Virginia Cooperative Fish and Wildlife Research Unit

2012 Cooperators' Meeting

Virginia Department of Game and Inland Fisheries

U.S. Fish & Wildlife Service — Department of the Interior

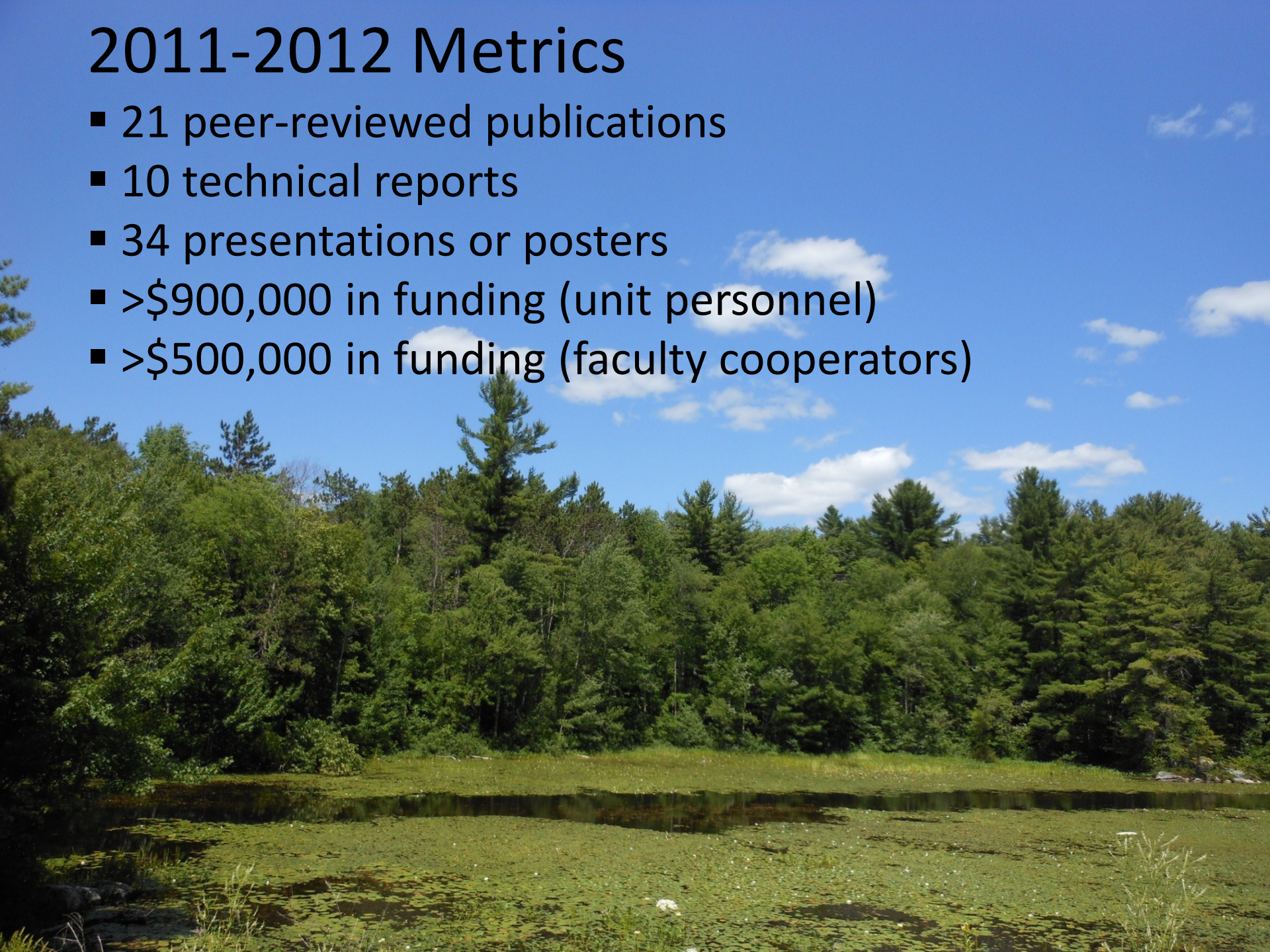
Virginia Tech

The Department of Fish and Wildlife Conservation — Virginia Tech

USGS — science for a changing world

2011-2012 Metrics

- 21 peer-reviewed publications
- 10 technical reports
- 34 presentations or posters
- >$900,000 in funding (unit personnel)
- >$500,000 in funding (faculty cooperators)



Completed Projects

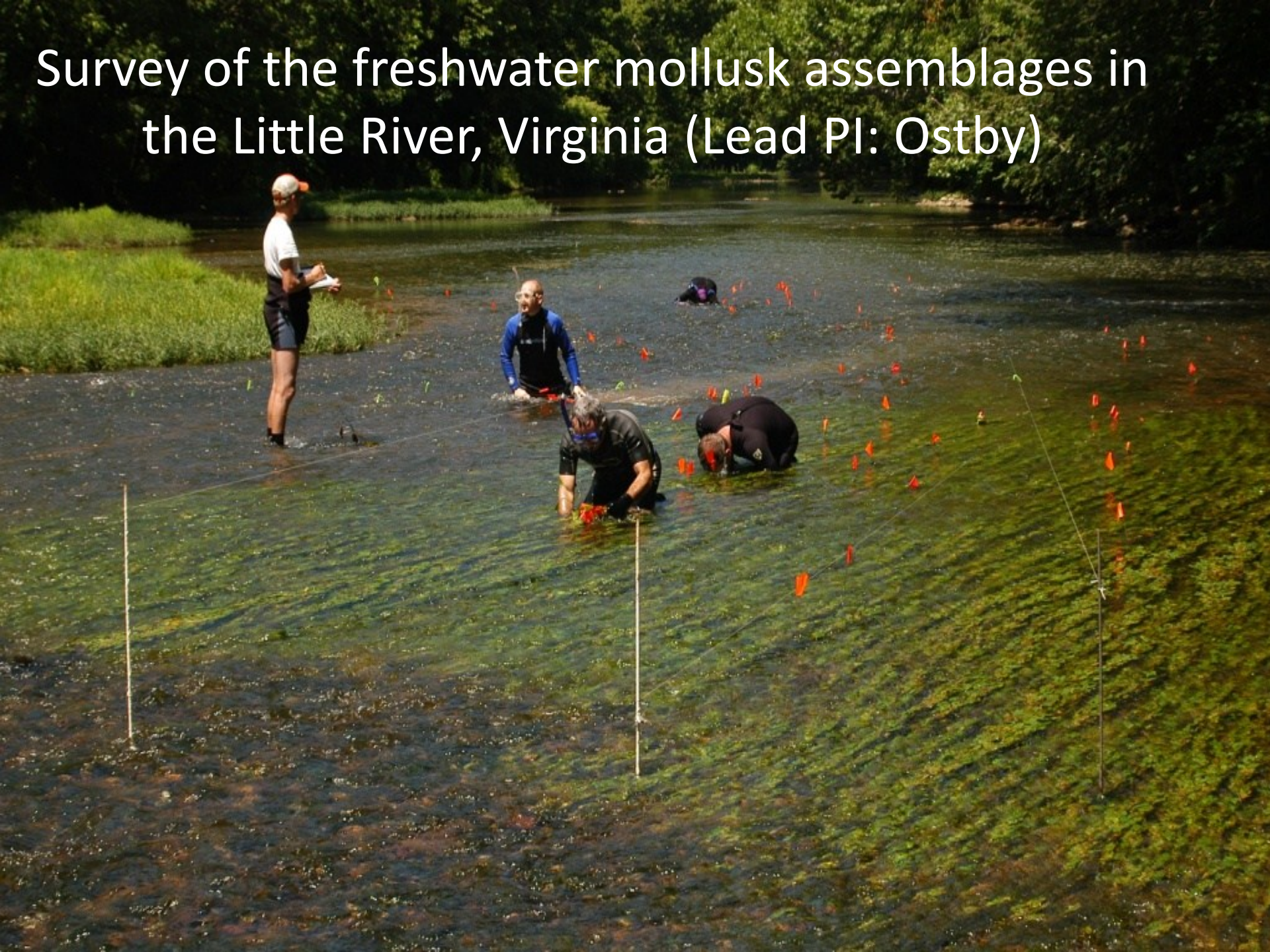
(Angermeier)

Habitat suitability for Roanoke logperch near Philpott Reservior

Assessing impacts of Roanoke River Flood Reduction Project on the endangered Roanoke Logperch

Assessment of the distribution and abundance of Roanoke logperch (*Percina rex*) in the Dan River basin of Virginia

Survey of the freshwater mollusk assemblages in the Little River, Virginia (Lead PI: Ostby)




Status of the freshwater mussel fauna in the Powell River, Virginia and Tennessee (Lead PI: Henley)

Evaluating potential effects of widening US highway 64 on red wolves, Washington, Tyrell, and Dare Counties, North Carolina (Vaughan and Kelly)

Final Results of research along 12 miles of US 64

- Barb wire bear hair samples collected: 851
  - 537 bear road crossing events - from at least 54 individual bears (42M:12F)
- Black bears captured: 116 (87M:29F)
  - 57 (30M:27F) GPS collared – Crossing the road an avg. of 2 times/100 days
  - 78% collared females and 50% collared males never crossed the roadway
- Recorded road kills

  15 bears 8 WT deer 1 red wolf 3 bobcats 7 river otters
  124 mid-size mammals 82 small mammals 1,153 birds 75 bats
  4,014 reptiles 7,498 amphibians
- Photo-Captured wildlife crossings (at barb wire breaks)

  260 black bears 177 red wolves 120 wild canids 170 WT deer
  209 bobcats 208 raccoons
- Identified 6 Important Crossing locations where wildlife underpasses would be most effective in conserving wildlife and protecting motorist

Evaluating potential effects of widening US highway 64 on the black bear population of Alligator River National Wildlife Refuge, Dare County, North Carolina (Kelly and Vaughan)

Multigenerational, multi species test for endocrine disrupting chemical effects (Vaughan and Alexander)

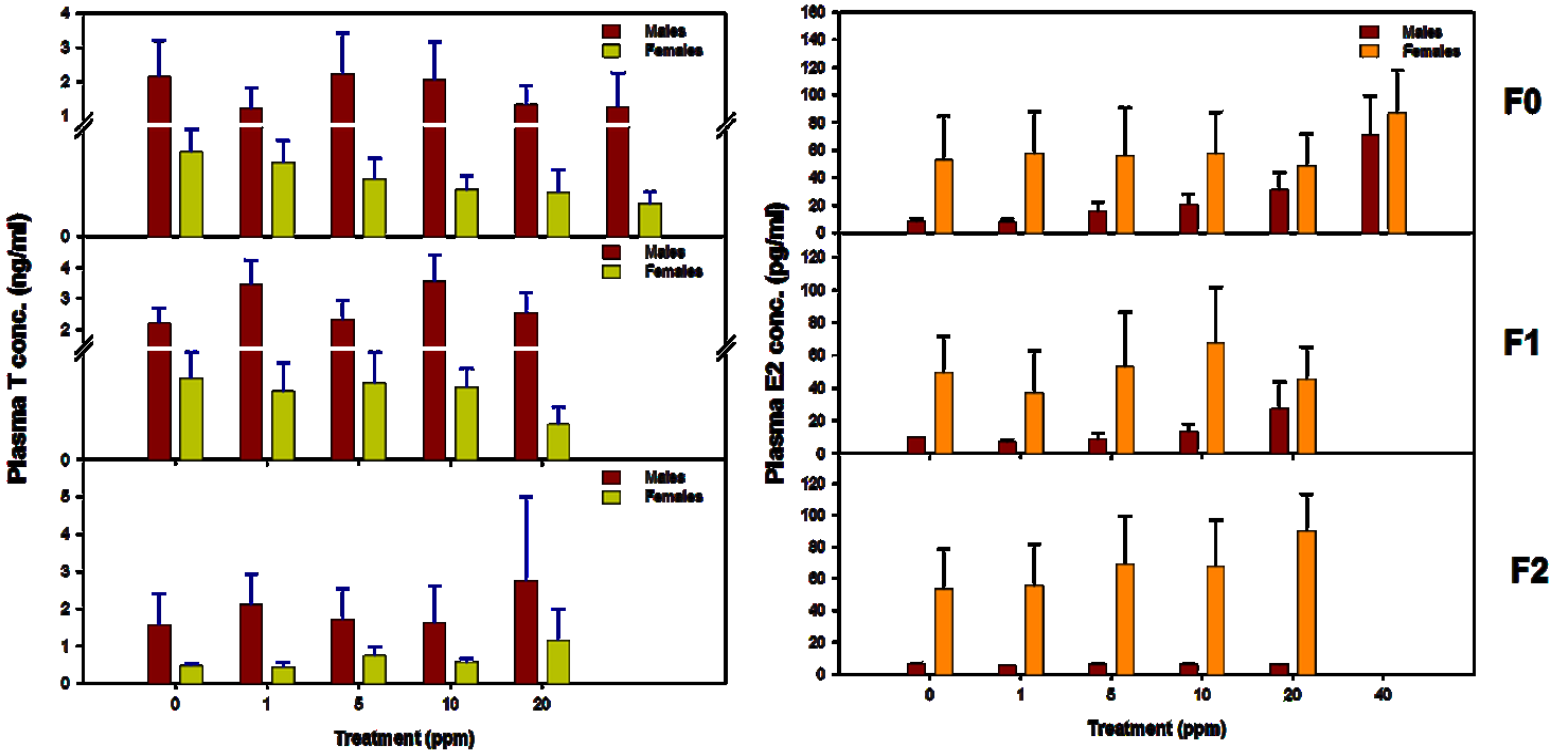


Fig. 1 Circulating concentration of testosterone (a) and estradiol (b) for adult Japanese quail at the end of the trenbolone treatment for each generation

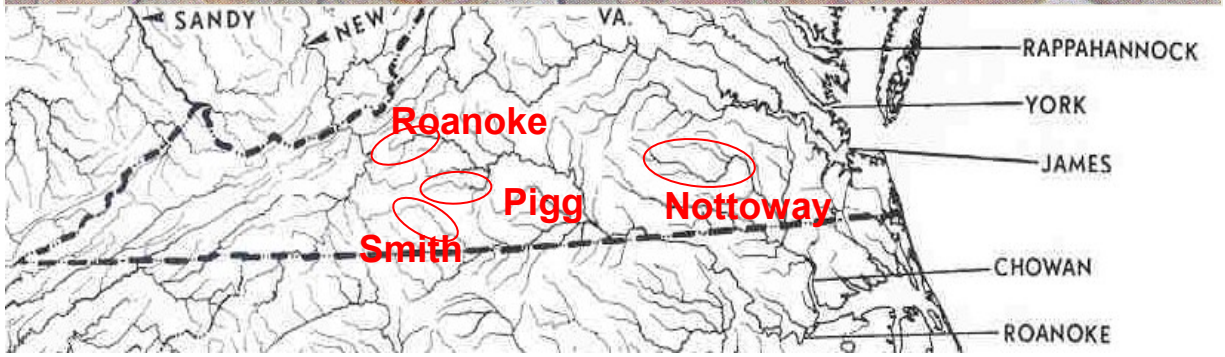
Noninvasive tracking of jaguars (*Panthera onca*) and co-occurring feline species in Belize by genotyping feces and remote camera trapping (Kelly and Vaughan)


Endangered fish surveys for the Virginia Department of Transportation
SPONSOR: Virginia Department of Transportation
(Lead PI: Angermeier)

Assessing post-construction impacts of the Roanoke River Flood Reduction Project on the endangered Roanoke logperch

Habitat suitability for Roanoke logperch near Philpott Reservior

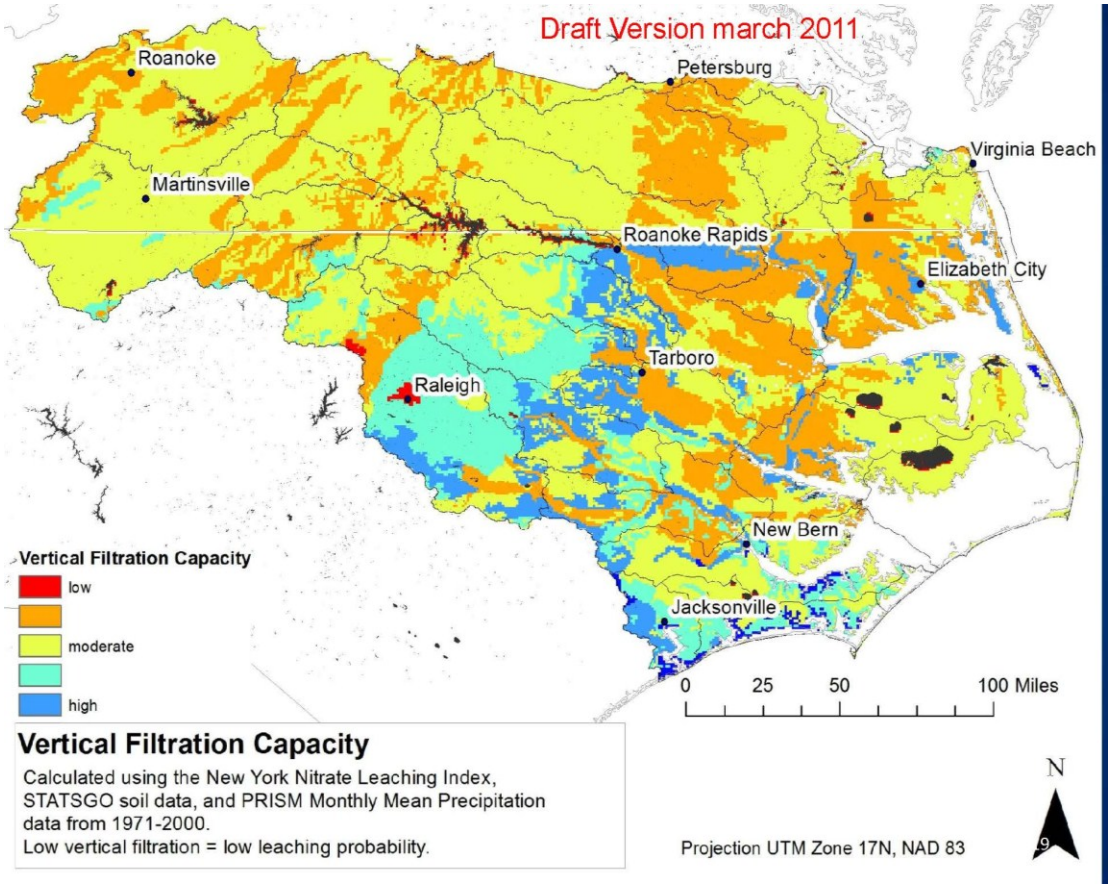
Sponsor: U.S. Army Corps of Engineers (Lead PI: Roberts)

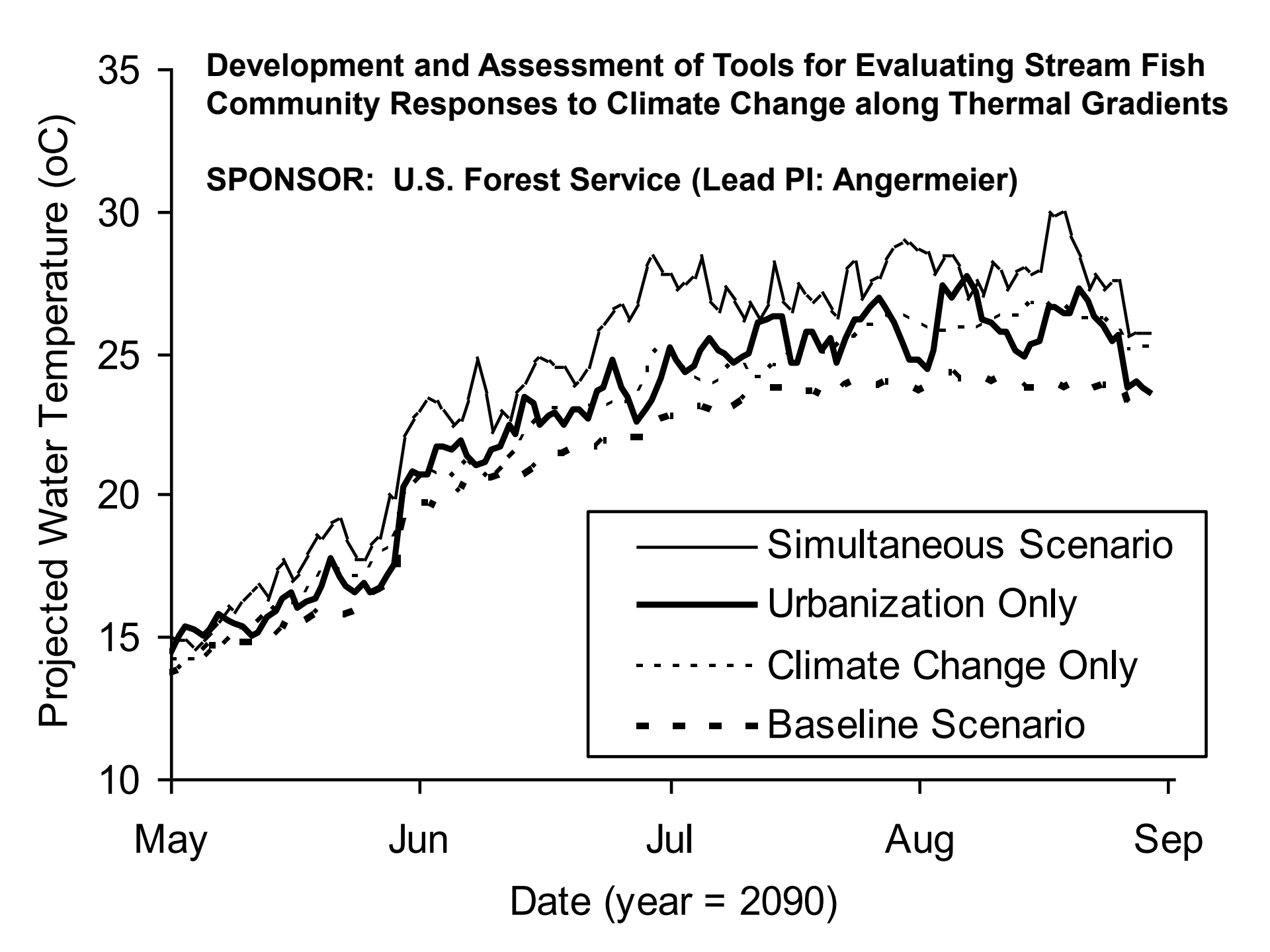


Population ecology of variegate darter in Virginia

Spatial analysis of relations among conservation practices, aquatic ecosystem services, and human well-being in the Albemarle-Pamlico basin

SPONSOR: U.S. Geological Survey (Lead PI: Angermeier)

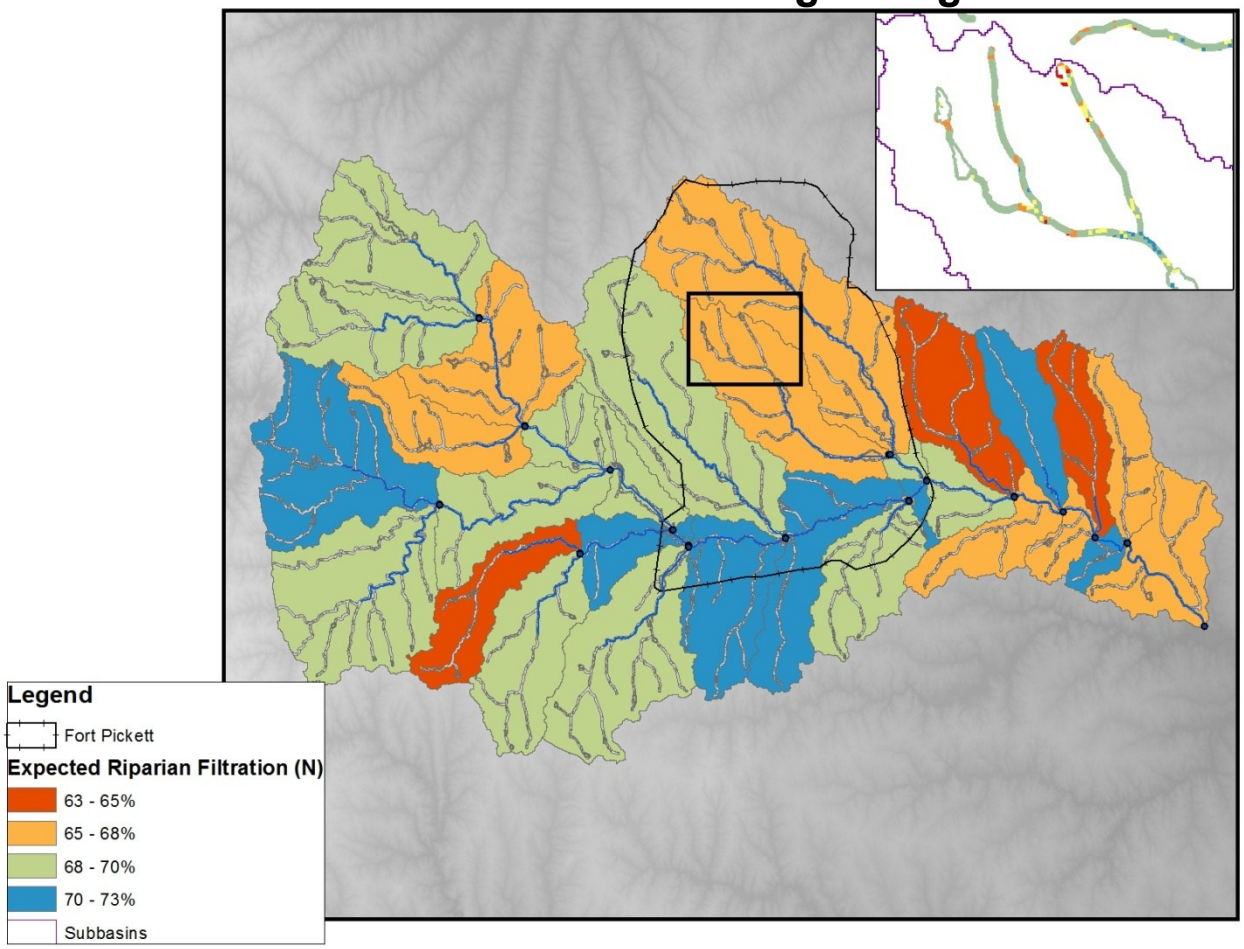



Development and Assessment of Tools for Evaluating Stream Fish Community Responses to Climate Change along Thermal Gradients
SPONSOR: U.S. Forest Service (Lead PI: Angermeier)
Projected Water Temperature (oC)
35
30
25
20
15
10
May
Jun
Jul
Aug
Sep
Date (year = 2090)
Simultaneous Scenario
Urbanization Only
Climate Change Only
Baseline Scenario

Regulating Services as Measures of Ecological Resilience on DoD Lands

SPONSOR: U.S. Department of Defense, ESTCP (Lead PI: Angermeier)

Sediment and Nitrogen Regulation

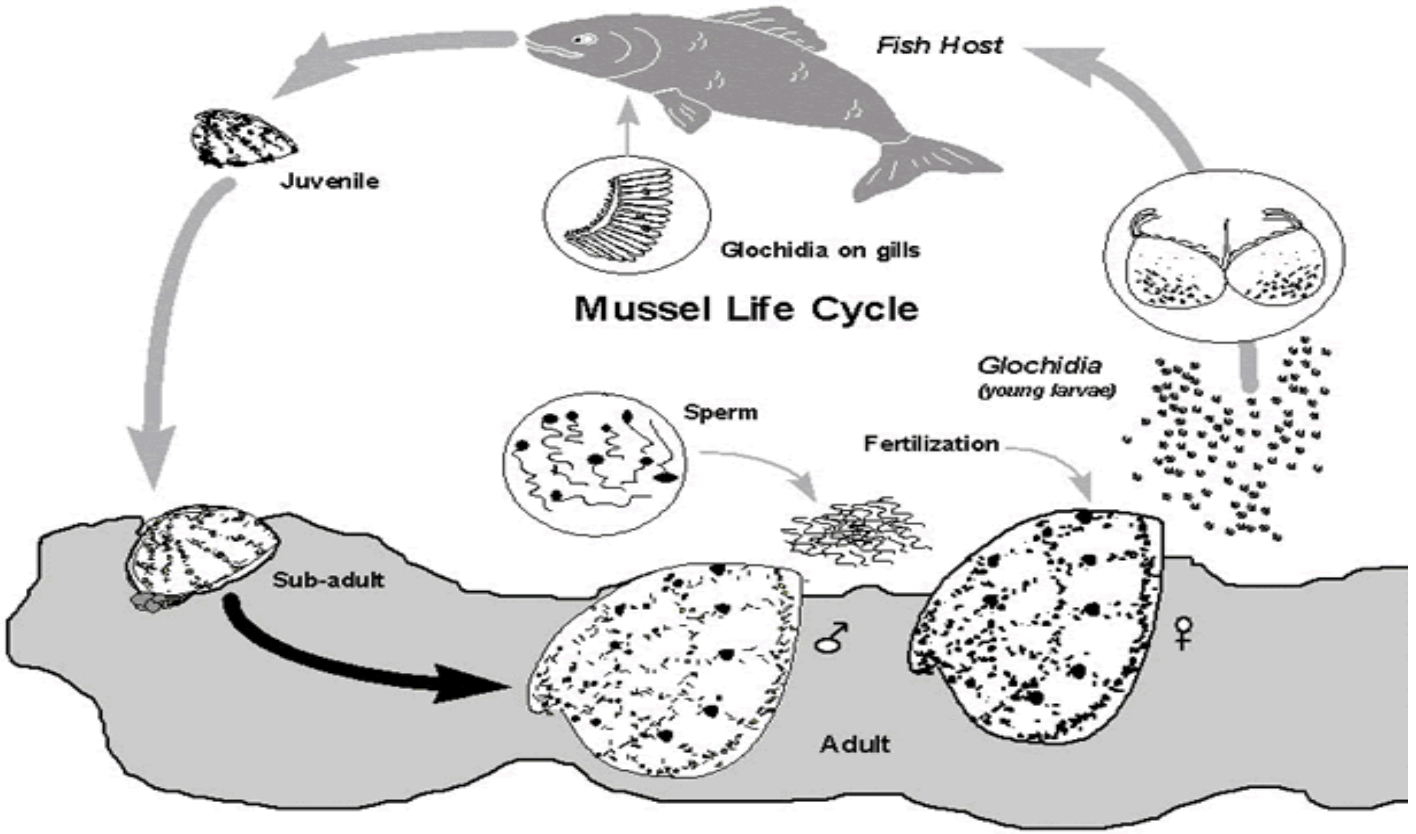


Comparison of habitat suitability among sites supporting strong, localized, and extirpated populations of candy darters *(Etheostoma osburni*)

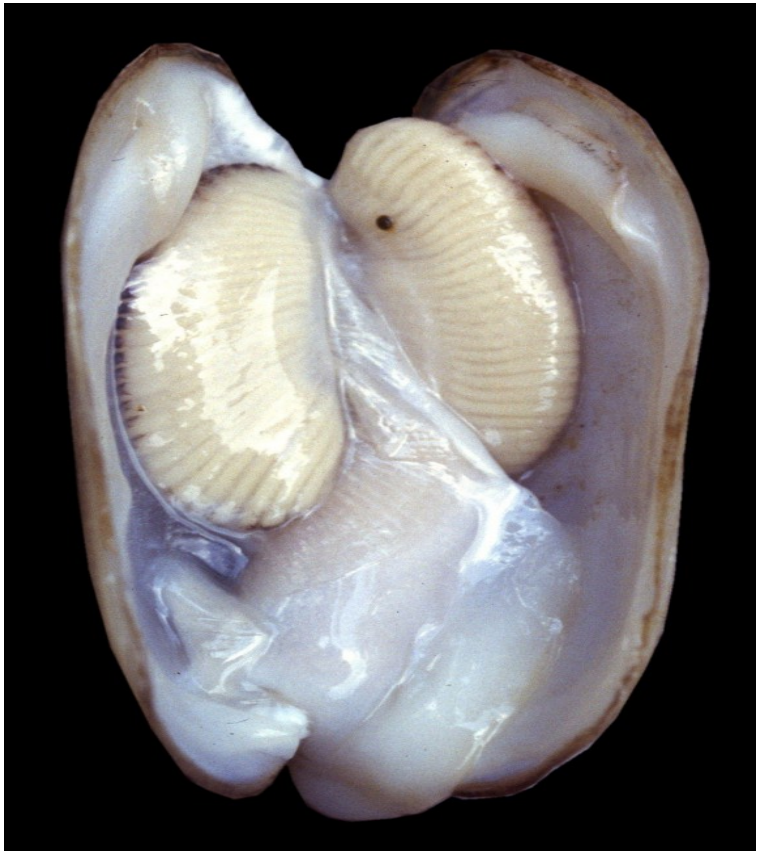
SPONSOR: Virginia Department of Game and Inland Fisheries
(Lead PI: Dunn)

Bayesian population dynamics modeling to guide population restoration and recovery of endangered mussels in the Clinch and Powell Rivers, Tennessee and Virginia

SPONSOR: United States Geological Survey (Lead PI: Jiao)



Biological monitoring and geomorphological characterization for the USGS Eastern Region Initiative on the Clinch



An evaluation of freshwater mussel body burdens following in situ exposure to contaminants in Clinch River

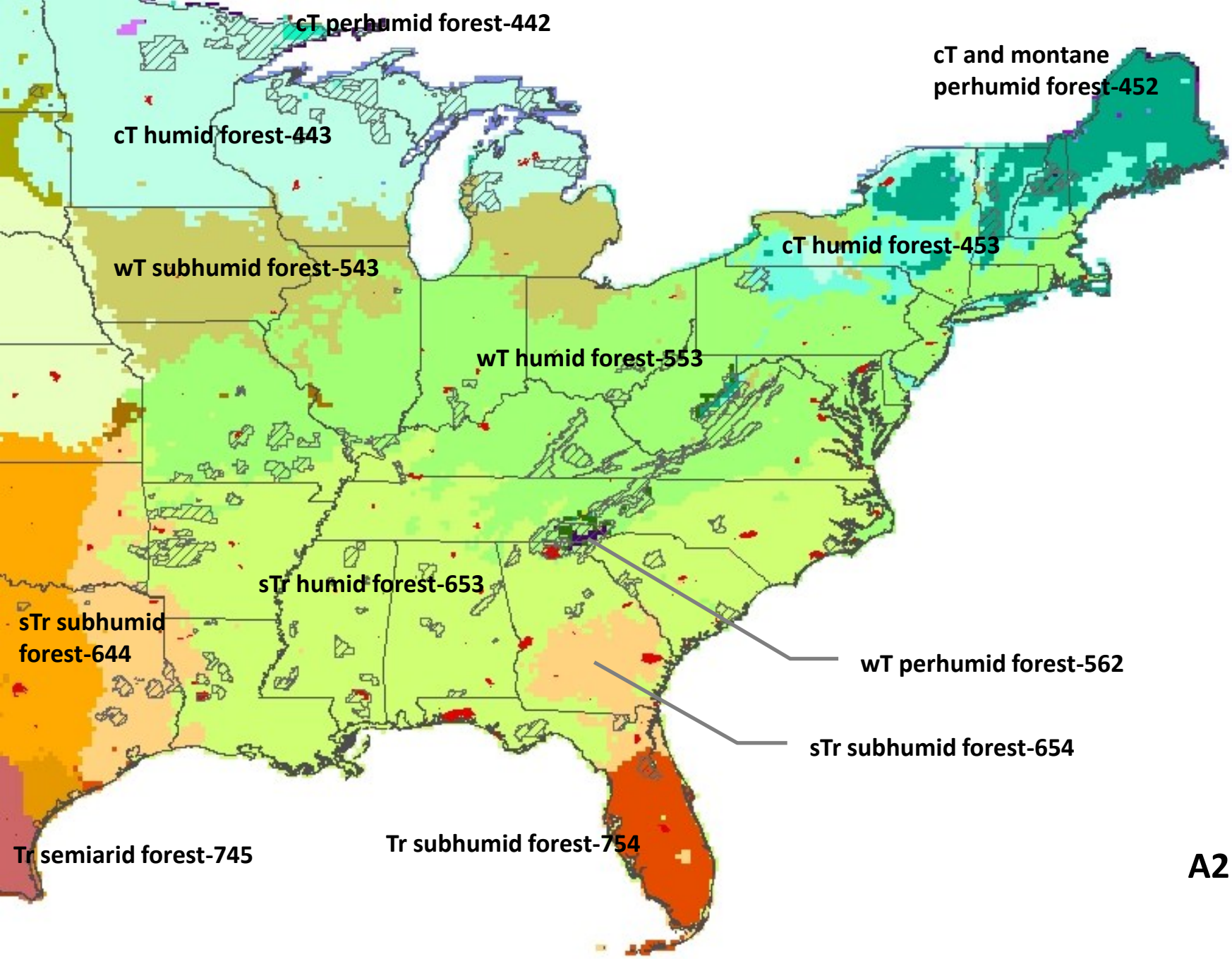
SPONSOR: U.S.G.S. (Lead PI: Ostby)

Stream Surveys for *Villosa perpurpurea* and other native mussels in Beech Creek, Hawkins County, Tennessee

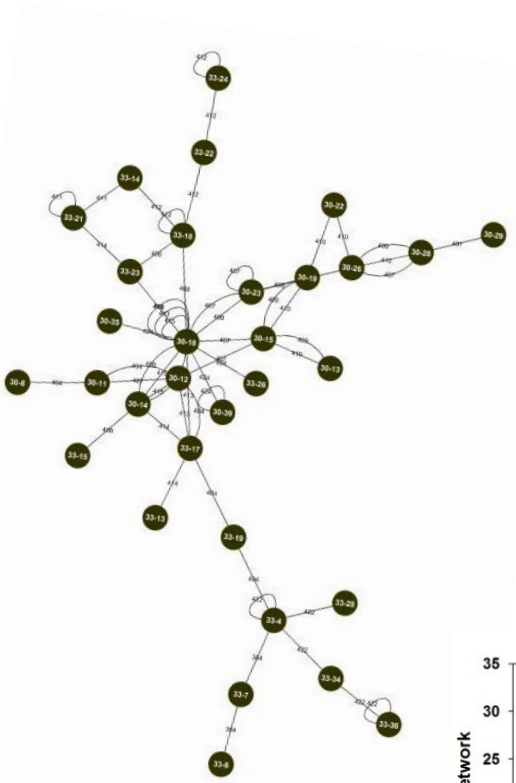
SPONSOR: U.S.F.W.S. (Lead PI: Ostby)

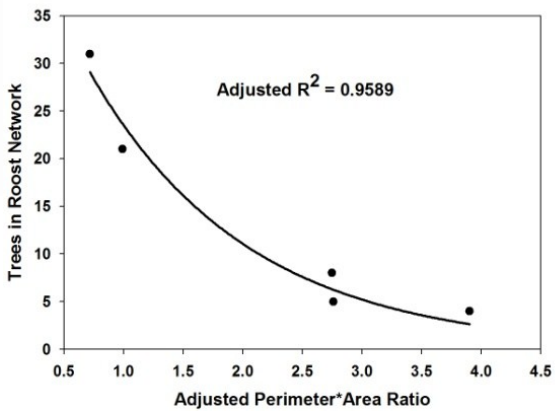
Semi-quantitative freshwater mussel surveys in the Wards Creek, Rocky Creek, Buck Mountain Creek,and Swift Run sub-watersheds of the Rivanna River

SPONSOR: T.N.C. (Lead PI: Ostby)

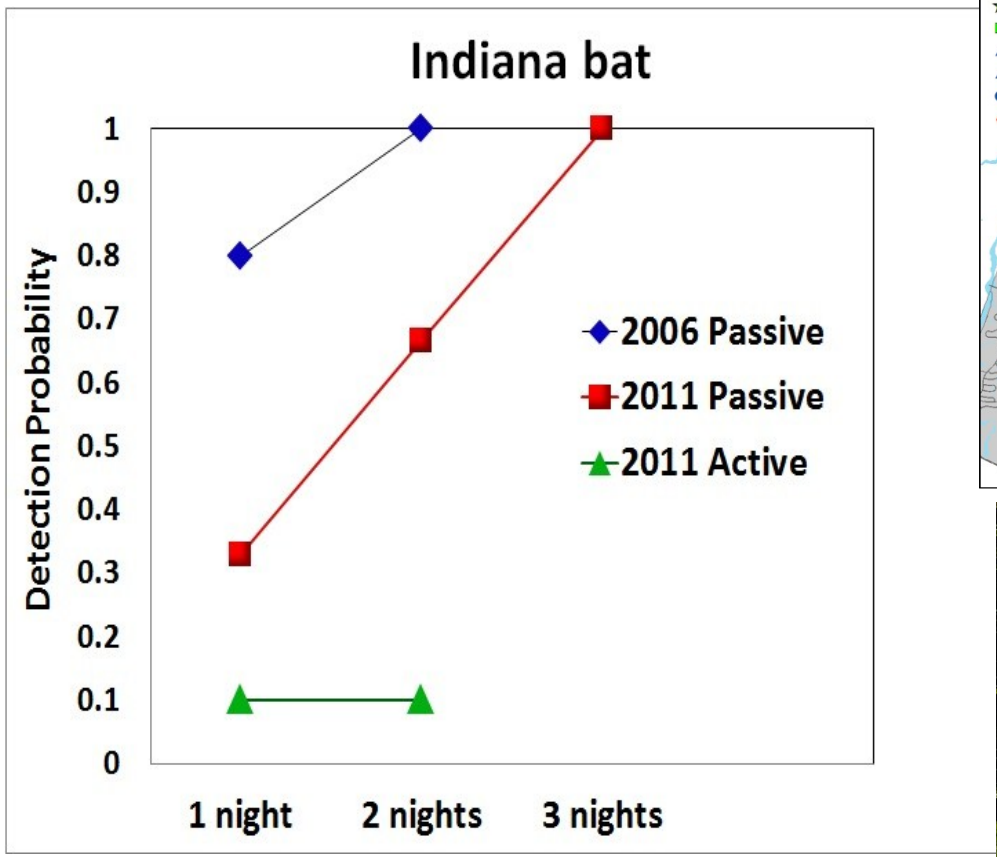

cT perhumid forest-442
cT and montane perhumid forest-452
cT humid forest-443
cT humid forest-453
wT subhumid forest-543
wT humid forest-553
sTr humid forest-653
sTr subhumid forest-644
wT perhumid forest-562
sTr subhumid forest-654
Tr semiarid forest-745
Tr subhumid forest-754
A2 2085

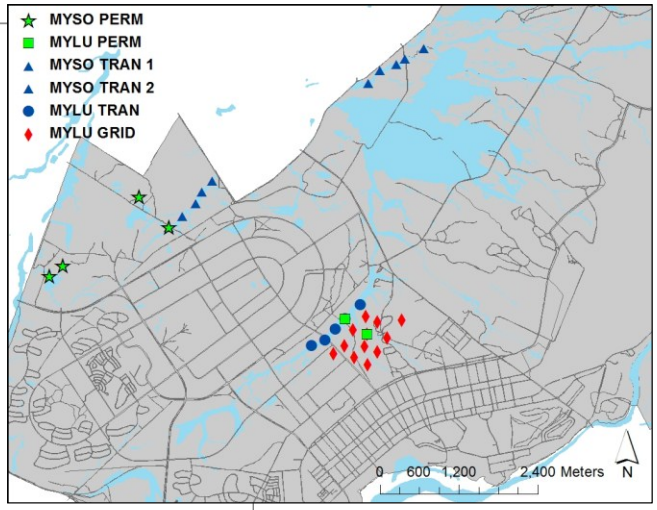
Effects of a hierarchal and spatially differential disruption of roosts and roost areas on non-random assorting (social) dynamic in bats using ephemeral forest conditions (Army 6.1 – Ford)





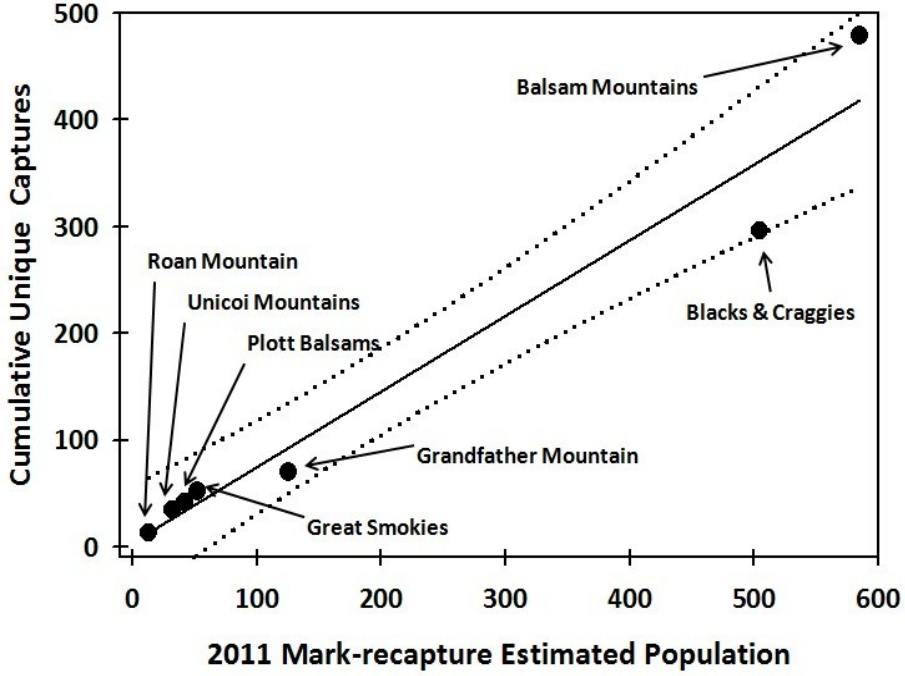
Acoustical Sampling Following White-nose Syndrome at Fort Drum, New York: Pilot Test to Determine Efficacious Techniques to Address Surveillance Needs (Army Installation Command – Ford)

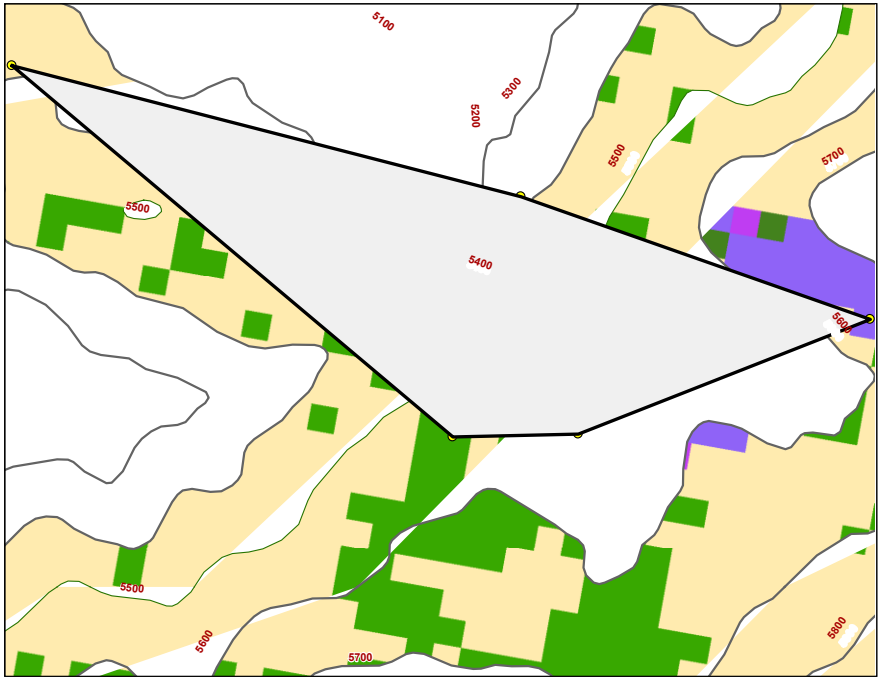


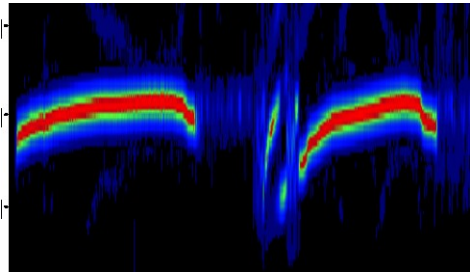


Assessing occupancy and detection rates for the Carolina northern flying squirrel: examination of nest-box surveys in Program Mark and Program Presence and development of acoustical survey techniques (NC Wildlife Comm. and USFWS – Ford)

Figure 2. Linear relationship between cumulative captures of Carolina northern flying squirrels and site-specific POPAN population estimation, 2011.







White-tailed Deer Impact and Vegetative Response in the Blue Ridge, Ridge and Valley and Appalachian Plateau of Virginia in Relation to Landscape and Land Ownership Characteristics (VDGIF – Ford)

Figure 2. Conceptual legacy impact

Formerly high

Continual low

Continual high

Traditional woody browse survey

Tests woody species recovery/composition

- If formerly high = continual low and/or different from continual high, then recovery?
- If formerly high = continual high, then recovery impeded by legacy effects?

Choose other taxa (herbs/birds) to compare for legacy effects

- If formerly high = continual low, then recovery with no legacy effect?
- *If formerly high different from continual low then woody browse survey not appropriate for biodiversity assessment of herbivory impacts*

Traditional woody browse surveys sufficient!

Assessing the responses of breeding shorebirds to military jet overflights of the Core MOA at Cape Lookout National Seashore

Sarah M. Karpanty and James D. Fraser

- Objectives:
  - To understand how a lowered floor for military overflights affects the behavior and demography of colonial waterbirds and Wilson's Plovers.
  - To maximize application of our data to the varied management needs of the US Marine Corps, National Park Service, and other resource management agencies.

- Field work and draft final reports completed; 2 M.S. students will be defending their theses in August 2012

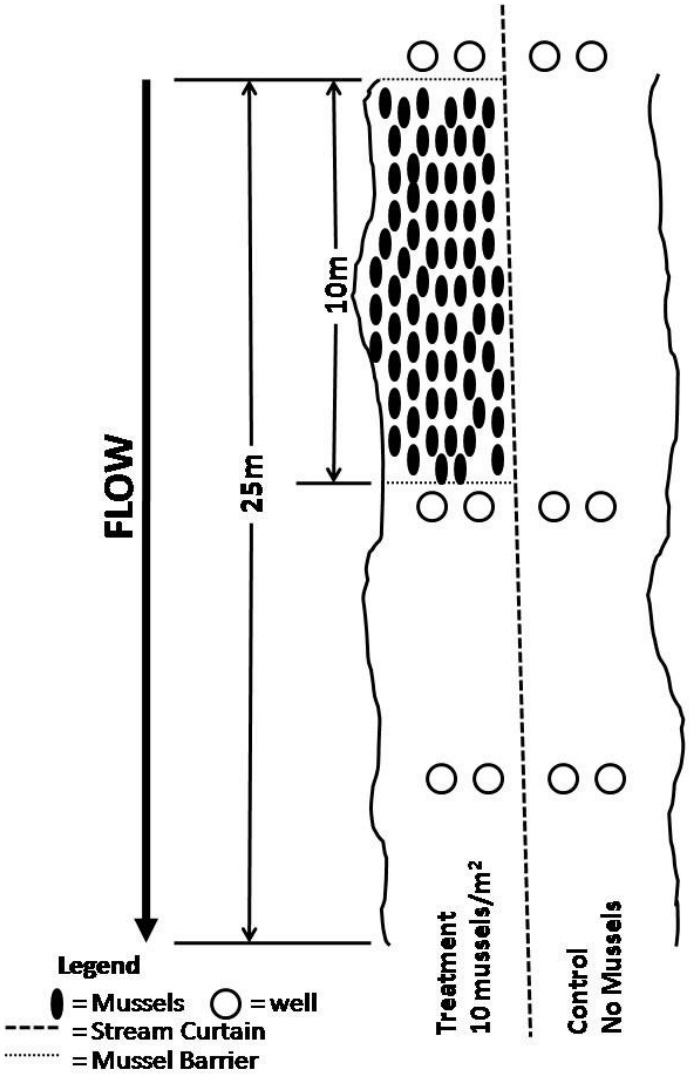
- Major Finding: No biologically-relevant alterations of behavior or demography due to military overflights at current use frequencies and altitudes.

Incubating Least Terns during U.S. Marine Corps overflights at Cape Lookout National Seashore, captured by Reconyx PC-90 cameras

Missouri River Piping Plover Population Dynamics in relation to natural and Artificial Sandbars; Least tern and piping plover response to flooding on the Missouri River (Daniel Catlin, James Fraser, and Sarah Karpanty)

- Post-flood research (at least 3 years)
  - Demography
    - Compare the reaction to created habitats
  - Food resources
- Why has adult survival declined?
  - Cyclic vs. static

Evaluation of the functional role of freshwater mussel beds in maintaining water quality and suitable habitat for fishes and endangered freshwater mussels (Benfield and Garst)



Development of Demographic Metrics to Evaluate Success of Mussel Reintroductions in the Upper Tennessee River System (Jones)

- **Objective 1:** Locate and characterize stream habitat patches in the Clinch, Powell and Nolichucky rivers to use as potential reintroduction sites for each species

- **Objective 2:** Estimate survival, recruitment, immigration rates and fecundity for both species

- **Objective 3:** Conduct population viability analysis (PVA) to compare outcomes for alternative translocation and reintroduction strategies

Project Duration: September 2011 to February 2014.

Restoration of freshwater mussel populations to high priority geographic areas in the upper Tennessee River system

Project Goal: Establish viable populations of endangered mussels in Clinch, Powell and Nolichucky rivers.

Project Duration: April 2011 to December 2013.

Tagged endangered mussels cultured at FMCC

Graduate student Tim Lane releasing mussels in the Powell River, TN in 2011.

Reintroduction Efforts

Translocated and Propagated mussels stocked in the three river reaches

Species	Upper Clinch River	Lower Powell River	Lower Nolichucky River
Cumberlandian Combshell	1820	754	673
Oyster Mussel	5592	1439	3605

Releases in Upper Clinch River 2006-2011

Releases in Lower Nolichucky River 2007-2011

Releases in Lower Powell River 2008-2011

Efforts will continue in each reach in 2012

Agencies Collaborating:
VDGIF AWCC
TWRA
USFWS
Virginia Tech FMCC

FishTraits database redesigned for Virginia Tech Library hosting starting 9/2012 (Frimpong)

Select traits to change | Django site admin - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Select traits to change | Django site admin

170.224.166.73/admin/fish/traits/?o=3

Ask.com

Django administration

Welcome, **test**. Documentation / Change password / Log out

Home › Fish › Traitss

Select traits to change

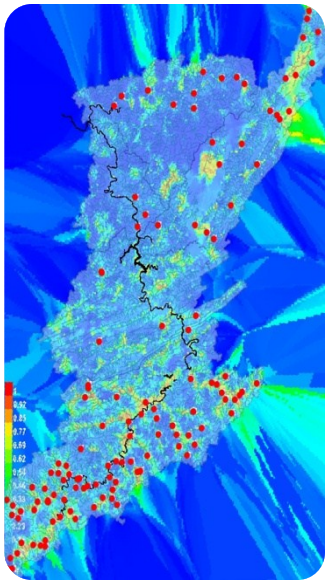
Add traits

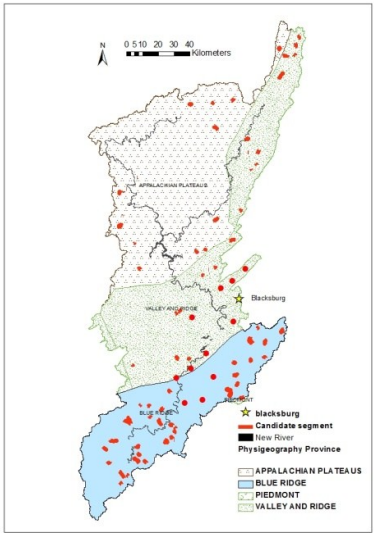
Action: --------- Go 0 of 100 selected

ID	NOTES	SID	ALTSID	FID	GENUS	SPECIES	GID	SCIENTIFICNAME	ITISTSN	COMMONNAME	OTHERNAMES	REPSTATE	FAMILYNUMBER	NATIVE	NONFEED	BENTHIC	SURWCOL	ALGPHYTO	MACVASCU	DETRITUS	INVLVFSH	FSHCRCRB	BLOO
2	2	Aalabama	Aalabama	Clupeida	Alosa	alabamae	Alosa	Alosa alabamae	161705	Alabama shad	(None)	AL	97	✓	⊖	⊖	⊖	✓	⊖	⊖	✓	⊖	⊖
3	3	Aalutace	Aalutace	Cyprinid	Acrocheilus	alutaceus	Acrochei	Acrocheilus alutaceus	163531	chiselmouth	(None)	OR	102	✓	⊖	✓	✓	✓	✓	✓	✓	⊖	⊖
4	4	Aariommu	Aariommu	Centrarc	Ambloplites	ariommus	Amblopli	Ambloplites ariommus	168099	shadow bass	(None)	MS	349	✓	⊖	✓	✓	⊖	⊖	⊖	✓	✓	⊖
6	6	Abeanii	Abeanii	Percidae	Ammocrypta	beanii	Ammocryp	Ammocrypta beanii	553376	naked sand darter	(None)	MS	350	✓	⊖	✓	⊖	⊖	⊖	⊖	✓	⊖	⊖
182	182	Abifasci	Ebifasci	Percidae	Ammocrypta	bifascia	Ammocryp	Ammocrypta bifascia	168514	Florida sand darter	(None)	AL	350	✓	⊖	⊖	⊖	⊖	⊖	⊖	✓	⊖	⊖
7	7	Abreviro	Abreviro	Acipense	Acipenser	brevirostrum	Acipense	Acipenser brevirostrum	161069	shortnose sturgeon	(None)	NC	60	✓	⊖	✓	⊖	⊖	⊖	⊖	✓	✓	⊖
8	8	Abrunneu	Abrunneu	Ictaluri	Ameiurus	brunneus	Ameiurus	Ameiurus brunneus	164035	snail bullhead	(None)	NC	143	✓	⊖	✓	⊖	✓	✓	⊖	✓	✓	⊖
9	9	Acalva	Acalva	Amiidae	Amia	calva	Amia	Amia calva	161104	bowfin	(None)	NC	63	✓	⊖	✓	✓	⊖	⊖	⊖	✓	✓	⊖
10	10	Acatus	Acatus	Ictaluri	Ameiurus	catus	Ameiurus	Ameiurus catus	164037	white catfish	(None)	NC	143	✓	⊖	✓	✓	⊖	✓	✓	✓	✓	⊖
11	11	Acavifro	Acavifro	Centrarc	Ambloplites	cavifrons	Amblopli	Ambloplites cavifrons	168098	Roanoke bass	(None)	NC	349	✓	⊖	✓	✓	⊖	⊖	⊖	✓	✓	⊖
12	12	Achrysoc	Achrysoc	Clupeida	Alosa	chrysochloris	Alosa	Alosa chrysochloris	161707	skipjack herring	(None)	NC	97	✓	⊖	⊖	✓	⊖	⊖	⊖	✓	✓	⊖
13	13	Achrysog	Achrysog	Cyprinid	Agosia	chrysogaster	Agosia	Agosia	163533	longfin dace	(None)	NM	102	✓	⊖	✓	⊖	✓	⊖	✓	✓	⊖	⊖

Fish distribution modeling and field-testing of underway in the New River basin (VA, WV, & NC)

New River Shiner distribution model with Maximum enthropy





Sites being Sampled for Model validation

Restoration of Pine Flatwoods Wetlands on Eglin Air Force Base (Haas)

- Wetland restoration treatments have been applied.
- Drift fences are in place to monitor amphibian response.

Endangered Reticulated Flatwoods Salamander

Histological Evaluations of Organ Tissues of Pheasantshells (*Actinonaias pectorosa*) from Horton Ford and Simones Island, Clinch River, Tennessee and Virginia (Henley)

Correlations (*Spearman's rho*) between tissue concentrations of trace elements and fractions of kidney diverticula cells containing lipofuscin (FKDCL) in mussels collected from Semones Island and Horton Ford (n=16), $^{*}p \leq 0.01$, $^{**}p \leq 0.001$, $^{***}p \leq 0.0001$.

	FKDCL
As	0.64^{*}
Ba	0.74^{*}
B	0.64^{*}
Co	0.84^{***}
Fe	0.74^{*}
Mn	0.73^{*}
Hg	0.75^{**}
Ni	0.63^{*}
Ag	0.85^{***}
Sr	0.66^{*}

Angermeier Proposed Projects for 2012-13

1. Larval ecology of Roanoke logperch in the upper Roanoke River watershed

2. Population viability analysis for Roanoke logperch

3. Habitat suitability for Roanoke logperch near Philpott Reservoir

4. Evaluating air-water temperature linkages in Shenandoah National Park streams

5. Use of structured decision-making in the conservation of fishes and mussels in the upper Tennessee River basin

6. Survey for Roanoke logperch in Tinker Creek, Botetourt County, Virginia

7. Assessment of the distribution and degree of introgression of Roanoke bass populations in Virginia

Ford Proposed Projects for 2012-13

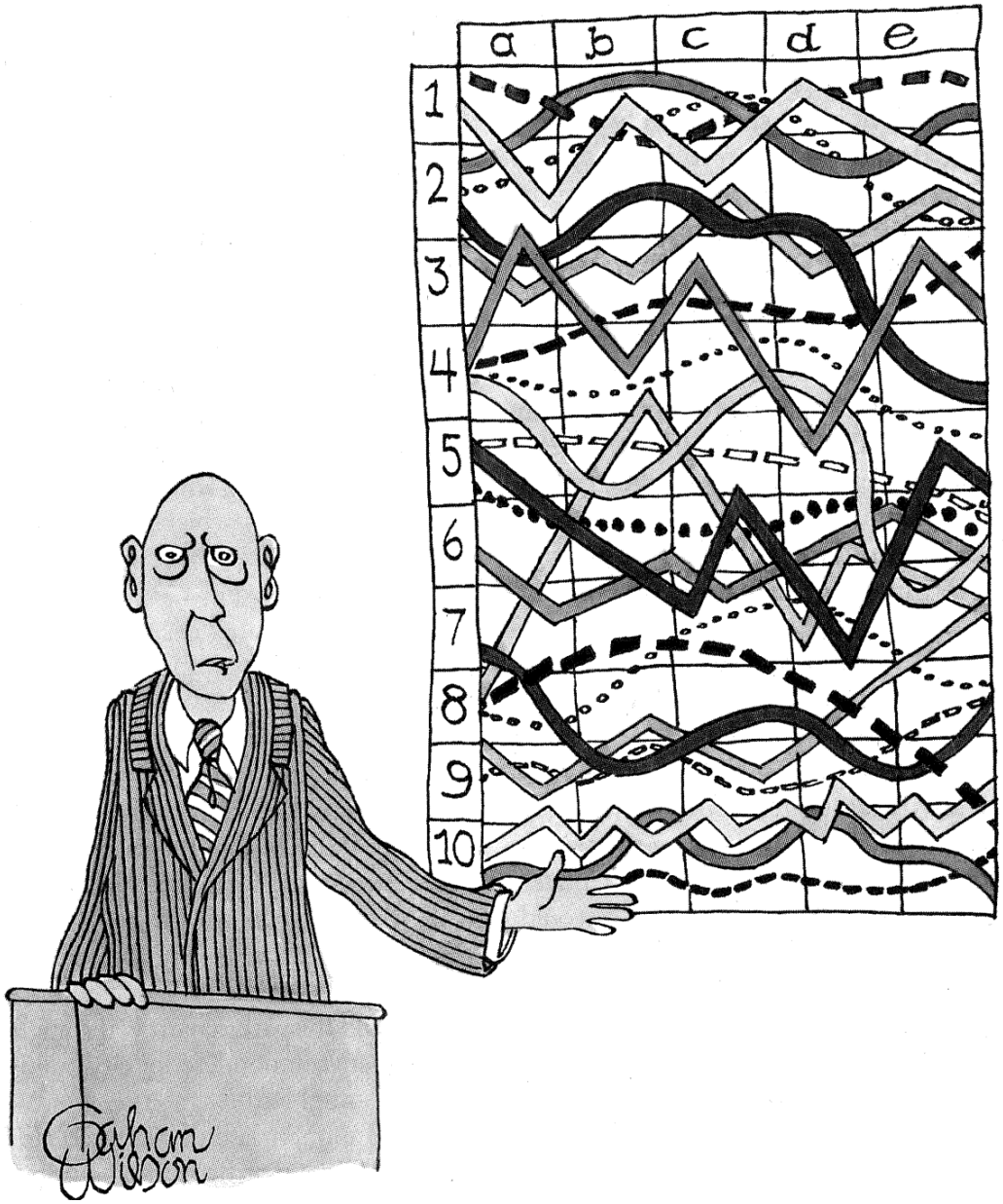
1. Micro-habitat characteristics of Virginia northern flying squirrel (*Glaucomys sabrinus fuscus*) foragings sites: relating structure, composition and soils to habitat identification, conservation and restoration needs

2. Development of a species action plan and workshop to aid in the management of endangered Carolina northern flying squirrels at Blue Ridge Parkway and in Great Smoky Mountains National Park

3. Cross-scale assessment of functional and structural ecological changes from surface coal mining in Appalachia through development and application of an index of biological integrity.

4. Cerulean warbler and associated species response to silvicultural prescriptions in the central Appalachian region

5. Bat response to desired forest conditions in southern bottomland hardwoods in the Lower Mississippi Alluvial Valley: baseline needs for sustainable implementation of strategic habitat conservation



"I will pause for a moment so you can let this information sink in."