Hopi Long-term Monitoring Program for Öngtupqa
Cultural Importance

- Origin point
- Location for numerous traditional narratives and the home for many deities
- Ancestral home
- Resources
- Final resting place
Monitoring Methodology

• Goal:
  – Integrate traditional Hopi cultural values into a science-based long-term monitoring program

• Challenges:
  – Restrictions on entry into Öngtupqa
  – Sampling issues

• Survey based approach
  – Premise: it is during the interpretation of data and not necessarily during its collection where cultural values and traditional knowledge are best integrated
  – Developed out of the TEM integration project (2001-2004)
Data Acquisition

• Relies primarily on data collected by other scientists
• Information converted to Standardized Presentations
  – Data needs to be made relevant; convert into familiar terms or concepts
• Independent observation by limited number of Hopis on river trips
  – Repeat visits to specific sites
  – Locations with culturally important resources
  – Repeat photography
  – Voucher specimens
Surveys

- “General” survey (13 questions)
- River Trip participant survey (20 questions)
- River Trip participants address resource health for a wider suite of resources

- Both cover
  - General cultural questions
  - Resource health questions
  - Management questions
Survey Categories

• Cultural
  – Should Hopi be involved in management and monitoring?
  – Is monitoring information important?
  – Relevance of information?

• Resources
  – Marshes
  – Birds
  – Hopi Salt Mine
  – Willows
  – Native Fish
  – Snakes
  – Springs and seeps
  – Archaeological Sites
  – Animals
  – Insects

• Management
  – Is recreation appropriate?
  – Should trout be removed?
  – Do non-native species have a role?
  – Treatment of Archaeological Sites?

➢ Yes/No and Narrative response options
Results To Date

• Monitoring program “officially” begun in 2008; Surveys conducted annually since 2003
• 182 surveys have been completed by Hopis
  – represents 111 individual Hopis
• Response pattern same for people who take river trips and those who don’t
• Response pattern same for participation on a single river trip or multiple river trips
• Response pattern same for men and women
• Over all surveys and across all resource categories, 68% of the responses indicate a positive assessment of resource health
Are Archaeological Sites Healthy

Normalized Response vs. Year

- Yes
- No
- Other

Year:
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

Normalized Response:
- 0
- 0.1
- 0.2
- 0.3
- 0.4
- 0.5
- 0.6
- 0.7
Note: Birds and Hopi Salt Mine follow this same pattern
Note: Animals, Insects, and Springs and Seeps all follow this same pattern
Are Snakes Healthy

- Yes
- No
- Other
Is Removing Trout to Hopefully Help Native Fish Right or Wrong

- **Right**
- **Wrong**
- **Other**

Normalized Response vs. Year

Do Non-native Species Have an Equal Role

Legend:
- Yes
- No
- Other

Normalized Response

Year:
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
Archaeological Site Treatment

- **Generic eroding site:**
  - 38% Excavate
  - 26% Rebury
  - 6% Other
  - 31% Let Erode

- **Human-caused erosion:**
  - 36% Excavate
  - 38% Rebury
  - 9% Other
  - 16% Let Erode

<table>
<thead>
<tr>
<th>Action</th>
<th>Percentage</th>
<th>Intervention</th>
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<tbody>
<tr>
<td>Excavate</td>
<td>38%</td>
<td>64%</td>
</tr>
<tr>
<td>Rebury</td>
<td>31%</td>
<td>75%</td>
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Conclusions and Recommendations

• Work to date demonstrate the feasibility of this approach to capturing Hopi assessment of resource health

• Larger sample size is needed:
  – Longer temporal duration
  – More annual participation

• Need additional input on terrestrial resources:
  – AMP has not consistently collected information on the status of a number of resource categories that are culturally important to the Hopi Tribe. This includes archaeological sites, vegetation, avifauna, reptiles, insects, and mammals.