

# Kenai Brown Bear Management

Alaska Department of Fish and Game  
Division of Wildlife Conservation  
Region II staff  
Alaska Board of Game - March 2014

- *Review of management directives*
- *Population size and growth*
- *Evaluation of 2013 bear mortality*
- *What is sustainable*
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# Kenai brown bear management directives - 2014

- Alaska Constitution (Article 8, Section 4)  
*“...wildlife... belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses.”*
- Board direction to reduce the population and stabilize at a lower level.
- Annual cap of 70 bears killed by human causes starting in 2014
  - no cap in 2013
  - RB300; Sept. 01 – May 31; one bear/yr; permits at ADF&G or on-line
- Kenai National Wildlife Refuge directive to manage for “natural diversity”
  - Agreement that this can include a stable population at current levels.
- ADF&G objective to manage for a Kenai brown bear population that will:
  - support consistent hunter opportunity
  - support non-consumptive opportunity
  - have minimal adverse bear-human interactions

# Kenai brown bear population growth

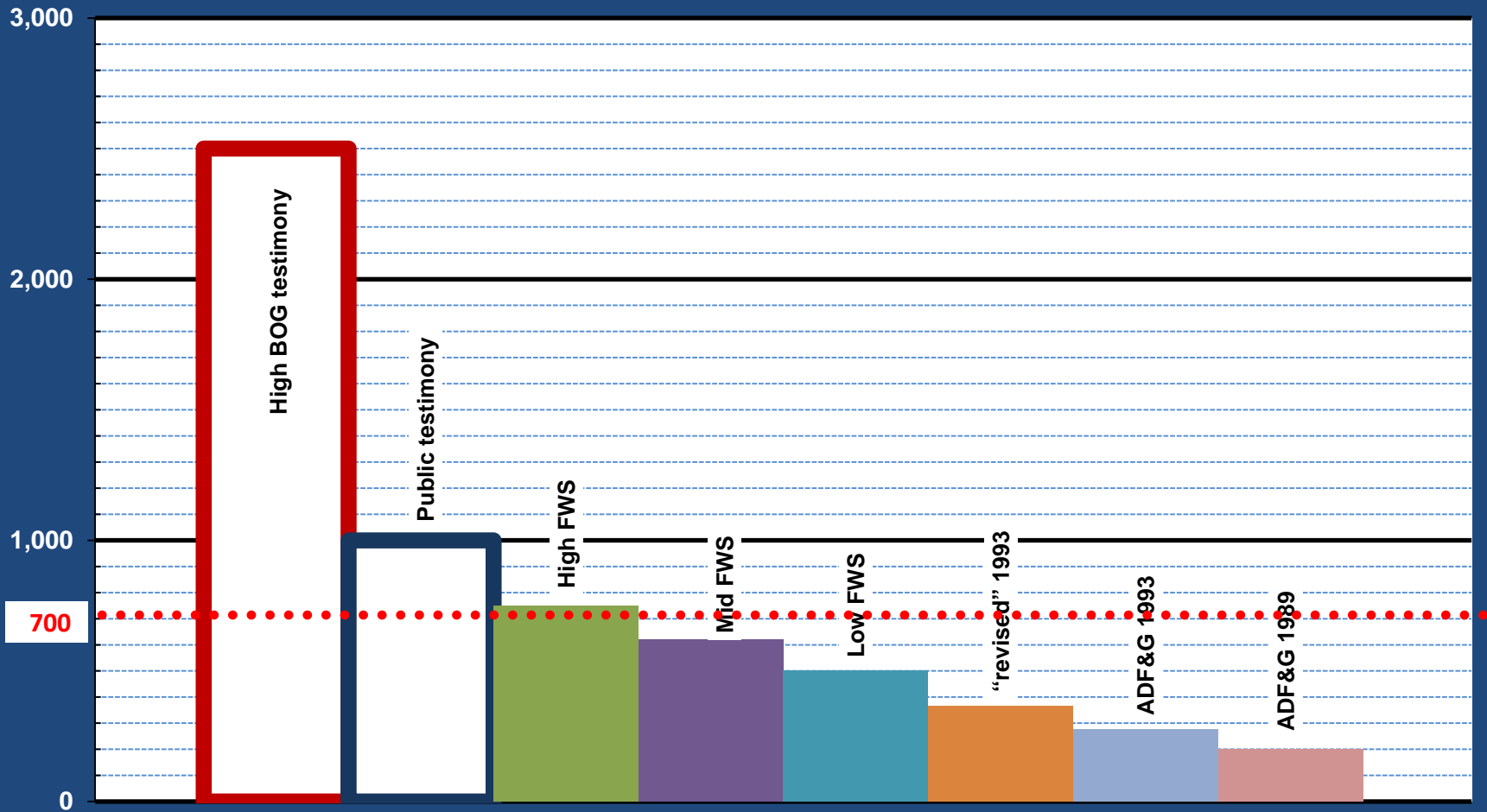
Demographic data from the 1990s to 2012 suggest a population that was growing at a rate of up to 3% per year. The exact rate is unknown because of uncertainty in the data.

A 3% growth rate is very high for a hunted brown bear population, but it is biologically feasible under extraordinary conditions. Anything much higher than that is unlikely.

If you start with 366 bears in 1993 (revised ADF&G estimate) and apply a simple compounding formula that adds 3% per year, you end up with 642 bears in 2012.

Biology is never that simple, but this illustrates that it is feasible that this bear population flourished under the management scheme that was designed to rebuild it from a low level that caused concerns, to a higher level that also caused concerns.

# Estimated Kenai brown bear population level



# Estimated Kenai brown bear population size 2012

For the purposes of modeling, estimating sustainable harvest levels, and assessing population trend it is necessary to “pick a number” as a starting point.

There is no single objective number that satisfies everyone, either for the bear population 20 years ago, or for the bear population now, and each of the estimates on the previous graph were derived in differing ways.

For the purposes of this discussion, we will be using a population estimate of 700 bears, the estimate used by the Board while deliberating the current regulations.

We will also assume there is virtually no bear movement on or off the Kenai Peninsula – in essence, it is the same as an island population.

A Kenai population of 700 bears would be expected to include about 50% females (350), about half of which are adults (175).

We will also assume that the population increased at an average rate of 3% per year from 1993 to 2012.

# Evaluating 2013 bear mortality

- The number of **bears reported as killed by human-caused factors in 2013** was:
  - Hunting = 45 (24 males, 21 females, 0 unknown)
  - Non-hunting = 24 (10 males, 12 females, 2 unknown)
  - **TOTAL = 69** (34 males, 33 females, 2 unknown)

Based on data from radio-collared bears, there may also have been an unreported human-caused mortality as high as an additional 28 bears (4% of the total population)

- The number of **adult female bears** ( $\geq 5$  yrs old) reported killed by humans was:
  - Hunting = 15
  - Non-hunting = 8
  - **TOTAL = 23**

- So far, **1,284 permits** have been issued – they are still available for spring hunters

- These data suggest a kill rate of 10% (possibly as high as 14%) in 2013.

# Evaluating 2013 bear mortality

- Harvest rates of 2 – 10% have been used to manage brown bear populations in various parts of the state.
- Some of the reasons for such a wide range include differences in:
  - productivity
  - natural mortality
  - food resources
  - sex ratio of the harvest
  - movement into the area from surrounding areas
- Another confounding factor is unknown or imprecise population estimates
- Brown bears have a relatively low reproductive potential:
  - females start reproducing when they are 5 years old
  - first litter or two is usually lost
  - cubs stay with mother for about 3.5 years
  - average weaned litter size is about 2 cubs

# Evaluating 2013 bear mortality

- In brown bear management, as with other big game species, the key component to monitor is the survival of adult females.
- Adverse impacts on that segment of the population will have residual impacts long after any short-term change. Consequently, cow moose harvests, for instance, are only authorized in special situations and are highly regulated and controlled.
- The reported annual human-caused **adult female bear mortality from 1993 – 2011** ranged from 2 – 8, with an **average annual kill of 4.3 per year**.
  - **2012 = 13** adult sows reported killed by human causes
  - **2013 = 23** adult sows reported killed by human causes
- Radio-telemetry data suggest **17% of the adult sows were killed by humans in 2013**.
- Demographic data (stable age distribution analysis) indicate an **18% decline** in the number of adult females in the population due to the 2013 kill.



## Evaluating 2013 bear mortality

- All evidence indicates that human caused mortalities in 2013 have reversed the population trajectory and reduced the Kenai bear population.
- It is inadvisable to sustain the level of adult female mortality experienced in 2013 for another year.
- However, there is no evidence of long-term detrimental impacts to the population caused by the 2013 harvest.

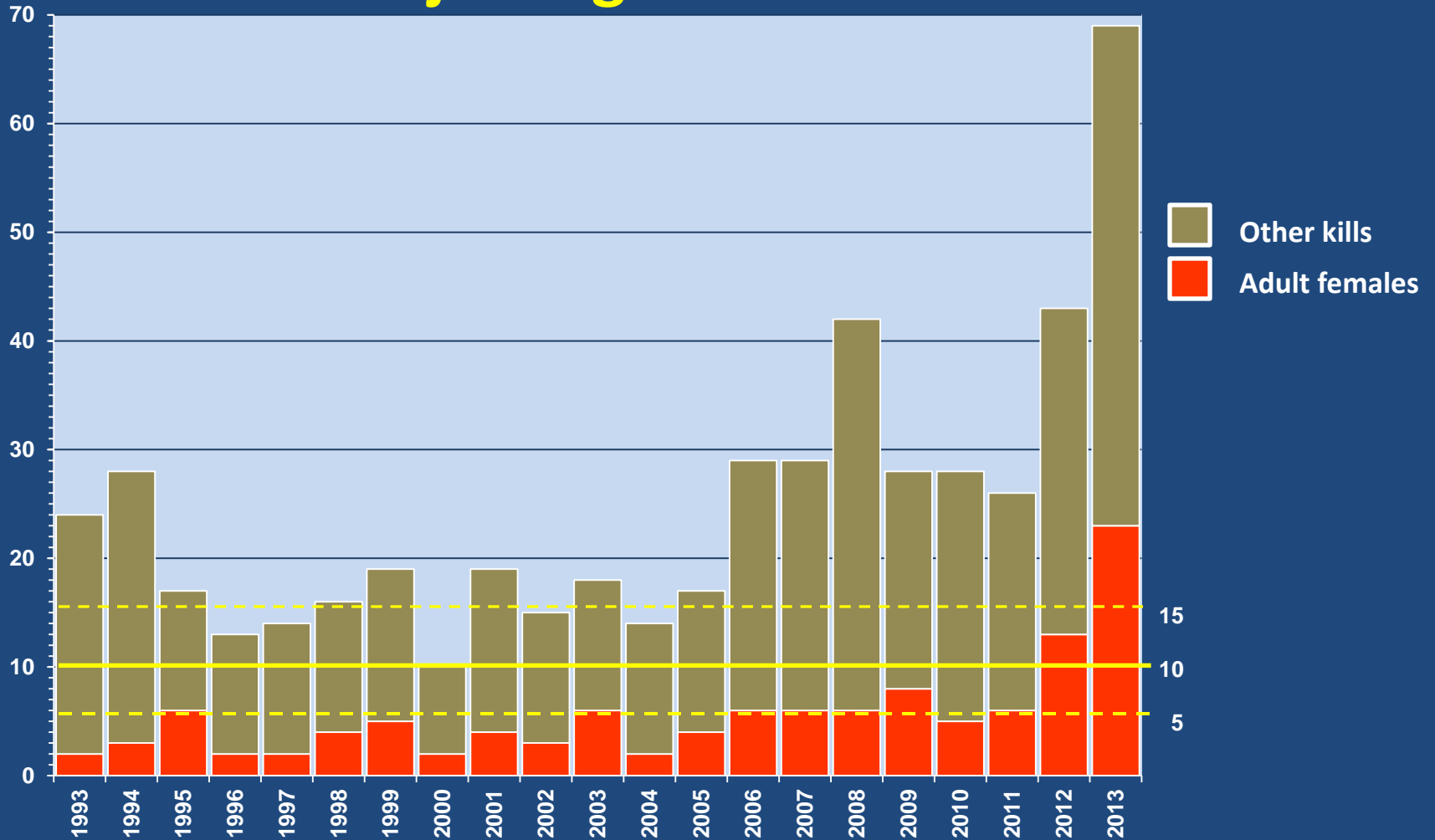
# What is sustainable?

- We did not calculate a “minimum viable population” estimate for the Kenai, as requested by the Board in March 2013, because of a lack of precise, long-term demographic data.
- As an alternative to an actual estimate, we contend that the estimated population size in 1998 when it was first declared a “population of special concern” (250-300) can be considered as a surrogate for a minimum population level. History has proven that at that level the population can be sustained and increased as long as habitat is comparable.
- The ultimate question remains, however, how accurate was that population estimate and how will we know when we are at that level again...
- Any reduction below current levels will adversely impact hunter opportunity and non-consumptive opportunities.
- Any reduction below current levels will adversely impact the Kenai National Wildlife Refuge directive to manage for “natural diversity” (stability at 2014 level).

# Projecting into the future

- We used an established wildlife population model (Vortex) and actual Kenai brown bear demographic data to investigate the population trajectory both before the liberalization of regulations and after.
- Models were limited due to the fact that:
  - statistically robust demographic data have only been collected in the past 6 years
  - scientific literature warns that you need 10 – 15 years to make valid projections
  - it is possible that collared bears are not a perfect representation of the population
- Consequently, each model had very wide margins of error, encompassing both stability and drastic population declines using the same data.
- Preliminary information from the models suggested that **an annual human caused mortality of 7 – 17 adult female bears is sustainable at least in the short run.**
- To help determine an appropriate harvest strategy to achieve long-term stability in the population we also looked at other information such as historic harvests and locations of bear-human problems.

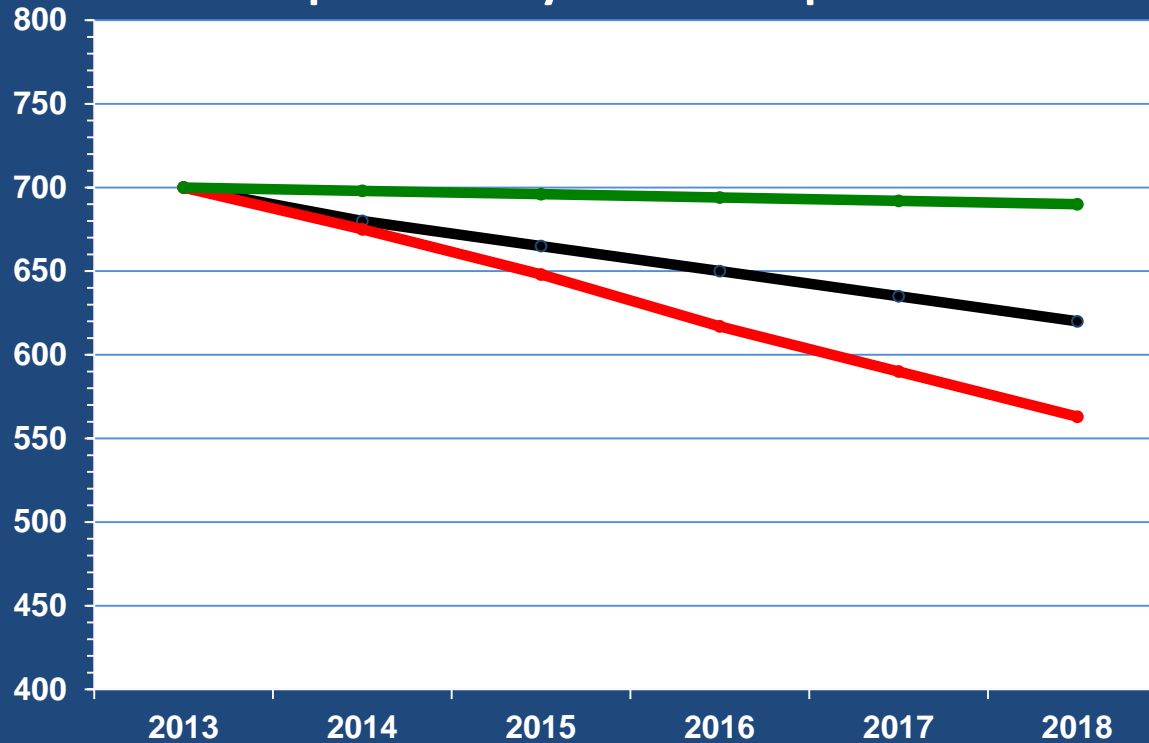
# Projecting into the future



The average adult female kill by humans was 7.1 bears/year during the 7 years that we were relaxing harvest restrictions (2006-2012)

# Projecting into the future

preliminary model outputs

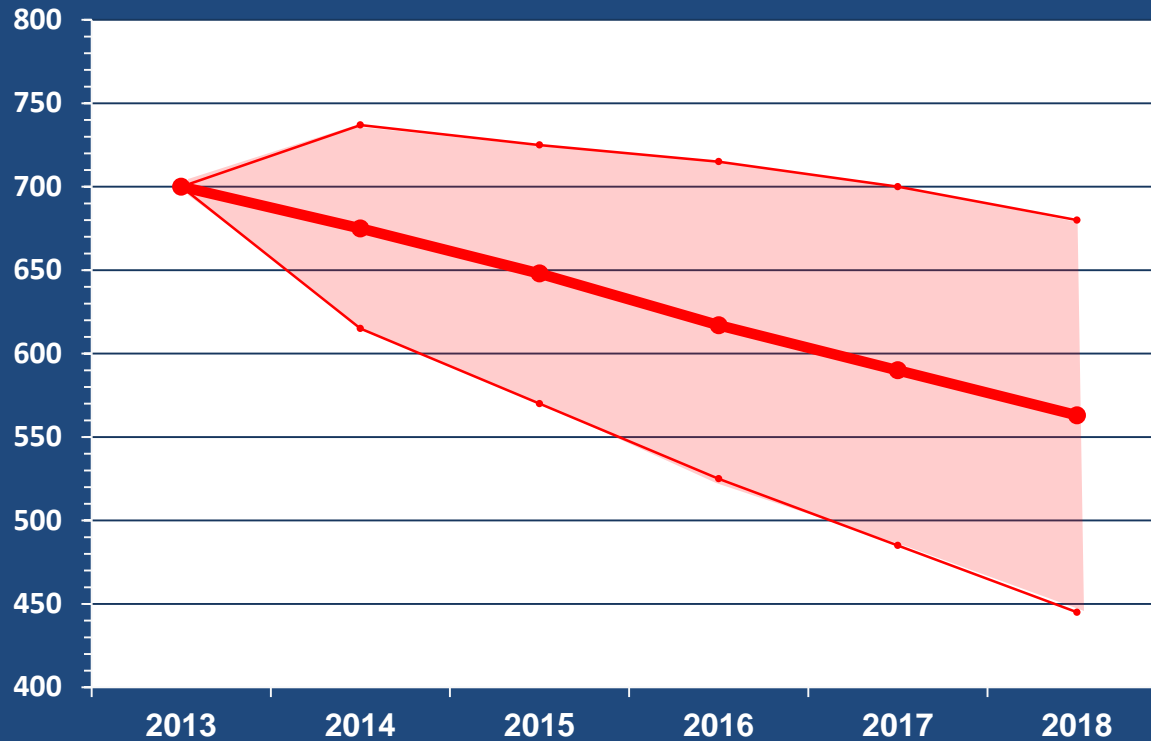


Estimated impact of 7, 12 and 17 adult females per year killed by humans

**Green = 7/yr**   **Black = 12/yr**   **Red = 17/yr**

# Projecting into the future

preliminary model outputs



17 adult females  
(10 more than average)

Estimated impact of 17 adult females per year killed by humans  
(error ranges are 1 standard deviation)

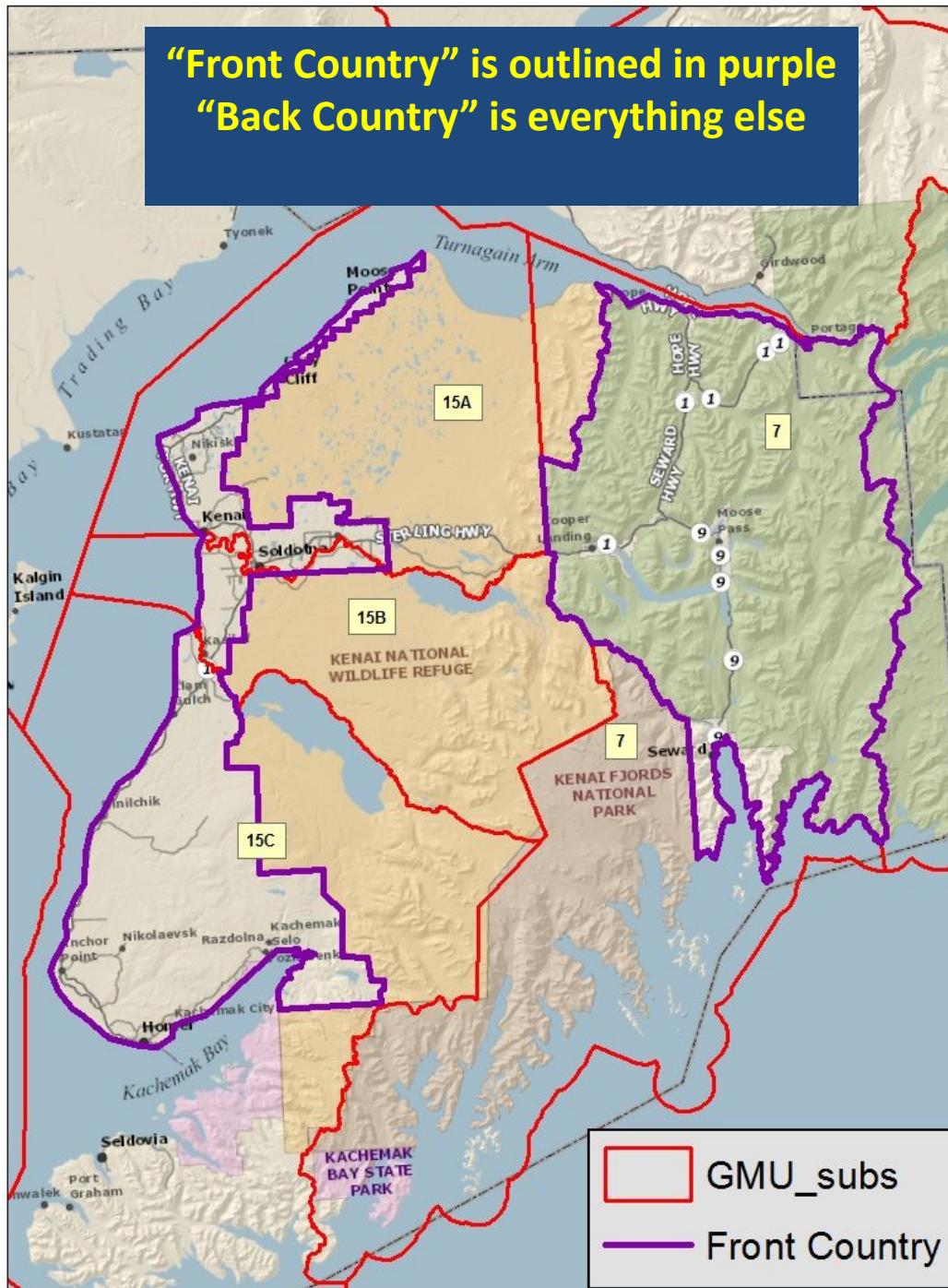
Model outputs can also give an idea of the risk associated with each harvest strategy.

This model shows the estimated projections with a 17 adult female kill.

# Management Actions

- Based on the available data, and existing directions and agreements, it is our intent to maintain existing seasons, methods, means and bag limits in 2014.
- If the human-caused mortality reaches **5 adult female bears in the “back country”** (about 50% of the Peninsula) we will close that portion of the registration hunt by Emergency Order.
- If the human-caused mortality reaches **12 adult female bears in the “front country”** we will close that portion of the registration hunt by Emergency Order.
- If the total human caused mortality on the Peninsula reaches a **total of 70 bears** we will close brown bear hunting in all of Units 7 and 15.

“Front Country” is outlined in purple  
“Back Country” is everything else





# Management Actions

- This strategy is intended to balance the desire for a long-term stable population with the risk of overharvest.
- It is intended to focus harvest pressure on bears that routinely come in close contact with people.
- Along with this harvest strategy, we are committed to:
  - expanding efforts to minimize unnatural bear attractants (human and domestic animal food and garbage) on the Peninsula
  - increase bear safety education
  - expand efforts to teach hunters how to increase their likelihood of harvesting male bears.
- We will also focus our brown bear research efforts on gathering demographic data and exploring new ways to evaluate the stability of the population.



## Management Actions

- We want to emphasize the adaptive nature of this strategy.
- We will re-evaluate all regulations and our harvest strategy during the upcoming year and discuss options for future management actions at the March 2015 BOG meeting.

# Brown bears taken over bait

- Current regulations allow the take of brown bears over bait as long as the bear meat is salvaged for human consumption. The Department is **neutral** on proposals that would relax this requirement.

- We have been informed that the Kenai National Wildlife Refuge will not allow this on the lands that they manage.

- US Forest Service reserves the right to prohibit brown bear baiting on the lands they manage through their existing permit system.



# Human Caused Mortality 2013

