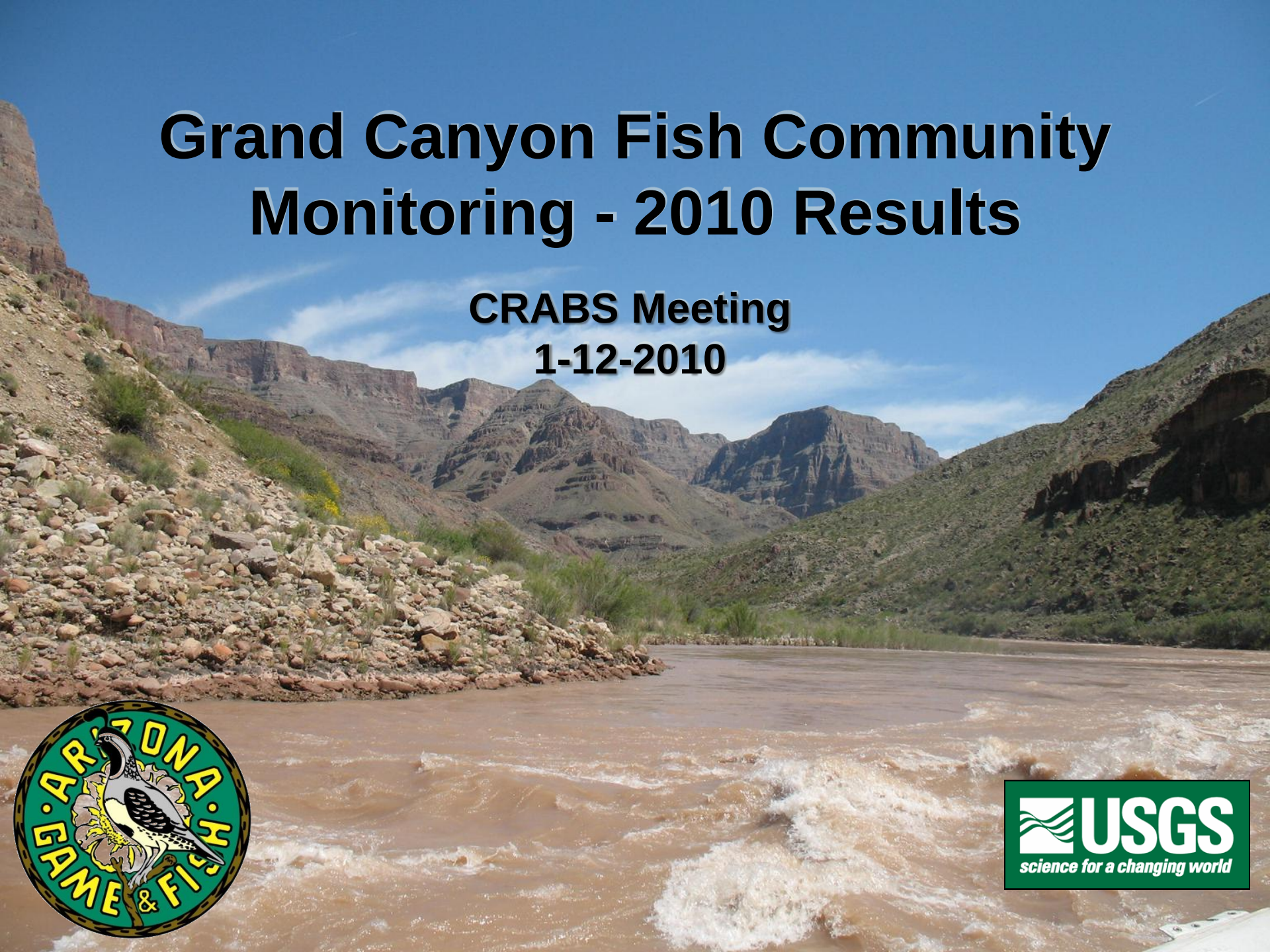
Grand Canyon Fish Community Monitoring - 2010 Results

CRABS Meeting
1-12-2010



Background

Non-native salmonids (i.e., rainbow and brown trout) have increased in abundance since early 1990's

Salmonids may limit recruitment of native fishes

(Minckley 1991; Marsh and Douglas 1997; U.S. Department of Interior 2002)

GCMRC Protocol Evaluation Program advocated long-term monitoring of non-native fish species

Photo: Rogers 2005

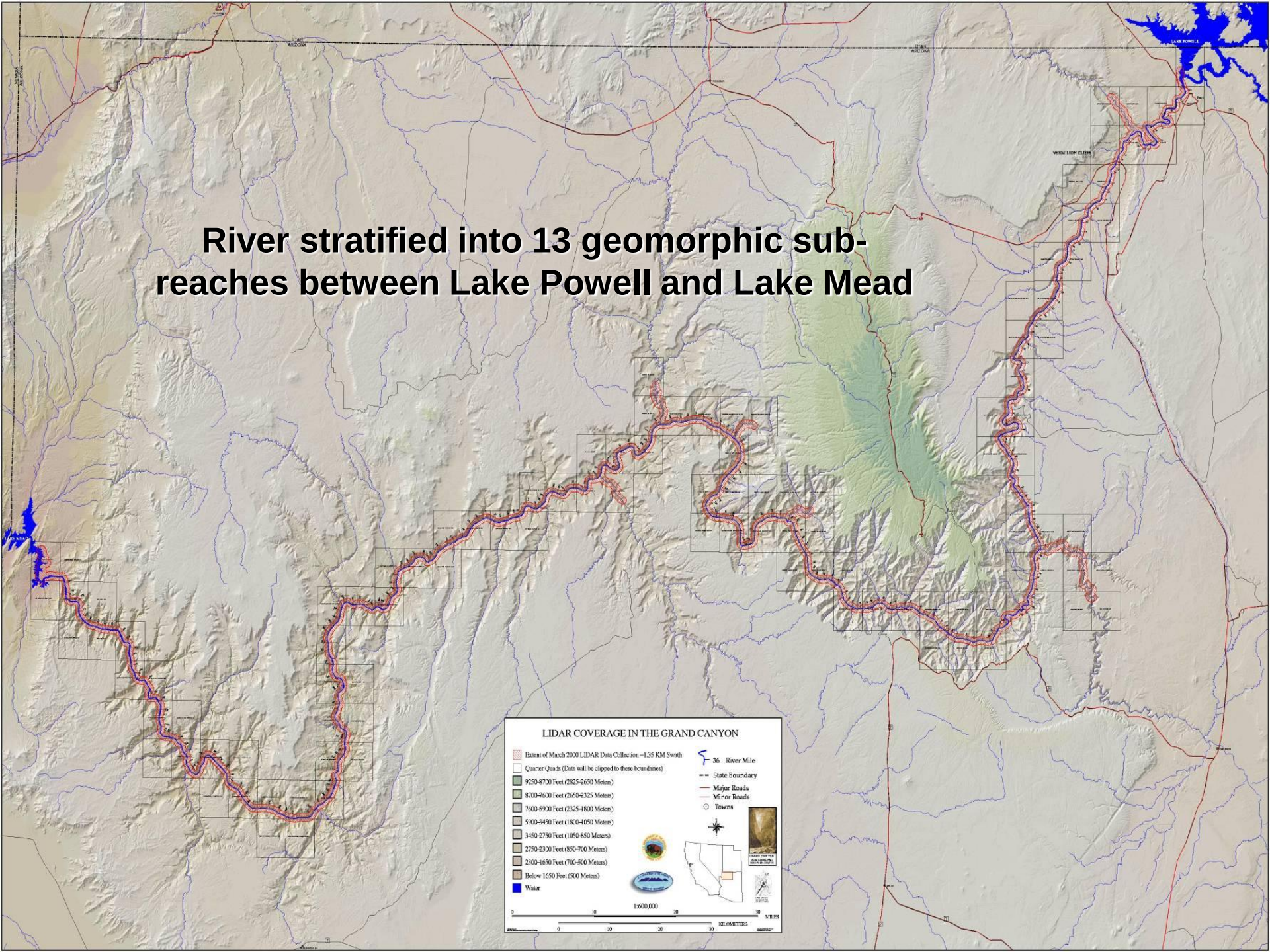
Mainstem fish community monitoring

2010 Objectives

- Describe trends in nonnative salmonid and carp, and native catastomid catch-per-unit-effort (CPUE; fish/hr) and distribution from 2000 – 2010.

- Measure changes in fish CPUE near the confluence of the Little Colorado River.

- Evaluate the ability to monitor movement and growth of rainbow trout by Floy tagging.


River stratified into 13 geomorphic sub-reaches between Lake Powell and Lake Mead
LIDAR COVERAGE IN THE GRAND CANYON
Extent of March 2000 LIDAR Data Collection ~1.35 KM Swath
Quarter Quads (Data will be clipped to these boundaries)
9250-8700 Feet (2825-2650 Meters)
8700-7600 Feet (2650-2325 Meters)
7600-5900 Feet (2325-1800 Meters)
5900-3450 Feet (1800-1050 Meters)
3450-2750 Feet (1050-850 Meters)
2750-2300 Feet (850-700 Meters)
2300-1650 Feet (700-500 Meters)
Below 1650 Feet (500 Meters)
Water
36 River Mile
State Boundary
Major Roads
Minor Roads
Towns
1:600,000
MILES
KILOMETERS

Methods: Electrofishing

- Two trips conducted in Spring (April– May)
- Randomized site selection within study reaches
- Single-pass shoreline electrofishing at night (2 boats)
- 800-900 transects (1 transect = ~300 sec. shock time)
- Data attained: Species ID, TL (all species) & FL (natives only; mm), Wt (g), and tag returns (i.e., Floy, PIT, and/or fin-clips)

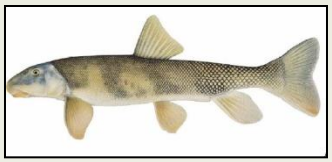
Goal: Gather information on any fish we can get our hands on!

Non-native monitoring targets:

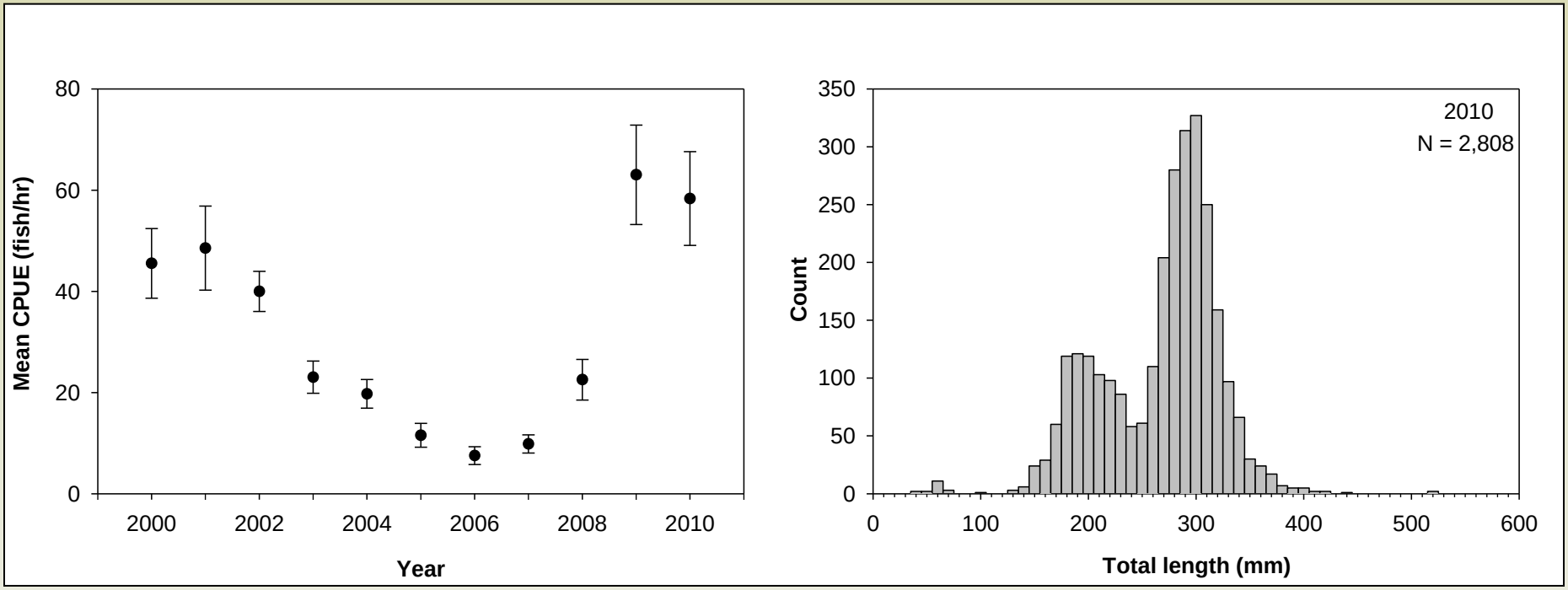


Also, rare and elusive species (e.g., centrarchids)

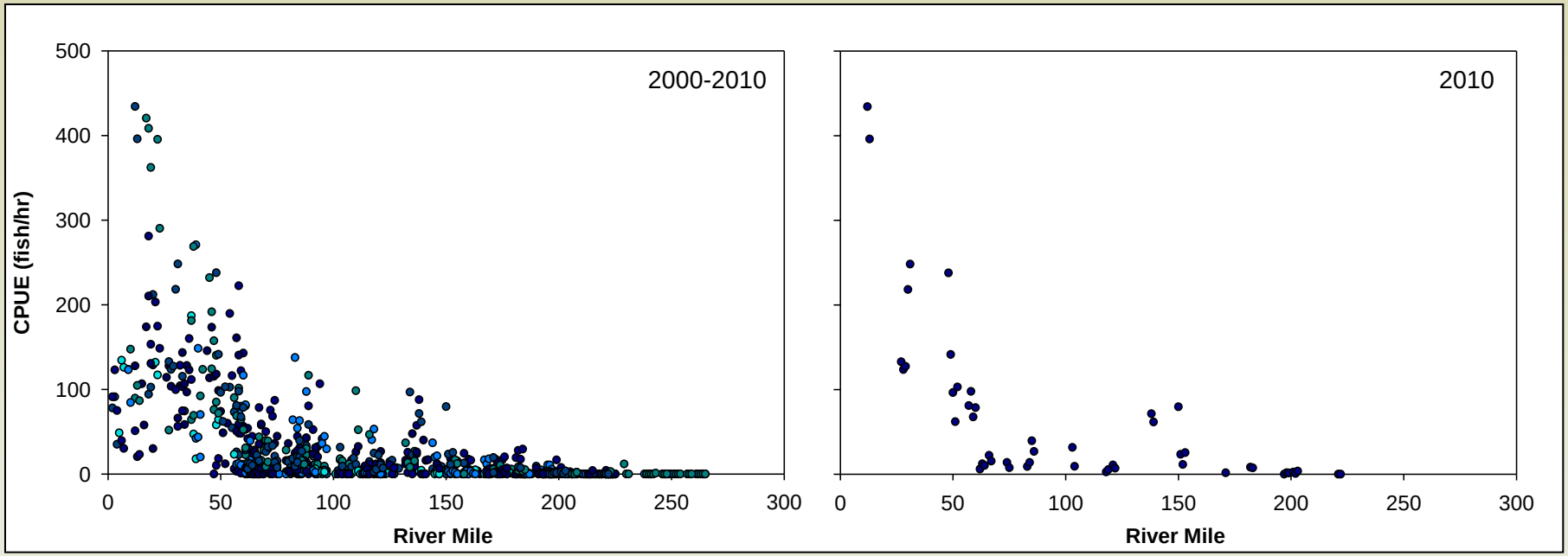
Native monitoring targets:



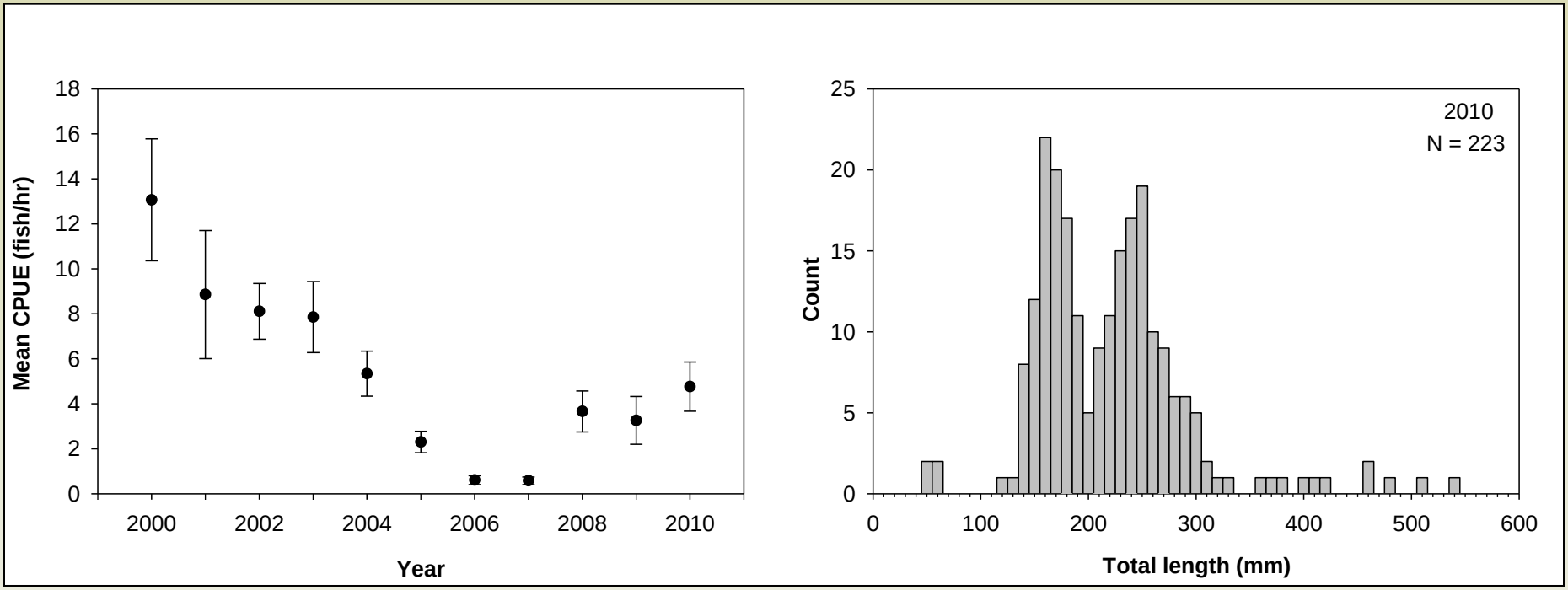
Rainbow trout



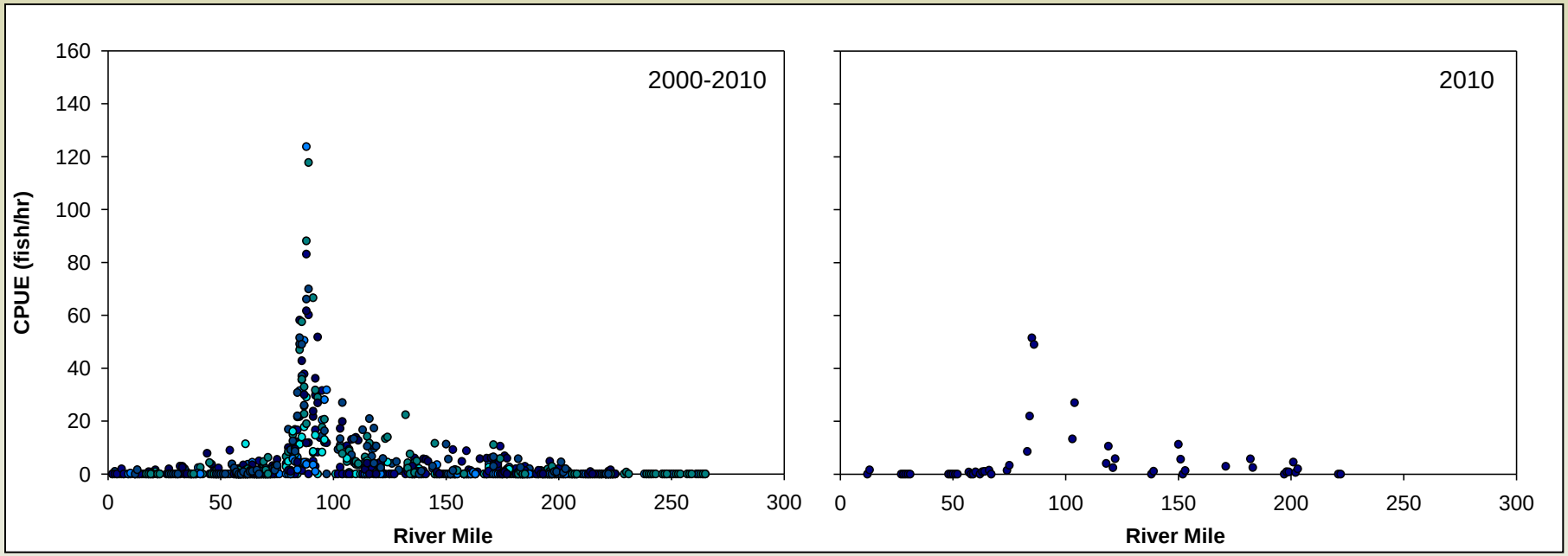
Rainbow trout



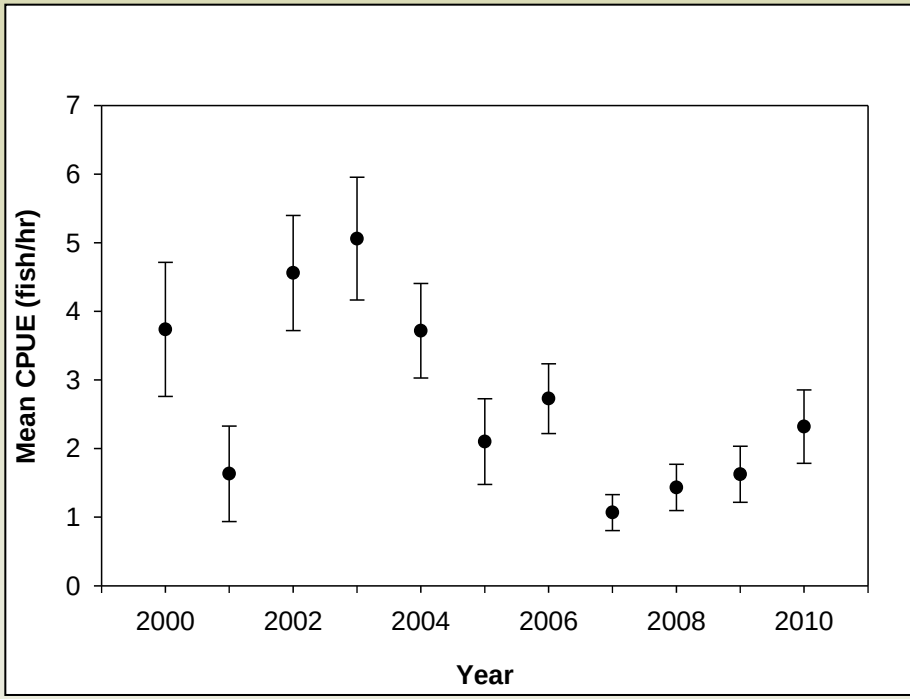
Brown trout

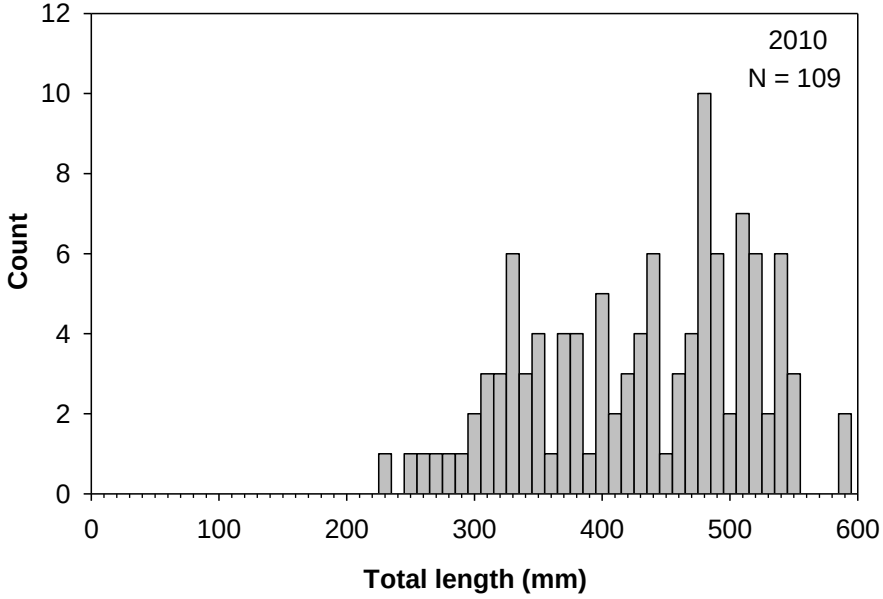

Mean CPUE (fish/hr)
0
2
4
6
8
10
12
14
16
18
2000
2002
2004
2006
2008
2010
Year
Count
0
5
10
15
20
25
0
100
200
300
400
500
600
Total length (mm)
2010
N = 223

Brown trout

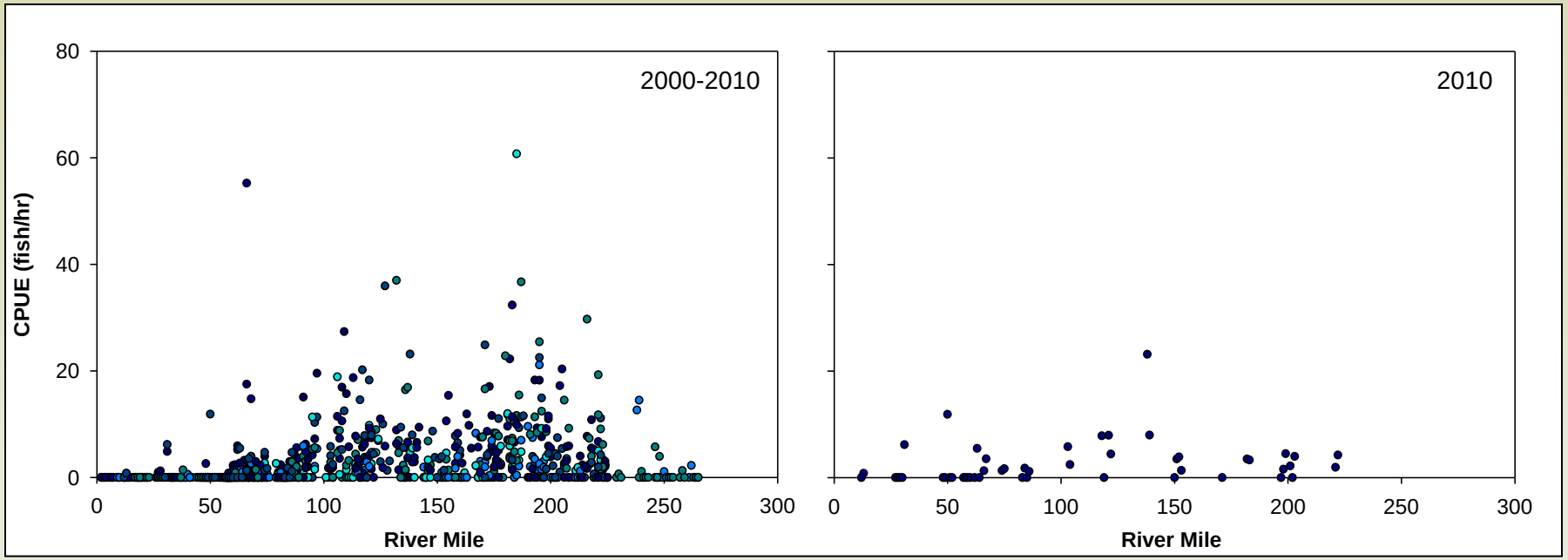

2000-2010
2010
CPUE (fish/hr)
River Mile
River Mile
0
20
40
60
80
100
120
140
160
0
50
100
150
200
250
300

Common carp

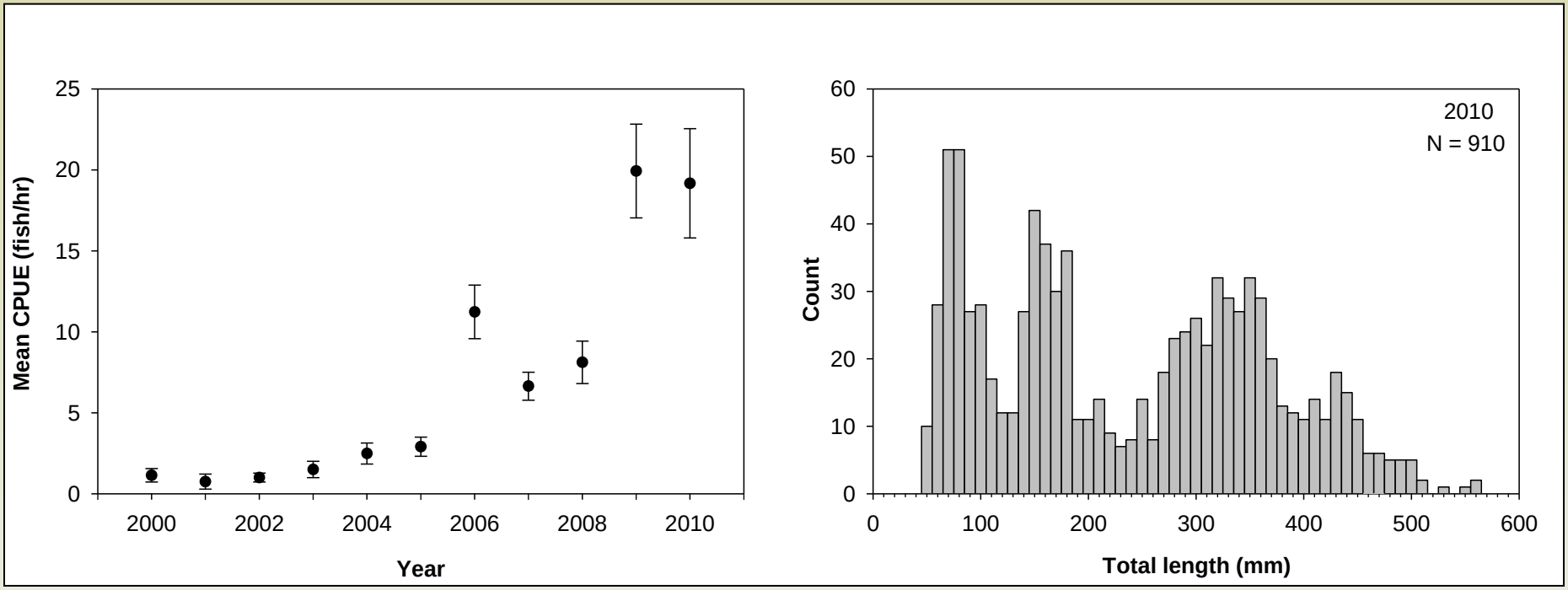

Mean CPUE (fish/hr)
0
1
2
3
4
5
6
7
2000
2002
2004
2006
2008
2010
Year


Count
0
2
4
6
8
10
12
2010
N = 109
0
100
200
300
400
500
600
Total length (mm)

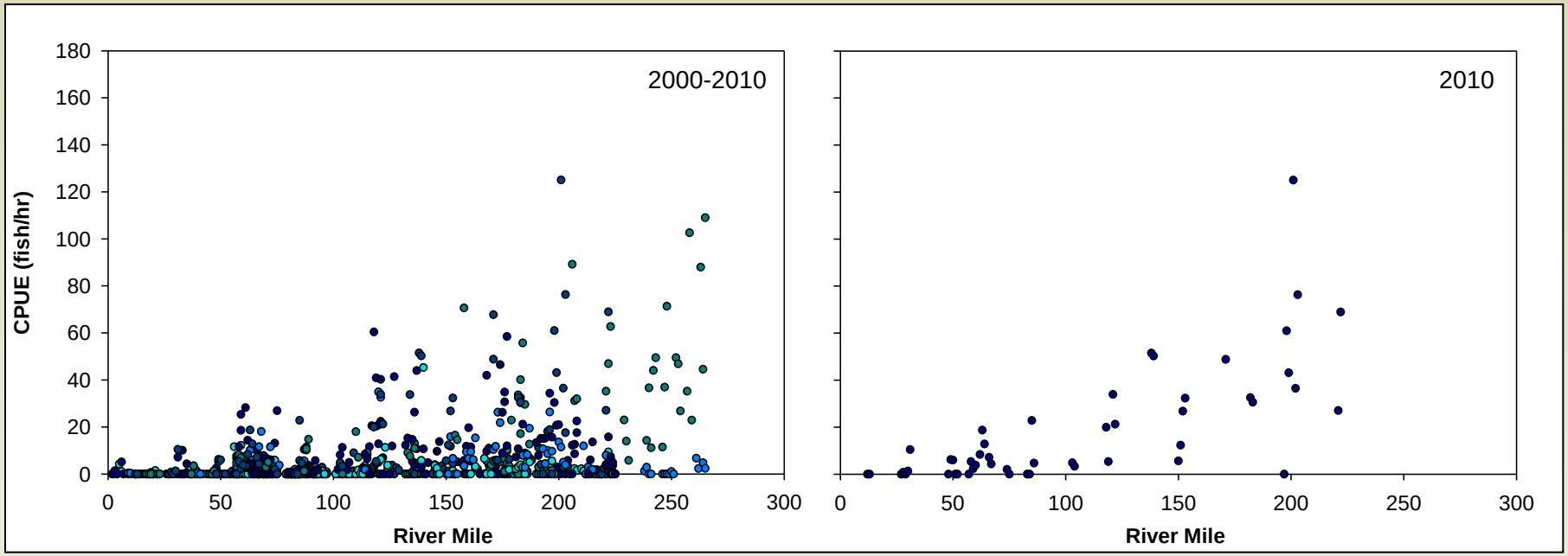
Common carp

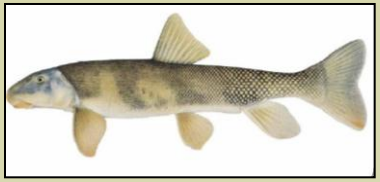

2000-2010
2010
CPUE (fish/hr)
River Mile
River Mile
0
20
40
60
80
0
50
100
150
200
250
300

Flannelmouth sucker

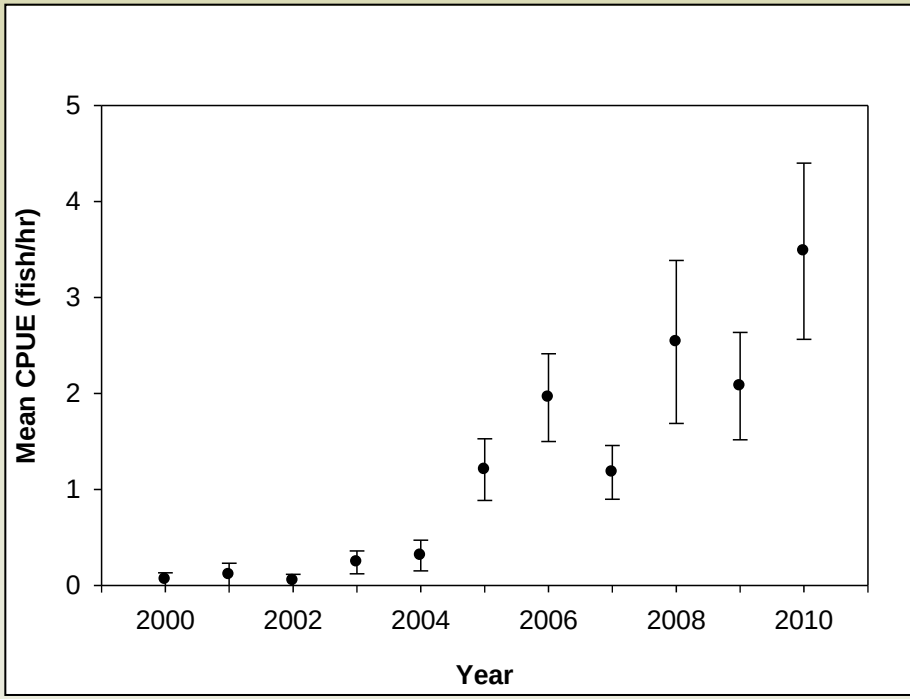


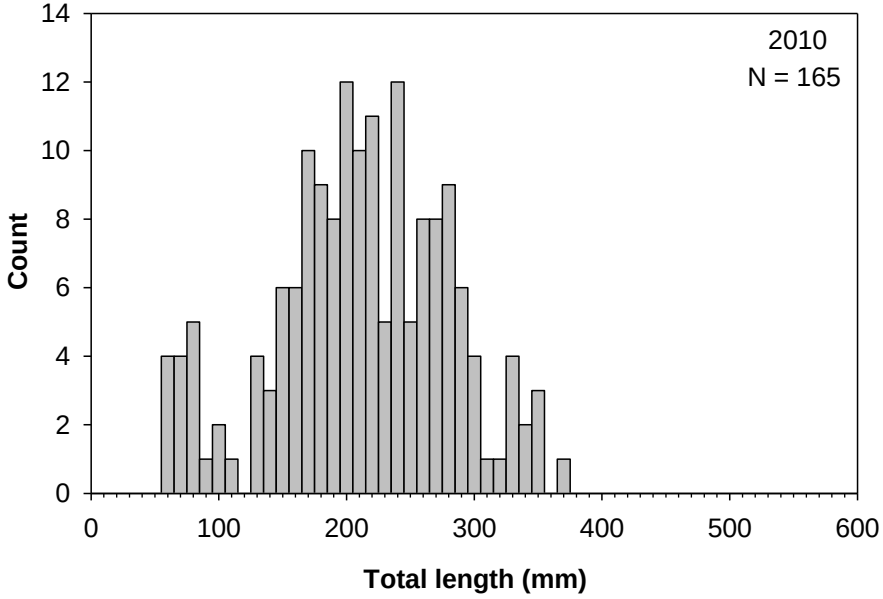
Flannelmouth sucker

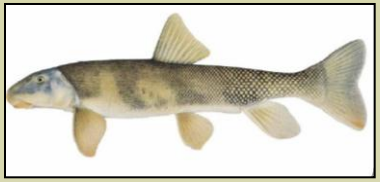




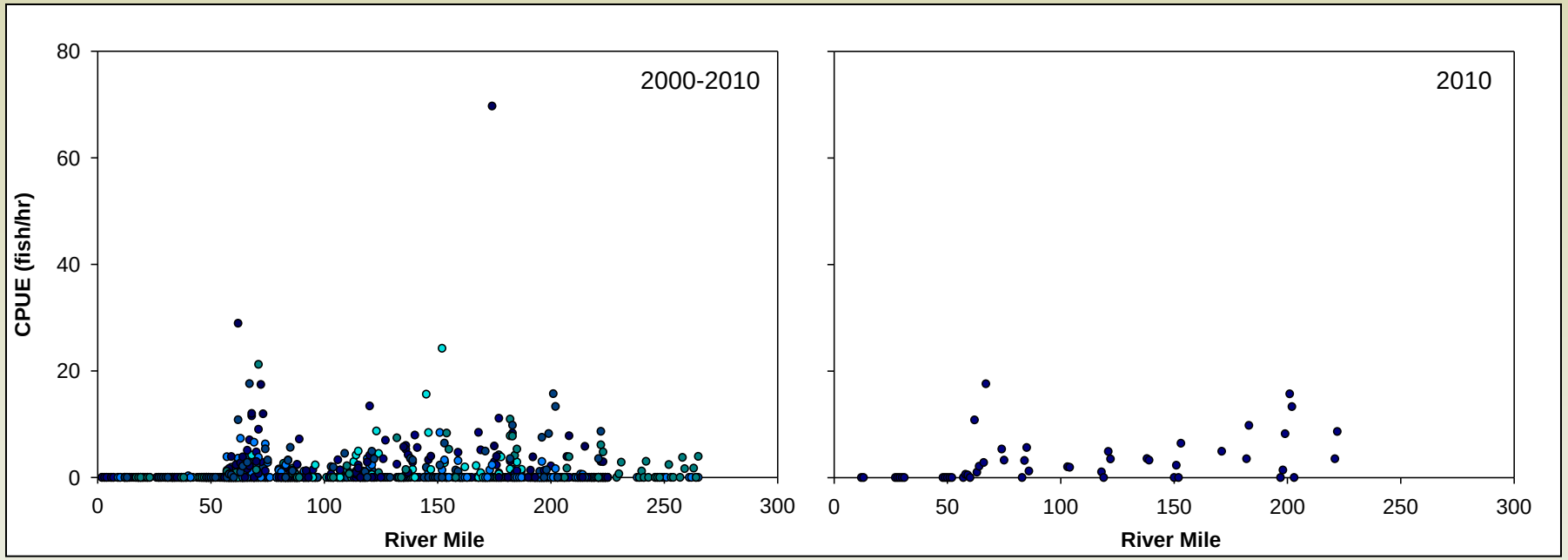
Bluehead sucker

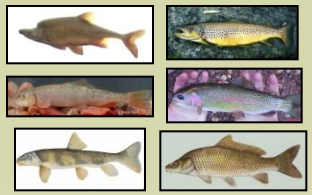






Bluehead sucker





Conclusions

- Since mid-2000's - increasing trends in CPUE for all species both native and nonnative
- Fish distribution consistent with previous years
- Why? Hypothesized that temperature and mechanical removal contributed…
- Maybe we need to take a closer look at Lake Powell productivity, and nutrients released from the dam