Drought monitoring, impacts, and rescues of California Redband Trout

Michael Dege
California Department of Fish and Wildlife
California’s Ongoing Drought
Upper McCloud Watershed

65 Miles north of Redding, CA

Small isolated spring streams

McCloud Redband – SSC

Dr. Behnke *O. m. stonei*
Sheepheaven Creek

January 7, 2014

Surface flow – no fish (285 feet)
Surface flow – fish present (1125 feet)
Intermittent ice (265 feet)
Solid ice (1000 feet)
Dry
Sheepheaven Creek  September 29, 2014

Surface flow – no fish (285 feet)
Surface flow – fish present (1735 feet)
Intermittent flow (125 feet)
Dry
### CDFW Fish Rescue Matrix

- **General guidance**
- **Three levels of evaluation** (monitoring, translocation, rescue)
- **Flexibility and professional judgement**

#### Level 1 (Monitoring at risk populations)

<table>
<thead>
<tr>
<th>Action</th>
<th>Trigger</th>
<th>Response</th>
<th>Peripherals</th>
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</thead>
<tbody>
<tr>
<td>If a water is considered ‘at risk’ and is occupied by state or federally listed species, native species, or species of special concern, conduct onsite evaluations to assess existing instream habitat condition and flows at various locations and across seasons</td>
<td>Surveys find low or intermittent flow, potential stranding, and/or disconnection of wetted habitats that will likely lead to adverse effects to, and potential loss of, the population</td>
<td>Evaluate potential areas for translocation, assess disease threats, estimate logistical needs/procedures, and evaluate contribution/value of the extant population to the persistence of the species or strain</td>
<td>Significant effort should be placed into estimating timelines associated with desiccation and urgency of threat</td>
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<td>Surveys find flow conditions that will likely allow populations to persist across seasons and not lead to adverse effects and/or loss of the population</td>
<td>Continue monitoring at intermittent intervals, based on season and localized flow/discharge (resources permitting)</td>
<td>Special considerations should be made to assess impacts to fish distribution/persistence in relation to barriers (natural/natured) and overwinter survival</td>
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<tr>
<td>Evaluate potential areas for translocation, assess disease threats, estimate logistical needs/procedures, and evaluate contribution/value of the extant population to the persistence of the species or strain</td>
<td>Population is essential to maintain species, strain, or “meta” population recovery and conservation</td>
<td>Initiate Level 2 translocation evaluation</td>
<td>Consideration of individual population’s role in a disconnected “meta” population should be considered. Loss of unique alleles/genetic diversity and or numbers of adults collectively could be significant</td>
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<td>Population is not essential to species or meta population recovery and conservation</td>
<td>Continue monitoring at intermittent intervals, based on season and localized flow/discharge if resources are available (Level 1 monitoring)</td>
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Assessing/Implementing Fish Rescues

Implementing McCloud Redband rescues

- Species risk level – high risk species, genetically unique
- Observed and predicted habitat conditions (repeated)
- Historical information (1977, 1987-92)
- Risk to rescue
- Conditions compromise fish health and biological function = rescue
Assessing/Implementing Fish Rescues (cont.)

McCloud fish rescues (3 options):

- Instream relocation
- In-basin relocation
- Hatchery relocation

Swamp Creek
Self contained McCloud Redband isolation tanks

- Size class and stream isolation
- Production ➔ conservation hatchery practices
# 2013-15 McCloud Redband Rescues

<table>
<thead>
<tr>
<th></th>
<th>Edson*</th>
<th>Moosehead*</th>
<th>Sheepheaven*</th>
<th>Swamp*</th>
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<tbody>
<tr>
<td>Instream translocation</td>
<td>131</td>
<td>45</td>
<td>52</td>
<td>249</td>
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<tr>
<td>In-basin translocation</td>
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<td>MSH translocation</td>
<td>224</td>
<td>285</td>
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<td>534</td>
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* size class shift

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Reintroduction

- Reintroduction strategy/criteria (environmental/biological data, 2013 Reintroduction Plan)
- Predictive/forecast approach with ground truthing
- One year/seasonal is as much as you can buy
Next Steps

Short-term solutions

- Reintroduction
- Stream refugia pools
- Barrier removal
- Increasing genetic diversity

Long-term solutions

- Angling regulations
- Conservation Agreement
- Increasing genetic diversity – HGMP
- Reclaiming historic habitat
But, the drought is not over...

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