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Can we hunt bears?

- legally
- safely
- sustainably

Should we hunt bears?

- conservation of species
- funding
- conflict resolution

Successful hunter - Nevada 2011

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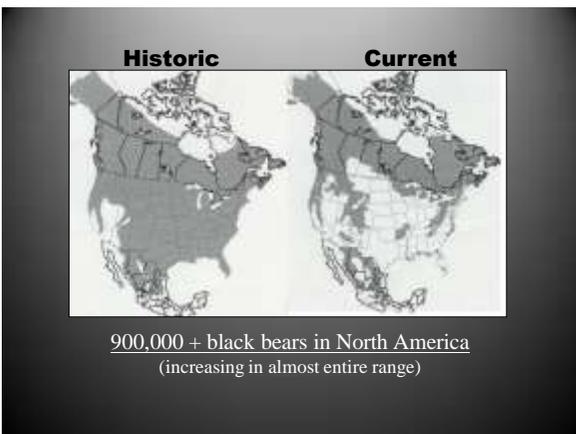
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<u>Brown Bear (Grizzly)</u>	200,000 + 47 countries	
<u>Polar Bear</u>	20,000-25,000 5 countries	
<u>Asiatic Black Bear</u>	< 50,000 18 countries	
<u>Andean Bear</u>	10,000-20,000 5 countries	
<u>Sloth Bear</u>	10,000-20,000 5 countries	
<u>Sun Bear</u>	< 10,000 11 countries	
<u>Giant Panda</u>	1 country Limited habitat	
<u>American Black Bear</u>	900,000+ 4 countries expanding populations	

*Brown 2009  
Garshelis 2009  
Willamson 2002*

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300-400+ bears





Nevada's portion of larger Sierra Nevada population

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### CAN WE HUNT BEARS – LEGALLY?

**NRS 501.102 – "The Legislature declares that hunting permitted by law in this State:**

- Is a valuable activity in the management of game mammals and game birds.
- Is an excellent source of food, recreational opportunities and employment.
- Provides a beneficial use for firearms, archery equipment and other legal weapons used to take game mammals and game birds, following the pioneer spirit of Nevada.



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### CAN WE HUNT BEARS – SAFELY?

#### Hunter safety requirements - state law

License needed to mountain bike, hike or camp?

1989-2010 – Nationwide **31** incidents over span of **21 years** involving bear hunting.

2001-2010 – Nationwide **2,643** incidents over span of **10 years** involving deer hunting.



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### HUNTING WITHIN THE LAKE TAHOE BASIN



U.S. Forest Service - Lake Tahoe Basin Management Unit

- over 150,000 acres
- over 75% of land in Tahoe basin
- **managed for multiple use**

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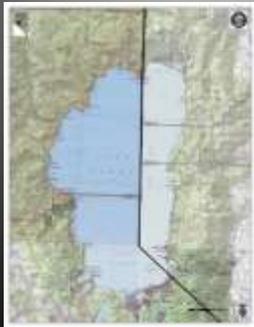
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### HUNTING WITHIN THE LAKE TAHOE BASIN



U.S. Forest Service - Lake Tahoe Basin Management Unit

- over 150,000 acres
- over 75% of land in Tahoe basin
- **managed for multiple use** – *hunting is a form of recreation recognized in the multiple use policy*

#### The Multiple Use - Sustained Yield Act of 1960 -

...develop and administer the renewable resources of timber, range, water, recreation and wildlife on the national forests for multiple use and sustained yield of the products and services.

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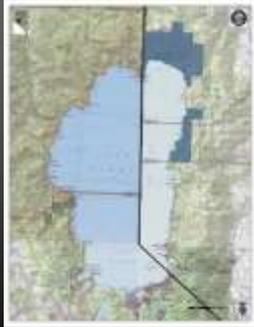
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### HUNTING WITHIN THE LAKE TAHOE BASIN



• **Washoe County & Carson City**  
*No-hunt zones – represented by 5,000' buffer around existing residences*

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### HUNTING WITHIN THE LAKE TAHOE BASIN



• **Washoe County & Carson City**  
*No-hunt zones – represented by 5,000' buffer around existing residences*

• **Douglas County**  
*No hunt zones – represented by 1,500' buffer around existing residences*

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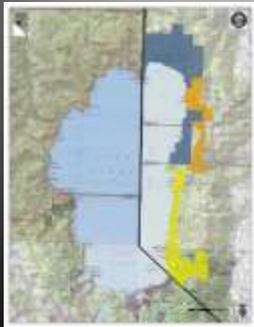
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### HUNTING WITHIN THE LAKE TAHOE BASIN



• **Washoe County & Carson City**  
*No-hunt zones – represented by 5,000' buffer around existing residences*

• **Douglas County**  
*No hunt zones – represented by 1,500' buffer around existing residences*

• **Lake Tahoe Nevada State Park**  
*No shooting zones*

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### HUNTING WITHIN THE LAKE TAHOE BASIN



*The hunting that already takes place in the Lake Tahoe Basin...*

*Hunting in the Carson Range - Nevada statistics:*

- average of 201 deer hunters per year last 10 years – high of 269
- hunt days afield for blue grouse hunters last 10 years –
  - ✓ average 1257 days annually
  - ✓ high of 2586 days in 2009-10

*Bear hunting on California side has been taking place for several decades.*

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### HUNTING WITHIN THE LAKE TAHOE BASIN



*So, is it safe?*

*"To my recollection there has never been an issue in the Basin with bear hunters being too close to homes or injuring someone."*

*California Fish & Game Warden supervisor*

*"Looking back over the last decade, enforcement personnel from our hunter safety division have confirmed that no accidents were reported."*

*California Fish & Game J. Holley, Biologist Supervisor*

*There has never been an injury caused by hunters in Tahoe Basin on Nevada side despite hundreds of tags and thousands of hunter days afield.*

*Nevada Department of Wildlife*

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### DO WE HAVE A SUSTAINING POPULATION?

*Sustained yield: production of a biological resource under management procedures which ensure replacement of the part harvested by regrowth or reproduction before another harvest occurs – Merriam Webster m-w.com*




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**Long-term black bear study**  
One of the longest running studies of American black bear in U.S.

**BEAR RESEARCH**




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**Beckmann-Lackey study area**  
1997-2008





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**On-Going Urban Bear Research – 15<sup>th</sup> Season**  
Cooperative Research with University of Nevada, Reno  
Wildlife Conservation Society – Dr. Jon Beckmann

Total sample size of 517 bears to date, not including recaptures




Data since 1997    Marked 310 bears & deployed 80+ Collars

VHF - GPS - SAT

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Population densities

Home range sizes

Age/Sex structures

Denning chronology

Physical characteristics

Mortality & survival rates






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Research results

- Relocation ineffective
- Aversive conditioning moderately effective
- Denning ecology-entry/emergence altered
- Behavioral differences urban/wildland bears
- Increased mortality/fecundity rates in urban bears
- physical changes associated with urbanization
- Density - 2<sup>nd</sup> highest in North America (urban centers)

NDOW-2008 estimate, Beckmann et al 2002



Three internationally recognized experts associated with this work over the 15 year period  
*Jon Beckmann, Joel Berger and Jim Sedinger*

Capture histories for all bears provided to attorney for Nobearhuntv.org in April 2011  
*(raw data & summary of data, summary of analysis)*

- ✓ Population is male biased 2:1
- ✓ Population estimate 300-400+ statewide 2011 projected

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Data analysis summary

Records of every single bear on every occurrence in system – capture & recaptures and documented mortalities for all marked and unmarked bears  
*420 bears for 709 occurrences – 1997 to 2008*

7/20/99	20 GRN RT GLENBROOK	TAT/TAG	150,941 DEAD	7	F
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NOTES: SHANNAHAN. 160 ACTIVE IN GLENBROOK, SPOONER. SOW TO 21 GRN. 7/11/00 IN GLENBROOK AT 200 LBS, 9/12/00 IN SECRET COVE AT 280 POUNDS. 8/22/01 IN GLENBROOK AT 200 LBS WITH CUB-GREEN RES. RELEASED IN LITTLE VALLEY. 6/2007 ON WEST SHORE OF TANGIE BY CDIG

Program MARK used to calculate a variety of demographic parameters such as: capture probability, survival, mortality, recruitment, population size and rate of population increase (G. White 1999)

Population size – Jolly-Seber model structure in MARK uses proportion of marked individuals in first capture period to number of new individuals and marked individuals in subsequent capture periods (G.M. Jolly 1965, G.A.F. Seber 1965, 1986)

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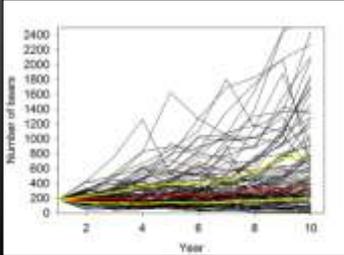
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Population trajectory simulation

- 100 simulations of population change over 10 years
- Mean lambda of 1.16, standard deviation of .4
  - Starting base population of 180 bears
  - random variation simulating the realm of possibilities
  - median population size after 10 years was 374 bears



Red - median of all simulations  
 Yellow - First and third quartiles  
 (50% of all simulations fall between these values)

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Data analysis summary

How accurate are the results?

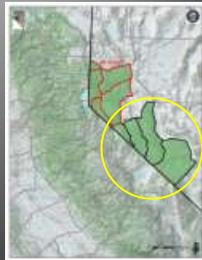
Results in population models are inherently conservative

- ✓ Heterogeneity in capture probabilities

Uncertainty is a given, but it decreases with higher sample sizes

Further conservatism built into 2008 analysis

- ✓ 223 bears removed from analysis
  - dead on first encounter
  - dependent cubs with no further encounters
- ✓ Current levels of mortality accounted for
- ✓ Estimates based on results from study area




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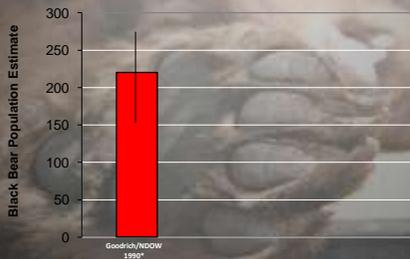
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\*Population estimate calculated from density estimates (using 20-40 bears/100 km<sup>2</sup>; avg. of 30) extrapolated over parts of western Nevada containing bears and bear habitat

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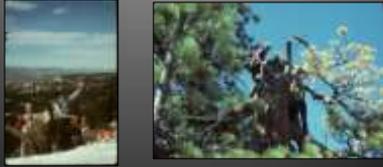
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Goodrich - summary

- Assumption of two different bear populations.
- Two capture periods – two month period in 1987, one month period in 1988
- Captured 30 bears total during the study
- No bears were captured in urban settings
- Density estimates based on Lincoln index using minimum convex polygons
- 20-40 bears km<sup>2</sup> in the two relatively small study areas
- No population estimate ever published (*study area specific estimate = 24*)



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\*Population estimate calculated from density estimates (using 20-40 bears/100 km<sup>2</sup>; avg. of 30) extrapolated over parts of western Nevada containing bears and bear habitat

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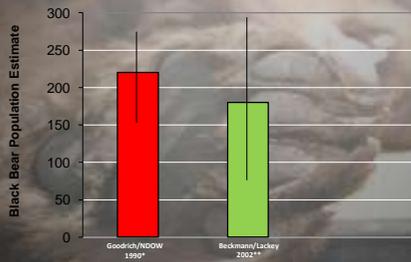
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\*Population estimate calculated from density estimates (using 20-40 bears/100 km<sup>2</sup>; avg. of 30) extrapolated over parts of western Nevada containing bears and bear habitat

\*\* First rigorous population estimate for NV based on statistics using mark-recapture model - Program MARK (small sample size leads to large CI)

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Beckmann - summary

- Capture period – 1 July 1997 to 30 June 2001 (4 years)
- Sample size of 99 bears (3-times size of Goodrich)
- 78 were in urban areas, 28 in wildland areas
- Density estimates based on Lincoln-Peterson index modified for replacement
- 3.2 – 120 bears/km<sup>2</sup>
- Population estimate of 180 ± 117 (95% CI) – Program MARK




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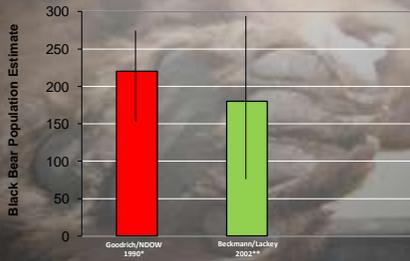
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\*Population estimate calculated from density estimates (using 20-40 bears/100 km<sup>2</sup>; avg. of 30) extrapolated over parts of western Nevada containing bears and bear habitat  
 \*\* First rigorous population estimate for NV based on statistics using mark-recapture models using Program MARK (small sample size leads to large CI)

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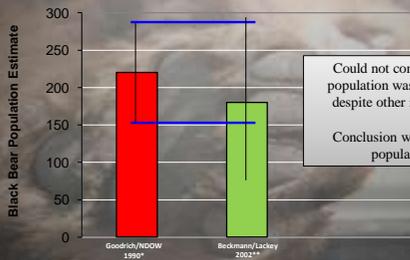
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Could not conclude that population was increasing despite other indications  
 Conclusion was a stable population

\*Population estimate calculated from density estimates (using 20-40 bears/100 km<sup>2</sup>; avg. of 30) extrapolated over parts of western Nevada containing bears and bear habitat  
 \*\* First rigorous population estimate for NV based on statistics using mark-recapture models using Program MARK (small sample size leads to large CI)

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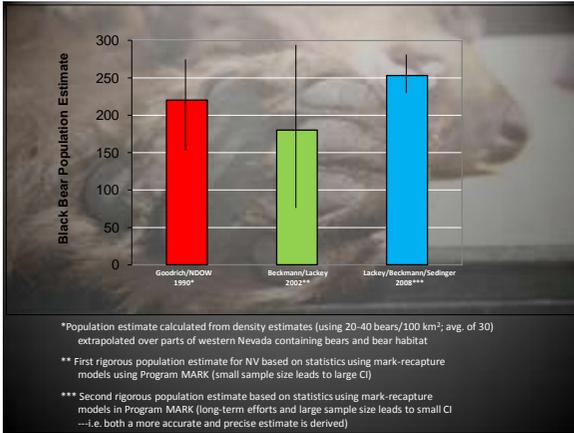
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Lackey, Beckmann, Sedinger - summary

- Capture period – 1 July 1997 to 26 November 2008 (12 years)
- Sample size of 420 bears (truncated to 197 for model)
- Did not calculate density estimate because of population estimate
- Population estimate of 253 ± 27 (95% CI)

The left photograph shows a black bear in a natural, rocky habitat. The right photograph shows two people, likely researchers, handling a black bear on the ground, possibly for a capture or tagging operation.

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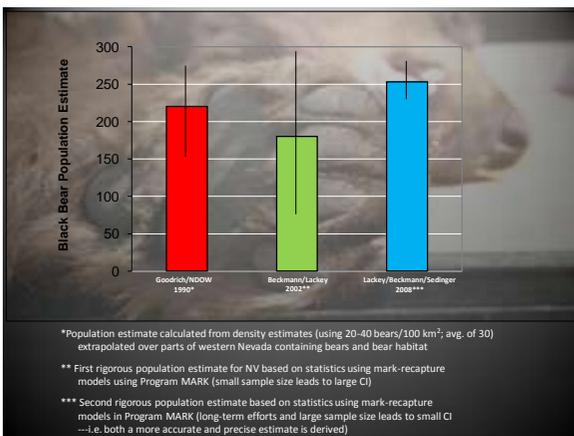
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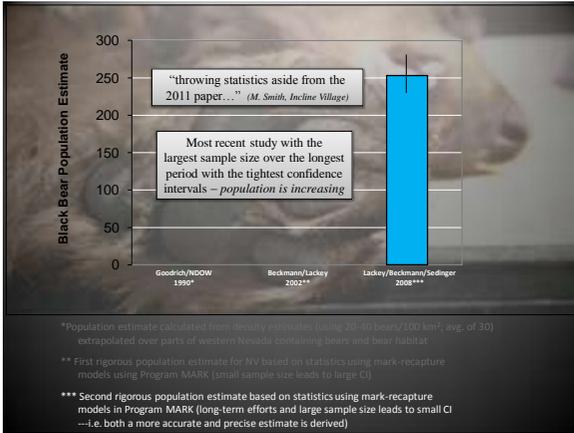
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- ✓ Population estimates between Goodrich 1990 & Beckmann 2002 are not statistically comparable
- ✓ Increased sample sizes – 30 to 99 to 197 - produced increased accuracy and more precise estimates thereby decreasing uncertainty
- ✓ Long-term studies produce more data revealing changes in system demographics & behavioral traits

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Current estimates will be published as have all our results for several years

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### OTHER INDICATIONS OF POPULATION STATUS

#### Bear-human conflicts

- Steady increase in complaints



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### OTHER INDICATIONS OF POPULATION STATUS

#### Evidence of an expanding population

- sightings in historic habitat



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### OTHER INDICATIONS OF POPULATION STATUS

#### Mortality rates

- 316 documented mortalities since 1997
- 63 in 2007! Average of 23 annually due to anthropogenic causes



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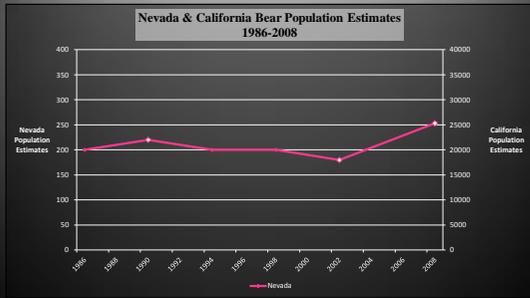
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### OTHER INDICATIONS OF POPULATION STATUS




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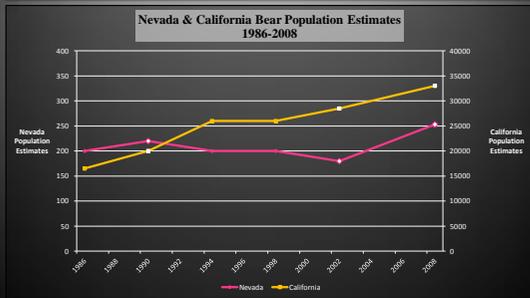
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### OTHER INDICATIONS OF POPULATION STATUS

California estimate increased roughly 62% from 1990-2008, essentially from Goodrich's study in 1990 to present




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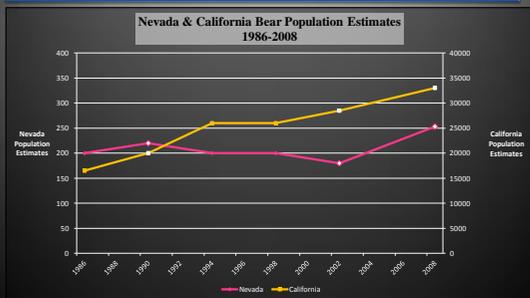
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### OTHER INDICATIONS OF POPULATION STATUS

California estimate increased roughly 15.7% from 2002 to 2008, Beckmann's study to current estimate - *not a statistical estimate of  $\lambda$ , but similar to our reported 16%*




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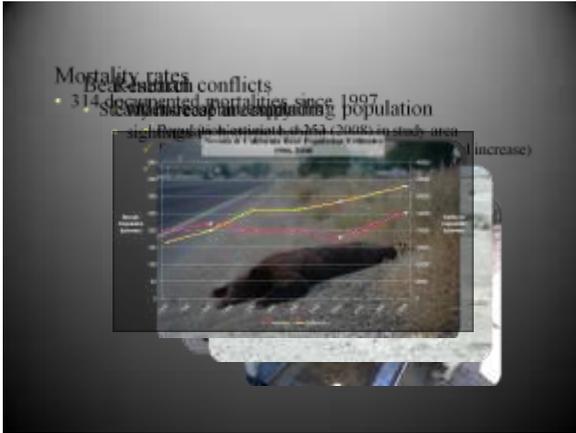
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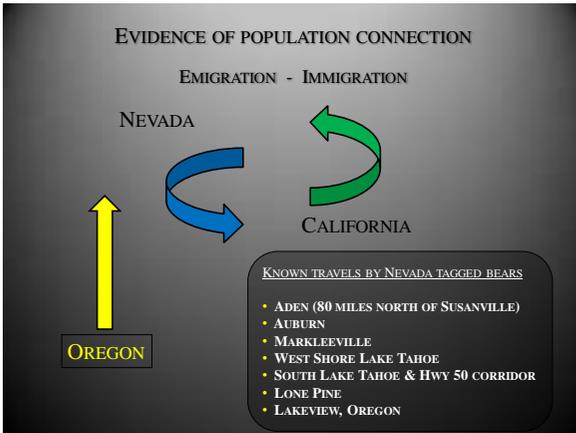
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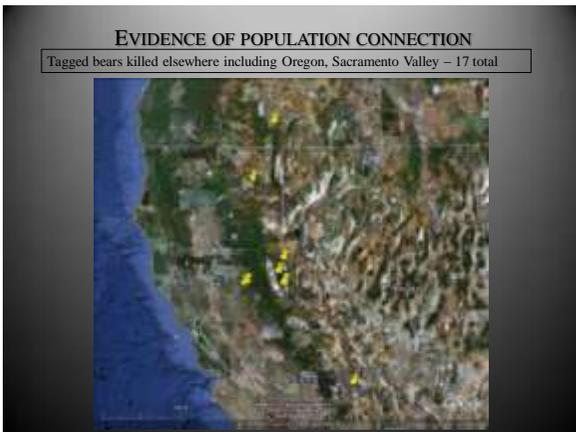
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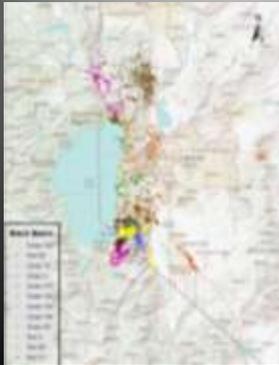
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EVIDENCE OF POPULATION CONNECTION



GPS location data from 12 collared bears, 2005-2008




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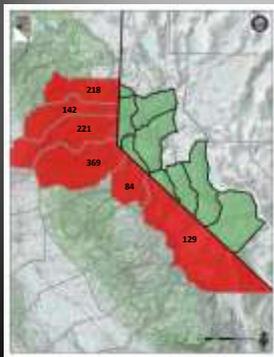
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Number of bears killed by California hunters in counties bordering Nevada hunt units, 2005-2010

Sierra	218
Nevada	142
Placer	221
El Dorado	369
Alpine	84
Mono	129
<b>Total</b>	<b>1163</b>

Bear hunt units increased in 2005 to include parts of Mono County due in part to population increase

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QUOTA AND TAG CALCULATIONS

- Sustained yield estimates - rate of population increase (16%) would be  $\approx 40$  bears (estimate of 250 bears \* .16)
- Quota set very conservatively @ 20 bears (6 females – 30%) female quota of 6 is only about 54% of female sustained yield estimate
- Utah's high success rate of 44% was applied to establish number of tags @ 45.

- Population estimate is very conservative
  - ✓ core area
  - ✓ modeled conservatively
  - ✓ growing population
- Quota is very conservative
  - ✓ half of sustained yield estimates

Roughly 40 bears could be removed annually through hunting and the population would remain stable (at current levels)

This built-in mechanism allows for kills above the set quota, should they occur

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*"Born in the hands of hunters"*



**THE PUBLIC TRUST DOCTRINE**  
 THE 1842 U.S. SUPREME COURT RULING – *Martin v. Waddell*

- Wildlife resources are owned by no one
- Held in trust by Government for the benefit of present and future generations



*Role of science over partisanship as the proper tool for discharge of wildlife policy*

- 1930 American Game Policy Act
- 1937 Federal Aid in Wildlife Restoration Act

*"Implementation of these principals has led to increased professional management of hunting programs"*  
*The Wildlife Society*




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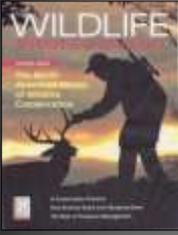
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**THE NORTH AMERICAN MODEL OF WILDLIFE CONSERVATION**

*"One reason the North American Model of Wildlife Conservation has been hailed as the greatest model of effective conservation world wide is that it rests on a bedrock philosophy: Wildlife is a public resource..."*  
*John Organ & Shane Mahoney – The Future of Public Trust. TWP 2007*

*"The Public Trust Doctrine (and) The North American Model of Wildlife Conservation are under siege...privatization of wildlife (restricted access), game farms and the animal rights movement...are eroding the underpinnings of The Public Trust Doctrine"*  
*John Organ & Shane Mahoney – The Future of Public Trust. TWP 2007*




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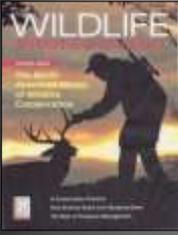
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**THE NORTH AMERICAN MODEL OF WILDLIFE CONSERVATION**

*"Hunting as become central to the success of the model"*  
*The Wildlife Society – position statement*



*"The Public Trust Doctrine (and) The North American Model of Wildlife Conservation are under siege...privatization of wildlife (restricted access), game farms and the animal rights movement...are eroding the underpinnings of The Public Trust Doctrine"*  
*John Organ & Shane Mahoney – The Future of Public Trust. TWP 2007*




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How is killing a bear conservation of the species?

"Historically...in both North America and Europe, managed hunting has been an effective system for protecting bear populations. It has worked because it has enlisted a clientele interested in ensuring continued abundance of the resource."

Some states reclassified bears as big game giving them protected status as early in the early 1900s... "these laws were passed because bear populations had noticeably diminished."

"Ironically, bear populations that have been managed for sustained harvests have generally fared better than populations in which hunting has been prohibited, mainly because the former better controls illicit hunting than the latter." Garshelis 2002



Successful hunter—Nevada 2011

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FUNDING RESOURCES

Funding statistics - 2011 Nevada bear hunt

- \$23,256.10 in application, tag and license fees
- \$69,768.30 available in matching Federal Pittman-Robertson funds
- Total of **\$93,024.40** in funds available to NDOW

Nevada Bighorns Unlimited-Reno

\$400,000-\$500,000 funded annually! to youth programs, NDOW programs, habitat improvement & research



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Expenditures - 2011 Nevada bear hunters

- \$2800 to \$8620 in addition to license and tag fees
- ✓ fuel, hotels, equipment and gear, food, taxidermy fees



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### EFFECT ON BEAR/HUMAN CONFLICTS

Will the killing of bears involved in bear/human conflicts (nuisance bears) **permanently** solve the conflict issue? → NO

Can the killing of bears involved in bear/human conflicts (nuisance bears) solve issues on a site-specific basis (temporary)? → YES



Courtesy The Wildlife Portal.tv

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### EFFECT ON BEAR/HUMAN CONFLICTS

*Correlation of reduction of nuisance black bear complaints with implementation of (a) hunt vs (b) non-violent program*  
Tavss 2005 – Department of Chemistry, Rutgers, New Jersey

- change in complaints from 2002 to 2003 only
- ignored previous 10+ years data
- ignored other possible factors: habitat or climatic changes, bears killed, ordinances, etc
- based conclusions on wrong information – Implementation of NDOW's Aversive conditioning program
- a "report" presented at a public hearing, not peer-reviewed?




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### EFFECT ON BEAR/HUMAN CONFLICTS

*American black bear nuisance complaints and hunter take*  
Treves et al 2010 – Nelson Institute for Environmental Studies, Wisconsin

- looked at 10 year data set – nuisance complaints from a hunted population
- no correlation on statewide scale
- positive correlation at smaller scale, bear hunt units
- concluded no clear evidence of hunting reducing complaints – "probably because hunting was not effectively designed for that goal"
- appeared in a peer-reviewed, professional publication – *Ursus* 21 (1) 2010




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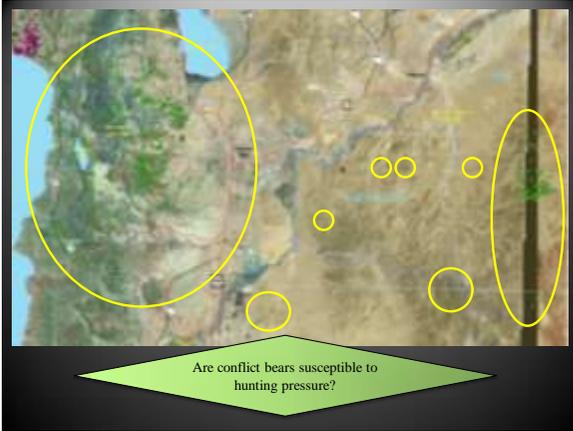
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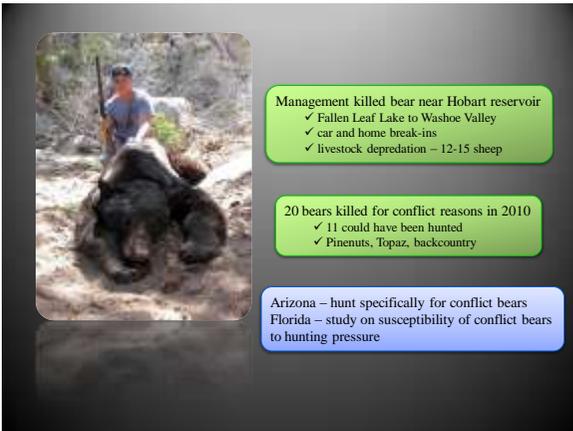
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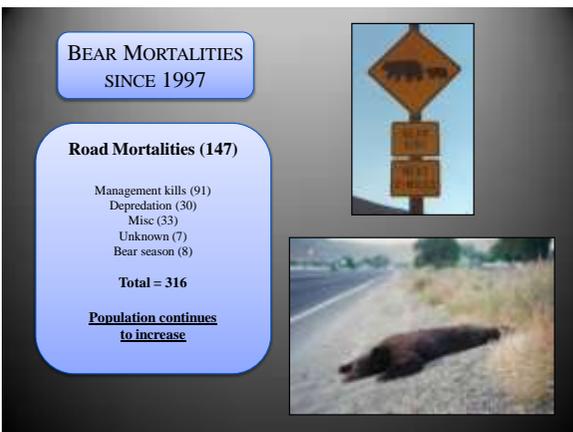
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IS HUNTING THE END OF IT?



NDOW will continue all current management programs:

- Aversive conditioning with on-site releases
- Karelain Bear Dogs
- Orphan bear cub rehabilitation with *Animal Ark*
- Bear research

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SHOULD WILDLIFE POLICY BE MADE BY POPULAR VOTE?

"direct democracy allows voters to decide if hunting and trapping will remain privileges in America, and it also allows voters to decide on the fairness and humaneness of forms of hunting and trapping. This takes personal choices away from hunters and trappers, and places them in the hands of those who may or may not have any knowledge of or first-hand experience with hunting or trapping." *Minnis 1998*




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- The public at large supports hunting.
- Hunting is allowed in every state of the union.
- Moreover, bears are hunted in every state in the west that has a viable bear population.
- The legislature has deemed that hunting is a supported and valuable activity. The legislature passed laws memorializing that intent.
- By law, the NDOW is required to manage all wildlife in the state and regulate hunting. The NDOW thus carries out hunting programs that practice compensatory mortality that is not deleterious of the total population.
- Black bear, by law are considered big game and thus available to be part of a hunting program
- The data we collect from the harvested bears provide important information on the status of the population (demographic information-- age, sex, condition, distribution etc.) necessary for the management and conservation of the species.




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Can we hunt bears?

- legally
- safely
- sustainably

**YES, WE CAN**

Should we hunt bears?

- conservation of species
- funding
- conflict resolution



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Questions?



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[www.ndow.org](http://www.ndow.org)



[www.wcs.org](http://www.wcs.org)



[www.thewildlifeportal.tv](http://www.thewildlifeportal.tv)

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Will Nevada bear hunt negatively affect home prices or business in Lake Tahoe?

- has bear hunting affected California side?
- have other hunts had an effect?



Median price for Sold listings  
Incline Village

- 2008 - \$1,115,000
- 2009 - \$1,000,000
- 2010 - 815,000
- 2011 - 800,000 (1382 active listings)

(source - Multiple Listing Service)

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