

## Population parameters

- Issues regarding current pop estimate:
  - o Chao2 = accurate population estimate?
    - Rebuttal paper in 2014
    - Study team is confident but there is question out there
    - Further explain “model-averaging”
    - **SOLUTION:**
      - **IGBST** will add clarifying language to the rule
  - o Population trend
    - Also based on Chao2
    - Trend sensitive to how long time period use
    - Rate of increase is slowing (“population trend is declining”)
    - \*\*\*Make sure this phrasing is very simple (eight grader can understand)
    - **SOLUTION:**
      - Won’t do additional modeling but **IGBST** will add clarifying language to build confidence in trend
- New population estimator:
  - o Mark-resight
    - Less biased
    - More accurate estimate of how many bears on ground
    - PROBLEMS: based on number of collared bears and can’t get enough bears on the air. So, does not have power needed to detect population trend. Can be really accurate in detecting population that year but not good at projecting. Need population decline for 10 years before can detect it
  - o IGBST wants to investigate a new method
    - Will need to calibrate new estimator
      - States don’t want calibration language
      - Forest Service and peer reviewers say we have to add calibration language
    - In Appendix C of Conservation Strategy → current content not appropriate
      - Too specific about how calibrate; ties our hands in creating a new method
    - Calibration is also in body of Conservation Strategy
      - Study Team proposed some good language for discussing calibration
  - o **SOLUTION:**
    - *Option 1:*
      - Remove paragraph on calibration from Appendix C
      - Add language to Chapter 2 of Conservation Strategy to discuss calibration (compromise language)
        - o Seth: Can’t keep floor of 600 if population estimate doubles with new estimator. Need stronger language
        - o ADD: whatever 95% confidence interval for new method will be the floor
      - **Jennifer and Jodi continue to work with IGBST and steering committee**
    - *Option 2:*
      - Don’t discuss calibration at all

- o BUT if don't commit to re-calibrating, could allow a massive reduction that Dan would not tolerate
    - **BRING TO MATT?**
- Carrying Capacity
  - o **SOLUTION:**
    - IGBST will draft response to comment and maybe add additional explanation to the rule
- Mortality
  - o Exceeding total allowed mortality limits two years in a row prior to delisting...
    - Provide materials to help landowners bear-proof (need materials and an outreach person) → not possible
    - Late August-October is highest mortality
    - (not in our control)
      - Hunters don't have to carry bear spray!
      - Modify elk hunting units
  - o More bears/approaching carrying capacity → more conflictual interactions → more control/human-caused mortality
    - Potential response: Bears will start to expand outside DMA and those mortalities don't count so we've already accounted for that. In theory shouldn't be exceeding mortality
  - o Not having human-caused mortality under control could be symptom of issues with threats-based criteria, not adequately addressing listing factors → "sufficiently minimized so won't cause species to be on brink of extinction in near future" (doesn't need to be absolute certainty having completely alleviated these threats)
  - o Adding additional mortality is a huge concern
  - o **SOLUTION:**
    - Jennifer will continue to work with IGBST to develop response to this issue
      - Standard response of the Service: Recovery plans are not binding, possible roadmap, many routes to recovery. Possible to meet some criteria and not others and still consider population recovered
- Vital rates
  - o **SOLUTION:**
    - IGBST helps draft response
      - Will re-evaluate vital rates every 5-10 years
    - Comment: should be 5 years, not 5-10 → change in content (definitely Conservation Strategy, maybe rule)
- Density
  - o **SOLUTION**
    - Not going to do more modeling
    - Response (maybe tweaking language in rule)
    - We painted ourselves into corner: we've been saying population stable and that range increased by 40% (implies lower density). But population has increased slightly and a lot of occupied range outside the DMA
    - We do not believe that there is lower density; the bears are not leaving the core of the ecosystem. We count more females with cubs
    - Scientists disagree
    - **Work with IGBST**

- Population management triggers
  - Change triggers to alleviate confusion
    - If worried that states will manage towards lower end of 600-674 range, make our status review trigger 600 for 3 consecutive years. Will never be a problem if really managing to 674 (tempting fate if states managing to 600) → disincentivize the bottom. How are two sides interpreting management flexibility
      - BUT study team kicks off review at 612; too close? Study team should be higher so they can give recs to states to fix problem before we do a review
        - 3 consecutive years creates more separation
      - How handle having triggers in Conservation Strategy? Need to be transparent and upfront
      - Triggers tie to recovery criteria. Might look awkward if they all tie to recovery criteria except one
    - Right now 500, huge buffer between our bottom and when we act, encouraging states to manage at lower end?
    - **SOLUTION**
      - Remove 48 females with cubs
      - In Trigger 3: “or” instead of “and” and add “600 in 3 consecutive years”
      - Remove Trigger 2 (= Recovery Criterion 1)
  - **TALK TO MATT**
- Add more figures and tables
  - **IGBST** is making figures, we can roll those in

## Recovery

- Pro/con meeting recovery criteria → debate about whether species recovered or not
  - **SOLUTION:**
    - Address in comment response (look at Wyoming wolf rule, 2007 final grizzly rule) (this is our view and why we think the species is recovered)
    - **Jennifer will write**
- Demographic recovery criterion 1
  - Don't have to change recovery criteria if changing basis for delisting
  - For genetic health. Because it says 500, confuses as management objective. Removed “genetic health clarification,” now a footnote
  - 500 or 48 females with cubs → 48 females with cubs actually translates to 600
  - Is this still the best available science for genetic concerns?
  - **Option 1: get rid of whole criterion**
    - Rationale
      - Genetics not an issue (basis for criterion is a threat that isn't real so don't need criterion → we argue hard in rule that genetics not an issue)
      - Public is confused by use of 500 when real threshold is 600 (and 48 females with cubs suggests 600)
      - Is 500 really the best science for genetic health?
      - 48 females with cubs redundant to population of 600 (48 females with cubs implies population around 600). 600 is a better indicator than 48 anyway → already covered biologically by other criteria

- This criterion not being met for 2 years in a row, potential for problem
- TALK TO MATT
- Recovery criterion 2
  - SOLUTION:
    - Clarify language
    - 6 year window measured at 3 different points (covers 8 years, not 18). Moving window
    - Figure?
    - Jennifer with IGBST
- Why monitoring in DMA and criteria only address PCA?
  - SOLUTION:
    - IGBST will write comment response
    - Developed for different reasons
      - PCA = primary conservation focus area, source
      - DMA = larger so that we don't write off mortalities that occur outside PCA
- Recovery criterion 3
  - SOLUTION:
    - Explain in comment response
    - Maybe IGBST raises their 612 trigger for biology review (change text)
      - "or" instead of "and" (3 consecutive years OR 612)
    - Jennifer
  - TALK TO MATT (all these parts move together)
- Additional criteria
  - SOLUTION:
    - Respond to comments
    - Jennifer
- IUCN classification
  - SOLUTION:
    - Doesn't have bearing on our regulations
    - Wyoming wolf example?
    - Regional office writes (Alex)
- Carrying capacity not an appropriate metric
  - SOLUTION
    - Argument: Basing on carrying capacity is wrong metric, base on effective population size, even if harder (increase habitat/connectivity to allow for larger carrying capacity that more closely matches effective population size, have to try)
    - Not a criterion, explain away
    - Basis for the management targets, which are a criterion. But measuring recovery by having sustainable mortality limits
    - Explain away in response
    - 674 = biologically recovered population. Some studies suggest that higher numbers are desirable but we believe that based on best available science this is plenty to sustain a viable population that is not T or E
      - Explain why we know it's biologically recovered, robust

- o Genetically healthy
  - o Vital rates are good
- Change language at beginning of notice to address emphasis on carrying capacity at beginning of rule (not about carrying capacity but about being biologically recovered)
- Jennifer with IGBST

## Delisting

- Pro/con delisting
  - o Address like address recovery pro/con above
- Ohio State Survey (in popular press)
  - o **SOLUTION:**
    - Approach researchers → Jennifer
      - Summary of conversation in email (do you concur?) for the record
    - We believe not a representative sample because know no one from states, IGBST, etc. responded
    - Don't know expertise, qualifications of these people. Not necessarily familiar with legal standards
    - Jennifer/Alex
- Section 4(a)(1) → 5 factor threats analysis outside of DMA (for whole DPS)
  - o No regulations outside of DMA at all
    - May have lost a case because didn't address entire entity in factor analysis...
  - o **Option 1:** Argue address in SPR section
  - o **Option 2:** try to address in 5-factor analysis
    - For each factor, acknowledge that each factor not ameliorated outside DMA?
      - BUT Vulnerable to incomplete threats assessment
  - o **Option 3:** Address in introductory habitat management section (13178) to set the stage
    - Focused on areas that are biologically capable of recovering species
    - Can't say we don't need to address threats outside DMA
    - Acknowledge higher threat outside but don't need those areas to recover species
  - o See issues 9-11 in Wyoming wolf final rule
  - o **SOLUTION:**
    - Need to think more

## General comments

- Don't trust science, lack of transparency, monopoly so don't share data
  - o Sensitive data is not shared (e.g. location data)
  - o **SOLUTION:**
    - Response to comment
      - Look at 2007 rule
    - Jennifer writes response
- Type II errors
  - o **SOLUTION**
    - Explain IGBST
    - Best available science response
    - Jennifer writes response

- Managed threats?
  - SOLUTION
    - We are not claiming these are not threats but rather that they have been ameliorated to the level that they no longer could result in the extinction of the species in the near future
    - Jennifer writes response
- Modifying boundaries
  - Don't include upper green in DMA?
  - Expand DMA to include wilderness lands adjacent to DMA
  - DPS expanded to whole state of Montana
  - SOLUTION
    - Reiterate definition of suitable habitat and how we defined the DMA boundaries
    - Explain that any proposed changes to DMA/DPS in comments inconsistent with how we defined DMA or how you can apply DPS (or is this too much detail?)
    - Jennifer writes response
- Update taxonomic reference
  - Don't change
  - SOLUTION
    - We are keeping the same
    - Scientific disagreement
    - Jennifer writes response
- Wilcox 2016 quote
  - SOLUTION
    - States have developed adequate regulatory mechanisms to maintain a recovered population
    - Jennifer writes response
- CS and state plans not final
  - SOLUTION
    - CS and state plans now final
    - We gave public opportunity to comment on rule in light of the state plans and federal agency management plans (which together make up the contents of the final conservation strategy; CS not a regulatory doc, just summarizes)
- Inadequate public involvement
  - SOLUTION
    - Provided adequate notice of rulemaking through FR, news articles, public hearings. Could provide comments through regulations.gov, mail, etc.
    - Inadequate time?
    - Alex will write
- Section 7
  - SOLUTION
    - WY wolf rule, search for Section 7
    - BUT we say that Bitterroot could be re-colonized by GYE or NCDE
    - Not required but even if it were there would be no jeopardy
    - RO will write (Alex work with Doug)
- Tribal concerns: guarantee of government-to-government consultation
  - SOLUTION

- Quote secretarial order, recognize responsibilities
  - Requires that we consult as early in the process as possible
  - We feel we complied with this by having multiple consultations (formal and informal) throughout the process including this tribe on XX date (Ivy has info on consultations)
  - Alex will write
- Tribal concerns: Cultural significance and treaty rights
  - SOLUTION
    - Considered what tribes had to say about spiritual importance
    - Nothing presented superseded the ESA's requirement to make these decisions solely based on best scientific and commercial data available. Sensitive to concerns and willing and able to continue the conversation after the delisting
    - Alex will write

## Factor B

- Pro/con
  - SOLUTION
    - Summarize arguments for and against hunting (Trophy hunting)
    - After delisting, hunting is under purview of the states (up to them to make decisions about whether to open a season)
    - Jennifer writes
- Hunting boundaries: PCA as secure area
  - PCA as "secure area" that minimizes human-caused mortalities, source population → gives false impression that there won't be hunting in PCA
    - There can't be hunting in a secure area; by definition, would not be secure
  - SOLUTION
    - Change statement claiming to be a "secure area"; use different language, be more explicit
    - Jennifer
- Hunting boundaries: JDR, inholdings in GTNP
  - SOLUTION
    - Response to comment → Look at WY wolf for example
    - Jennifer
- Hunting boundaries: food aggregate sites
  - SOLUTION
    - Talk with states about timing of season (not overlap with moth sites)
    - Jennifer
- Hunting boundaries: connectivity areas
  - SOLUTION
    - Response to comment
    - Jennifer
- Mortality limits
  - Need to be more conservative to allow for all the sources of error
    - SOLUTION
      - IGBST writes response for how 7.6% is sustainable, explain basis of 7.6% (peer reviewed published paper)

- No biological basis for 9 and 10% mortality and concerns for delay in our ability to respond to population decline
  - **SOLUTION**
    - Ask states to explain biological basis for 9 and 10%
    - Validate power of detecting declines with study team modeling
    - Jennifer facilitates
- Need limit outside DMA
  - **SOLUTION**
    - Policy decision, not biology decision
    - Mortality that occurs in those areas doesn't matter to population
    - Look at 2007 final rule for example (14881, Issue 8)
    - Mortality in places where connectivity most likely counts towards mortality limits, is regulated (because they are part of the DMA, specifically just carved them out)
    - Do not expect the rest of areas outside DMA, but in DPS, to contribute towards sustainable population
    - If leave DPS, fully protected under ESA
    - Jennifer writes
- Calculation of total and background mortality
  - Total mortality vs. discretionary mortality → still confusing
  - **SOLUTION**
    - Clarify!
      - Provide better definition of what discretionary means (there is discretion in how deal with problem bear)
    - Example background calculation table and calculations
      - Include table from public hearing instead
      - Update explanatory language
      - Make clear what table addresses
        - More verbage on how cohorts calculated
        - Explain how address governor's concerns (Gov. Mead wanted to remove this table and explanation)
      - BUT don't have agreement on how calculate background mortality → can't put in rule
        - Discuss this with Steering Committee
        - Update in rule and add to Chapter 2 of Conservation Strategy
    - Also consistently clarify total mortality in the Conservation Strategy
    - Jennifer consults with Steering Committee and writes
- Buffers around the parks
  - **SOLUTION**
    - Response 25 WY wolf
    - No biological basis
    - We don't have the authority to do that unless compromises viability of entity, which doesn't
    - Jennifer will write
- Moratorium on hunting immediately following delisting
  - **SOLUTION**
    - State's purview

- Response 25 WY wolf
- NPS discretionary mortality
  - SOLUTION
    - Park Service will be allowed to remove bears
    - Will count against total allowable mortality. If exceeded, will be reduced
    - Steering Committee will draft response

### Factor C

- Frequency of diseases and parasites increase with climate change
  - SOLUTION
    - Response
    - Jennifer will write
- Human-caused mortality
  - Talk to Matt about projected numbers from IGBST
  - SOLUTION
    - Response
    - Jennifer will write
  - Maybe move to Factor B?
- Poaching: relationship between hunting and poaching
  - SOLUTION
    - Need to address uncited statement that hunting reduces poaching (change rule)
  - Maybe move to Factor B?
- Poaching: adequate resources to investigate
  - SOLUTION
    - Response to comment
- Natural predation underestimated
  - SOLUTION
    - Response to comment
- Trafficking in bear parts in delisted area
  - SOLUTION
    - We're not concerned about it
    - No data to indicate this will be a problem. Not listed in Alaska so nothing would really change (already have this dynamic and not a problem)
    - Hard to tell where it came from
      - Talk about Alaska?
    - Internationally → still under CITES? Is it under CITES?
- IGBST conflict reduction report
  - SOLUTION
    - Comment response

### Factor D/Post-delisting monitoring plans

- Be clearer/firmer in language
  - SOLUTION
    - Use will instead of may, if we can
    - Remove "anticipated, expected" from references to state plans
- Existing regulatory mechanisms, can't consider expected regs or plans
  - SOLUTION

- These will be final before we publish final rule
- MOA/Strategy DOC
  - SOLUTION
    - Comment response: Case law helps us
- FS, state plans, YNP compendium inadequate
  - SOLUTION
    - Comment response: They are adequate and they will be in place
    - Add language that pertains to what BLM will do (send to steering committee)
- Funding not guaranteed so not regulatory mechanisms
  - SOLUTION
    - Comment response: see Wyoming Wolf and 2007 final rule
- Adequacy of hunting reg requirements that Service gave to states
  - Timing of hunt
  - Identifying sex
  - SOLUTION
    - Comment response
      - Shutting down hunt when female mortality reached; don't need to be able to identify
      - Can't hunt any bear with young
    - Give to states to answer
- Missing Triggers
  - No triggers for:
    - Habitat quality
    - Food items
  - SOLUTION
    - We monitor these things in conservation strategy
      - Monitoring strategy doesn't have a feedback loop?
    - Don't add triggers
      - Population triggers indirectly cover other metrics
      - Also, general trigger covers this, "depart significantly in application of management plans/conservation strategy" (page 105 in CS)
      - If forest service violates, will get sued. No point in having trigger for something where litigation is really likely
- Mortality triggers
  - SOLUTION:
    - "routinely violated" would also trigger status review (13225)
- Trigger: "depart significantly"
  - Define significantly
  - SOLUTION
    - Give examples of what would or wouldn't be significant departure that leaves fuzziness in middle
- Trigger: states list as predators
  - SOLUTION
    - Any change to state management that impacts to bear that leads us to believe required re-evaluation under act will be considered
    - Discussed with wolves in MT
- Other trigger concerns

- SOLUTION
    - Explain away
- Connectivity
  - SOLUTION
    - Explain away
- Nuisance/conflict bears
  - Defining discretionary mortality
    - Already addressed above
  - Concern that treatment of nuisance bears will be less conservative upon delisting
    - SOLUTION
      - As long as within mortality limits, shouldn't be a concern
      - Incentive to be more conservative because then more allowed for hunting
  - What's human safety?
    - SOLUTION
      - No written protocol, some IGCC guidelines but there's precedence from 40 years of experience
      - Been done in a way that allowed for population growth throughout this entire period
      - Incentive to be more conservative because then more allowed for hunting
  - Grizzly Bear Management Relocation Plan
    - No written plan but do have pre-approved states
    - States respond
- Service's authority
  - Explain away
- 5-year minimum review period. States don't want monitoring/management in perpetuity
  - SOLUTION
    - Issued a final rule once already that explained why needed to managed in perpetuity
    - Law says "monitor effectively *for not less than 5 years*"
    - Add text recognizing that Conservation Strategy may need to grow and evolve and FWS will consider whether is evolution is a significant departure
    - Emphasize that we allow for changes
    - Need for a strategy will stay in place forever
    - Jennifer writes

#### Factor E

- Genetics
  - Will brush up on literature and respond
- Food
  - Monitor body condition
    - Addresses concerns that diet quality declining → if body condition doesn't decline, it's fine
    - Don't monitor other foods → can't monitor everything, if monitor body condition will show us that getting sufficient nutrients

#### SOLUTION

- Change in rule
  - Change in Conservation Strategy
- o Food sources declining
  - **SOLUTION**
    - Comment response
- o Climate change
  - Food
  - Denning
  - Fire regime change
  - Jennifer: Reach out to Amy Nicholas (WY FO)
- o Whitebark pine adaptive management
  - Need to specify triggers and responses
  - What would this look like???
  - Not a threat like we thought it was before (cite new info) (somewhat new info, and somewhat changed mind)

Forseeable future not defined in delisting rule and we need to define it?

For further discussion with Matt:

- Service status review triggers
  - o 500 → 600
  - o Dropping Trigger 2
  - o Dropping Recovery Criterion 1
- Recalibration/Chao2 triggers
- Lag effect: detecting 10% decline could result in declines too quickly; we're seeking modeling
- Exceeding mortality limits in 2015 and 2016
  - o Mortality (see section in Population Parameters)
- Calculating background mortality
- NPS retaining discretionary mortality and buffer zone stuff
- Perpetuity of Conservation Strategy issue

500 = genetic health goal, not population

500 or 48 females with cubs → 48 females with cubs actually translates to 600

600 to 747 = 95% confidence interval. 674 = average