



COMMONWEALTH of VIRGINIA

Department of Game and Inland Fisheries

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June 19, 1992

Dr. Robert E. Jenkins
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Roanoke College
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Dear Bob:

How was the Ichs and Herps meeting? Good, I hope. I received your letter of 22 May and, per your request, enclosed is information Mark Ferguson and I collected during our Copper Creek trip during 19-22 May. Included with the enclosed information is a summary/comparison data table which was compiled by Mark.

As suggested by these data, it was a rather depressing trip. Although I still believe that sedimentation is a big concern in Copper Creek, I suspect that there is a water quality problem that is contributing largely to the observed decline in the freshwater mussel population in this stream, which may also be the reason we haven't seen the yellowfin madtom since 1988. I say this because at certain sites (Rt. 642 Crossing and Spivey Ford), the substrata appeared to be in good shape and very suitable for mussels, yet few live mussels were found. At all four sites examined, the majority of live mussels found occupied the silty margins of streams. *Villosa iris* was the most common species in this microhabitat type—a species which seems to prefer calmer/siltier areas. Most disturbing was that the clean-swept, swift riffle microhabitats at each of the sites were devoid of mussels—and we searched these areas intensely, knowing that most rare mussel species prefer such conditions.

As stated in Mark's summary, *Corbicula* densities have increased substantially, an exotic species commonly found in degraded habitats.

I spoke with Steve Ahlstedt a few weeks ago about our findings; he was not too surprised it seemed, stating that in 1980 he warned that the increasing clearing of the riparian habitat was already adding excess silt into Copper Creek. He also said that in 1988 drought conditions were such that Copper Creek almost dried up, which could definitely impact/kill beds of mussels. However, as judged by some qualitative surveys conducted by my technician and I in 1991, mussel densities appear to be greater at various locations in the

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upper reaches, although the diversity is still low. My hypothesis is that water quality is the main issue to be addressed (fecal coliform levels? pesticides?), in conjunction with sedimentation problems.

This next week (22-25 June), Mark and I will attempt to float Copper Creek in a canoe, with the intent to document, with photos, obvious and visual signs of physical habitat degradation. If this pilot trip proves successful, we may be able to solicit help from volunteers (i.e., canoe organizations) to conduct similar habitat surveys on other rivers in Virginia (training sessions likely will be needed, but very feasibly done).

We haven't conducted any more fish surveys since 3 May Bob, with you. I'll be in touch regarding results of next week's efforts. Please call if you'd like to discuss any of the enclosed information, or if I can aid you in preparation of your manuscript.

Sincerely,



Sue Bruenderman,
Aquatic Nongame Biologist

enclosure

cc: Andy Moser, USFWS, Annapolis, MD
Dick Biggins, USFWS, Ashville, NC
Don Gowan, TNC, Abingdon, VA
Tom Smith, Div. Nat. Heritage, Richmond, VA
Lou Sievard, VSWCB, Richmond, VA
Greg Moser, SCS, Richmond, VA
Dick Neves, USFWS, Blacksburg, VA
Fred Leckie, VDGIF, Richmond, VA

COPPER CREEK - Qualitative Assessment of Mussel Community
Comparison of TVA 1980 data with VDGIF 1992 data

Methods:

TVA: 4-5 divers; 45-90 min/diver at each site.

VDGIF: 2 snorklers; 80 min/person at each site.

Four of Ahlstedt's richer sites were chosen: RM 1.8, 2.1, 3.5, and 11.0. Mussels were also collected at RM 13.8 but snorkling was not employed, so this information was excluded from tallies but included in the table below.

Summary:

TVA collected a total of 16 species, 363 specimens (\bar{x} =72.6,SD=31.4).

VDGIF collected a total of 6 species, 63 specimens (\bar{x} =15.8,SD=18.0).

Cumberlandian species:

TVA collected 10 species, 258 specimens.

VDGIF collected 3 species, 57 specimens.

Federally endangered species:

TVA collected 2 species, 16 specimens; from 2 sites.

(*Fusconaia cor*, *F. cuneolus*)

VDGIF collected no Federally endangered species.

State endangered species:

TVA collected 3 species, 40 specimens; from 4 sites.

(*Alasmidonta viridis*, *Epioblasma capsaeformis*, *Villosa perpurpurea*)

VDGIF collected 1 species, 4 specimens; from 2 sites.

(*Villosa perpurpurea*)

State threatened species:

TVA collected 1 species, 4 specimens; from 2 sites.

VDGIF collected 1 species, 2 specimens; from 1 site.

(*Quadrula cylindrica* from both sites)

Special concern species:

TVA collected 1 species, 11 specimens; from 3 sites.

(*Fusconaia barnesiana*)

VDGIF collected no special concern species.

Corbicula sp. were reported as being rare in Copper Creek in 1980 by TVA, but were common in 1992.

The two most downstream sites (RM 1.8 and 2.1) were the two most diverse sites in the 1980 TVA surveys; in 1992, however, the mussel communities of both of these sites were greatly reduced, with few species and specimens found. The most upstream site held the greatest number of mussels among the four sites surveyed in 1992.

Medionidus conradicus, common throughout the stream in 1980, was not found at any of the four sites in 1992.

Pleurobema oviforme, also common in 1980, was only abundant at one site in 1992. *Villosa perpurpurea* also greatly reduced.

1992: Relict shells were very abundant and represented a much more diverse mussel fauna than was suggested by living specimens. Mussels were often absent or in very low abundance in habitats which appeared suitable (swift riffles with gravel/cobble substrata). Live mussels were often found only in slow, silted pool/backwater areas.

Copper Creek Collections

	RM 1.8		RM 2.1		RM 3.5		RM 11.0		RM 13.8	
	TVA	VDGIF	TVA	VDGIF	TVA	VDGIF	TVA	VDGIF	TVA	VDGIF
<i>Alasmidonta viridis</i>	1	0	3	0						
<i>Elliptio dilatatus</i>	6	0	4	0	6	0			2	0
<i>Epioblasma capsaeformis</i>	1	0	4	0	1	0				
<i>Fusconaia barnesiana</i>	5	0	5	0	1	0				
<i>Fusconaia cor</i>			6	0						
<i>Fusconaia cuneolus</i>	3	0	7	0						
<i>Lampsilis fasciola</i>	4	1	2	1	2	1	1	0		
<i>Lampsilis ovata</i>	1	0								
<i>Medionidus conradicus</i>	17	0	36	0	34	0	1	0	21	0
<i>Pleurobema oviforme</i>	32	0	7	0	3	2	11	38	23	2
<i>Ptychobranhus fasciolaris</i>	2	0	2	1					1	0
<i>Ptychobranhus subtentum</i>			2	0			2	0	6	0
<i>Quadrula cylindrica</i>	2	0	2	0			0	2		
<i>Villosa iris</i>	23	4	10	2	11	3	5	4	7	7
<i>Villosa perpurpurea</i>	17	0	7	1	2	0	4	3	7	0
<i>Villosa vanuxemi</i>	1	0								
TOTAL ABUNDANCE	115	5	97	5	60	6	24	47	67	9
SPECIES	14	2	14	4	8	3	6	4	7	2

Sampling effort at each site in 1992 was roughly $\geq 1/2$ that in 1980.

RELICT SHELLS COLLECTED IN 1992:

RM 1.8:	RM 2.1:	RM 3.5:
<i>Actinonaias pectorosa</i>	<i>Actinonaias pectorosa</i>	<i>Actinonaias pectorosa</i>
<i>Elliptio dilatata</i>	<i>Amblema plicata</i>	<i>Amblema plicata</i>
<i>Fusconaia cor</i>	<i>Elliptio dilatata</i>	<i>Elliptio dilatata</i>
<i>Fusconaia cuneolus</i>	<i>Fusconaia barnesiana</i>	<i>Fusconaia cuneolus</i>
Io (?) - very, very old	<i>Fusconaia cor</i>	<i>Lasmigona costata</i>
<i>Lampsilis fasciola</i>	<i>Fusconaia cuneolus</i>	<i>Medionidus conradicus</i>
<i>Lexingtonia dolabelloides</i>	<i>Lampsilis fasciola</i>	<i>Pleurobema oviforme</i>
<i>Medionidus conradicus</i>	<i>Medionidus conradicus</i>	<i>Villosa iris</i>
<i>Pleurobema oviforme</i> (?)	<i>Ptychobranhus subtentum</i>	<i>Villosa perpurpurea</i>
<i>Villosa iris</i>	<i>Quadrula cylindrica</i>	<i>Villosa venumemensis</i>
<i>Villosa venuxemensis</i>	<i>Villosa iris</i>	Unknown mussel
<i>Villosa perpurpurea</i> (FD)	<i>Villosa vanuxemensis</i>	
RM 3.5: <i>Actinonaias pectorosa</i>		
<i>Amblema plicata</i>		FD - Fresh dead
<i>Elliptio dilatata</i>		