

# Summary of 2009 South River Biota Projects

SRST Meeting April 21, 2009

A. Condon, USFWS

E. E. Mack, DuPont

# Projects for 2009

- Avians (2)
  - Cristol, Folsom/Evers (BRI), FWS
- Fur-bearing mammals (1)
  - Yates/Evers (BRI)
- Amphibians & Reptiles (2)
  - Hopkins
- Trophic Modeling (1)
  - Newman

# Avians

Dan Cristol, College of William & Mary

## Mercury Dosing Study

- Proposed:
  - Determine sublethal effects level for songbirds fed a constant low-dose of mercury (realistic conditions)
  - Mortality, reproductive impairments, immune suppression, endocrine disruption, neurological damage, behavioral abnormalities



Bill Garland



# Mercury Dosing Study

- Progress:
  - Permits approved by state and university
  - Aviaries built (except drainage, more wren cages)
  - Starlings (88) and Zebra Finches (40) are in aviary
  - Wrens will be captured after breeding season
  - Hired post-doc, 3+ graduate students
  - Dietary doses to begin once drainage is approved
  - In progress: Federal permit for wrens, drainage fix

# Avians

Dave Evers/Sarah Folsom, Biodiversity Research Inst.

## Spatial trends of Mercury in Songbirds

- Proposed:
  - Determine geographic extent of mercury contamination downstream in South Fork Shenandoah River (in Songbirds)



# Spatial Trend Study

- Progress:
  - Field house secured for May-July
  - Some scouting of sites has been completed
  - 1 reference site (Cowbane area), 5 downstream sites (first at confluence, 2 at 10 miles apart, 2 at 20 miles apart)
  - Scouting planned for early May (May 4-15)
  - Mist netting will begin late May (last week)

# Avians

## USFWS

### Carolina Wren Reproductive Success

- Proposed:
  - Monitor Carolina Wren nests
  - Collect data on clutch initiation date, number of eggs, number of nestlings hatched, number of fledglings, mercury levels of adult(s), nestlings
  - Nest box cameras (supplement dosing study)



# Carolina Wren nest success

- Progress:
  - Nest boxes in place (195 reference, 165 contaminated)
  - Began box checks April 7
  - 1 active nest – Reference
  - 3 active nests – Contaminated
  - 12 more possible nests....



# Bats

Dave Evers/Dave Yates, BRI

## Spatial trends of Mercury in Bats

- Proposed:
  - Use radio telemetry to establish distance bats are travelling from South River (RM 10-20)
  - Determine geographic extent of mercury contamination downstream in South Fork Shenandoah River (in bats; 5 subreaches)



# Spatial trends of Mercury in Bats

- Progress:
  - All set to begin field work in May

# Amphibians & Reptiles

Bill Hopkins, Virginia Tech

## Mercury Effects in Snapping Turtles and American Toads

- Proposed:
  - Turtles (pilot study):
    - Effects of mercury on reproduction
    - Samples for trophic models
    - Determine mercury levels in edible tissues
  - Toads:
    - Determine relative importance of trophically derived vs. maternally derived mercury on toad success
      - Larval → metamorphosis
      - Survival and growth of post-metamorphic Juveniles



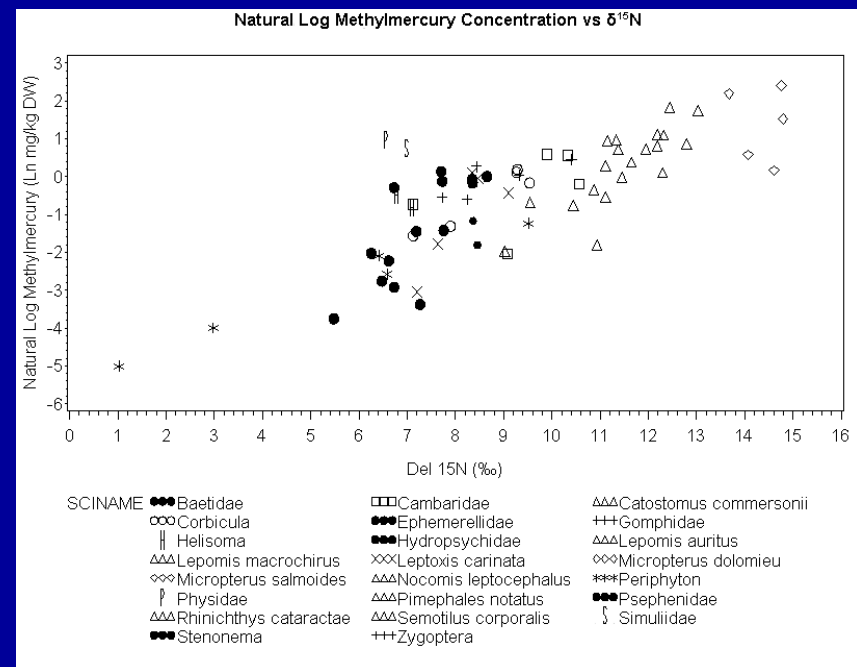
# Amphibians & Reptiles

- Progress:
  - Endocrine and immune assays for '08 bird manipulation study completed
  - Toad and turtle personnel hired for '09 field season
  - Aquatic mesocosms completed and ready
  - Terrestrial enclosures completed and ready
  - New Hg diet developed and currently being tested on wood frogs
  - Crew in field for collection of breeding pairs of toads
    - Finally - everything is hopping!
    - Lab and mesocosm experiments will be up and running this week!

# Trophic Modeling

Mike Newman (VIMS)

- Proposed:
  - Develop preliminary floodplain trophic models
  - Apply existing aquatic models to remediation scenarios
  - Explore effects of phase II manipulations on mercury in 1<sup>o</sup> consumers



# Trophic Modeling

- Progress:
  - Selected two sites with the screech owl and kestrel as top predators for flood plain models
  - Identified samples needed for flood plain model
  - Planning collection of emergent insects and trophic analysis for Eco-Study Phase II program