Supplemental Information Related to Blue Catfish and Flathead Catfish in the Bay Watershed

June 8, 2011

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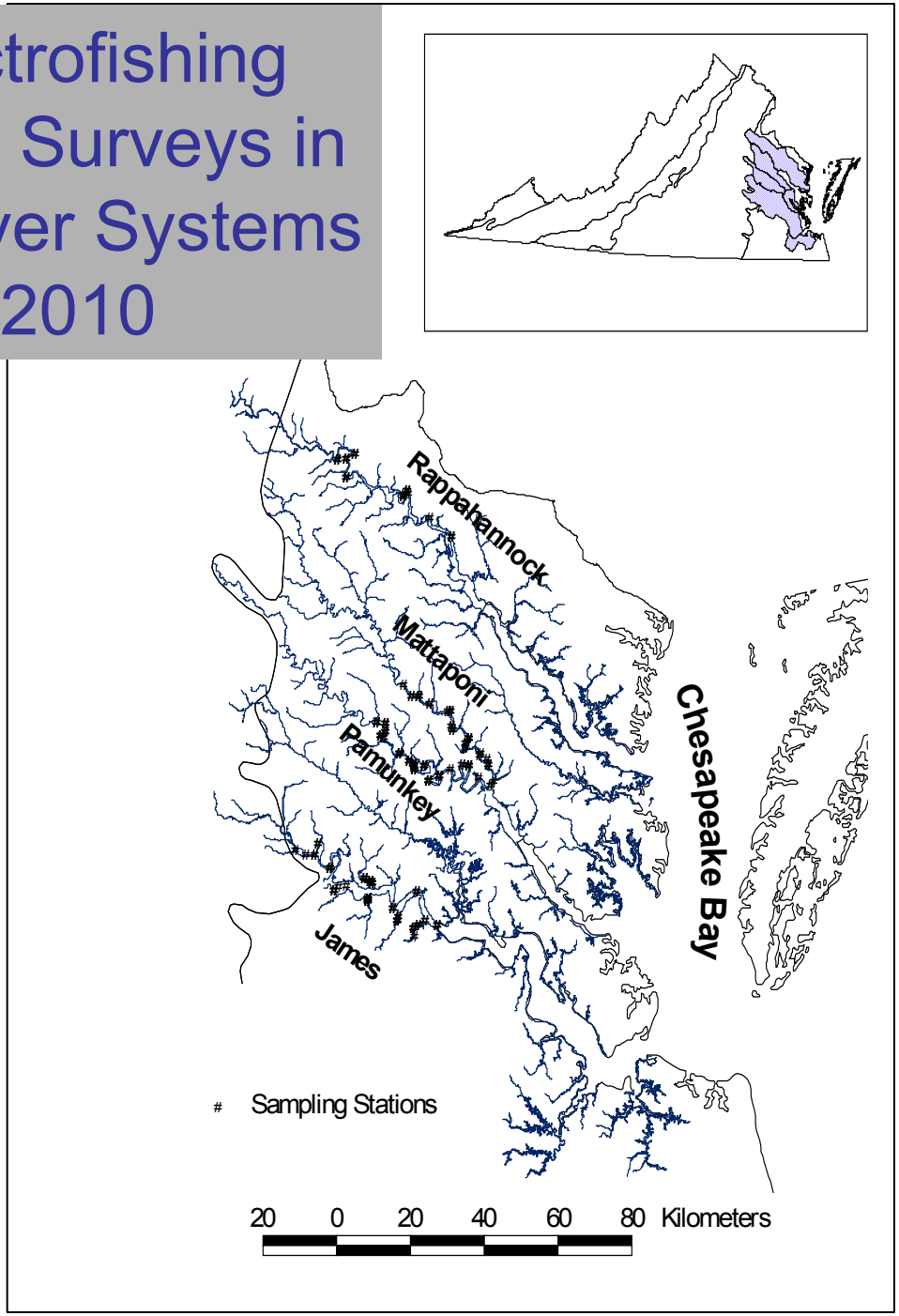
Flathead Catfish

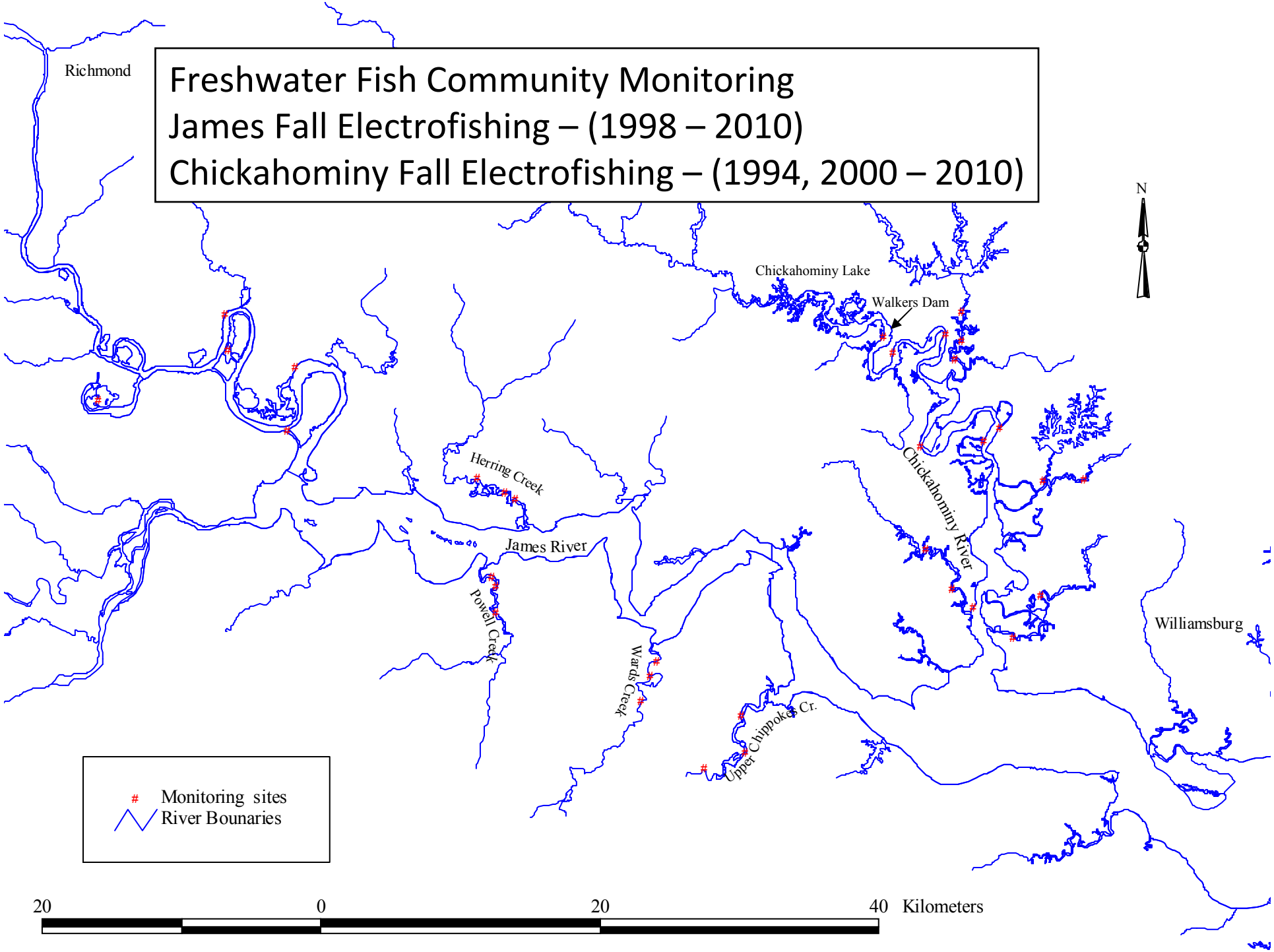
- Impacts related to introduced populations are documented
  - Sunfish species
- Similar impacts can be expected in the Bay watershed
- Non-tidal tributaries being focal points
  - In Virginia, with the exception of the upper tidal James, there has been slow and limited expansion in tidal waters, with densities extremely low
- No method of eradication. Control?

Catfish Electrofishing Fixed Station Surveys in Four Tidal River Systems 2001 - 2010



Populations Not In Equilibrium

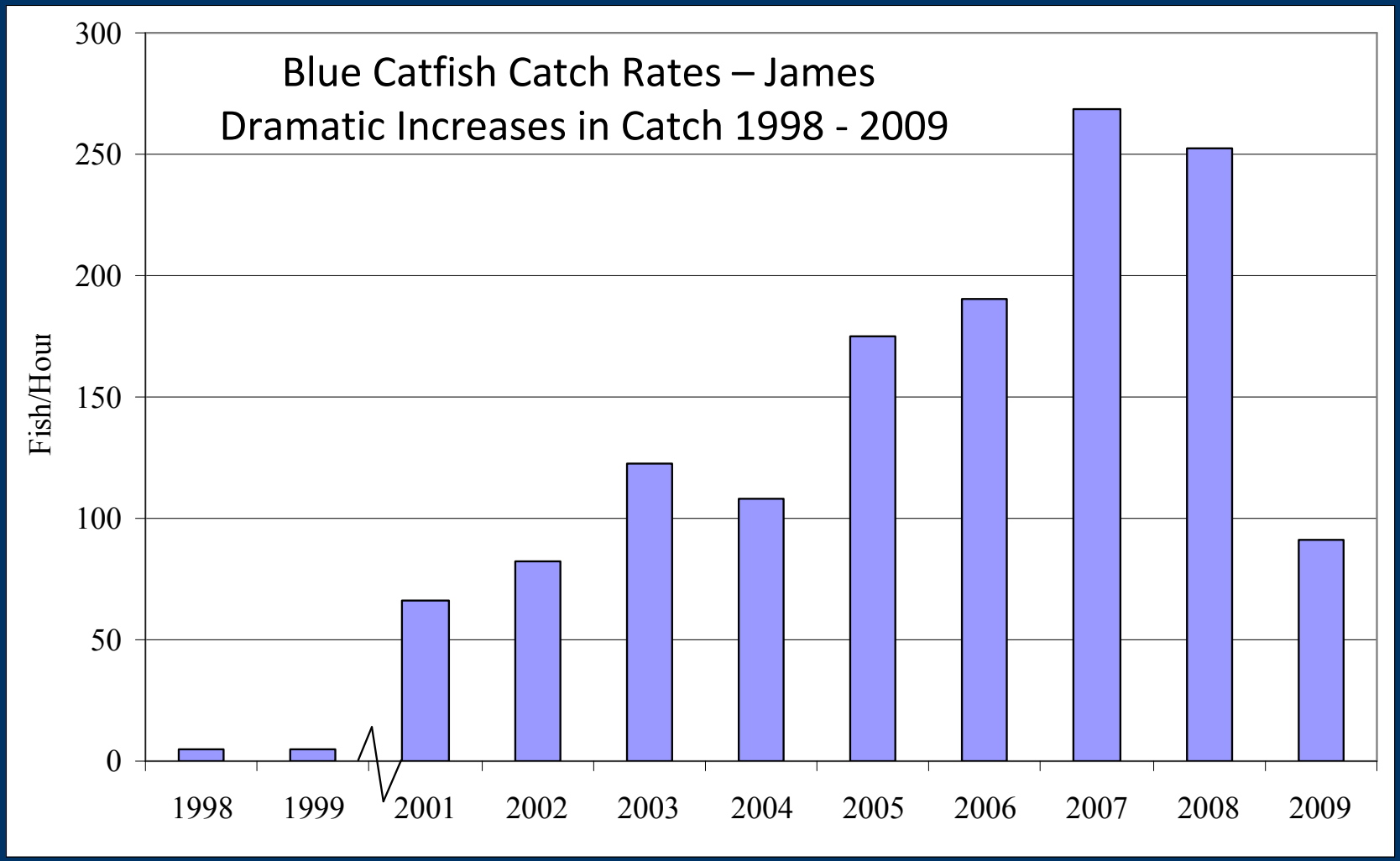
- Approximately 40 yrs post-introduction, blue catfish populations in Virginia tidal rivers have not reached equilibrium
- Following a period of expansion….as of 2010
  - Declining growth in all four rivers
  - Slowing growth is impacting size structure
  - James
    - Dramatic increases in catch rates (density) until 2010 when a significant reduction occurred
    - Trend of reduced recruitment
- Long-term status (e.g. density, growth, size structure) of these populations is unknown – confounding answers to questions of impact


Freshwater Fish Community Monitoring
James Fall Electrofishing – (1998 – 2010)
Chickahominy Fall Electrofishing – (1994, 2000 – 2010)
Richmond
Chickahominy Lake
Walkers Dam
N
Herring Creek
James River
Chickahominy River
Powell Creek
Wards Creek
Upper Chippokes Cr.
Williamsburg
Monitoring sites
River Bounaries
20
0
20
40
Kilometers

Community Level Impact?

- In shallow water habitats - No significant reduction in biomass, abundance, size distribution for other species (1990's – 2010)
  - Exception => white catfish and channel catfish
- No trophic cascades documented
- Blue catfish function at multiple trophic levels
  - 85 – 98% are likely bottom foraging onmivores
  - 9 – 13 years until shift to piscivory (top predator)
    - Primary prey => under utilized forage base – adult gizzard shad
    - And smaller blue catfish

Fish Community Response?



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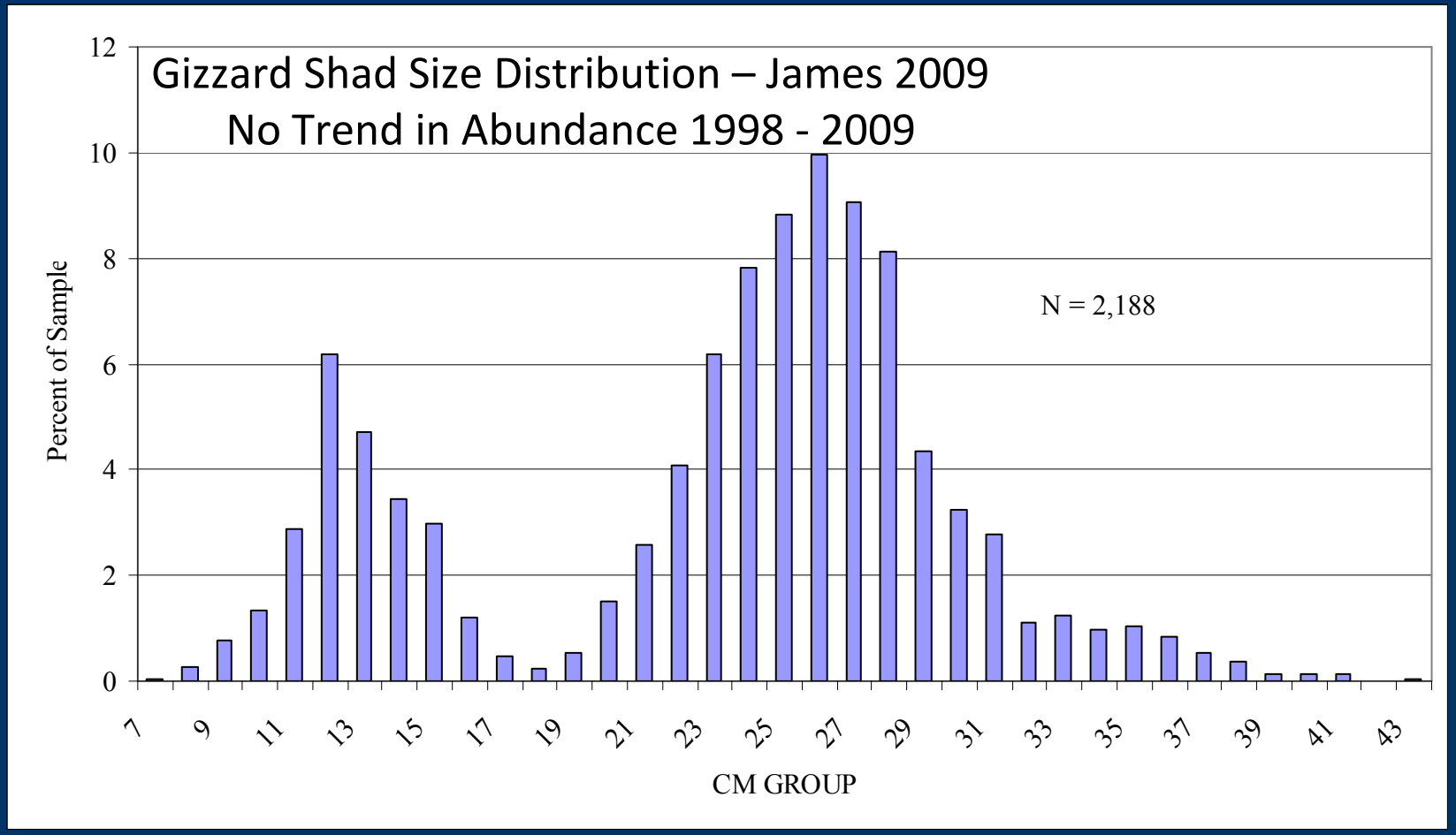

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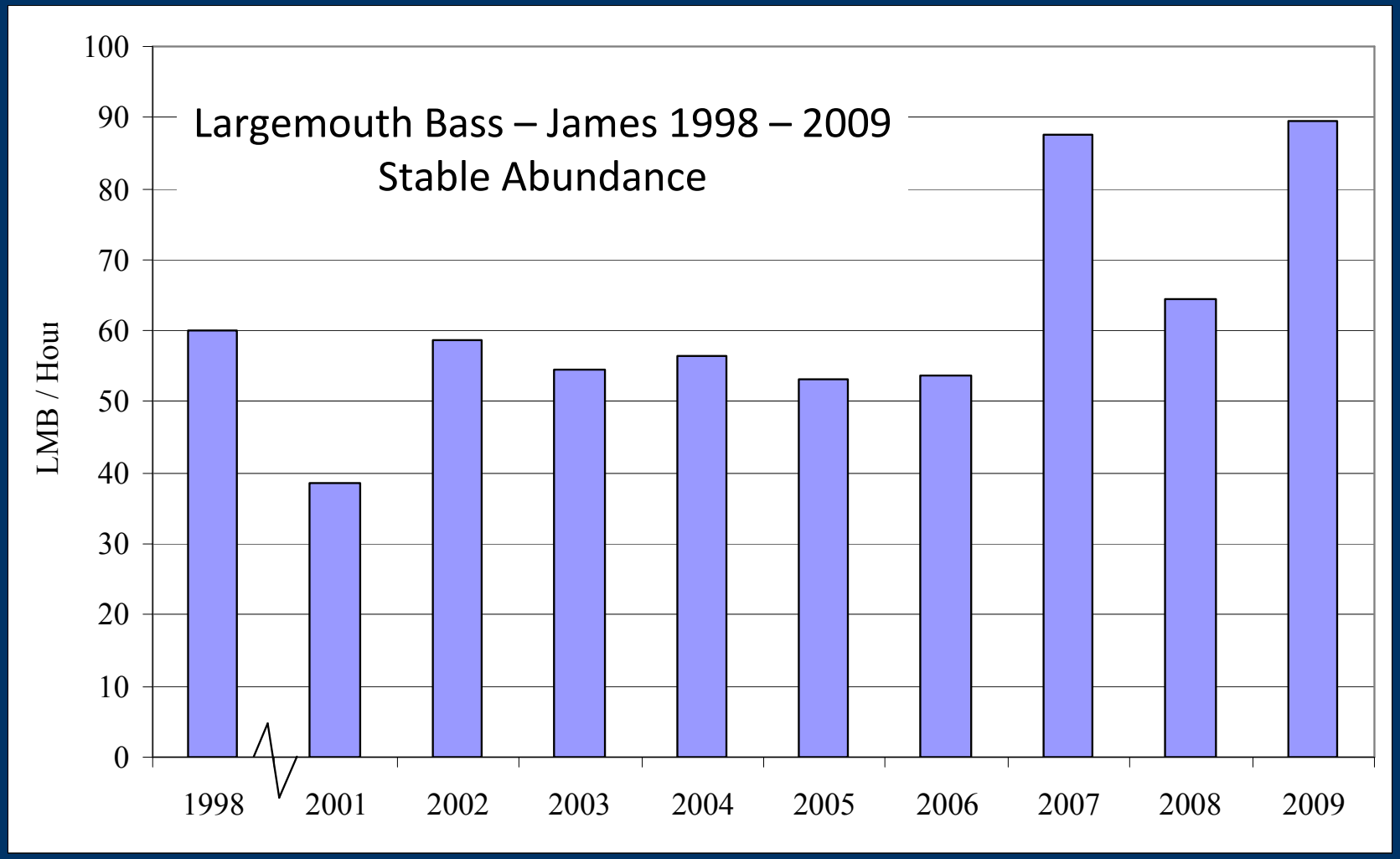
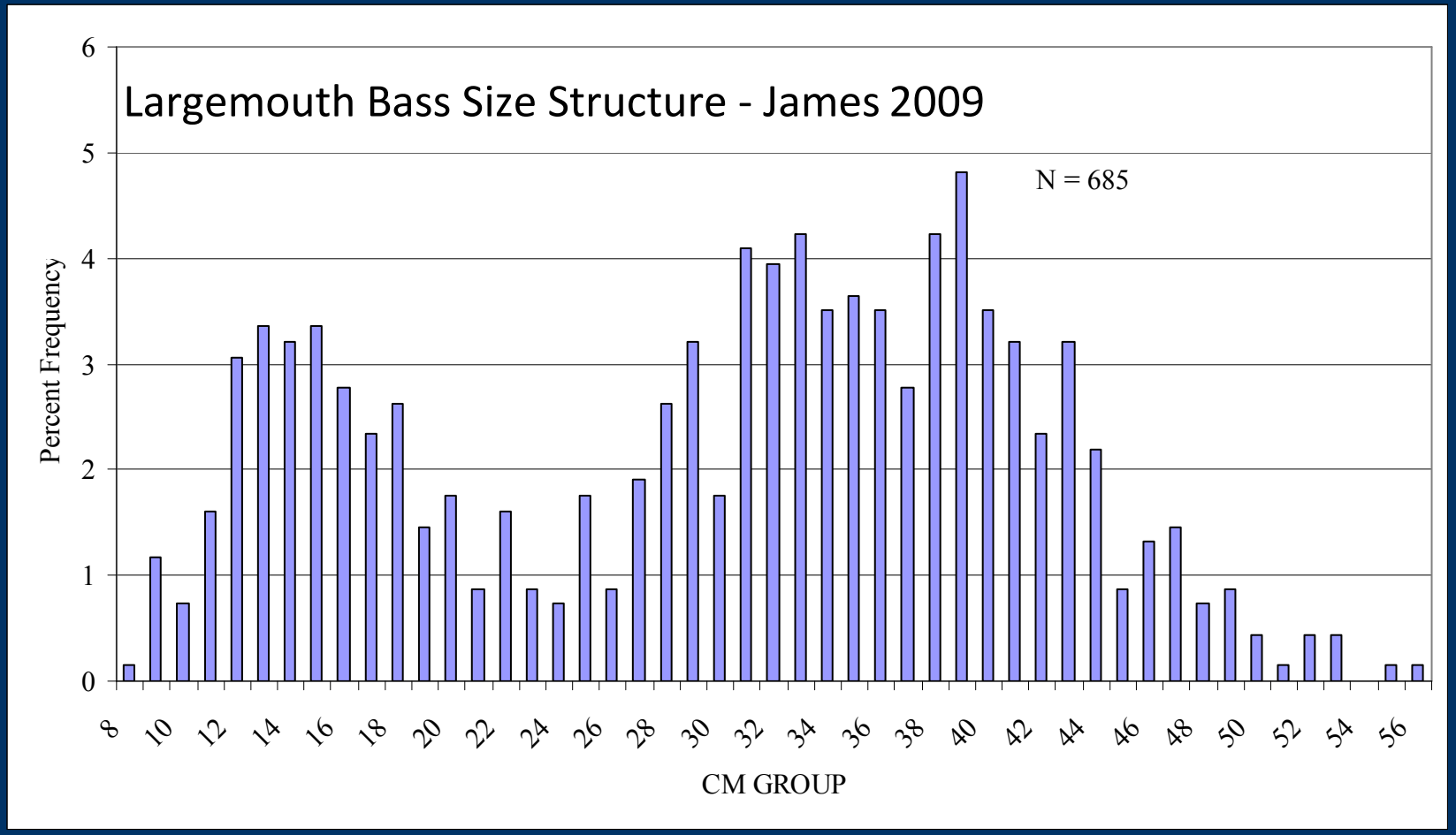


Through the time series adult largemouth bass in good condition (W_r > 100) and with good survival

Fish Community Response?



Nutrient Inputs

- James Fresh-Oligohaline reaches are highly eutrophic
  - Nutrient Inputs => High Primary Production => Secondary Production
    - High fish abundance/biomass
    - Successful blue catfish populations
    - High eagle and osprey production => Recovery

Cautionary Note: "The Threshold Impact"

Blue Catfish Summit 1 (May 2008)

Fabrizio, Garman, LaTour, Lipcius, Mann, Olney, Wells,…

Steve Bowman, Jeff Corbin, Gary Martel, Rob O'Reilly, Jack Travelsted,…

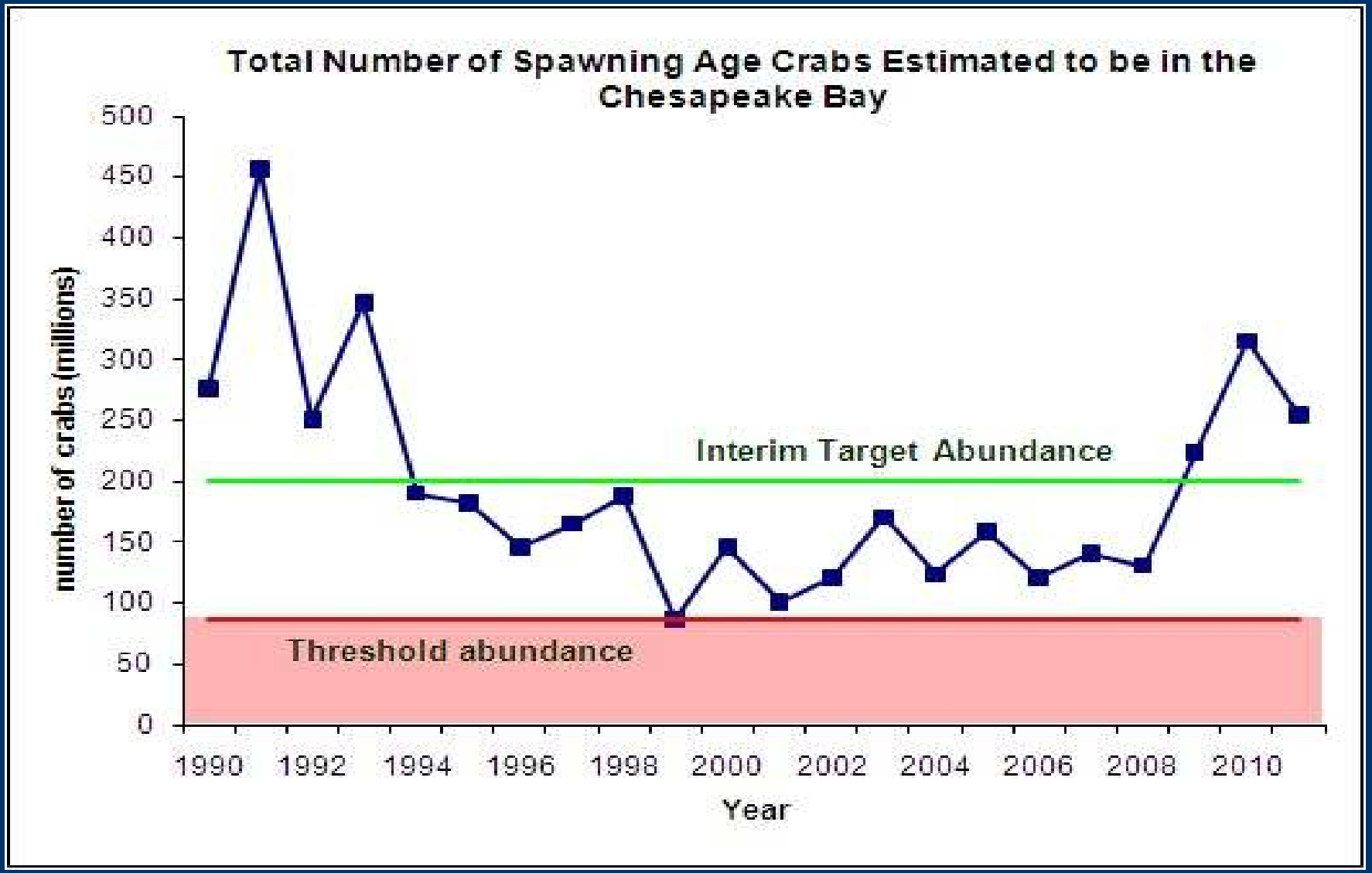
- Blue catfish and blue crab overlap significantly in the lower segments of Virginia western shore tributaries - "Blue Catfish the Threshold Impact"
- Watermen hear this know harvest restrictions on the way, and see increasing numbers of blue catfish in gear – where set in areas of overlap….

Blue Catfish Discussion Group (June 2009)

Fabrizio, Garman, LaTour, Lipcius, Mann, Varnell

- Science: "New" trophic level; salinity tolerance; omnivorous; est. 10's millions blue catfish in the lower reaches of Virginia rivers;…
- Science information gaps: feeding biology, food web dynamics, toxins,…
- Eradication not possible, attempt control via increased harvest < 32" (81 cm). Is control feasible? Concern regarding human health and market demand
- Research required before science can inform management

History: "The Threshold Impact"?

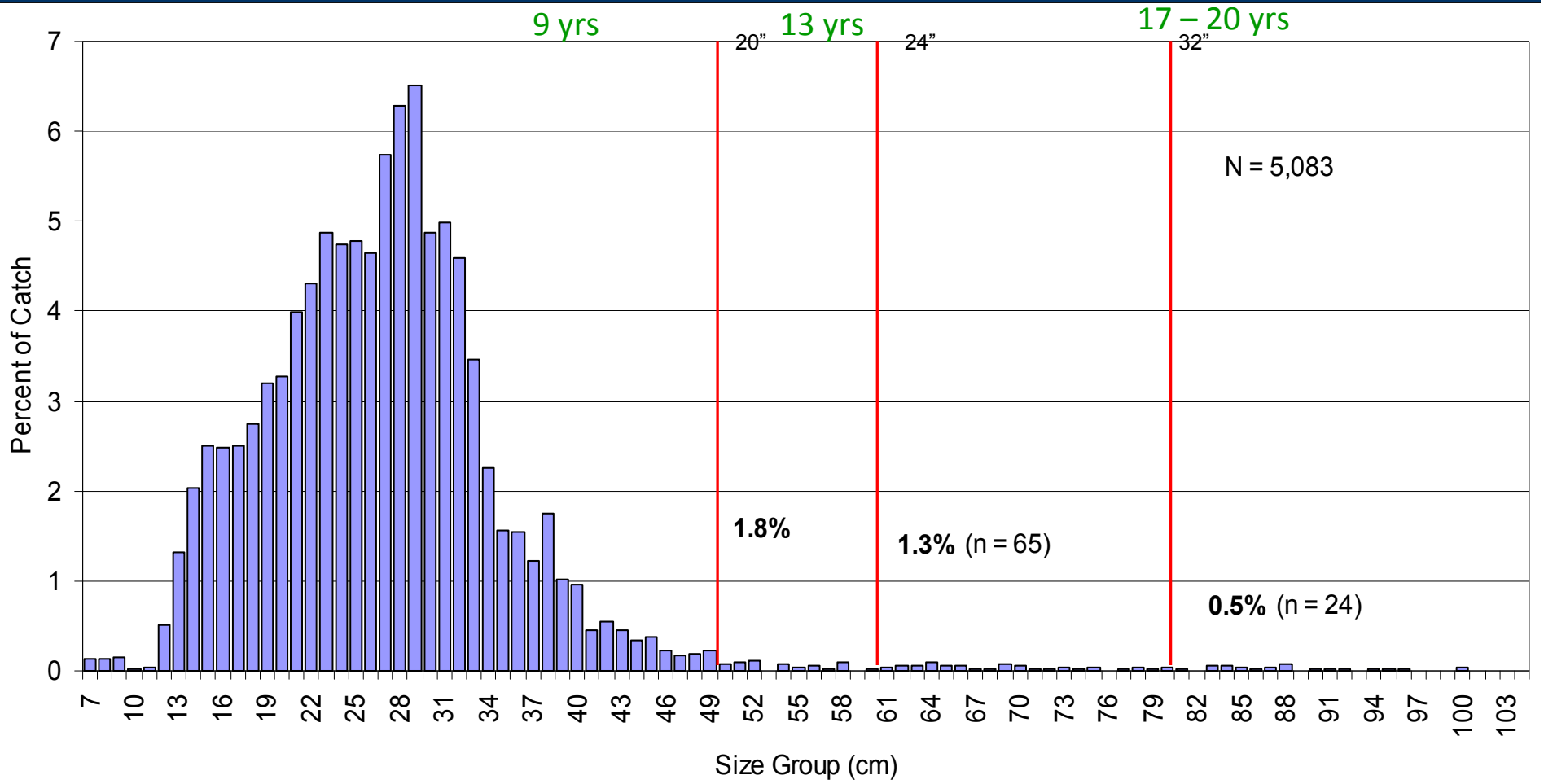


Source: http://www.dnr.state.md.us/fisheries/crab/dredge.asp

Cautionary Note

- Occurrence of scales and body parts in guts can not be assumed acts of predation
  - Bengal Tigers or Vultures?
- Additional work is needed over a broad spatial and temporal scale
  - Define trophic status, and
  - Interactions w/in the food web

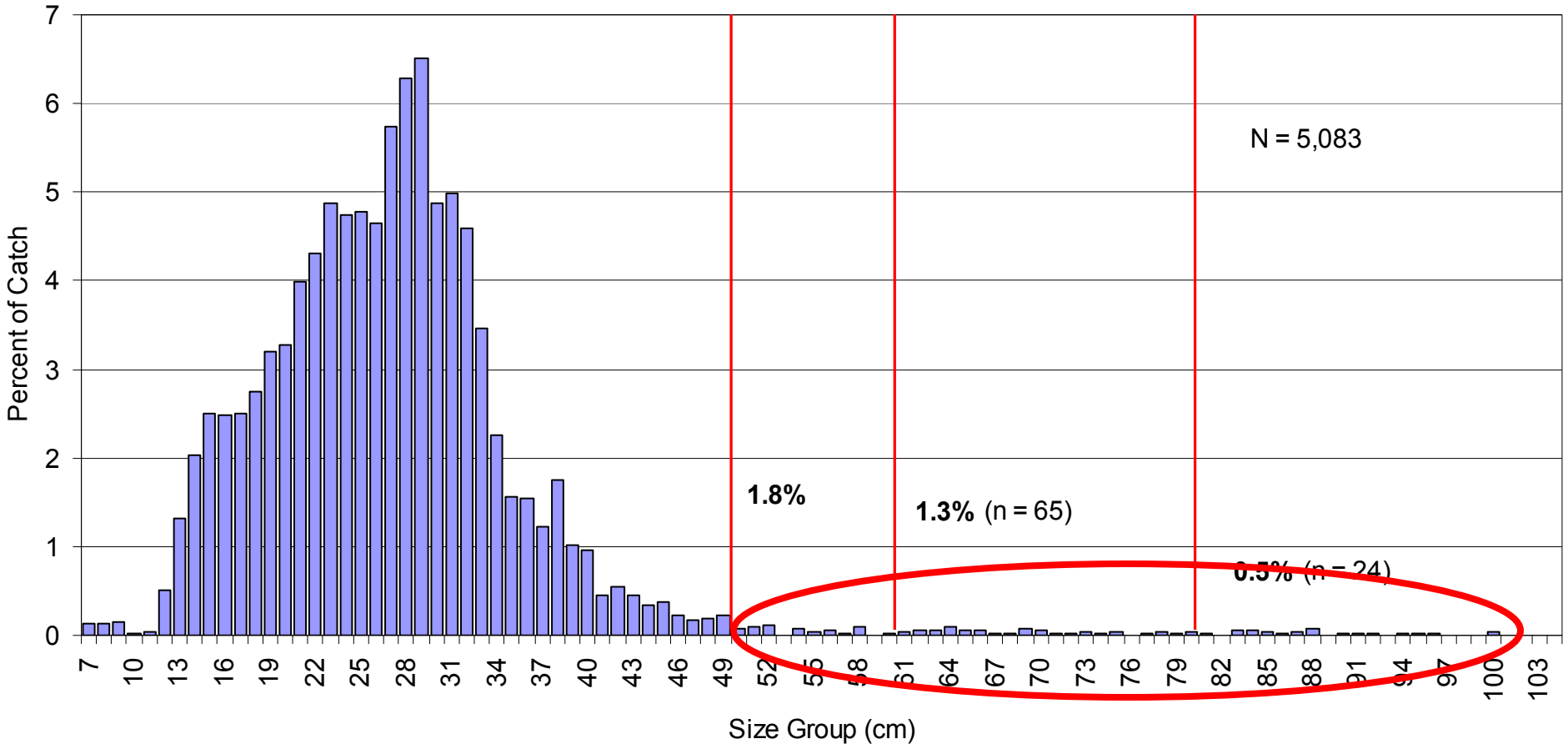
Bengal Tigers & Polar Bears – Or, Vultures? How Different From Channel Catfish?



Regarding River Herring & American Shad

- Generally depleted Coast wide - including many spawning rivers where non-native catfish are not established
- Hickory shad support robust fisheries in rivers from the Rappahannock to the James - all have substantial blue catfish populations
- Non-Native predation relative to predation by native species?
  - 0.5 – 1.8% of Rappahannock blue catfish => likely predator
  - Very low abundance of blue catfish predator in Rappahannock

Impacts of Non-native Predation?



Regarding River Herring & American Shad

Ocean Trawl By-Catch – Lessard and Byan (2011)

- Alosine by-catch 2000-2008 => ~30 million pounds
  (13,608 mt total or 1,512 mt per year)
  - alewife 13 million pounds
  - blueback herring 14.7 million pounds
  - American shad 2.3 million pounds
  - 5,896, 6,668, and 1,043 mt respectively
- Where is the population level bottleneck to recovery?
- There is need to investigate prior to making statements of significant impact
  -

Surveillance and Control

- Blue catfish have been established for almost 40 years
- Surveillance is not an issue, in Virginia
- Control is forever, eradication is not possible
  - Reference any number of case studies
    - Generalist, high reproductive potential, no control mechanism
- Market driven dramatic increase in harvest (commercial) is the only feasible control mechanism
  - Will it work? We do not know
    - ~1.5 – 2 million pounds commercial and high levels of recreational harvest have not acted to “control”
    - Growth, density, and survival w/o significant impact.

Reduced Susceptibility to Repeated LF EF

	Day 2 as % of Day 1	Day 3 as % of Day 1
CPE Q	56.2%	31.5%
CPE P	37.8%	21.6%
CPE M	38.7%	22.6%

- Representative size distribution (Buckmeier and Schlechte 2009; VDGIF unpub. data)
- Effectiveness low and highly variable
  - Approaches zero with ↓ water temperatures
  - Effective 4 - 5 months out of the year
  - A small fraction affected to the point of being available for capture
- Can not make multiple passes
  - Even w/ 24 hr time gap ↓↓ CPUE, larger fish w/ most reduction in catch
- Ineffective in non-tidal rivers and impoundments w/ typical water conductivity
- Effectiveness declines rapidly in salinity > 6ppt

Density

- Powell Creek Blue Catfish Three Days in July => 10,010 blue catfish
  - 4.8 km (3 mi), or 42 ha (104 ac) of habitat

Schnabel Population Estimate – Powell Creek July 2007		
28,621	681 fish/ha	5,963 fish/km
10,336 kg	246 kg/ha	2,153 kg/km

- Adjacent pool of recruits => w/in 3 months 7% recapture rate
  - Within 12 months recapture rate had gone to 0%

INVASIVE

Guidance White Paper for Executive Order 13112

"An invasive species is a non-native species whose introduction does or is likely to cause economic or environmental harm or harm to human, animal, or plant health. The National Invasive Species Management Plan indicates that NISC will focus on non-native organisms known to cause or likely to cause negative impacts and that do not provide an equivalent or greater benefit to society. In the technical sense, the term 'invasion' simply denotes the uncontrolled or unintended spread of an organism outside its native range with no specific reference about the environmental or economic consequences of such spread or their relationships to possible societal benefits. However, the policy context and subsequent management decisions necessitate narrowing what is meant and what is not meant by the term *invasive species.* Essentially, we are clarifying what is meant and not meant by "causing harm" by comparing negative effects caused by a non-native organism to its potential societal benefits. "

Guidance White Paper for Executive Order 13112

- "Essentially, we are clarifying what is meant and not meant by "causing harm" by comparing negative effects caused by a non-native organism to its potential societal benefits. "
  - Fisheries => Societal Benefits & Economic Input
  - Ecological Benefits?
    - Recovery of bald eagles and osprey in the upper portions of the Virginia rivers has been closely related to the availability of blue catfish prey
    - Capture of Nutrients / Energy?
- Managers and policy makers need to conduct science-informed cost-benefit analyses
- Need to develop quantified scientific evidence of population level impacts before making assumptions or statements of impact

VDGIF Management

- Before making shifts in management strategy, and before making assumptions of negative impact, VDGIF needs to have definitive scientific evidence determining and defining impacts

- The current strategy supports unlimited harvest of blue catfish under 32 inches, and limits harvest of blue catfish over 32 inches to one fish per person per day
  - In support of trophy fishery
  - Restrict consumption of larger fish

- Support of dramatic increases in harvest of smaller fish, assuming human health concerns are adequately addressed

VDGIF Management

- No harvest restriction on flathead catfish in tidal waters
- Illegal to stock fish in public waters without a permit

Summary

- The science is lacking to adequately inform GIT management policy development for blue catfish at this time
- Given the stated objective of the Fisheries GIT is to use science to inform management policy decisions, these gaps in scientific information offer a focus for continued GIT action and support
- Only after additional work, and time, will the GIT (and all agencies involved) have the appropriate level of knowledge to make science-informed policy decisions

VDGIF Suggested Management Strategy

- Support and advocacy for drastic increases in harvest of smaller blue catfish
- Including development of commercial markets and recreational angler harvest, assuming human health concerns are adequately addressed
  - Larger fish pose health concerns
  - Larger fish support a nationally recognized trophy fishery