictions on sex/age classes. LEH was introduced in 1977 when a portion of the provincial Grizzly Bear GOS hunt was replaced by LEH. By 1996, all Grizzly Bear hunting in the province was put on either a LEH system for resident hunters or a quota system for non-resident guides. The Grizzly Bear is now the only species in British Columbia that is managed entirely through LEH and quota.

The Ministry of Environment has been collecting detailed harvest data for Grizzly Bears since 1976. This data, combined with inventory, research, monitoring, and habitat assessments provides vital information on the sustainability of the hunt. Figure 1 shows the trend in the Grizzly Bear harvest over the past 34 years. This, along with a number of other measures described throughout this document, has lead Ministry scientists to conclude that the Grizzly Bear harvest is sustainable.

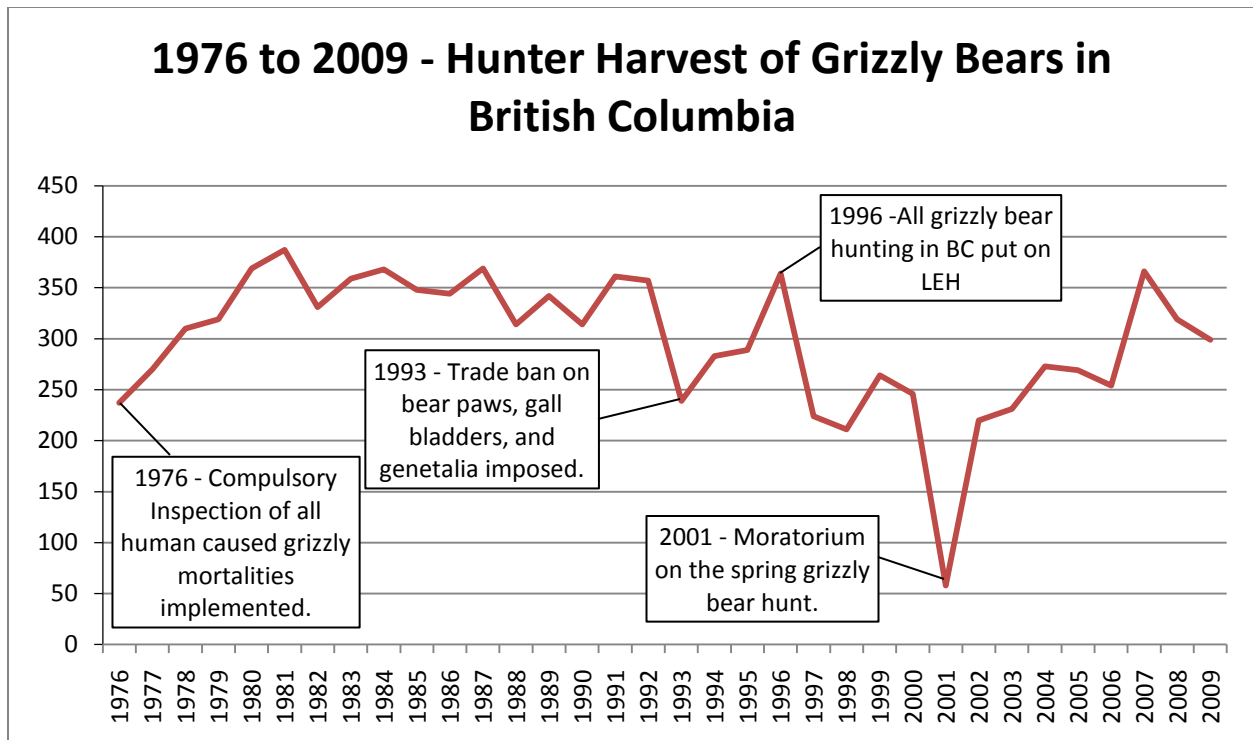


Figure 1: 1976 to 2009 Provincial Grizzly Bear Harvest. Since 1976 hunters have harvested an average of 297 Grizzly Bears annually.

2) What are Grizzly Bear Population Units (GBPUs)?

Grizzly Bears in BC are not part of one large interbreeding population, but rather are comprised of 57 discrete or nearly discrete population units (referred to as Grizzly Bear Population Units or GBPUs (see Figure 2)). Grizzly Bears are managed by GPBU in order to ensure local conservation and management objectives are being met and to reflect known and suspected fractures in Grizzly Bear distribution. GBPU's have been used for setting land use priorities for Grizzly Bear conservation during strategic land use planning and are currently being used to direct population recovery. GBPUs are the primary unit for establishing Annual Allowable Harvests (AAH) for viable populations that can sustain a harvest.

Grizzly Bears in the Northern Peace region live in habitats with different ecological characteristics than those in the Southern Kootenays. Hunting in the north has no impact on Grizzly Bear populations in the south. Similarly, the very intensive recovery effort for Grizzly Bears required in Southwest BC is very different from the management and conservation focus for bears in the Kutzeymateen area on the north coast. In addition to the 57 GBPUs, there is a large area of BC that has either never been occupied by Grizzly Bears or where adult female Grizzly Bears no longer inhabit.

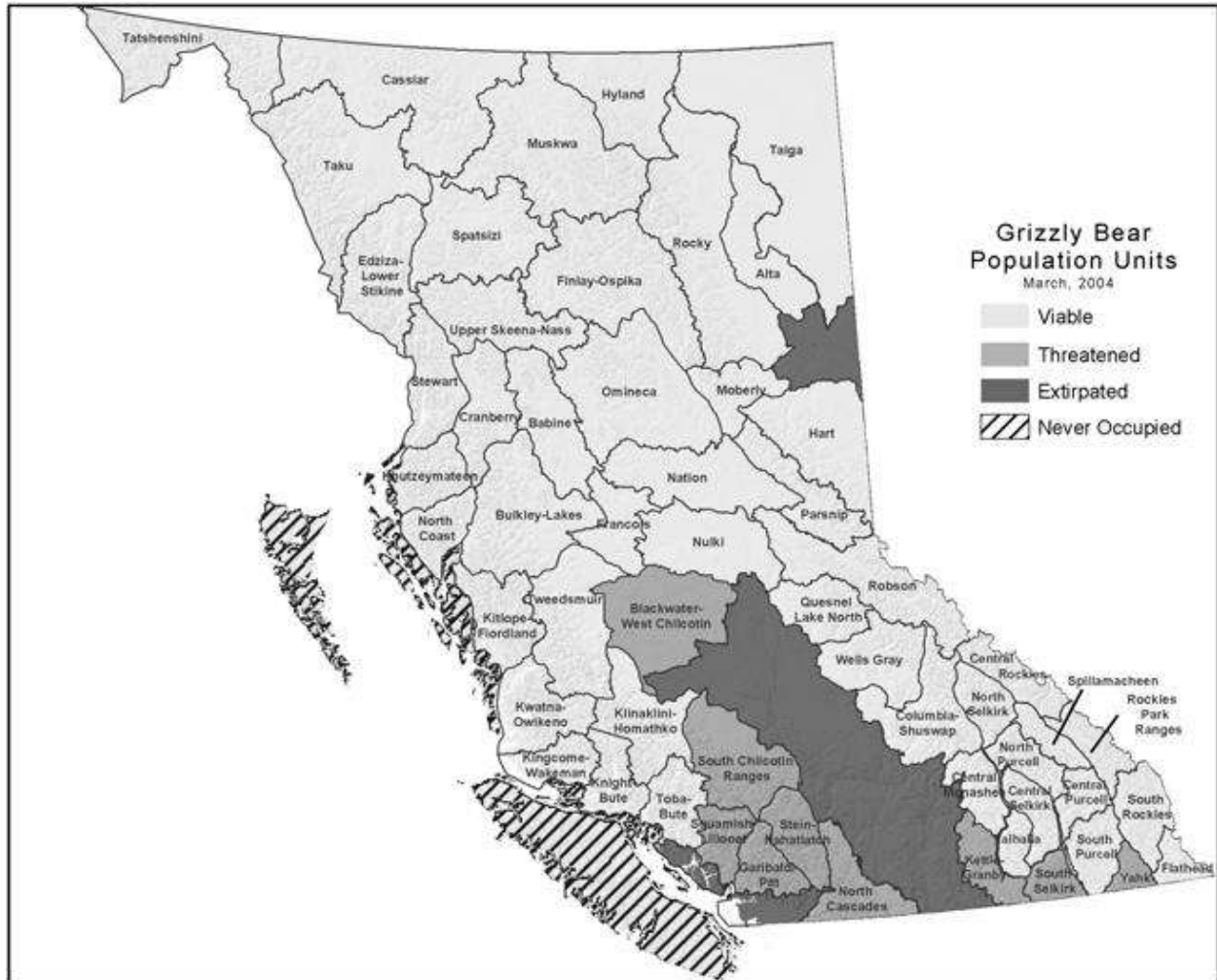


Figure 2. Grizzly Bear Population Units (GBPUs) in British Columbia.

3) What is the conservation status of BC's 57 GBPUs, and how were they determined?

The Ministry and its partners have invested over \$7 million in Grizzly Bear inventory to estimate BC's Grizzly Bear abundance and distribution and to assist biologists in determining the conservation status of each GBPU. GBPUs are classed as Threatened or Viable (Figure 3). This status is based on the difference between the current population estimate, and the estimated population capability for the GBPU, as determined through population and habitat modelling. Capability is defined as the inherent, idealized ability of the land to support a specific density of Grizzly Bears independent of human influence. If the current estimate is less than 50% of capability (i.e. the population is less than 50% of the number of animals that the habitat could support), the GBPU is designated as Threatened. There is no hunting allowed in Threatened GBPUs. The primary objective in these units is to recover the population to sustainable levels.

4) How does the Ministry estimate the number of Grizzly Bears in each GBPU?

Wherever possible, Grizzly Bears are inventoried using Mark-Recapture that relies on systematic hair-snagging within a grid (survey area) for subsequent DNA and statistical analysis. To date, over 30 Grizzly Bear mark-recapture inventories have been conducted in BC. Individual hair snags are set up in cells ranging from 25km²-100km², and survey areas composed of numerous cells cover multiple watersheds within GBPUs.

The sampling method, first used for bears in British Columbia, and published in peer-reviewed scientific journals, combines traditional mark-recapture methods and individual recognition through unique DNA profiles. The genetic signature of each bear is the “mark” and that bear’s pattern of detection on the grid across a defined time period are the potential “recaptures”. As a sampling session progresses, the number of “new” bears detected on the grid declines vs. the number of recaptures and that ratio and other measures are used to help determine a population estimate with a “confidence interval” (an estimate of reliability) around it. Inventories are designed to take advantage of natural or human-caused fractures in Grizzly Bear distribution in order to ensure “closure”, such that bears are restricted from coming into, or leaving the survey area during the hair sampling sessions and confounding results as a consequence.

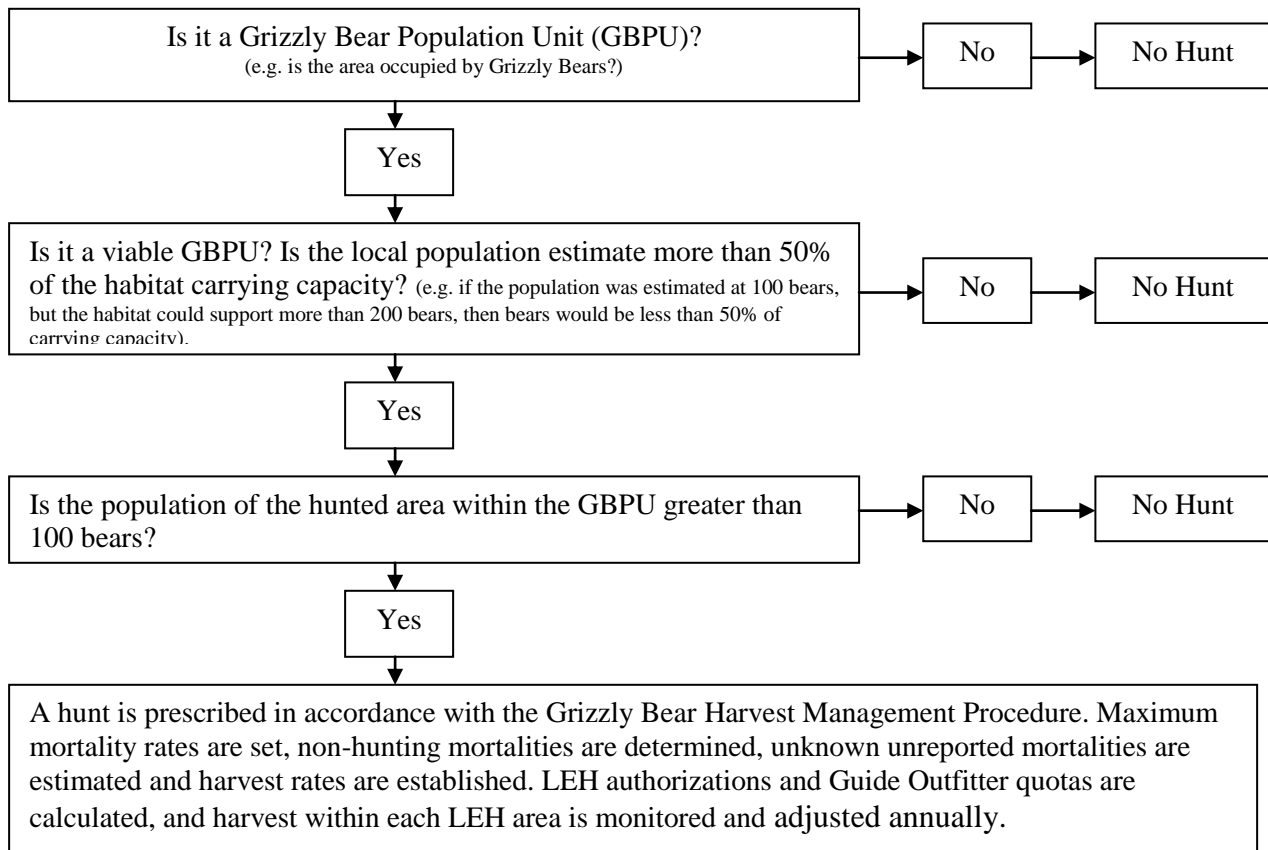
Where direct inventory is not possible, the Ministry estimates densities using a Multiple Regression Model that relates known densities from inventories to a list of environmental, geographic and human influences. This model can then be used to predict Grizzly Bear densities within GBPUs that have not been surveyed. For coastal British Columbia, a different model (termed the Expert Based Model) also considers the proportion of Pacific salmon in the diet as a factor that determines bear density, but the coastal model is more subjective than the interior model. Additional modelling is currently underway to reduce this subjectivity.

Periodic surveys enable some populations to be monitored over time to determine if their numbers are increasing, stable or declining. For example, 2009 was the 11th year of systematic aerial surveys of Grizzly Bears in the Kimsquit River in mid-coastal BC. That work is proving valuable in helping determine the potential impact of an apparent decline in Pacific salmon on Grizzly Bear numbers and productivity. The Ministry has recently undertaken a comprehensive GBPU-specific priority-setting exercise for future inventory, monitoring and distribution projects.

5) Why are some GBPU's open to hunting while others are closed? How is this decision made?

Viable GBPU's are subject to LEH only when the population is greater than 100 bears. A hunt may be allowed within an entire GBPU, or only within a portion of the GBPU. Portions of the viable unit may be closed to hunting if the current population is below acceptable levels compared to what the habitat can support, or if a Grizzly Bear No Hunting Area (GBNHA) has been designated. GBNHAs are established as representative benchmarks and typically surround large protected areas or conservancies. For example, the large Skeena-Nass GBNHA surrounds the Khutzeymateen Park, Canada's first official Grizzly Bear sanctuary.

The process for determining where hunting for Grizzly Bears will be open and where hunting will be closed is described by the flow diagram below:



6) *How much of the province is open to a Grizzly Bear hunt?*

Approximately 65% of the province (not including Vancouver Island or Haida Gwaii which are not within the historic range of Grizzly Bears), is currently open to Grizzly Bear hunting (see Figure 3).

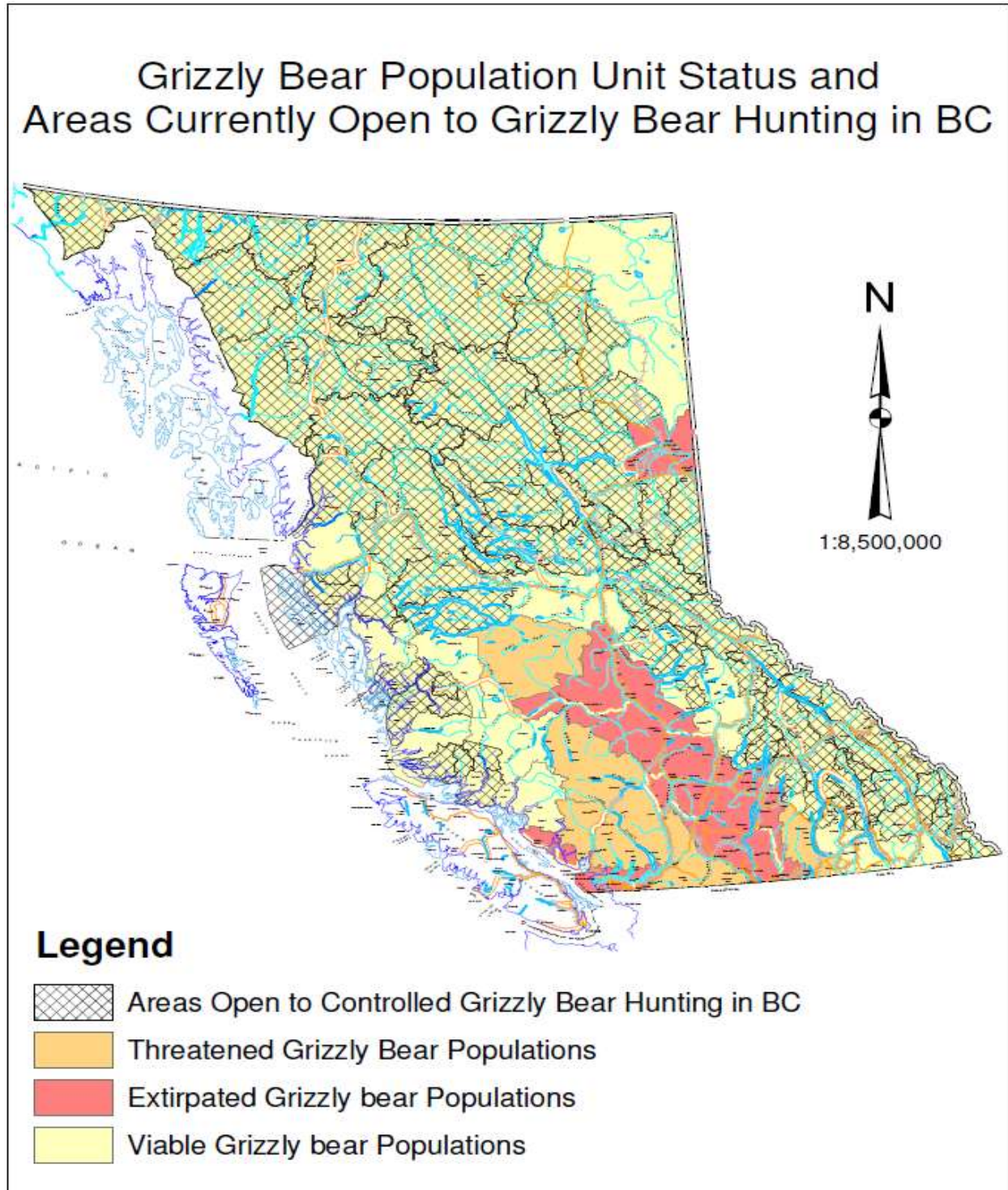


Figure 3: Grizzly Bear Population Unit Status and Areas Currently Open to Grizzly Bear Hunting in BC.

7) How does the Ministry determine the level of hunting mortality that is sustainable?

The proportion of a Grizzly Bear population that can be harvested by humans without creating a population decline was discussed in detail by the original Grizzly Bear Conservation Strategy Scientific Advisory Committee, and the subsequent Scientific Advisory Panel, see http://www.env.gov.bc.ca/wld/documents/gbear_finalspr.pdf.

The Panel Report contained the following (pages 11-12):

“A model involving the sustained yield concept discussed above may be used to estimate sustainable harvest rates, and then these rates can be applied to a population estimate to obtain an estimate of sustainable hunting mortality. Outputs from such models vary with the assumptions used. The B.C. government relies on results of a modeling exercise performed by Harris (1986b) that estimated maximum sustainable harvest mortality at 6%. This model used reproductive and mortality rates believed typical of “southern interior” Grizzly Bear populations and included density-dependent effects resulting from the increased survival of young in response to the removal of males. Miller (1990a) estimated the maximum sustainable harvest of Alaskan Grizzly Bears at 5.7% based on a model that did not include density-dependent effects. In all likelihood, differences between models used to estimate sustainable harvest rates for bears are insignificant compared to the typical magnitude of error in estimates of total population size. We note, however, that both the Harris and Miller models did not consider the effect of sampling error on the estimations of population size or demographic parameters on the estimated harvest rate.”

The Panel commissioned Dr. P McLoughlin to assess the risks of decline for hunted populations of Grizzly Bears given uncertainty in population parameters. That study (see http://www.env.gov.bc.ca/wld/documents/gbear_mcl.pdf) concluded that most Grizzly Bear populations in North America can tolerate approximately 3 – 5% total annual harvest before declines in probability of persistence accelerate to unsatisfactory levels. Given more recent estimates of demographic parameters for Grizzly Bears, the results of that study are now considered to have been conservative.

Based on the above information and demographic information collected by Dr. Bruce McLellan in the Flathead River in SE BC, the Ministry revised the Grizzly Bear Harvest Procedure in 2007 (see http://www.env.gov.bc.ca/wld/documents/grizzlybear_harvest_mgmt_proc_2007.pdf) to include the following:

“In general, GBPU's will be managed so as not to exceed the cumulative Annual Allowable Mortality (AAM) or female AAM over the course of an allocation period. The AAM for each GBPU will typically be calculated by using a maximum allowable mortality rate of 6%, unless a written rationale (that is consistent with stated management objectives) is available and supports the use of a higher or lower maximum allowable mortality rate. This rationale may consider such factors as:

- uncertainty in the population estimate,
- knowledge of the population's natural growth rate,
- location of the area within the species' distribution, or
- a difference between the estimates of population size and current carrying capacity.”

The procedure also includes a provision for females which states:

“The female AAM will be calculated as 30% of [overall] AAM” [that is, no more than 30% of the 6% can be female].

To date, this policy over-ride has only been invoked on one occasion – for the Tweedsmuir GBPU, LEH zone 5-08C, the Bella Coola Valley, by varying the management objective for the valley.

The 6% maximum, total human-caused mortality rate, applied on a five-year (allocation period) basis, remains fundamental to Grizzly Bear harvest management in BC. In practice, the rate as applied in over 135 different LEH zones and Wildlife Management Units, varies from 1.3% (Francois GBPU) to 5.7% (Stewart, Spatsizi, Upper Skeena-Nass, and Kwatna-Owikeno GBPUs) and averages 4.2 % over the area of BC where there is an open Grizzly Bear hunt. Rates are directly proportional to bear population productivity – higher rates are applied only where there is evidence of a healthy, higher density population.

More recent research on Grizzly Bear population demographics in Alaska and in Yellowstone Park supports the currently applied BC maximum of 6% for all human-caused mortality as sustainable and likely conservative for bears occupying good quality habitats. Computer modelling, based on recently documented reproductive and survival rates for Grizzly Bears, also indicates that 6% human-caused mortality is conservative and that rates up to or even exceeding 9% can be sustainable for some populations.

One of the major uncertainties associated with determining human-caused mortality limits has been the lack of conclusive evidence of density-dependent effects. Recent work on Black Bears in Northern Alberta advocates “the inclusion of density dependence in population projection models for bear populations”. However, density dependence would have less influence where Grizzly Bear populations are held below carrying capacity by human caused mortality.

Management Statement

The Ministry of Environment has adopted a 6% maximum allowable human-caused mortality rate as sustainable and likely conservative for Grizzly Bears occupying good quality habitats. The limit of all human-caused mortalities at 6%, supplemented by a procedural rule that no more than 30% of all human-caused mortalities can be females, and a regulation that stipulates there is no open season on any bear less than two years old or any bear in its company (thereby protecting females and their dependent offspring), provides sufficient safeguards to ensure that BC’s Grizzly Bear hunt is sustainably managed.

Legal harvests are closed when either (or both) the 6% total or the 30% female limits are exceeded. In practice, managers have adopted maximum allowable human-caused mortality limits of between 1.3 and 5.7% in recognition of the highly variable population productivity across the province.

8) What are the human-caused mortality rates for Grizzly Bears in British Columbia?

The Ministry sets a specific allowable human-caused mortality rate for each hunted GBPU based on a variety of GBPU characteristics. For example, higher density populations are able to withstand higher levels of human-caused mortality. While it is not uncommon for mortality in an individual year to exceed the annual allowable mortality for a GBPU, this does not represent a conservation concern or overharvest as adjustments are made in the following years to ensure total mortality over a five year period is not exceeded. It is extremely rare for mortality rates over a five year period to be in excess of the allowable mortality, and in these situations the mortality rates over the next five year period are significantly reduced or eliminated to compensate for the overharvest in the previous five year period.

Currently, 50% of the of the province's 135 Grizzly Bear hunts are set at 6% maximum allowable human-caused mortality, 24% are set at 5%, and 26% are set at 4%. (see Figure 4).

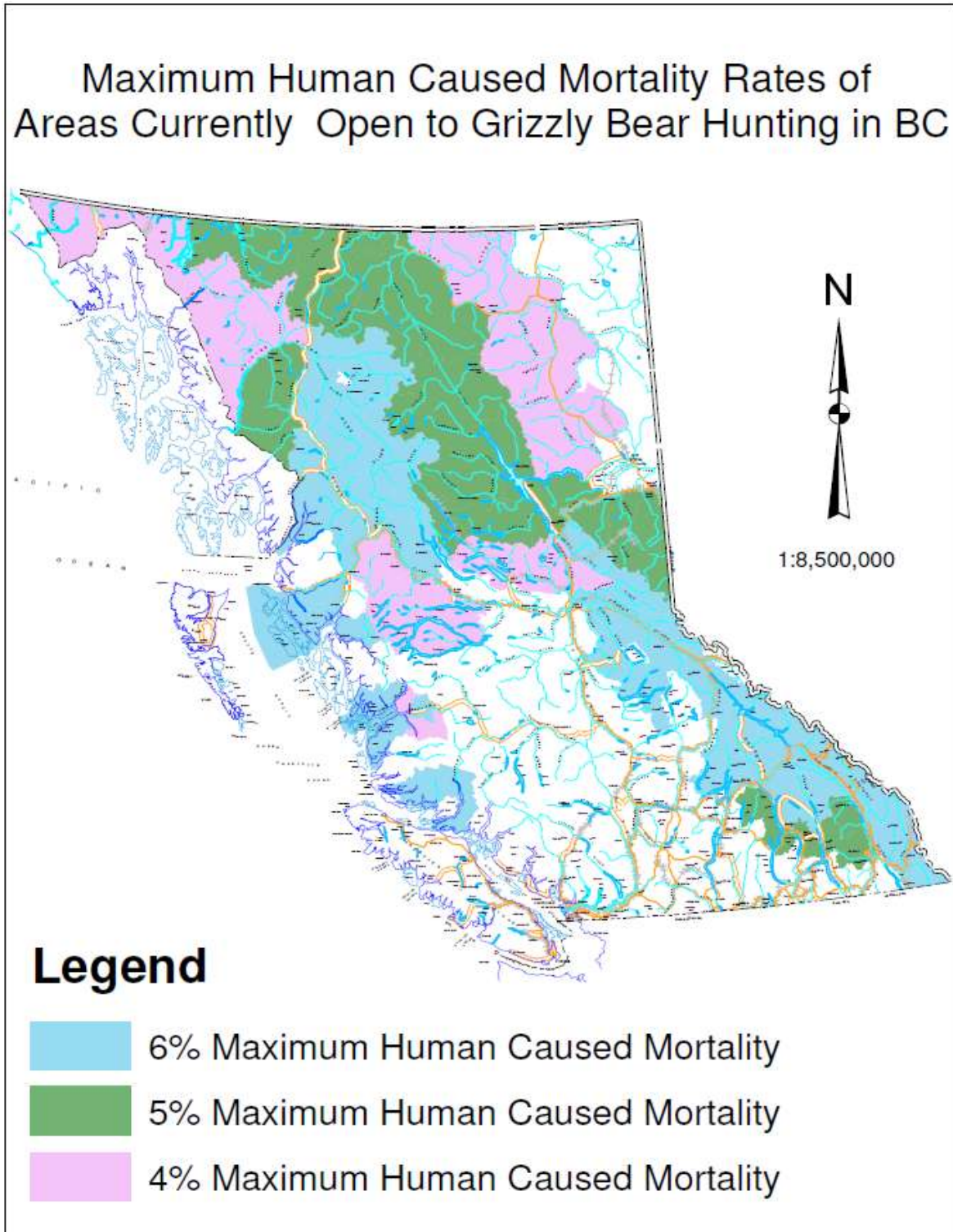


Figure 4: Maximum Human-Caused Mortality Rates of Areas Currently Open to Hunting in BC, as of spring, 2010.

9) How are the hunter harvest rates determined for Grizzly Bears in BC?

Once the maximum human caused-mortality rate is established, a series of calculations known as “step-downs”, are used to determine the Annual Allowable Harvest (AAH) rate. These calculations include subtracting the First Nations harvest rate, and the estimated unreported mortality rate from the maximum human caused-mortality rate. The procedure also factors in the expected number of reported non-hunting mortalities that will occur in the future (typically conflict bears) based on the previous records of reported non-hunting mortalities in that GBPU. Only after all of these step-downs are made is the AAH rate determined. Although this rate is calculated on an annual basis, it is applied over a five year period to allow for annual variation and to reflect natural population processes.

10) How does the province record the actual human-caused mortality levels for Grizzly Bears?

Human caused mortality of Grizzly Bears includes both legal hunting and other human-related causes.

Known human-caused mortality of Grizzly Bears includes the licensed harvest, bears removed through animal control activities, and animals that have died from other related human causes, such as collisions with motor vehicles or trains. Known illegally-taken animals are also included.

Mortality records are collected and kept within the Ministry’s Compulsory Inspection database. Compulsory Inspection for Grizzly Bears was initiated in 1975, and all reports submitted after 1976 are considered to be both complete and accurate. From 2004 to 2009, there were 2,138 reported human-caused Grizzly Bear mortalities in the province of which 358 (16.7%) were related to motor vehicle collisions, illegal kills, railway mortality, and animal control incidents.

Other sources of human-caused mortality, such as poaching, are less well known. The harvest by First Nations is also largely unknown, as traditional rights and title of First Nations on traditional territory exempts them from the requirement to report their harvest. However, using local knowledge, inventory and research, the Ministry has developed an estimate for these unreported causes. Generally, 0.3% to 2.0% of Grizzly Bears are believed to be killed and not reported in the province each year.

11) How many bears are killed in the province each year through human activities? Is it within sustainable limits?

The current maximum human-caused mortality for all hunted populations in BC combined is set at 682 bears per year. Of the 682 bears that can be sustainably removed from the hunted populations of the province, 120 are estimated as unreported mortality, leaving a sustainable mortality of 562 bears that could be removed through hunting, control kills, road-rail collisions, or other causes. From 2004 to 2009, the average reported mortality of Grizzly Bears in the province has been 297 per year, approximately 53% of the maximum limit. However, while this provides a “big picture”, mortality distribution is a critical component to the responsible diligent management of Grizzly Bears.

As described under question five, harvest is determined for each viable GBPU with a hunting season. In addition, many GPBUs have more than one LEH zone (total of 135 for the province) where desired harvest levels are established and monitored. In summary, human-caused mortality is tracked, calculated, and assessed first for each of the 135 LEH zones, and then for each of the 43 viable hunted GBPUs.

Of the 43 Grizzly Bear Population Units where a hunt exists, total mortality is below the maximum allowable human-caused mortality in 38 units as determined for the period from 2004 to 2009 (see Figure 5).

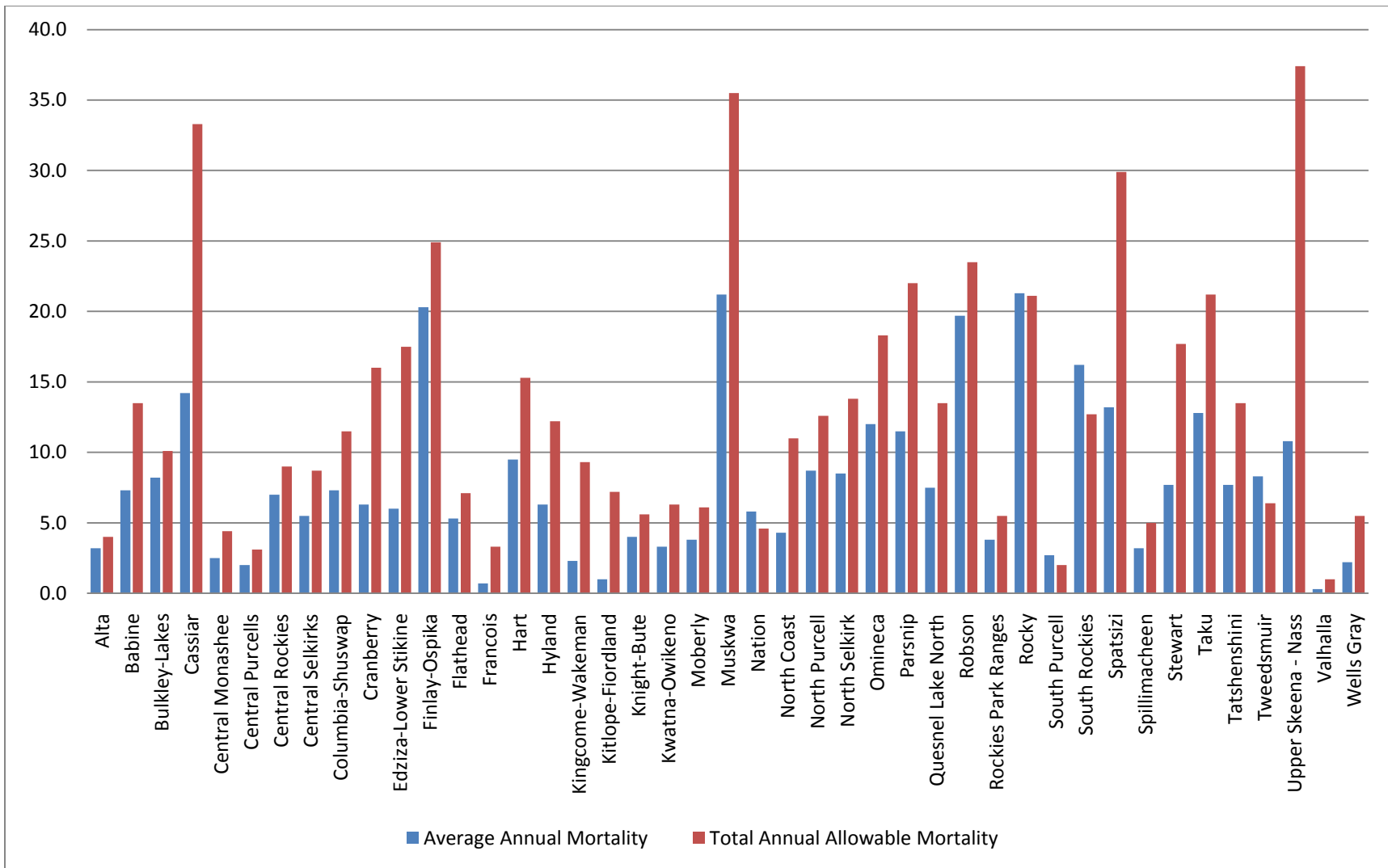


Figure 5: 2004 to 2009 average annual Grizzly Bear mortality compared to allowable Grizzly Bear mortality. Where the red line is taller than the blue line, it means that average annual mortality rates are below maximum mortality rates.

12) Which viable GBPUs are currently of highest management concern?

As shown in Figure 5, there are 5 GBPUs (Nation, Rocky, South Purcell, South Rockies, and Tweedsmuir) that are above the maximum allowable human-caused mortality, primarily as a result of high levels of non-hunting mortality (primarily motor vehicle/train collisions and conflict kills). Actions have been taken, and further actions are being considered, including further restricting or closing specific hunts, in order to reduce human-caused mortality within these 5 GBPUs to sustainable limits within the 5 year allocation period. The Ministry is concerned about these 5 units, which are described in more detail below

Nation GBPU: The population for the hunted portion of the Nation GBPU is estimated at 241 bears. The maximum human-caused mortality rate for the Nation GBPU is 4%. Once unreported mortality is factored in, the total Annual Allowable Mortality of Grizzly Bears in the hunted portion of the Nation GBPU is calculated at 4.6 bears per year. The average reported human-caused mortality within the hunted portion of the Nation GBPU from 2004 to 2009 was 5.8 bears per year. The hunted portions of the Nation GBPU are divided into 7 separate LEH zones; each zone has both a spring and a fall hunt. The average success rate in this GBPU over the past 5 years is 0.83%, which means that, on average, one bear is harvested for every 120 authorizations given. The Ministry has responded to increased mortality rates in the Nation GBPU by dropping the number of LEH authorizations from 51 in 2008 to 26 in 2009, and then further decreasing authorizations to 14 (1 authorization per zone per season) in 2010.

Rocky GBPU: The population for the hunted portion of the Rocky GBPU is estimated at 729 bears. The maximum human-caused mortality rate for the Rocky GBPU is 4%. Once unreported mortality is factored in, the total Annual Allowable Mortality of Grizzly Bears in the hunted portion of the Rocky GBPU is calculated at 21.1 bears per year. The average reported human-caused mortality within the hunted portion of the Rocky GBPU from 2004 to 2009 was 21.3 bears per year, a difference of 0.2 bears per year. The hunted portions of the Rocky GBPU are divided into 9 separate LEH zones; each zone has both a spring and a fall hunt. The average success rate in this GBPU over the past five years is 6.9%, which means that one bear is harvested, on average, for every 15 authorizations given. The Ministry has responded to increased mortality rates in the Rocky GBPU by dropping the number of LEH authorizations from 138 in 2008 to 127 in 2009, and then further decreasing authorizations to 84 in 2010.

South Purcell GBPU: The population for the hunted portion of the South Purcell GBPU is estimated at 68 bears. The hunted population within this GBPU is less than 100 bears; for most areas this would mean that the GBPU is closed. However, the boundary between this GBPU and adjacent GBPUs is “soft”, meaning there is significant enough immigration and emigration between the South Purcell GBPU and surrounding areas that this GBPU is managed on a larger scale than the GBPU boundary. The maximum human-caused mortality rate for the South Purcell GBPU is 5%. Once unreported mortality is factored in, the total Annual Allowable Mortality of Grizzly Bears in the hunted portion of the South Purcell GBPU is calculated at 2 bears per year. The average reported human-caused mortality within the hunted portion of the South Purcell GBPU from 2004 to 2009 was 2.7 bears per year. The South Purcell GBPU has one hunted LEH zone with only a spring season. The average success rate for this zone over the past five years is 27.3%; which means that one bear is harvested, on average, for every 4 authorizations. The Ministry has responded to increased mortality rates in the South Purcell GBPU by dropping the number of LEH authorizations from 3 in 2008 to 1 in both 2009 and 2010.

South Rockies GBPU: The population for the hunted portion of the South Rockies GBPU is estimated at 301 bears. The maximum human-caused mortality rate for the South Rockies GBPU is 5%. Once unreported mortality is factored in, the total Annual Allowable Mortality of Grizzly Bears in the hunted portion of the South Rockies GBPU is calculated at 12.7 bears per year. The average reported human-caused mortality within the hunted portion of the South Rockies GBPU from 2004 to 2009 was 16.2 bears

per year. The South Rockies GBPU is divided into 5 separate LEH zones with only a spring season. The average success rate for this GBPU over the past five years is 38%; which means that, on average, two bears are harvested for every 5 authorizations. The Ministry has responded to increased mortality rates in the South Rockies GBPU by dropping the number of LEH authorizations from 27 in 2008 to 25 in both 2009, and then further decreasing authorizations to 15 in 2010.

Tweedsmuir GBPU: The population for the hunted portion of the Tweedsmuir GBPU is estimated at 174 bears. The maximum human-caused mortality rate for the Tweedsmuir GBPU is 4%. Once unreported mortality is factored in, the total Annual Allowable Mortality of Grizzly Bears in the hunted portion of the Tweedsmuir GBPU is calculated at 6.4 bears per year. The average reported human-caused mortality within the hunted portion of the Tweedsmuir GBPU from 2004 to 2009 was 8.3 bears per year. The Tweedsmuir GBPU is currently divided into 3 separate LEH zones; each zone has both a spring and a fall hunt. In 2009, one of the zones within the Tweedsmuir GBPU (Zone C of Management Unit 5-09) was closed as it was encompassed by the Khutze-Kitlope-Kimsquit and Upper Dean-Tweedsmuir GBNHAs developed through the coastal Land and Resource Management Planning tables and implemented by the Ministry of Environment.

The situation regarding Grizzly-human conflict in BC is at its most significant in the Bella Coola Valley. A large number of Grizzly Bears are residents of the side tributaries and main valley. In addition, collaring studies have shown that transient bears travel vast distances to take advantage of the huge numbers of spawning salmon in the Bella Coola and Atnarko river systems. The valley bottom habitats are superlative coastal Grizzly habitat in any season, and it is not uncommon that bears are either displaced into human settlements and valley farms or deliberately seek human and vehicle presence to protect themselves from other bears. Conflicts in 2008 and 2009 were unusually high, likely due to lower abundance of spawning salmon. As many as 25-30 Grizzly Bears were destroyed in direct conflict situations over this two year period.

Bella Coola staff from the Environmental Stewardship Division have joined with the Conservation Officer Service and have received funding support from the Grizzly Bear Trust Fund and Bear Aware for a local Bear Aware education program to be delivered by the British Columbia Conservation Foundation (BCCF). Conflict response will be co-ordinated through the Ministry Call Centre (1-877-952-7277) and is the responsibility of the Conservation Officer Service office in Williams Lake. The local Bear Aware coordinator will be available for immediate, low-level conflict response and has a strong mandate for community education and outreach, with a focus on attractant reduction.

13) Who hunts Grizzly Bears?

Ministry policy identifies conservation as the highest priority, then First Nations use, followed by resident and non-resident use. First Nations may choose to exercise their right to harvest Grizzly Bears for food, social or ceremonial purposes. Residents are only eligible to hunt if they have a LEH authorization. Non-residents seeking to harvest a Grizzly Bear are required to hire the services of a licensed guide outfitter. Guide outfitters are given an annual quota for Grizzly Bears which, along with the resident harvest, is factored into the calculation of the Annual Allowable Harvest. The balance between resident and non-residents hunting opportunities is determined through a publicly consulted and approved Wildlife Allocation Policy.

From 2004 to 2009, resident hunters harvested an average of 191 bears per year, while non-residents harvested an average of 106 bears per year; a split of 64% for resident and 36% for non-resident hunters.

14) What are the hunting seasons for Grizzly Bears?

There are no General Open Seasons for Grizzly Bears in British Columbia. Rather, resident hunters must apply for and receive a Limited Entry Hunting (LEH) authorization in order to hunt Grizzly Bears. LEH is a random draw system where hunters submit applications to hunt for a certain species, during a specific time, in a specific area. Any hunter who has an outstanding fine under the *Wildlife Act* is not permitted to apply for a LEH authorization. The Grizzly Bear harvest is often referred to as a controlled hunt, as it restricts the number of LEH authorizations available to resident hunters, and thus controls the level of harvest.

Hunters that are not residents of British Columbia must hire the services of a licensed guide outfitter to hunt for Grizzly Bears. Guide outfitters receive a quota which stipulates the number of Grizzly Bears that their clients may harvest in their guide outfitting area during a licence year.

15) What assurances are there that Grizzly Bears will not be over-harvested?

There are 3 primary mechanisms that the Ministry uses to ensure that Grizzly Bears will not be overharvested. These include: (1) LEH/Quota; (2) Protection of females with dependent young; and (3) a female harvest limit.

LEH/Quota

The LEH/Quota system is very effective at controlling the Grizzly Bear harvest, and ensuring that an overharvest does not occur. The number of permits issued is set to achieve the Annual Allowable Harvest for resident hunters, based on their average success rate. The average 2004 to 2008 success rate for resident hunters was approximately 10.5%, but varies by GBPU. A 10% success rate means that for every 10 resident hunters in possession of a LEH Grizzly Bear authorization, on average only 1 will actually harvest a bear. If the allowable harvest of Grizzly Bears in an area was 10 for resident hunters, and the hunter success rate for that area was 50%, then 20 LEH authorizations would be available. If there is an anomaly, and success rates in a given year are higher than the previous five year average, the number of authorizations available the following year is reduced to account for the change in success rates.

By policy, the minimum success rate factored into the LEH permit calculations is 5%. That is, if success rates are lower, (e.g. 2%), the same number of permits are issued as if the success rate was 5%. This precaution further limits the number of LEH authorizations available in a season, decreasing the chances of a higher than average success rate resulting in excessive harvest. Additionally, there is a legislated Range of Authorizations (RoA) for each specific hunted zone in the province; 97% of the hunted zones in the province have a RoA of 1-50 per season, the remaining 3% are between 1-50 and 1-100. This additional restriction on the number of LEH authorizations serves two purposes: to reduce crowding and reduce the risk of excessive over-harvest due to extremely high numbers of authorizations.

Example: Say the target harvest of a LEH zone is 5 Grizzly Bears in a season, the average success rate over the preceding 5 years is 2%, and the maximum number of authorizations is 50. Based on the actual success rate, 250 authorizations could be sustainably issued for this zone (5/2%). However, the minimum success rate of 5% is used, which would result in 100 authorizations (5/5%). As this number is outside the legislated RoA for this zone, the actual number of authorizations available in this scenario would be further reduced to 50. Based on the actual success rate of 2%, the actual harvest should be 1 Grizzly Bear.

Similarly, the restricted quota that enables Guide Outfitters to take non-resident Grizzly Bear hunters is a responsive system. If harvest in an area has met or exceeded target levels, Grizzly Bear hunting opportunities for non-residents is closed.

Protection of females with dependent young

Another important management tool for assuring that Grizzly Bears are not overharvested is the regulation, passed in 1975, that states “it is unlawful to hunt a Grizzly Bear less than 2 years old, or any bear in its company.” This regulation protects family groups (mothers with yearlings or cubs) and thus ensures that young animals as well as a significant proportion of adult females are protected from harvest each year.

Female Harvest Limit

Grizzly Bear populations are extremely sensitive to human-caused mortality of females, and the Grizzly Bear harvest procedure stipulates that the maximum female mortality must not exceed 30% of the Annual Allowable Harvest (AAH). If female mortality is in excess of 30% of the AAH measures are taken to reduce mortality in following years. Since the fall of 2008, every hunter in possession of a Grizzly Bear LEH authorization has been provided with an informational document on why it is important to select a male Grizzly Bear and tools on how to distinguish between males and females.

16) Is the Grizzly Bear harvest in the “Great bear Rainforest” sustainable?

Much attention has been placed on the Grizzly Bear hunt in the Great Bear Rainforest (GBR). The population estimate for the entire GBR is approximately 2,000 bears. From 2004 to 2009 there has been an average of 24 reported mortalities within the GBR annually, representing 1.2% of the GBR population, most of which occurred as non-hunting mortality in the Bella Coola Valley. Even after factoring in other human-related causes of mortality, actual mortality is well within the sustainable mortality limits for the coastal GBPU's.

Approximately 53% of the GBR is open to hunting, leaving 47% that is closed. Included in the closed area are 470,000 hectares of Grizzly Bear No Hunting Areas (also referred to as Grizzly Bear Management Areas (GBMAs) in the Coastal Land and Resource Management Planning Process), which were previously open to Grizzly Bear hunting and prescribed closed through coastal Land and Resource Management Plans and subsequent Government to Government agreements with Coastal First Nations. Of the portion of the GBR that is open, the current population estimate is 970 bears. The average reported human-caused mortality within this area, from 2004 to 2009, was 21, or approximately 2.1% of the population. Of the 21 reported mortalities of Grizzly Bears per year, an average of 8 were non-hunting mortalities, and 13 were harvested by hunters. Harvest rates are well below sustainable limits for all coastal GBPUs with the exception of the Tweedsmuir GBPU which, because of its high occurrence of non-hunting mortality, is being managed under a slightly modified process. The Ministry is aware of, and concerned about the potential decline in Pacific salmon and the subsequent effect on coastal Grizzly Bears. As a result, we are planning and undertaking additional population monitoring of coastal populations.

17) Are Grizzly Bears harvested in BC Parks and Protected Areas?

In total, 14.3% of British Columbia's land base is protected. Since the establishment of the first Provincial Park at Strathcona in 1911, the system has grown to over 900 designated parks and protected areas, totalling over 13,000,000 hectares. Each BC Park has a management plan which, through a process of public consultation, guides how a protected area will be managed over the next ten to twenty years. The plan sets out objectives and strategies for conservation, development, interpretation and operation of a protected area. A management plan relies on current information relating to such subjects as natural

values, cultural values, and recreation opportunities within a protected area and resource activities occurring on surrounding lands.

Hunting is a recognized outdoor recreational opportunity that is permitted in many BC Parks, provided the activity is approved through the Park Management Planning Process. Policy provides that hunting in parks is more conservative than on crown land outside of parks.

From 2004 to 2009 there was an average of 33 Grizzly Bear mortalities per year in BC Parks and protected areas, of which an average of 28 were hunting mortalities, and 5 were non-hunting mortalities.

18) What is being done to manage Grizzly Bear mortalities in un-hunted areas?

Approximately 35% of British Columbia (not including Vancouver Island, the Sunshine Coast, the Lower Mainland or Haida Gwaii) is closed to grizzly hunting. Within these areas, the objective is to have no human caused Grizzly Bear mortality. However, non-hunting mortality (e.g. control kills, motor vehicle/train collisions) does occur in these areas, and the Ministry is concerned about these mortalities.

Areas where Grizzly Bear hunting is closed to hunting fall into three categories:

- 1) *Closed areas within viable GBPUs.* Area closures within viable GBPUs may occur for 1 of 3 reasons. These include:
 - a) *Grizzly Bear No Hunting Areas (GBNHAs):* In 2003 the Grizzly Bear Scientific Panel recommended the establishment of one Grizzly Bear Management Area (GBMA) in each of the 9 Ecoprovinces in BC. These areas are now referred to as Grizzly Bear No Hunting areas (GBNHAs); since one of the objectives for these areas is to establish benchmarks for non-hunted bear populations that can be used for further research and comparison with hunted populations. In 2008, through direction from the North and Central Coast Land and Resource Management Planning process, three GBNHAs, totalling 1.16 million hectares (470,000 hectares of which was previously open), were established within the Coastal Ecoprovince of BC. These include the Khutzamateen, Ahnuhati, and Nass-Skeena areas. There are 5 Ecoprovinces where GBNHAs have not been implemented and are under review.
 - b) *Closed areas because of specific vulnerability:* The estuaries of Knight Inlet, Kingcome Inlet, and Wakeman Sound are all closed to Grizzly Bear hunting due to vulnerability of Grizzly Bears in open estuaries with high visibility.
 - c) *Small, localized closures to reduce potential conflicts between hunting and commercial bear viewing operations:* Glendale Cove in Knight Inlet is one of the most recognized Grizzly Bear viewing areas in British Columbia. In 1995 a 17 km² Grizzly Bear hunting closure was implemented surrounding the viewing area of Glendale Cove.
- 2) *Total area closures within threatened GBPUs (areas closed to Grizzly Bear hunting).* Management efforts are focussing on recovering these populations to sustainable population levels. For example, under the Sea to Sky Land and Resource Management Plan, the associated Land Use Plans of local First Nations and the subsequent motorized access management plan for the Sea to Sky area, 11 seasonal motorized access closures have been implemented under the *Wildlife Act* to protect Grizzly Bears in the spring.
- 3) *Total area closures within extirpated areas.* Extirpated areas provide limited opportunities for recovery, largely because of human activities associated with urbanization, agriculture, and

transportation infrastructure that are not compatible with Grizzly Bears. An example of this is the lower reaches of the Fraser River and its estuaries which were once exceptional Grizzly Bear habitat. The population has been extirpated, and recovery is unlikely as the social tolerance for Grizzly Bears in urbanized and rural agricultural areas is very low. This is also true for most of the major agricultural zones, urban centers, and transportation corridors throughout the province. Minimal recovery efforts are being pursued in these areas as human developments have altered habitats to the extent that the modified environment will no longer support, or tolerate, Grizzly Bears.