An Overview of Inland Fisheries Surveys in North Carolina's Albemarle/Pamlico Region

Diadromous Fish

- Atlantic States Marine Fisheries Commission requires that anadromous fish populations be monitored and reported on annually by each state
- Fisheries Restoration Act of 1997 required state marine fisheries agencies to develop Fishery Management Plans for species under their jurisdiction
- DMF and WRC have cooperated in these efforts

Estuarine Striped Bass Management Plan

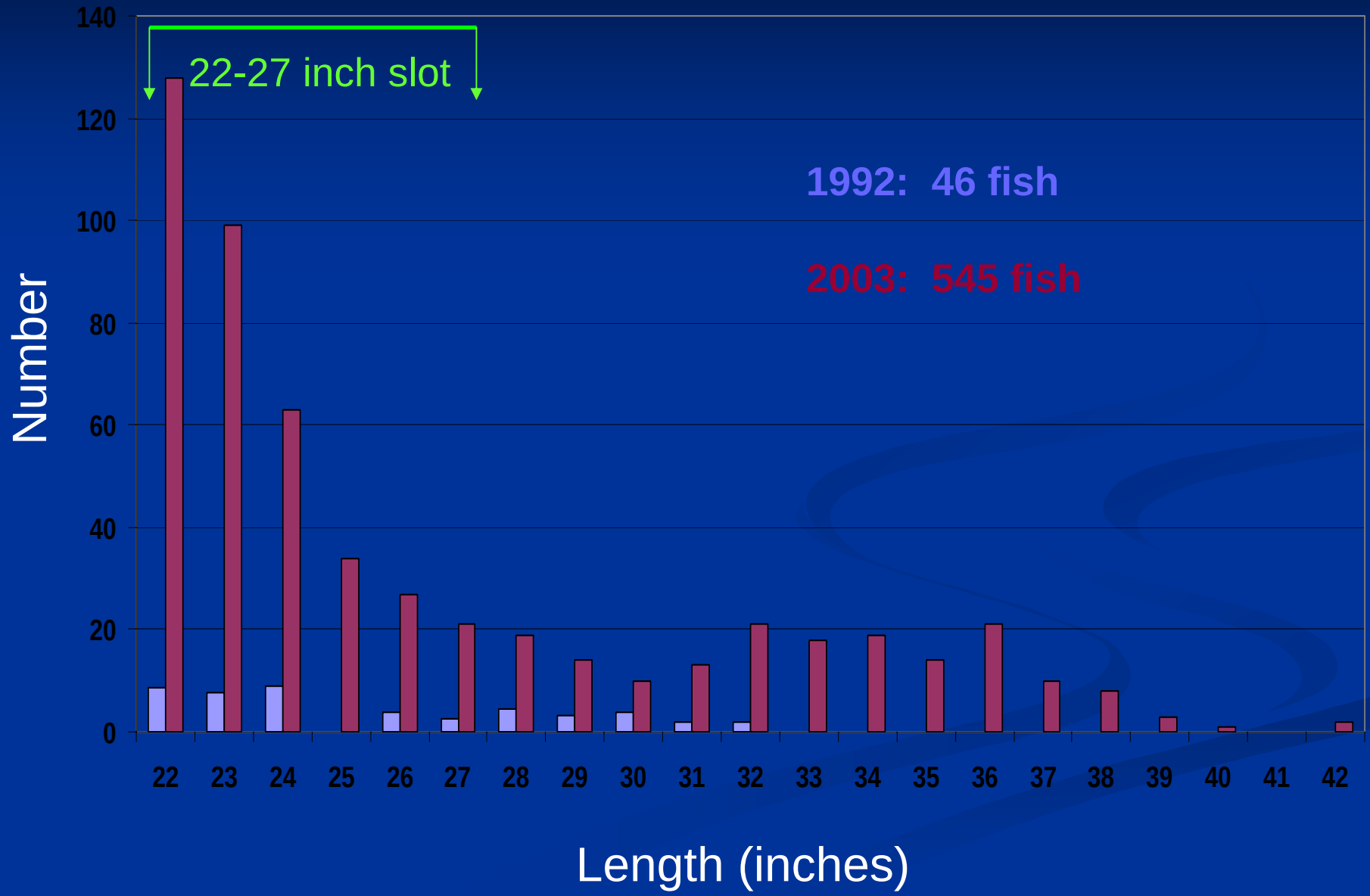
North Carolina Wildlife Resources Commission

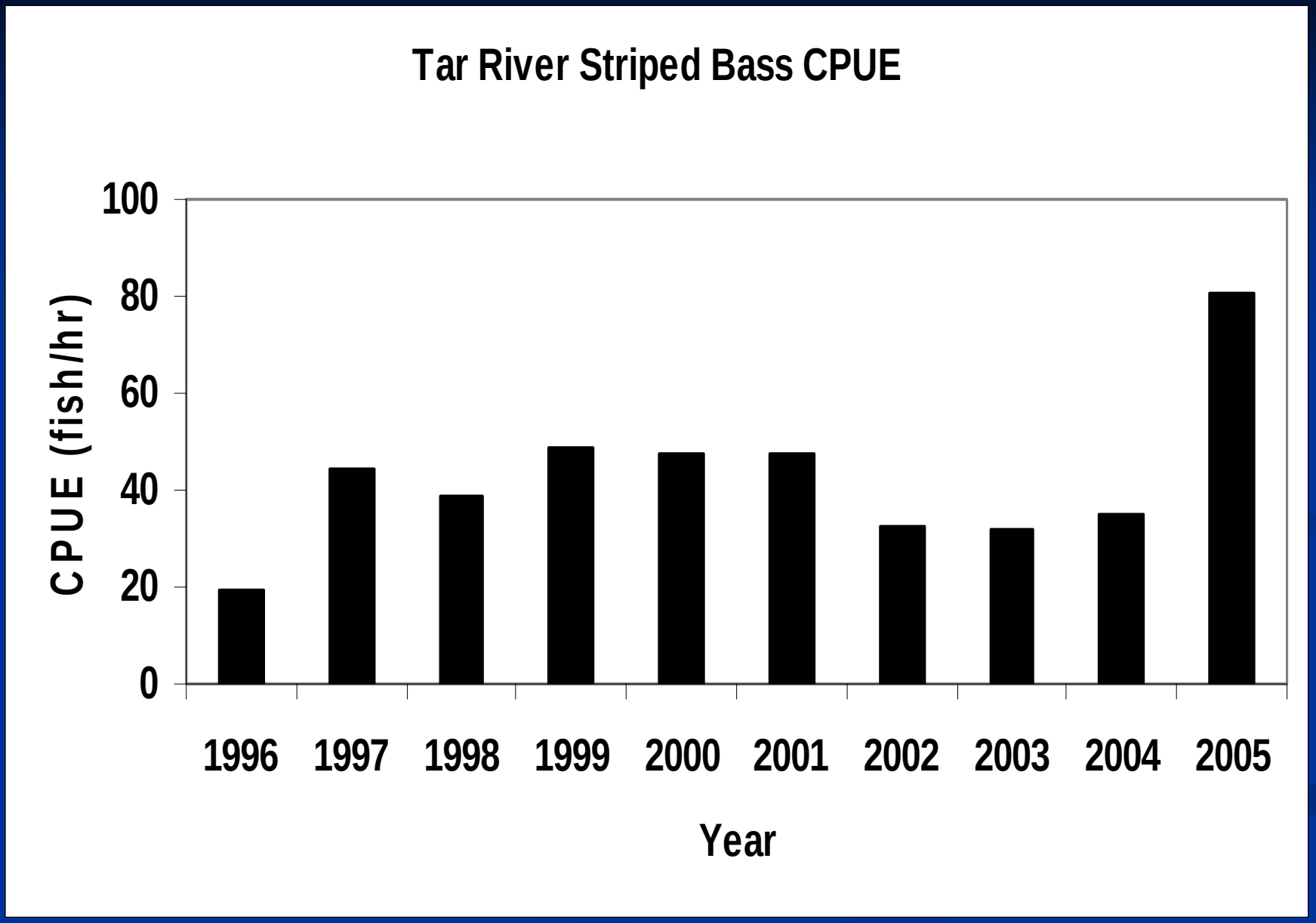
Division of Inland Fisheries

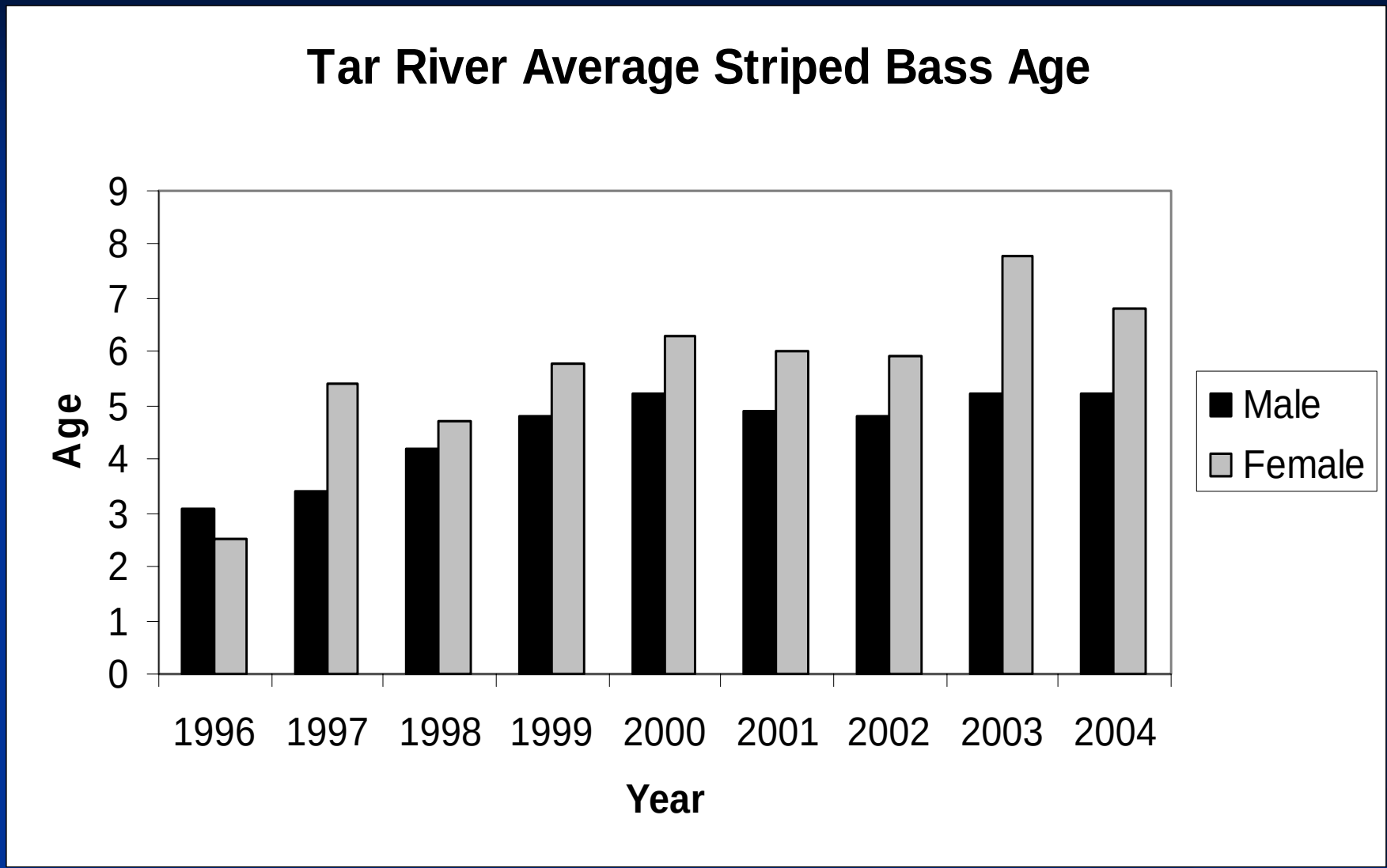
Spawning Stock Surveys

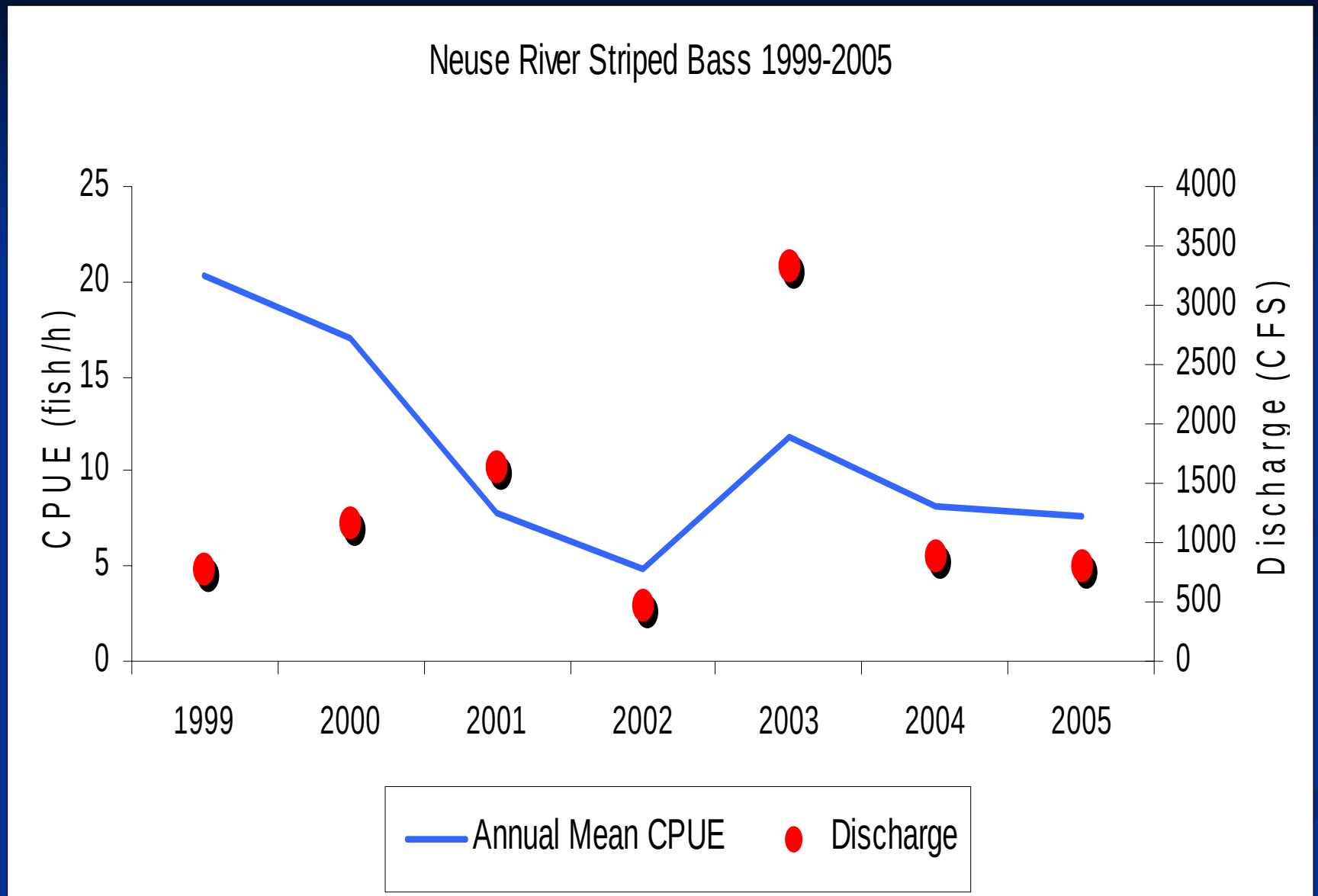
Spring Creel Surveys

Large Spawning Striped Bass: 1992 vs. 2003



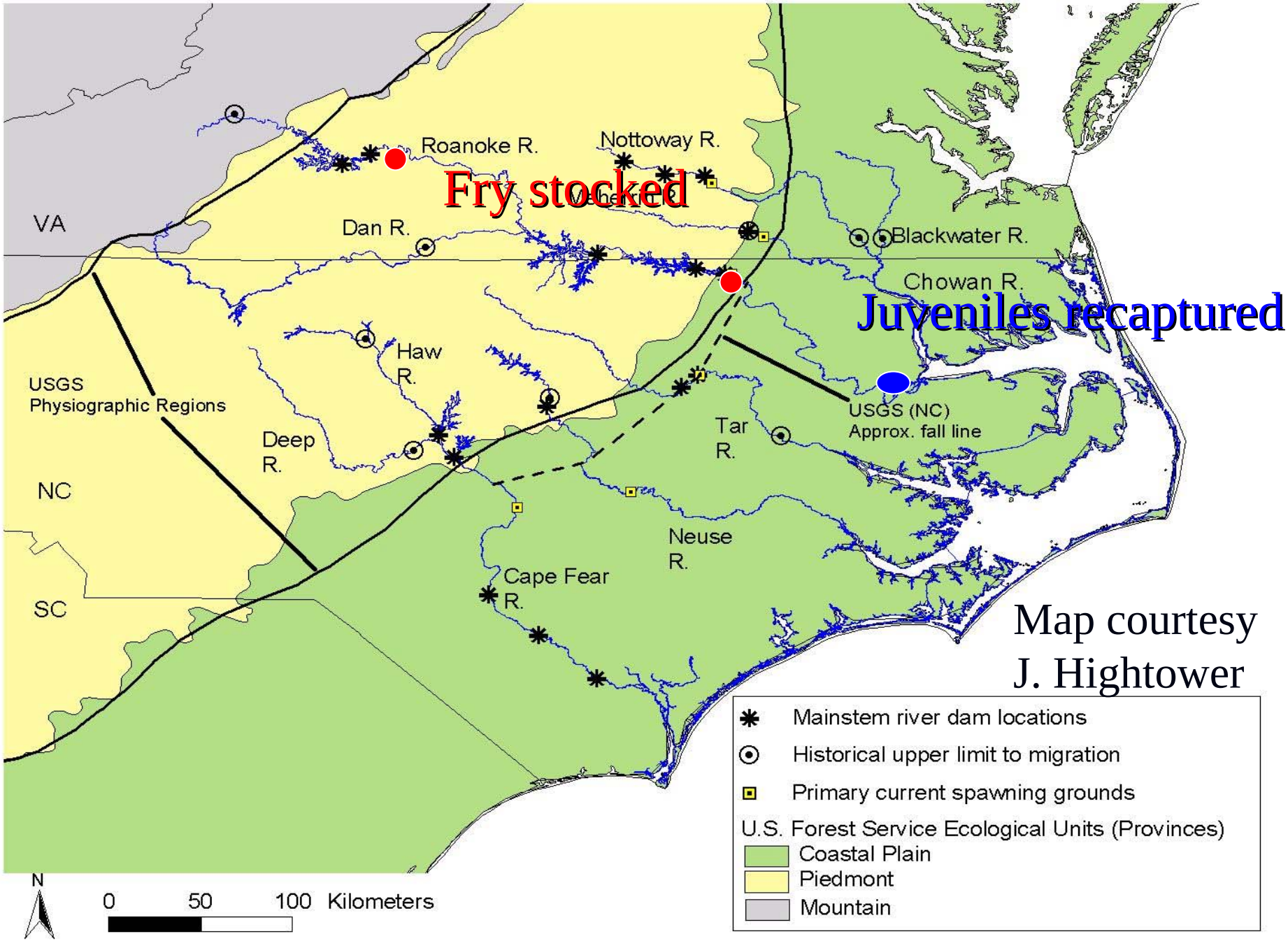

Tar River Striped Bass CPUE
CPUE (fish/hr)
100
80
60
40
20
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year


Tar River Average Striped Bass Age
Age
0
1
2
3
4
5
6
7
8
9
1996
1997
1998
1999
2000
2001
2002
2003
2004
Year
Male
Female


Neuse River Striped Bass 1999-2005
CPUE (fish/h)
Discharge (CFS)
25
20
15
10
5
0
4000
3500
3000
2500
2000
1500
1000
500
0
1999
2000
2001
2002
2003
2004
2005
Annual Mean CPUE
Discharge

American Shad

- Roanoke spawning stock is depleted
- WRC, USFWS, Dominion Power, and NCSU are cooperating in a restoration effort
- WRC annual electrofishing stock assessment
- WRC & USFWS hatcheries OTC-marked fry stockings
- Dominion to experimentally move adults above Roanoke Rapids Dam in 2006
- NCSU to pursue hydroacoustics pop. estimate


Roanoke R.
Nottoway R.
Fry stocked
VA
Dan R.
Blackwater R.
Chowan R.
Juveniles recaptured
Haw R.
USGS Physiographic Regions
USGS (NC) Approx. fall line
Deep R.
Tar R.
NC
Neuse R.
Cape Fear R.
SC
Map courtesy J. Hightower
Mainstem river dam locations
Historical upper limit to migration
Primary current spawning grounds
U.S. Forest Service Ecological Units (Provinces)
Coastal Plain
Piedmont
Mountain
N
0
50
100 Kilometers

Stocking Regimen Roanoke River

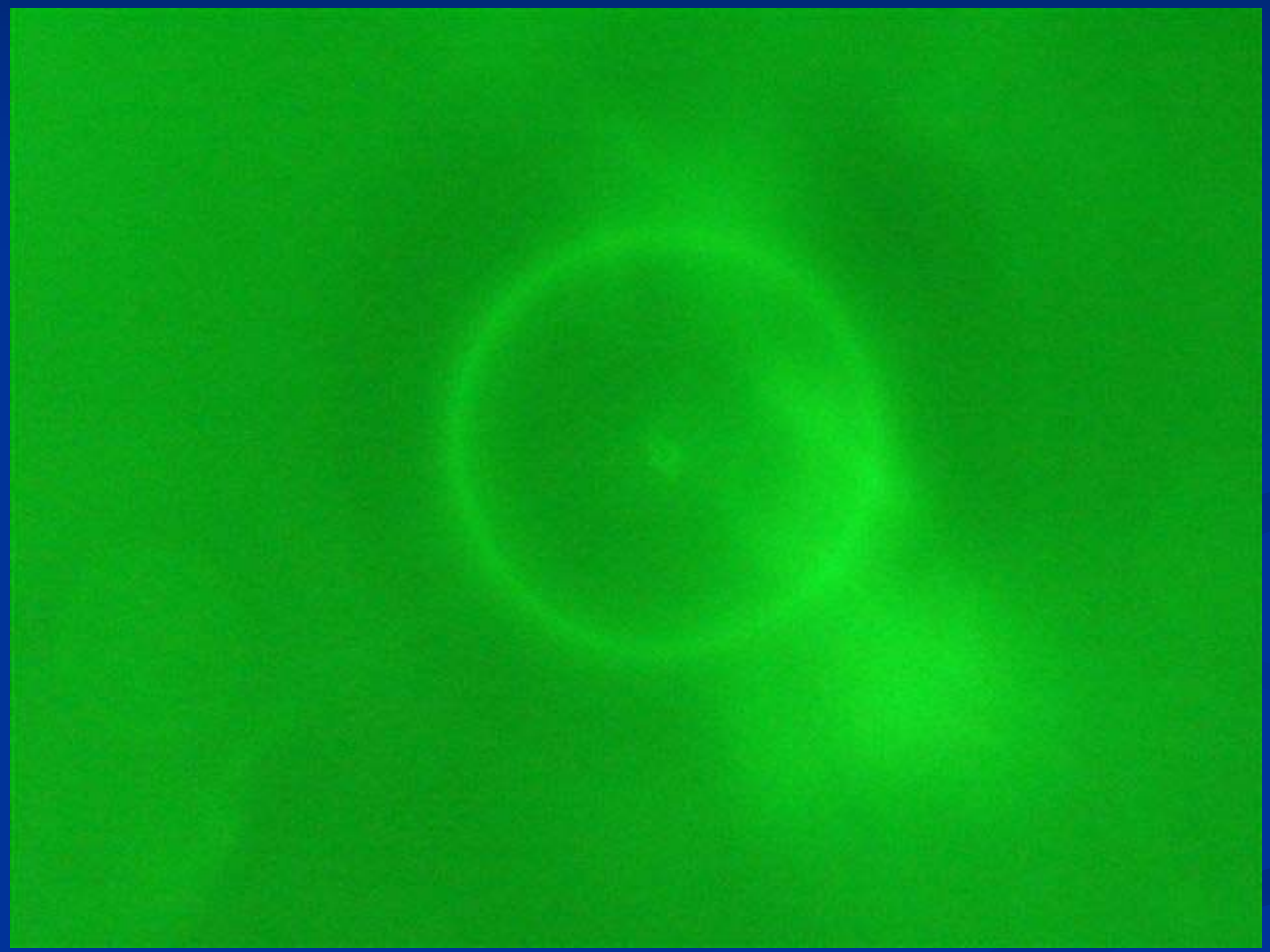
Year	Millions Stocked	OTC Mark	Age Class
1998	0.4	3	8
1999	0.3	3,6,12	7
2000	0.3	3,6,12	6
2001	1.3	3,6,12	5
2002	0.8	3	4
2003	0.6	3	3
2003	1.1	3,6	3
2004	1.1	6	2
2004	1.1	6,9	2
2005	1.3	9	1
2005	1.2	3,9	1

Juvenile Fall Outmigration

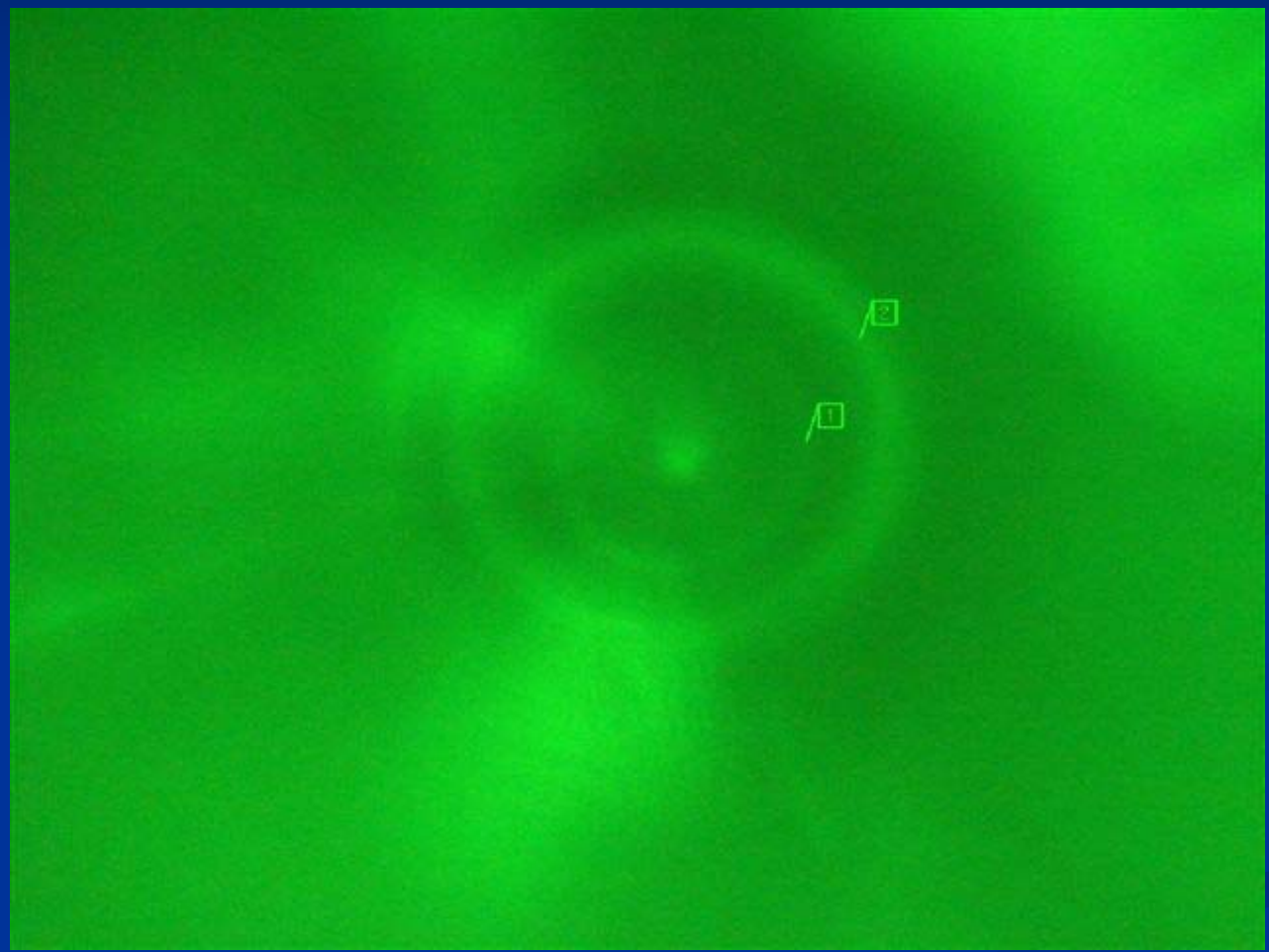
Year	Juveniles collected	Number w/ OTC tags
2001	19	0
2002	148	2
2003	165	6
2004	228	10
2005	421	16*

* 260 still to check

Single OTC Mark (Weldon)



Double OTC Mark (VA)



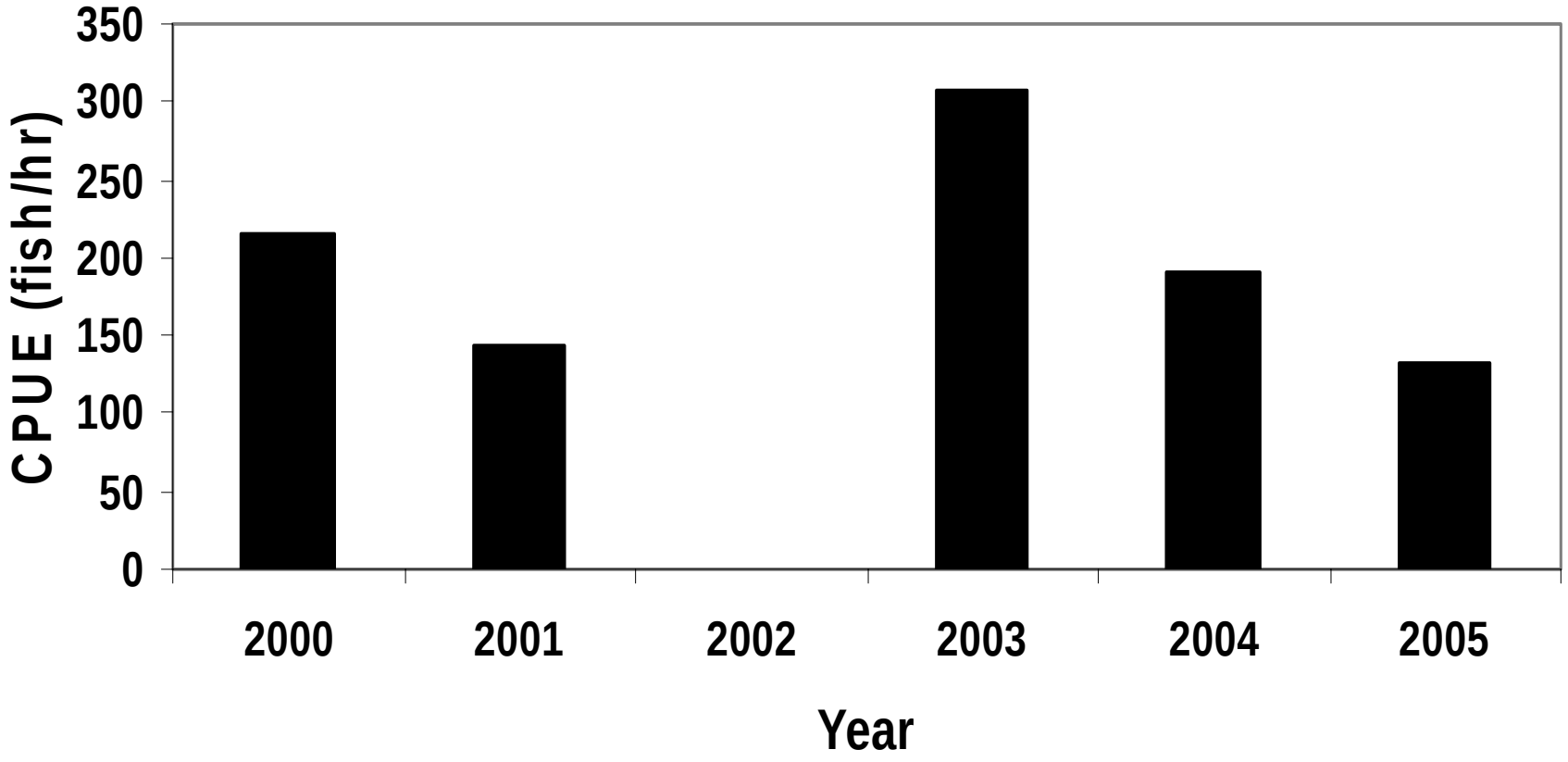
Juvenile Fall Outmigration

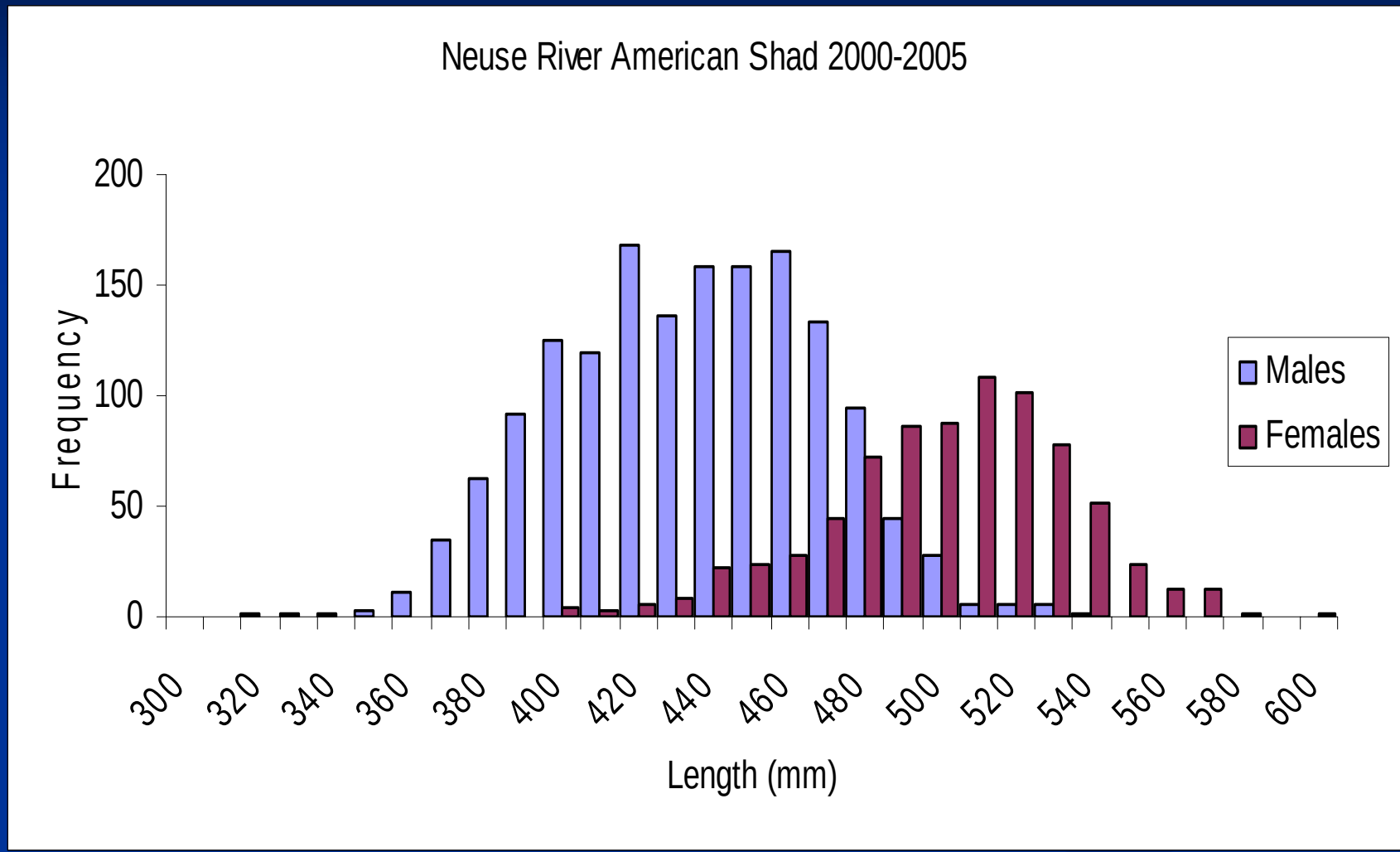
Year	Number w/ OTC marks	Single OTC mark (Weldon)	Double OTC marks (VA)
2002	2	2	N/A
2003	6	2	4
2004	10	5	5
2005	16*	14*	2*

* 260 still to check

American Shad, cont.

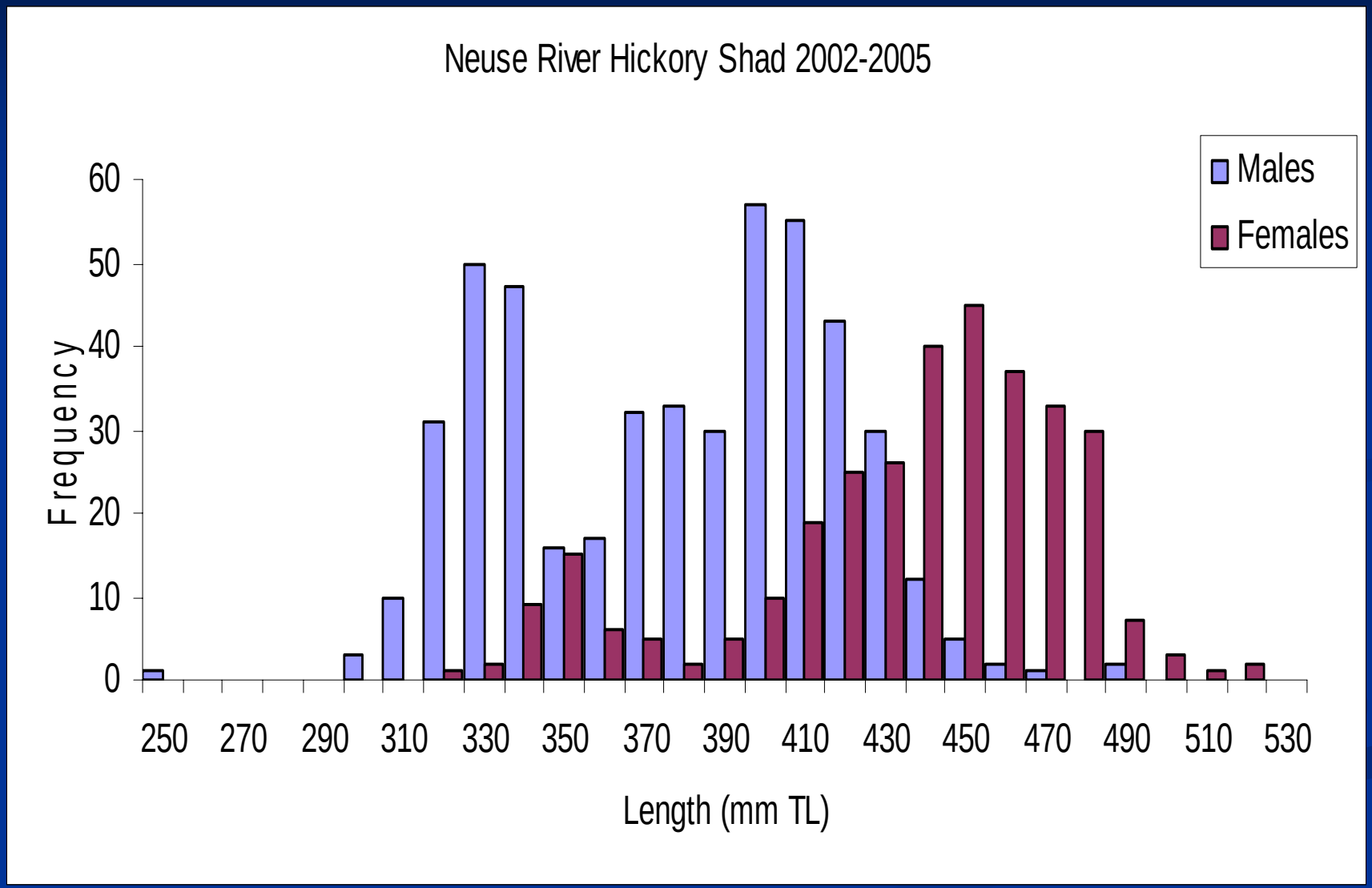
- Tar River population is doing relatively well and the spawning grounds below the dam at Rocky Mount are a primary source of broodstock for hatchery-reared fry
- Neuse population is more dispersed since removal of Quaker Neck Dam near Goldsboro and spawning occurs as far upstream as Milburnie Dam in Wake County during high flow years


Tar River American Shad CPUE
CPUE (fish/hr)
350
300
250
200
150
100
50
0
2000
2001
2002
2003
2004
2005
Year


Neuse River American Shad 2000-2005
Frequency
200
150
100
50
0
300
320
340
360
380
400
420
440
460
480
500
520
540
560
580
600
Length (mm)
Males
Females

Hickory Shad

- Earliest anadromous spawner
- Roanoke River population is very robust and supports a popular early spring fishery
- Much less abundant in Tar
- Lower Neuse supports a popular fishery particularly around Pitchkettle, Contentnea, and Bear Creeks


Neuse River Hickory Shad 2002-2005
Males
Females
Frequency
0
10
20
30
40
50
60
250
270
290
310
330
350
370
390
410
430
450
470
490
510
530
Length (mm TL)

Gaston and Roanoke Rapids Hydropower Dams Relicensing

- Dominion Power, USFWS, WRC, TNC, and NCSU cooperating on Roanoke River
- Adequate flows downstream of dams for water quality, fish, and vegetation
- American shad restoration
- Restoration of aquatic habitats in bypass reach
- American eel and A. shad passage above dams

River Herring

- The first finfish FMP developed under the FRA
- 2000 herring plan showed commercial landings declined from 10 million lbs. in early 70s to 500,000 lbs. in 1999 related to overfishing
- MFC capped commercial harvest at 300,000 lbs.

River Herring, cont.

- Since 2000 herring have been so few that commercial fishermen have been unable to catch the allowable harvest
- Stock assessment for the 2005 update of the FMP indicated the population was even further diminished
- After considerable discussion regarding a moratorium that included public input, MFC instead chose a 100,000 lb. harvest cap for 2006

River Herring, cont.

- WRC considered river herring stock status sufficiently depleted to warrant proposal of a moratorium in waters under its jurisdiction effective spring of 2007

- At the nine statewide annual Wildlife District Public Hearings held in January 2006, the WRC received public comment on a proposal to prohibit harvest or possession of river herring in Inland Waters of coastal rivers up to the first impoundment

- A decision on the proposal is pending

Largemouth Bass

- Widespread mortality in northeastern rivers associated with low dissolved oxygen following Hurricane Isabelle

- Stocked hatchery-reared largemouth fingerlings in these areas in effort to "jumpstart" population recovery

Stocking Evaluation

- 8-inch bass (February 2004) – 12,000
- 2-inch bass (June 2004) – 46,000
- 5-inch bass (September 2004) – 8,000

All Fish were injected with magnetic wire tags and stocked into 28 study sites (35 miles) in the Roanoke and Chowan Rivers

Project Objective: To determine which type of stocking makes the most significant contribution to our local bass populations

Recapture Electrofishing

- All bass weighed and measured
- All bass checked for cheek tags
- Released in shock site

Preliminary Conclusions

- 2-inch and 5-inch stockings were unsuccessful
- 8-inch stockings are contributing to local populations and have been found > 2 miles from original stocking points
- Native reproduction is occurring in spite of low numbers of adult bass, and should be sufficient to insure recovery

Creel Surveys

- Roanoke – Annual creel survey used to assess striped bass harvest & determine season closure date

- Chowan, Tar, Neuse (and Cape Fear) – Creels generally alternate yearly among these rivers

Neuse River Creel Survey

1 July 2002 – 30 June 2003

Objectives

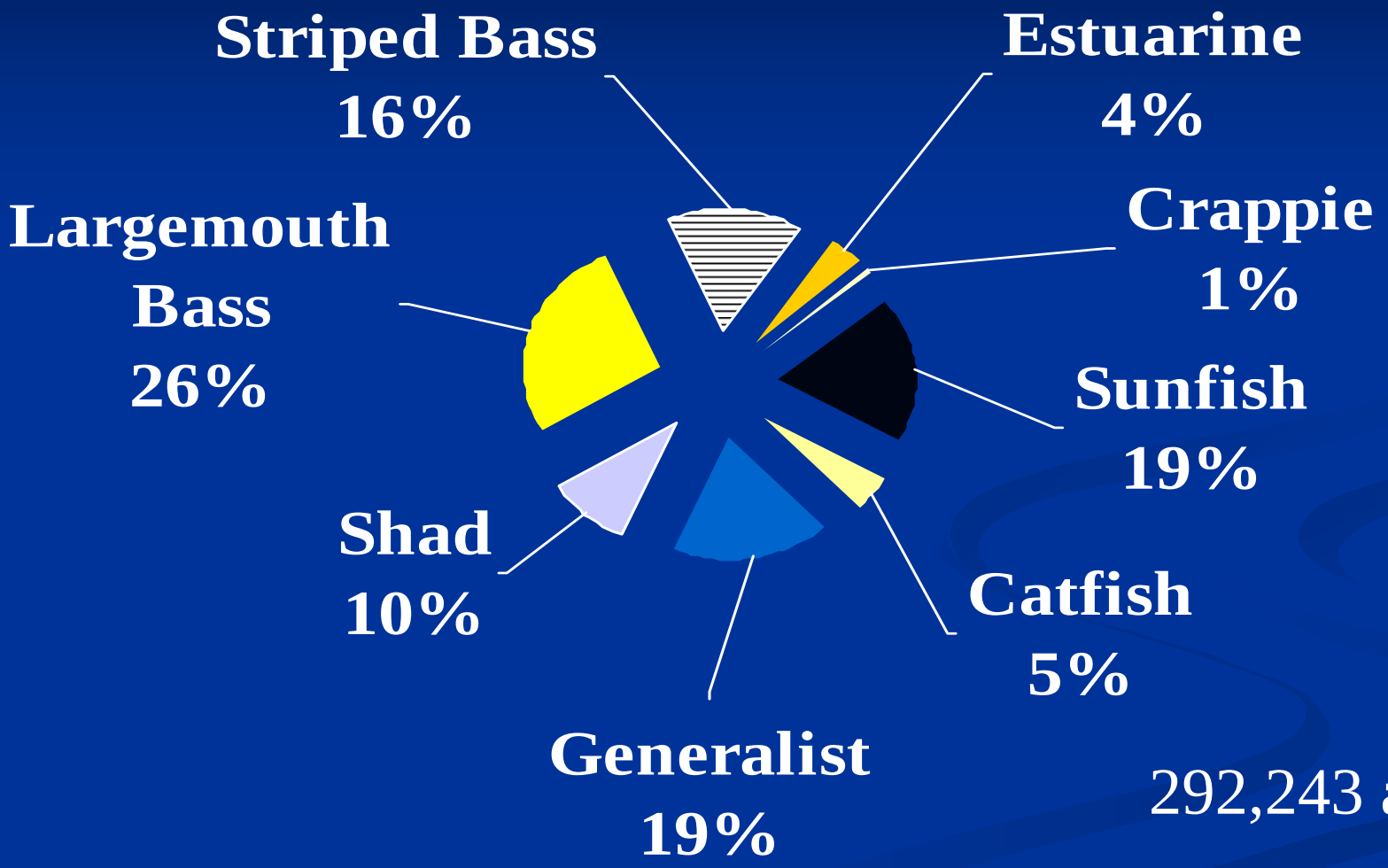
- Estimate and describe boat angling effort, catch, and harvest

- Collect trip-related information on angler residency, expenditures, and satisfaction

Angler Interviews

- Number of sample days- 209
- Number of parties interviewed- 749
- Number anglers in parties- 1383
- Average # anglers/party- 1.8
- Average fishing trip length- 5.3 hours

Neuse River Angling Effort



292,243 angler h

Trip Satisfaction %

Rating	%
Excellent	20.6
Good	35.4
Fair	20.2
Poor	23.8

Expenditures

- Gas comprised greatest per trip expense
- Neuse trips averaged $22 per trip
- Neuse avg. expense/angler-hr = $6.28
- Neuse willingness to spend avg. over and above present expense per trip = $53

Expenditures Cont'd.

- Estimated total expenditures for the Neuse = $1.8 million, Surplus or willingness to spend over present expense = $2.2 million

- Grand total of ~ $ 4 million was the estimated value of the surveyed portion of the Neuse River during 2002-2003.

Conclusions

- Effort greatest for largemouth bass.
- Catch & harvest greatest for sunfish.
- Most anglers reported a good overall trip.
- Substantial money spent by anglers.
- Factors that influence fishing activity (e.g., habitat alterations, mgmt actions) could have effects on economy.

Fish Community Assessments

- The Index of Biotic Integrity (IBI) was originally developed using electrofishing gear in smaller, wadeable streams.

- WRC is attempting to identify metrics in large coastal streams that can be identified from boat electrofishing.

Contentnea Creek Example

	E-fisher	Seine	Rotenone	Detcord
Total fish	1,234	157	4,757	1,059
No. of spp.	30	7	39	29

Determined boat electrofisher to be adequate with sufficient sampling effort

Fish IBI Sampling

- IBI sampling has occurred in coastal plain rivers since 1996
- Surveyed streams include Roanoke & North (hurricane effects) Tar, Neuse, Contentnea, Trent, White Oak, & New
- Using scoring criteria based on wadeable streams, most fall into fair-good categories but we know these categorizations are currently imprecise
- Efforts to modify scoring criteria for better application to large streams are ongoing

On the Horizon

- Continued annual sampling for striped bass and A. shad, to remain in compliance with ASMFC
- New sampling program for river herring
- Continued participation on DMF's FMP Development Teams
- Participate in implementation of Dominion relicensing studies on Roanoke
- Explore establishing lower Tar and Neuse striped bass JAI sampling program with DMF
- Cooperate with planned herring reintroduction at Lake Phelps