Causes, Consequences and Considerations for Management of Human-Black Bear Conflicts: Lessons Learned from Research in Durango

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Stewart Breck, David Lewis, Jared Laufenberg, Stacy Lischka, Paul Doherty, Tana Verzuh, and Cody Wallace
Why are human-bear conflicts increasing?

Are bears changing their behavior?

What should we do about it?

Population Size & Growth Rate

Stage-specific survival and reproduction

Behavior

Population Structure

Deterministic Stressors

Reduction of Human Food

Habitat (Human Development)

Human Conflicts

Bear-Human Conflicts

Harvest

Lessons Learned from Durango Bear Research

CAUSES OF CONFLICTS: changes in black bear behavior that contribute to increases in human-bear conflicts

CONSEQUENCES OF CONFLICTS: population trends in black bears living along the urban-wildland interface

STRATEGY TO REDUCE CONFLICTS: wide-scale urban bear-proofing to reduce bear conflicts
CAUSES OF CONFLICTS

Shifts in Bear BEHAVIOR that Increases Conflicts
Changes in Foraging Behavior

40 Adult female bears collared/year
Bears increased their selection for human development as they got older.
Changes in Hibernation Behavior
Used 158 den events (2011-2016) of collared female bears
Influence of HUMAN FOODS on black bear hibernation length

For every 10% increase in overlap, hibernation decreases by ~ 3 days.
Influence of MINIMUM TEMPERATURES on bear hibernation length

For every 1°C increase, hibernation decreases by ~1 week. Based on climate projections for CO, by 2050 bears will reduce hibernation by 15-40 days.
TAKE HOME MESSAGES

• When natural foods are limited, bears will readily forage on human foods, and bears appear to be increasing their use of development over time.

• Hibernation length is likely to decrease due to expanding development and increasing temperatures.

• Given changes in foraging and hibernation, we should expect more conflicts from the same number of bears in future.

• Reduced hibernation will also alter the number of bears susceptible to late-season harvest.
CONSEQUENCES OF CONFLICTS
Changes in Bear POPULATIONS due to conflicts
Surveys 2011-2014
2,556 Hair Samples
Durango Female Bear Population Trend (2011-2014)

Natural Food Failure

~60% decline
### All mortalities within study area

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<thead>
<tr>
<th>Year</th>
<th>Survival</th>
<th>NonHarvest</th>
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<tr>
<td>2011</td>
<td>0.92</td>
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<tr>
<td>2012</td>
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### Collared female bear mortalities

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TAKE HOME MESSAGES

• Increased bear use of development during poor natural food years can lead to significant population declines through high adult mortality

• Bear populations along the urban-wildland interface may be largely driven by non-harvest mortality (no management control, and little information about)

• Such effects are not well-recognized in management scenarios, but will play an increasing role in bear populations in the future

• Stay tuned . . . . .
Use of patch selection models as a decision support tool to evaluate mitigation strategies of human–wildlife conflict

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Testing the effectiveness of the bear-proofing experiment for reducing human-bear conflicts

- 10% Compliance = 272 conflicts
- 80% Compliance = 45 conflicts

Graph showing:
- Probability of annual conflict over Pre-treat and Post-treat periods
- Control and Treatment groups

Regular Containers = 115 conflicts
Bear Containers = 58 conflicts
Use of patch selection models as a decision support tool to evaluate mitigation strategies of human–wildlife conflict

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“Benefit reduction ≥55% in urban patches and ≥70% in urban-interface patches resulted in avoidance by bears [of development]”
TAKE HOME MESSAGES

• Distribution of bear-resistant containers resulted in 50% fewer conflicts than control areas

• More important, is compliance with ordinances to reduce access to human foods (by whatever means)

• ~60% compliance rate significantly reduced conflicts, which may serve as a useful management target
Implications for future management of conflicts
Black Bear Behavior is DYNAMIC, changing in response to environmental conditions, YET many of our management practices assume that behavior is FIXED.
Success in reducing human-bear conflicts will likely depend upon our ability to CHANGE HUMAN BEHAVIOR.
Thank You

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“Thanks” is not enough