Colorado River Aquatic Biologists 2015

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- Utah Division of Wildlife Resources

Lake Level

Year	High	Low
2010	3638	3618
2011	3660	3609
2012	3639	3609
2013	3609	3584
2014	3609	3574
2015	3596 in January	

Shad Caught in Trawl

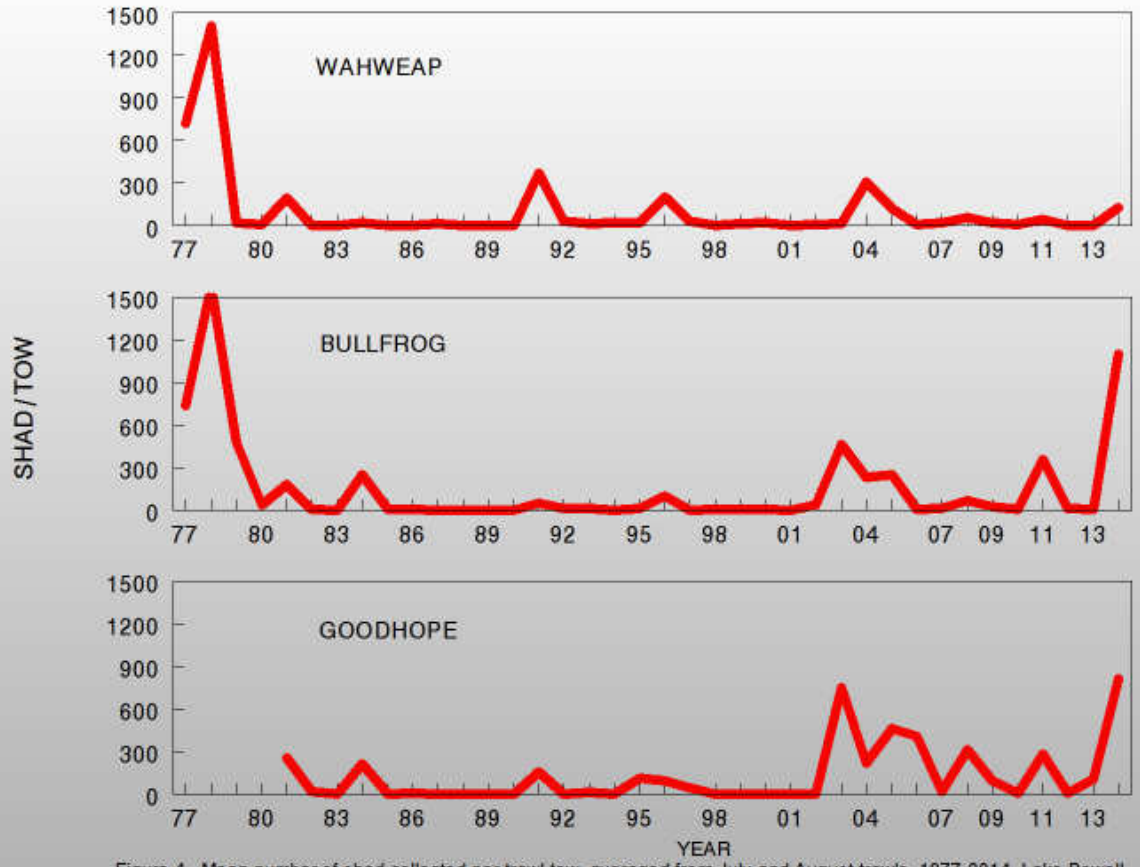


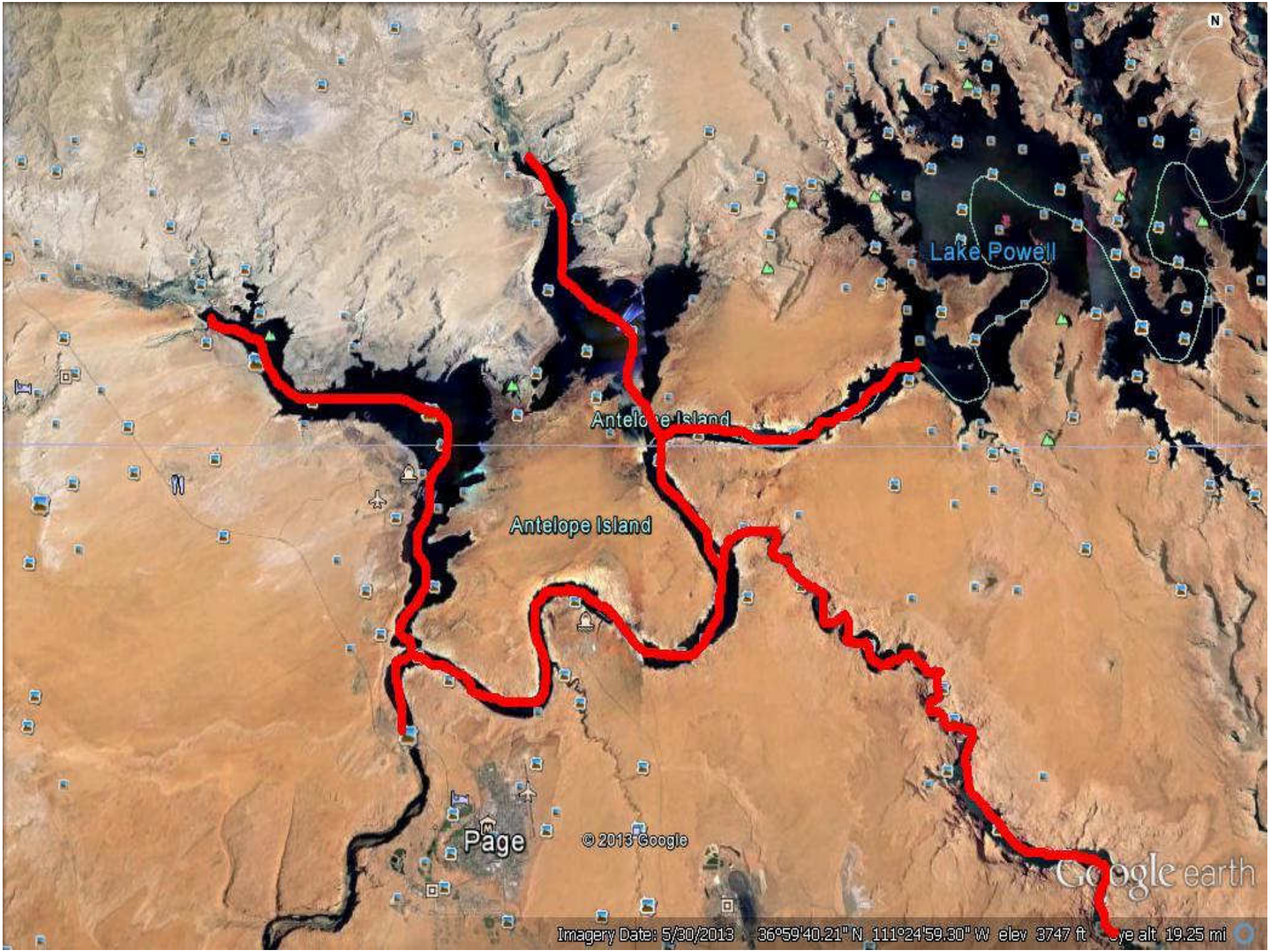
Figure 4. Mean number of shad collected per trawl tow, averaged from July and August trawls, 1977-2014, Lake Powell.

Fishery Rejuvenated 2014
Due to Forage Increase

- Threadfin Shad peak – Why?
- Gizzard shad constant
- Striped bass young population
- Largemouth bass recovered
- Walleye
- Smallmouth bass

Future of Lake Powell Fisheries?

- QM veligers found in 2012
- Adult mussels found in 2013
- Invasion covered lower 15 miles of lake
- Winter 2014


Lake Powell
Antelope Island
Antelope Island
Page
© 2013 Google
Google earth
Imagery Date: 5/30/2013 36°59'40.21" N 111°24'59.30" W elev 3747 ft
19.25 mi

Single Mussels found uplake

- 2 mussels found in Bullfrog Bay
- 95 miles uplake (boats move freely)
- Complete infestation may take 5 years

Lake Huron

Recent Food Web Alterations
-Lake Huron's Main Basin-

Zebra mussels

Round gobies

Quagga mussels

Angler use declines

1990

1995

2000

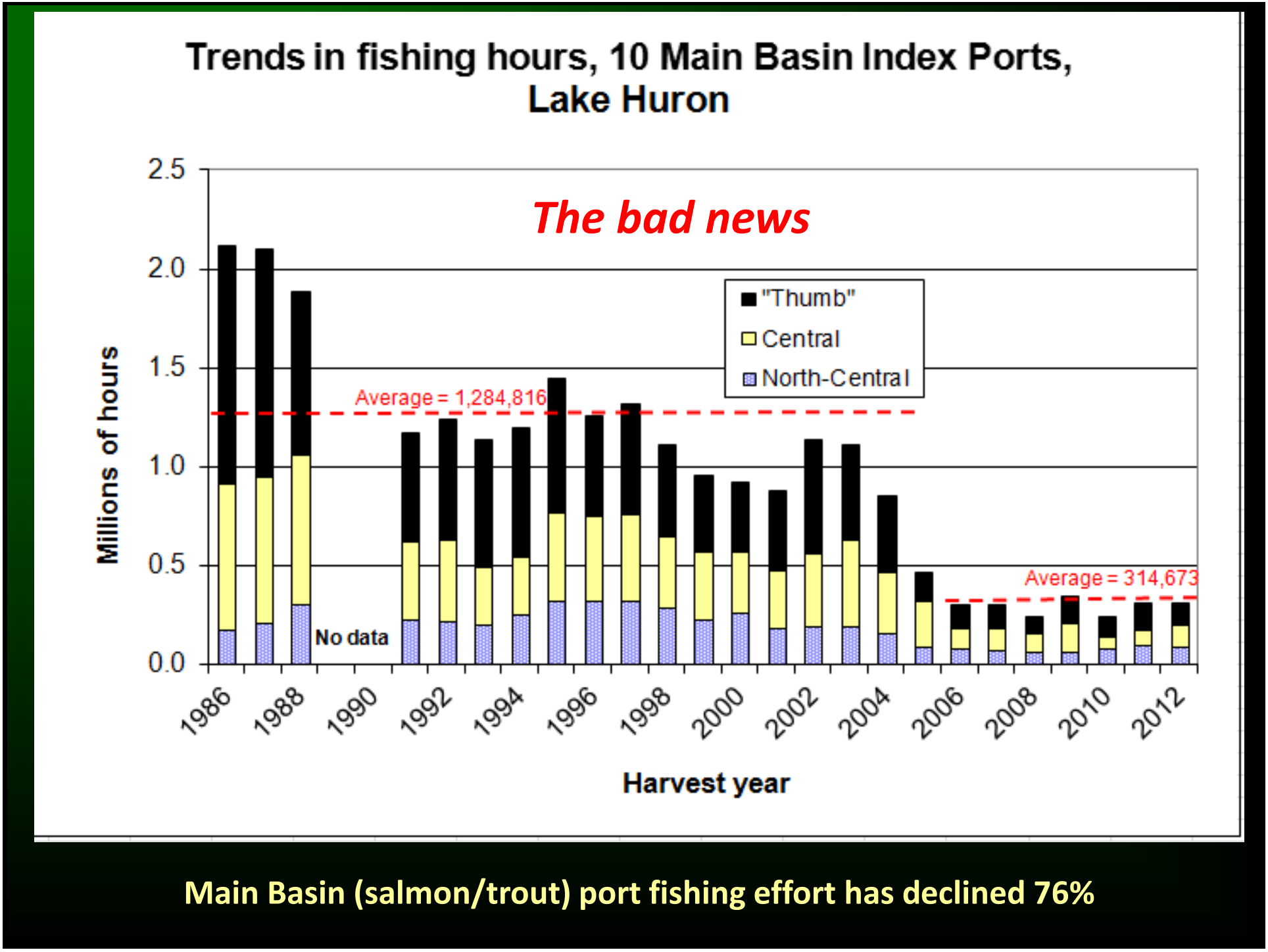
2005

Diporeia collapse begins

Zooplankton decline

Alewife collapse

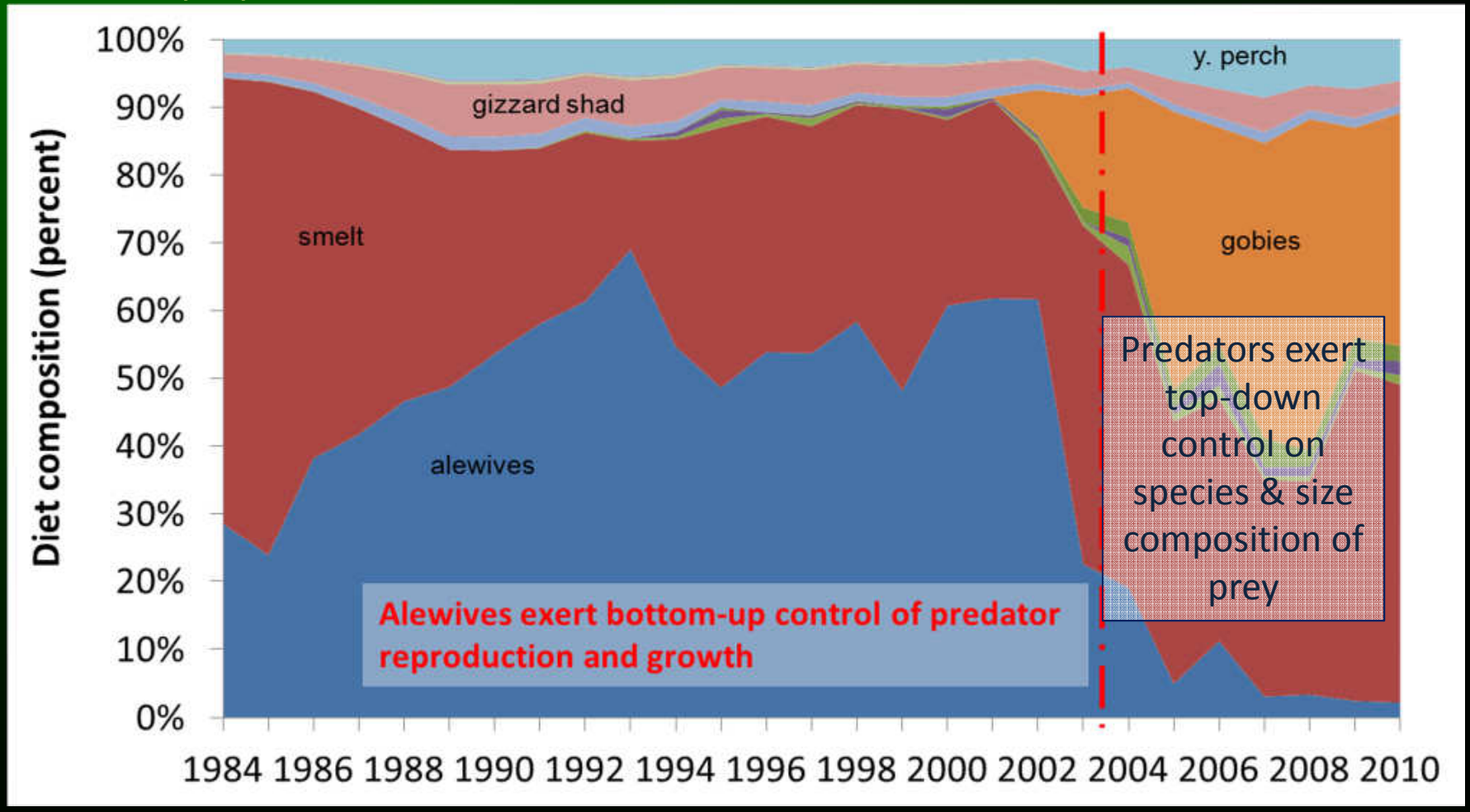
Chinook decline



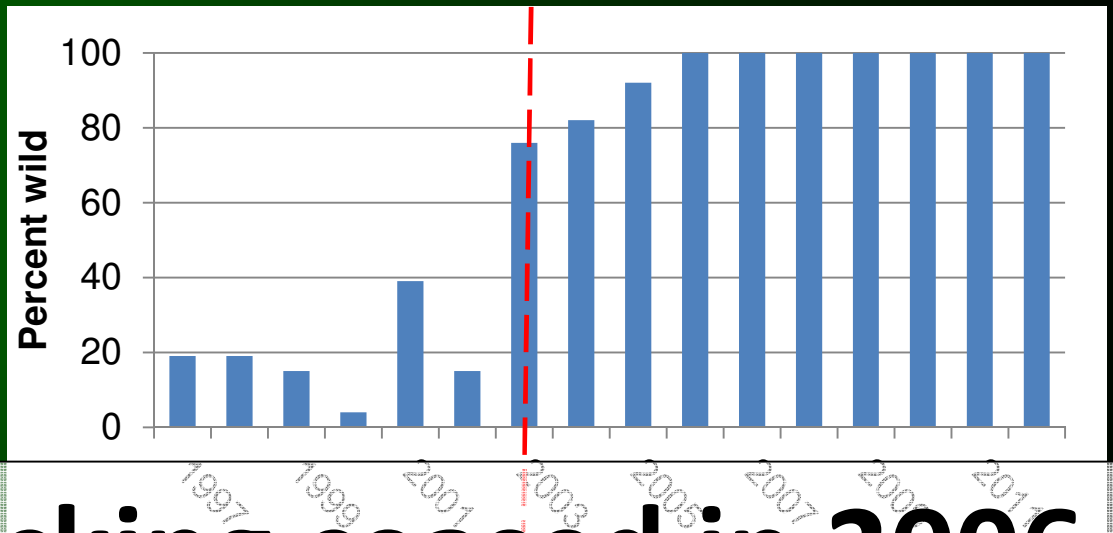
Main Basin (salmon/trout) port fishing effort has declined 76%

Change in relative effects: top-down vs bottom-up

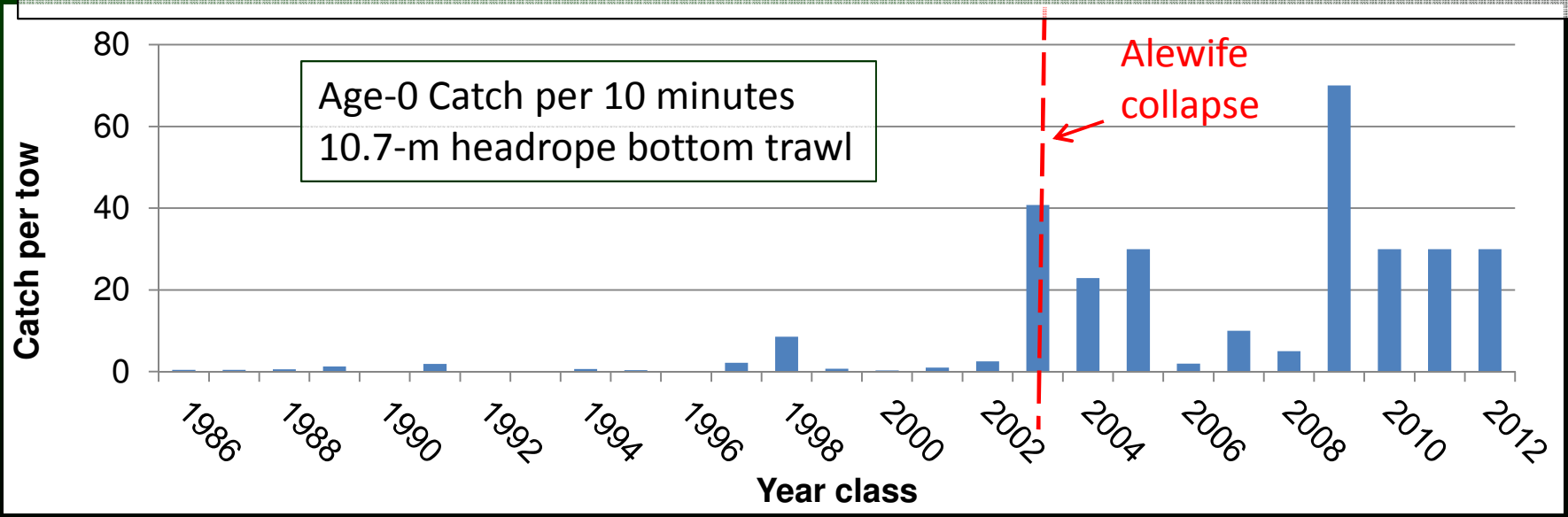
Piscivory by LAT, WAE, and CHS



Walleye reproduction



Walleye stocking ceased in 2006



Algal Blooms

- Cladophora in Great Lakes – Dead Zones

Microsystis - Polluted water
Possible Psuedofeces result

Lake Havasu

- Bass fishing much improved
- World record Redear sunfish
- Warm water reducing mussels from upper 18 feet –
- Surface temperature 88 F
- Striped bass not abundant
- Shad status not known

Lake Mohave

- Bass fishing good
- Striped bass in low numbers
- Shad low in numbers
- No Redear Sunfish
- Lake Mead Tail water cools upper lake
- Good habitat for stripers and mussels

Lake Mead

- Striped bass declining –but good condition
- Largemouth bass declining
- Smallmouth Bass maintaining
- Shad – peak year

Lake Powell Food Web

- Current food web
- Plankton>Shad>Stripers
- Plankton>shad, sunfish or crayfish>Bass

New Food Web

- Nutrients, plankton>mussels> mussel predator?>game fish
- Stripers and shad likely to decline
- Walleye and smallmouth likely to maintain

Lake Powell Food Web Alterations

Quagga mussels

Forage Fish??

Walleye, Bass

Angler use declines

2010

2015

2020

2025

Zooplankton decline

TFShad collapse

Striped bass decline

Fine for Moving Mussels

- Fiesta Queen - Hwy by Lake Powell
- $4,500 fine
- Ocean Vessel – Great Lakes - $3,000 fine
- 1 in 2010

Conclusion

- Future Lake Powell fishery is dependent on capturing energy diverted by mussels and transmitting that energy to sport fish.
- First step is to learn which food web will be the most effective in mussel-infested Lake Powell.
- Management action needed to DIRECT establishment of new food web.

Questions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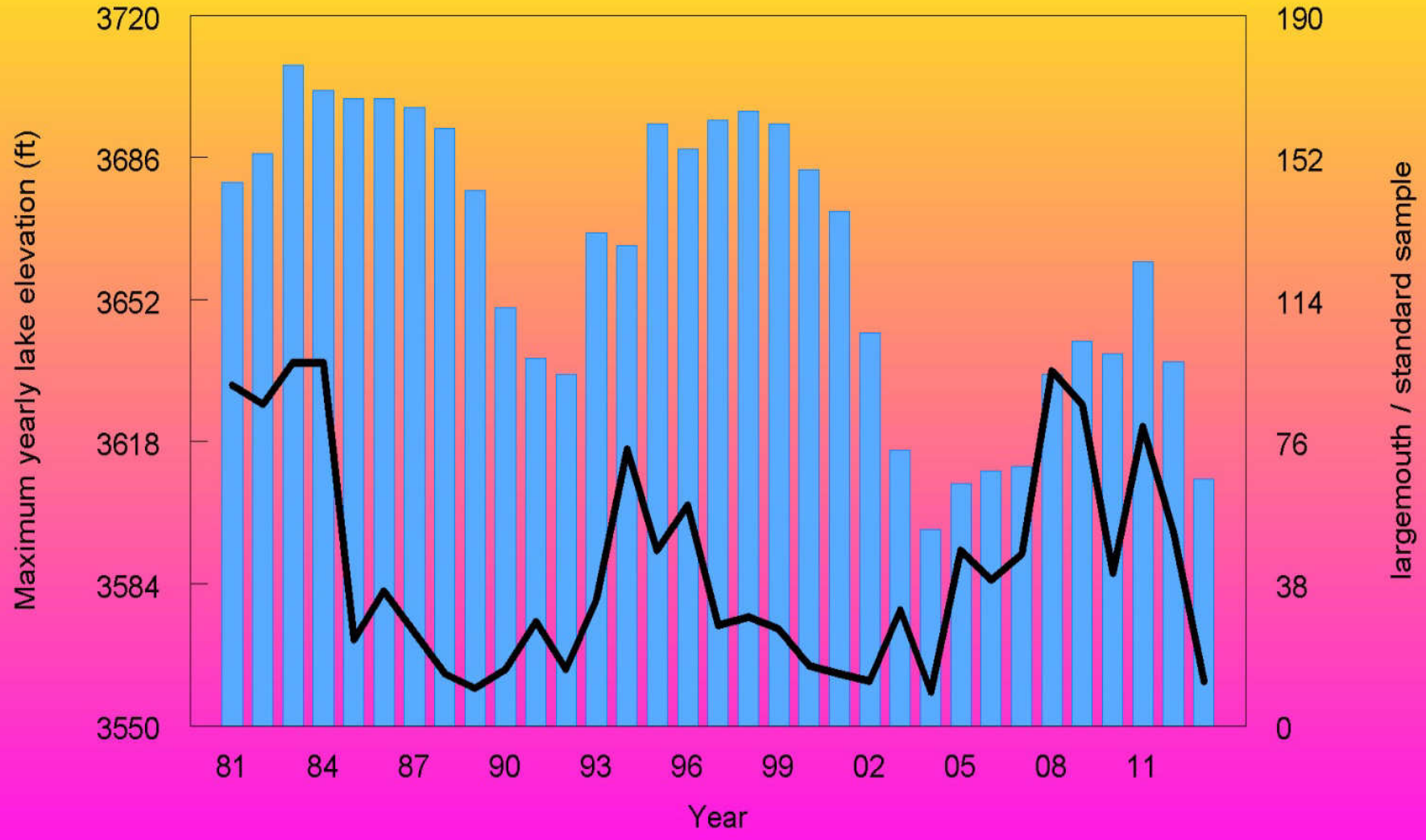

Figure 1. Relationship between maximum yearly water elevation (bar) and number of Largemouth Bass collected from annual fall gill-net survey (line), Lake Powell, UT, 1981 - 2012.

Shad Abundance - Striped Bass Condition

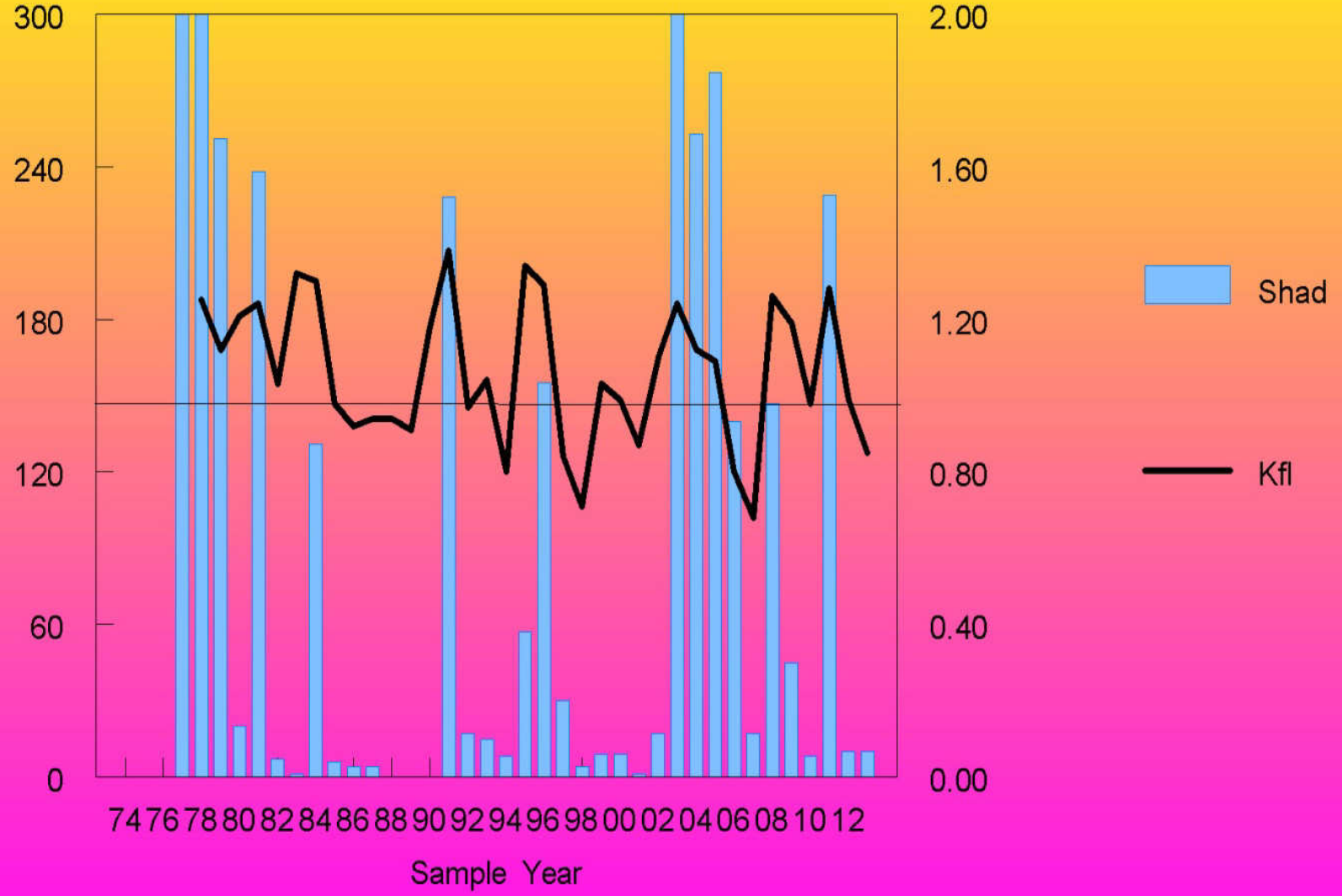

Figure 2. Pelagic shad abundance compared to adult striped bass condition, K(fl), 1976-2012, Lake Powell.