National Park Service
U.S. Department of the Interior

Grand Canyon National Park

Non-native Fish Control in Tributaries: Grand Canyon National Park

Brian Healy, Clay Nelson, Emily Omana Smith, Melissa Trammell, David Ward, Mike Yard, Dave Speas, Marianne Crawford

Joe Tomelleri Illustrations

EXPERIENCE YOUR AMERICA

Cooperators

- Funded by Reclamation and NPS

- Volunteers (several thousand hours)

Trout Control Projects

Shinumo Creek –
Rainbow Trout

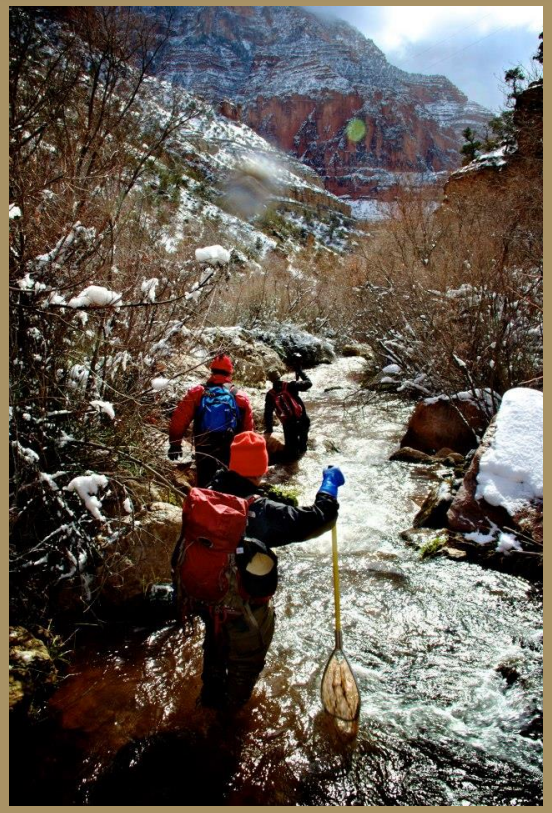
Bright Angel Creek –
Rainbow and Brown Trout

Project Background/Methods

- History: Trout initially introduced to GCNP,1920's and 1930's
- Non-native Trout Control: Conservation Measure for Humpback Chub in Biological Opinion (USFWS 2008, 2011)
- NPS Comprehensive Fisheries Management Plan (CFMP) 2013
- Non-native trout control via electro-fishing:
  - Shinumo Creek, Bright Angel Creek
  - Angling and netting

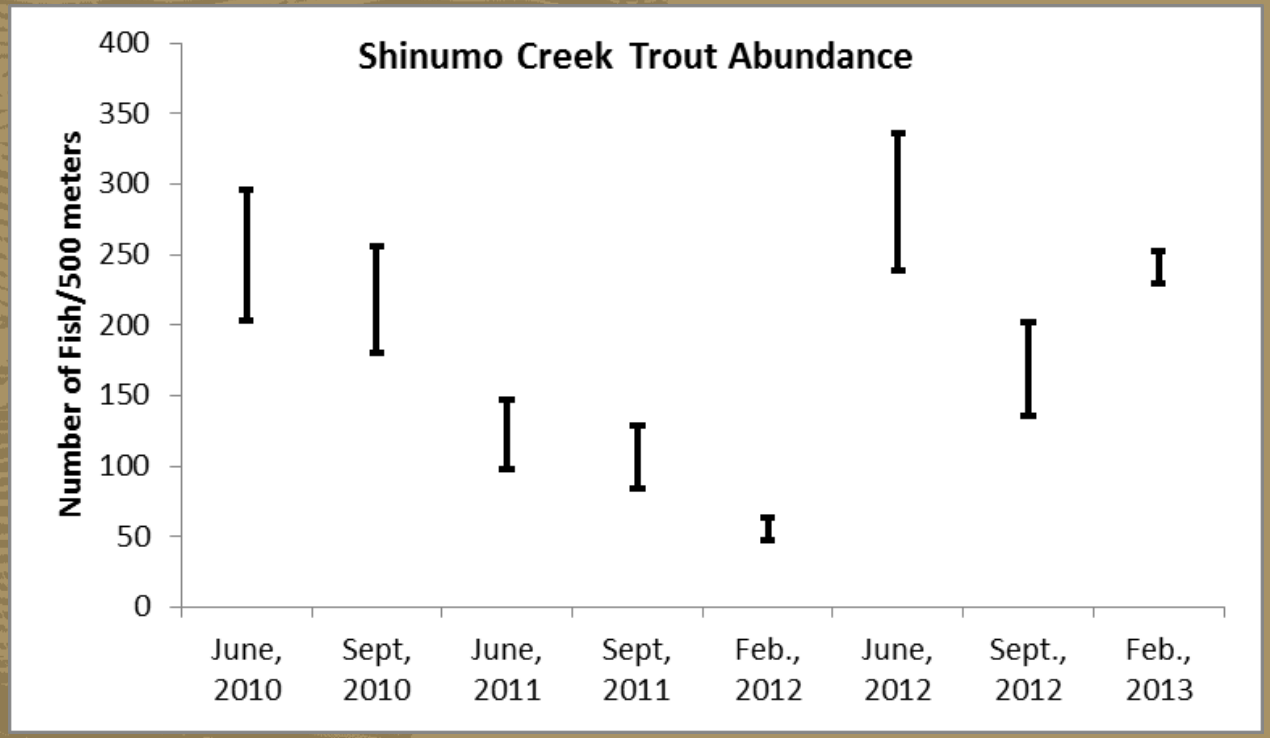
Goals and Monitoring

- Goals:
  - Improve Survival of Juvenile Humpback Chub
  - Restore Native Fish Communities
- Questions/Uncertainties:
  - Effectiveness (mechanical)?
  - Impact to native fish?
- Monitoring:
  - Native fish trends:
    - Abundance & Survival
  - Non-native fish trends:
    - Abundance and size structure



Shinumo - Results

- 70-94% of Trout removed (2010-2013 electro-fishing)
- Trout capture probability (efficiency) related to fish size: Range 0.38 to 0.88



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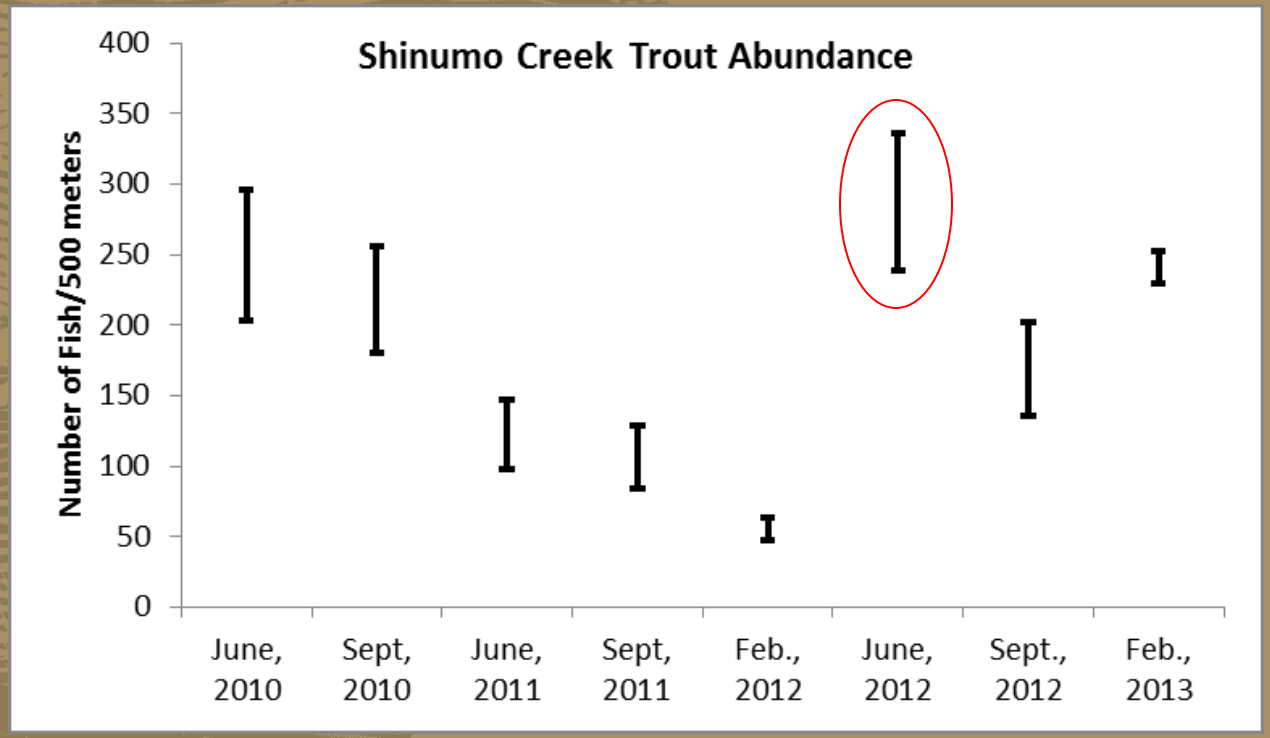
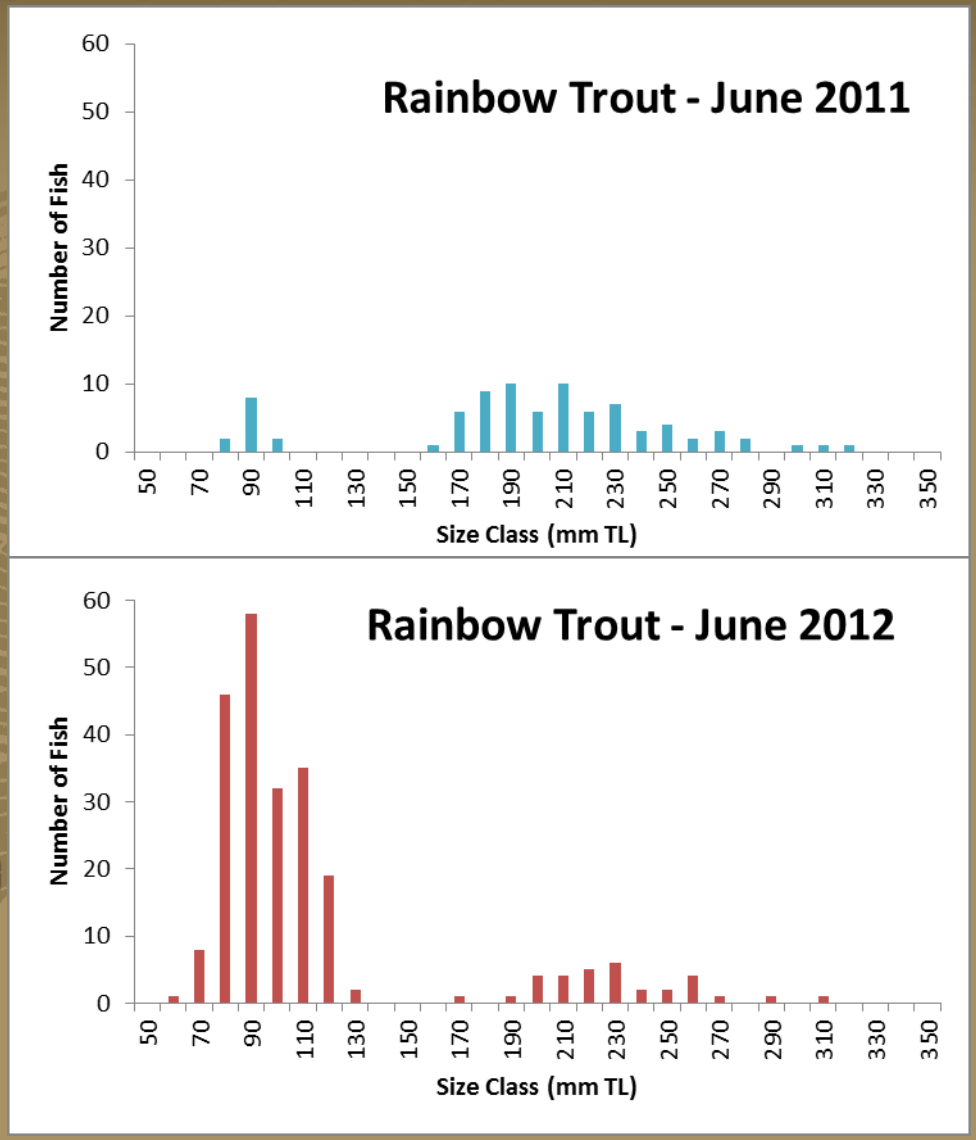


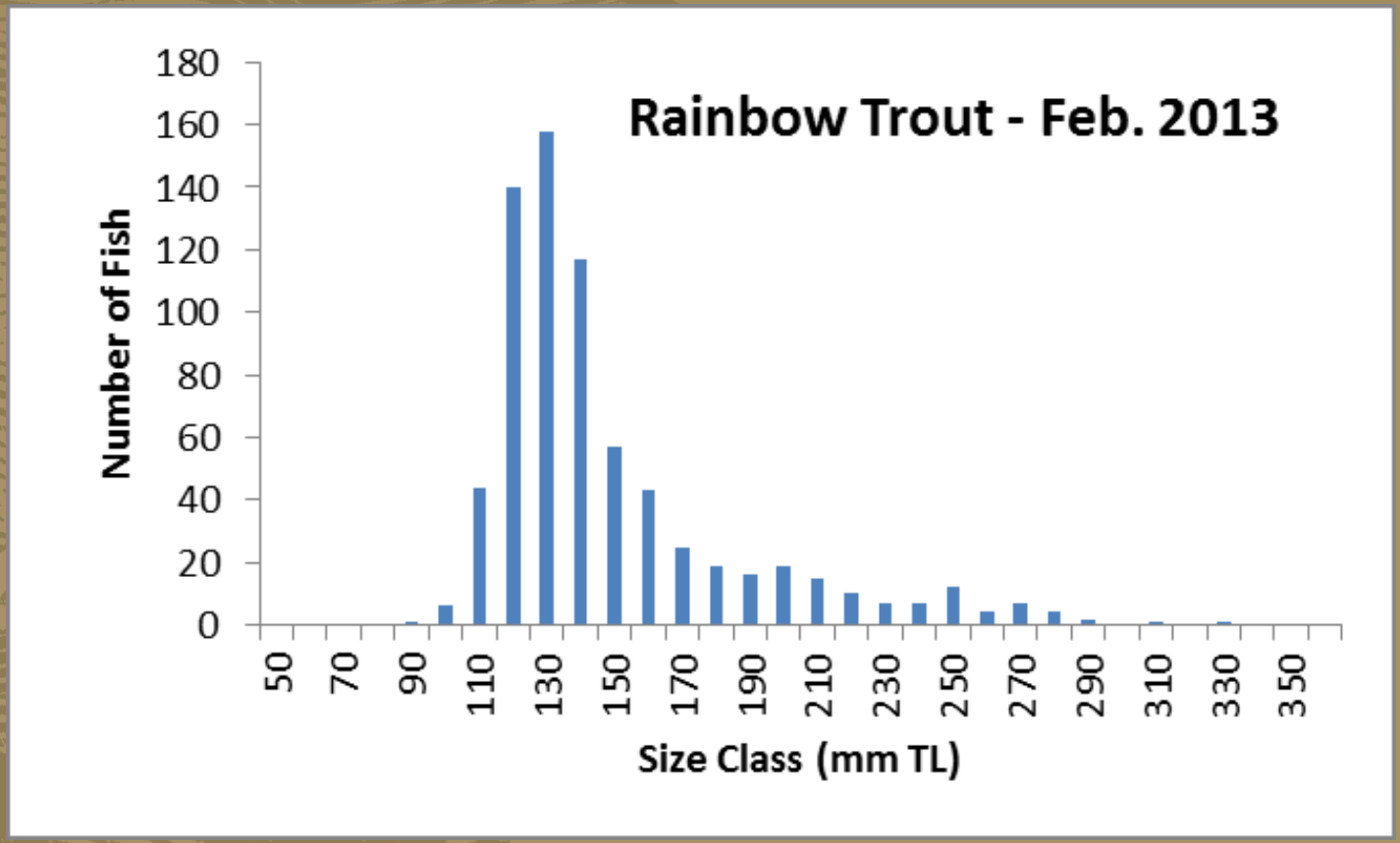
Rainbow Trout Size Structure

- Spurgeon et al. *in review*: RBT > 200 mm more likely to be piscivorous



Rainbow Trout Size Structure

- February 2013



Bright Angel Creek Trout Reduction Project

Actions: Remove Brown and Rainbow Trout

1. Install and operate a weir (fish trap)

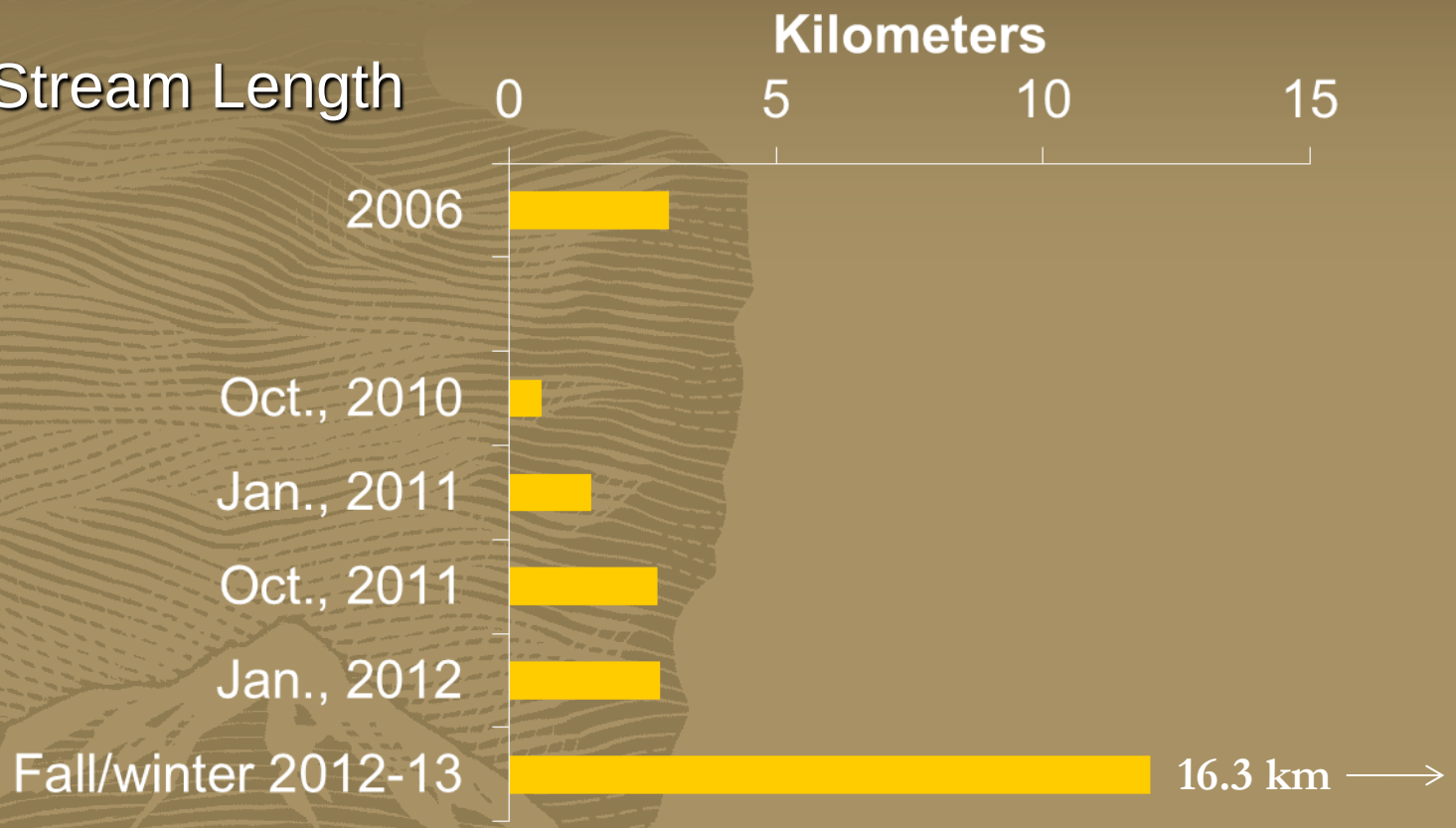
2. Backpack electro-fishing for monitoring and removal

3. Boat electro-fishing: Mainstem/Bright Angel Inflow

Preliminary Data/Analysis In Progress

Bright Angel – Electro-fishing Effort

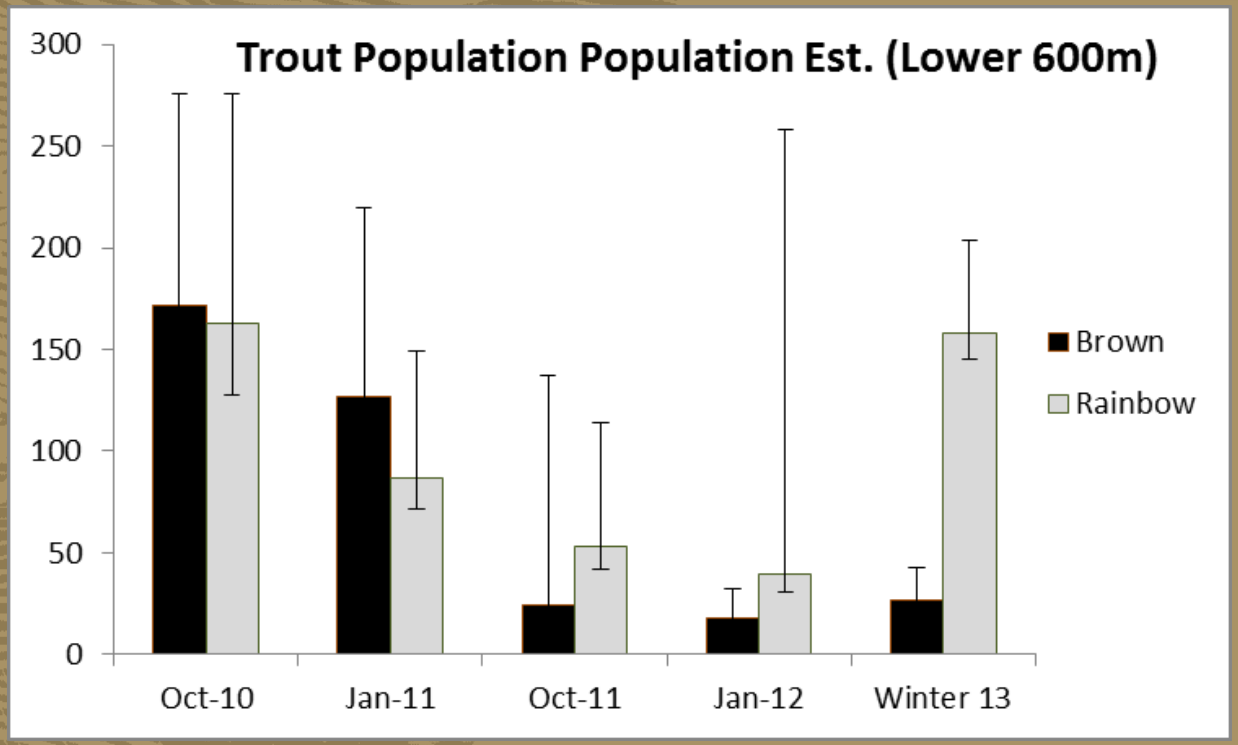
- Stream Length



- Bright Angel Creek = 21km/13 miles

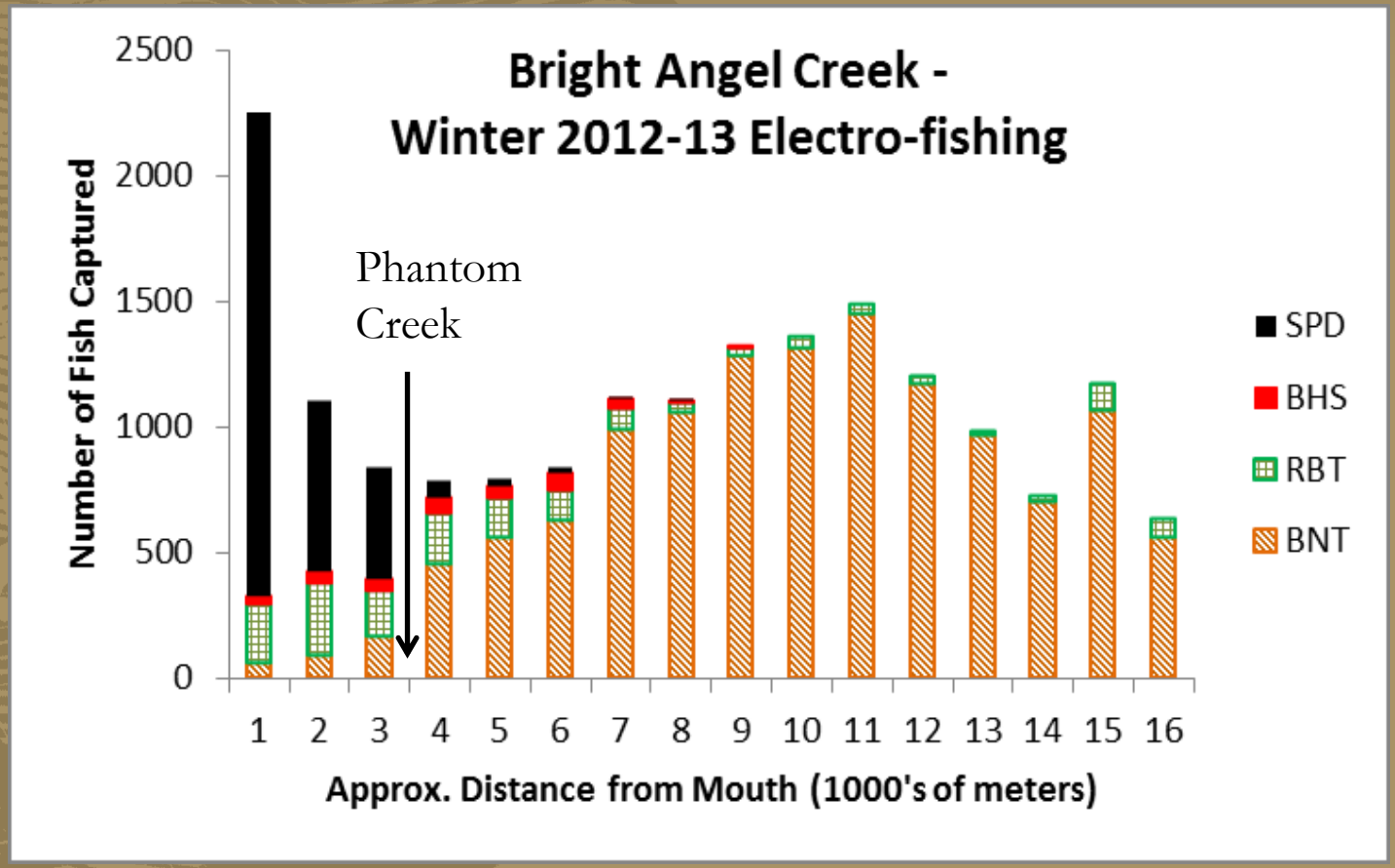
Bright Angel Creek - Results

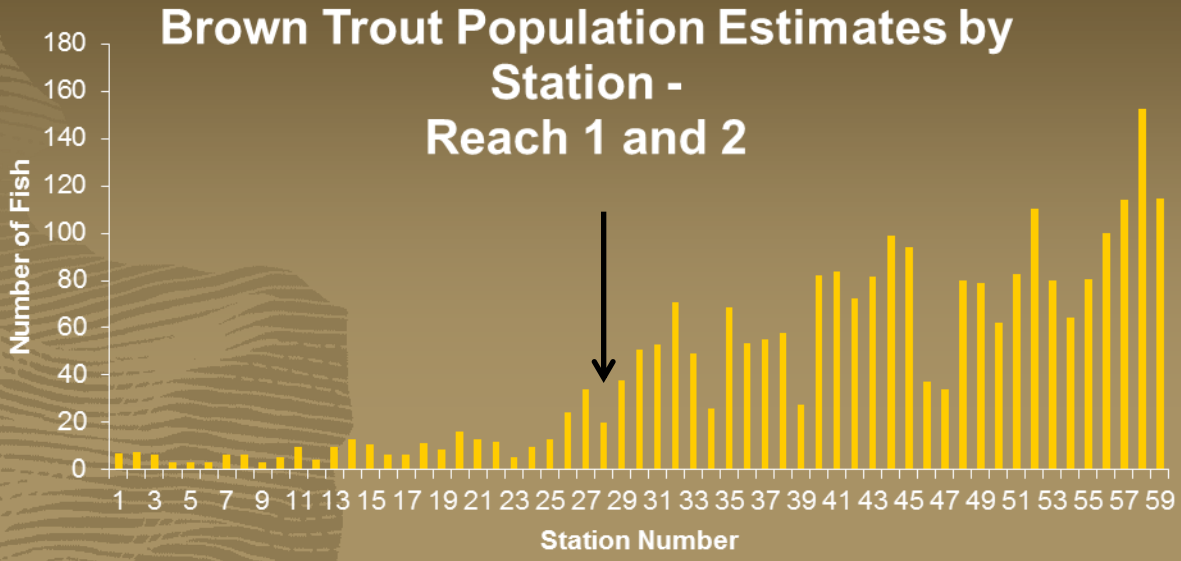
- Lower 600m: October 2010 – Spring 2013
  - Proportion removed (3-passes): 70 – 91%

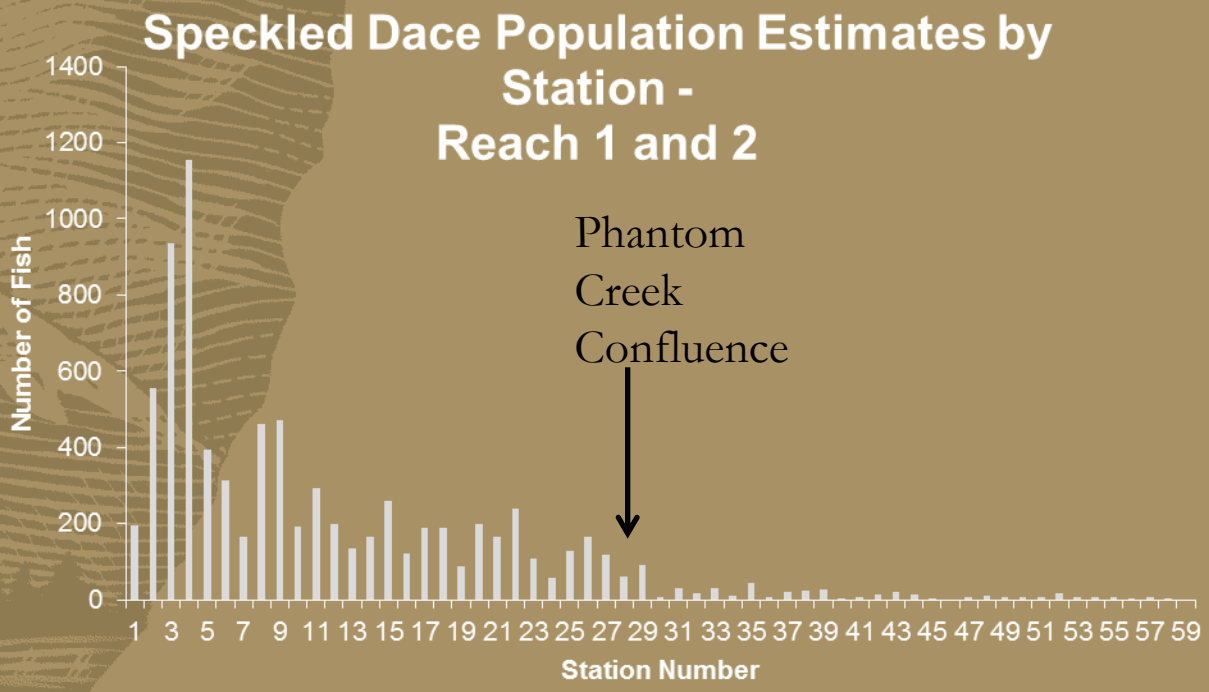


Results – Electro-fishing

- 2012-13: Species composition

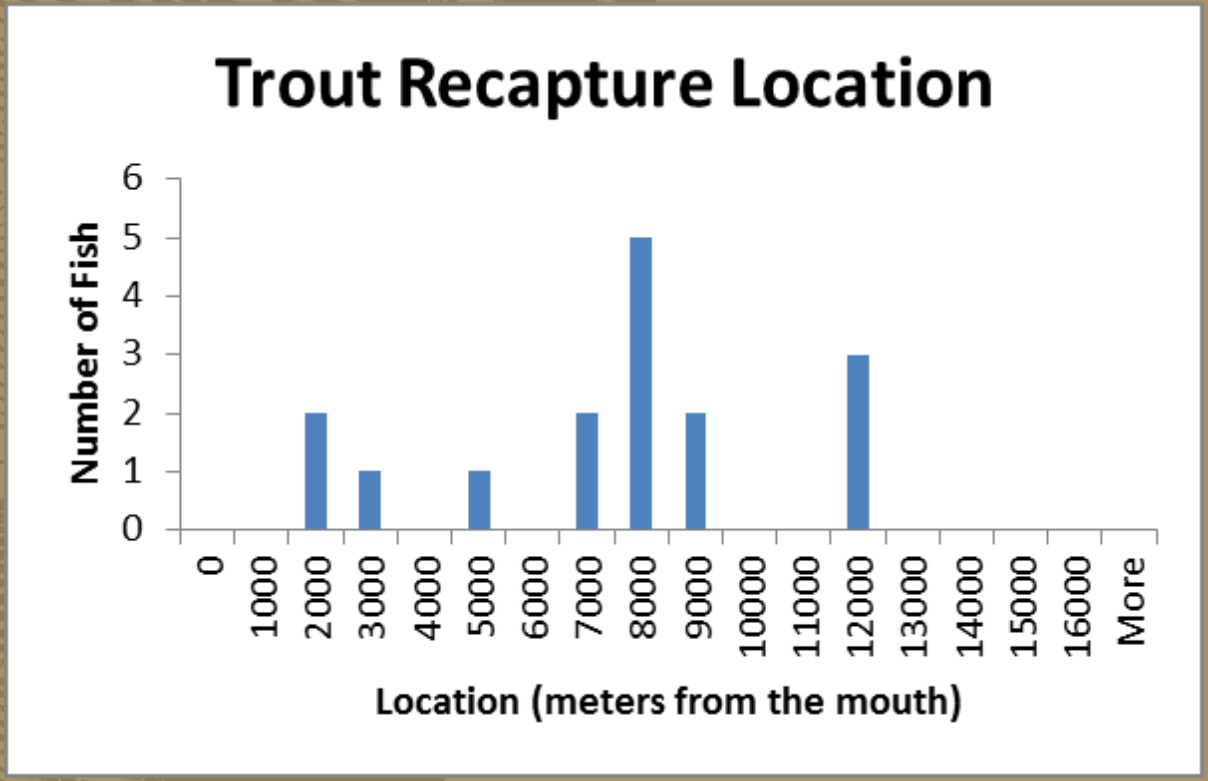



Brown Trout Population Estimates by Station - Reach 1 and 2
Number of Fish
0
20
40
60
80
100
120
140
160
180
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59
Station Number


Speckled Dace Population Estimates by Station - Reach 1 and 2
Number of Fish
0
200
400
600
800
1000
1200
1400
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59
Station Number
Phantom Creek Confluence

Trout Recaptures –

- 2012-13:
  - 16 total tagged recaptures (3 rainbow, 13 brown trout)
  - Initially tagged in the mainstem

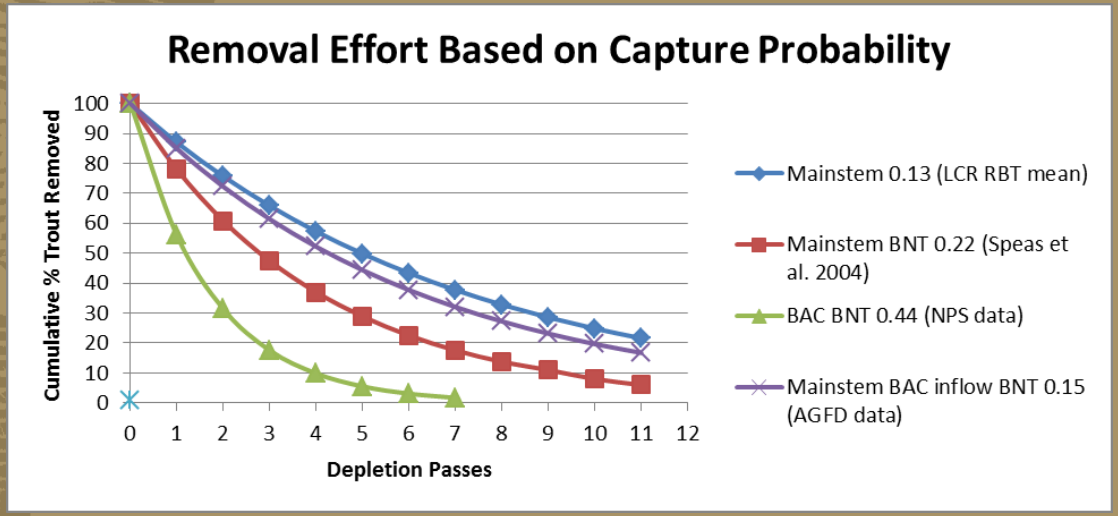


Results – Stream Electro-fishing

- Bluehead sucker survival: Preliminary/In progress
  - Number of BHS captured/tagged:
    - October 2010: 4
    - January 2011: 46
    - October 2011: 77
    - January 2012: 63
    - Fall 2012-13 : 338

Bright Angel Inflow– Electrofishing

- 80% trout reduction goal
  - Estimate of 20 nights of electro-fishing needed
- November-early December (trout aggregated)
- High Flow Experiment – cut removal trip in half
- Flooding in tributaries = muddy water
- Result = 2 nights/1 pass of clear water electrofishing
  - 10 total nights
  - Removed:
    - 1370 RBT
    - 336 BNT



Weir –

Weir Results –

- 2012-13 Installed early October – operate through early/mid-March
  - Expanded slightly to more fully encompass spawning periods

- Weir Captures:
  - 2010-11: 105 Brown trout, 107 Rainbow trout
  - 2011-12: 32 Brown trout, 55 Rainbow Trout
  - 2012-13: 176 Brown trout, 36 Rainbow trout
  - 2013-14: In progress (installed September 30, 2013)

Summary –

- 2012-13: Removed (approx.)12,470 brown trout, 1,735 rainbow trout
  - Beneficial us policy employed (per NHPA Section 106)
- Efficiently remove trout using electro-fishing
  - Expect compensatory response - future control needed
- Preliminary results:
  - Electro-fishing doesn't appear to be impacting natives negatively
  - Bright Angel Creek Brown trout control may result in increased native fish abundance
- Future:
  - Project, with monitoring, continues, CFMP decision point after 5 years

Questions?

Phantom Ranch Boat Beach, circa 1911