PETITION TO REDESIGNATE
LOYALSOCK CREEK (LYCOMING COUNTY)

(25 Pa. Code § 93.9l)

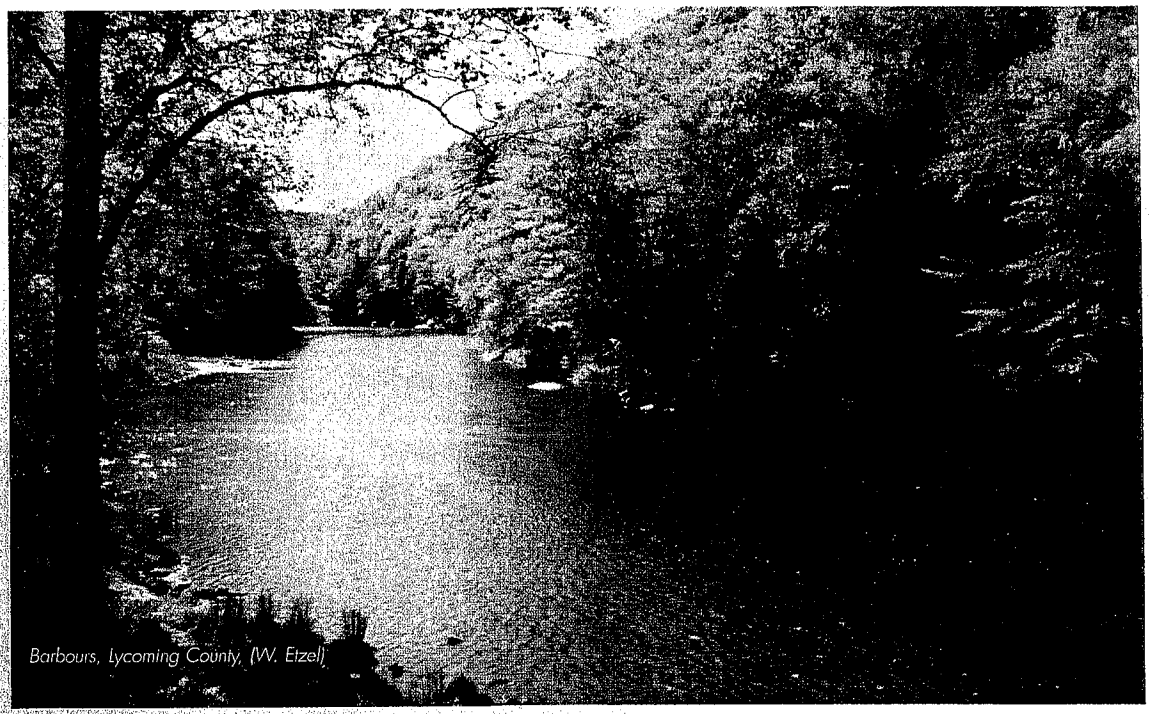
ENVIRONMENTAL QUALITY BOARD MEETING

FEBRUARY 19, 2008

A Petition for the Redesignation of the

Loyalsock Creek

Located in Lycoming County, Pennsylvania



Barbours, Lycoming County, (W. Etzel)

Submitted by the Loyalsock Creek Watershed Association

Carol Kafer - President
Wendy Etzel - Treasurer

COMMONWEALTH OF PENNSYLVANIA
ENVIRONMENTAL QUALITY BOARD

PETITION

I. PETITIONER INFORMATION

Name: Loyalsock Creek Watershed Association

Mailing Address: 888 Butternut Grove Road, Montoursville, PA 17754

Telephone number: Carol Kafer – President – 570- 320-2400 X7678
e-mail: ckafer@pct.edu

Wendy Etzel – Treasurer – 570-478-2003
e-mail: wetzel@uplink.net

Date: October 10, 2007

II. PETITIONER INFORMATION

A. The petitioner requests the Environmental Quality Board to:

Amend a regulation (Citation 25 Pa Code 93.9L)

Loyalsock Creek in Lycoming County is listed on Drainage List L (Section 93.9l). Information in the "Zone" column shows that the main stem is TSF from the Sullivan-Lycoming County border to the mouth.

B. Why is the petitioner requesting this action from the Board?

The purpose of the Loyalsock Creek Watershed Association (LCWA) is to "promote the protection and enhance the beauty and pristine conditions of the Loyalsock Creek watershed." In recent years we have witnessed increasing development that reveals a lack of uniformity in the ordinances of the seven municipalities that border this section of the creek. These inconsistencies include, but are not limited to: lack of protection of the aquatic environment, lack of protection against increased run-off and concomitant loss of ground water, increased creek bank erosion, lost of riparian buffer zones, and lack of preservation of the historical, recreational, and scenic value of the watershed.

Coordinating conservation efforts with seven different municipalities is very difficult. We have been more successful at solving problems when we have partnered with larger entities. One of our major concerns with the main stem of the Loyalsock has been the low pH and low alkalinities caused by acid mine drainage (AMD). Since 1999, three passive facilities for the treatment of AMD have been constructed in the Loyalsock

headwaters. The third was completed this past June with the help of the PA DEP, Bureau of Abandoned Mine Reclamation, and the Degenstein foundation. These treatment facilities have improved the water chemistry in the Lycoming County section of the Loyalsock to meet the water chemistry requirements for the HQ designation.

Stream bank erosion is a second major concern. In 2003, the LCWA used Growing Greener Grant funds to conduct a physical assessment of the Loyalsock Creek from its headwaters to the mouth. Based on our findings, the LCWA has planted over 800 riparian trees and shrubs in areas prone to erosion. We are also participants in the Lycoming County Storm Water Management Plan, and we are on the Advisory Committee for the Lycoming County Recreation, Parks, Open-Space/Greenways Plan.

Recently it has come to our attention that the main stem of the Loyalsock provides the appropriate environment for a large aquatic amphibian, the Eastern Hellbender. The PA Fish and Boat Commission lists the Eastern Hellbender as an "at risk" species. The Loyalsock Creek, with its clean flowing current and large boulders, is the home to one of only four breeding populations of Eastern Hellbenders in the West Branch Susquehanna basin. Including the mouth of the Loyalsock provides a corridor for repopulating other Pennsylvania waters. Visitors from as far as Japan have come to Lycoming County to study hellbenders. For additional information, please see Appendix: Hellbenders and the letter of support from Dr. Peter Petokas in Appendix: Letters.

We are also working to once again make the Loyalsock a home for native trout. Currently, the PA Fish and Boat Commission lists 22 tributaries within the Lycoming main stem section that have breeding native trout populations. With improved protection, the Loyalsock main stem could once again provide exciting fishing opportunities.

Redesignating the Loyalsock as a High Quality Trout Stocking Fishery will provide a more uniform protection than the current piecemeal approach. The Chapter 39 antidegradation regulations require that the PA DEP become involved in the process of issuing and approving permits, with a goal of maintaining HQ waters. Enhanced protection of the Loyalsock supports Lycoming County's recreation plan and the state's Endless Mountain plan for improving PA tourism.

C. Describe the types of persons, businesses and organizations likely to be impacted by this proposal.

The types of persons likely to be impacted in a beneficial way include:

- Those who fish for recreation – particularly fishing for trout
- Those who hunt along and nearby Loyalsock Creek
- Those who swim, snorkel, scuba dive, float or tube in Loyalsock Creek for recreation
- Those who boat on Loyalsock Creek – particularly canoeists and kayakers
- Those who are recreational bird watchers - particularly for aquatic birds
- Those who hike the Creek's banks and trails nearby
- Those who bicycle the watershed

The types of businesses and organizations likely to be impacted in a beneficial way include:

- Logging and other forestry-related businesses
- Retailers who specialize in supplies for hunting, fishing, hiking, horseback riding, camping, boating (especially kayaking and canoeing)
- Owners/operators of bed & breakfast establishments and motel & hotels along and nearby Loyalsock Creek
- Owners of skiing and summer lodges and cabin areas
- Rod & gun clubs
- Hunting and fishing camps
- Artists and photographers who capture the beauty of the watershed
- The art galleries that exhibit the art and photographic works
- Sportsmens' and sportswomens' organizations
- Owners/operators of game preserves
- Owners/operators of restaurants near the creek which capitalize on its viewability
- Local organizations (such as fire halls and churches) which offer breakfasts to those who fish and hunt Loyalsock Creek and
- Clothing manufacturers and retailers that provide outdoor recreational clothing
- Book writers and retailers that specialize in guides and outdoor publications
- Campground and recreational vehicle parks
- Universities and colleges that teach environmental & ecological subjects
- Consulting foresters
- Four wheel vehicle sales dealers
- Historical museums and sites
- Manufacturers and retailers of GPS equipment
- Water testing laboratories
- Topographic map retailers
- Picnic locations and services

D. Does the action requested in the petition concern a matter currently in litigation?

No

E. For stream Redesignation petitions, the following information must be included for the petition to be considered complete. Attach supporting material as necessary.

1. A clear delineation of the watershed or stream segment, both in narrative form and on a map.

The section to be redesignated is the main stem of the Loyalsock Creek from the Sullivan-Lycoming County border to its confluence with the West Branch of the Susquehanna River. A map of the Loyalsock watershed can be found in Appendix" Maps.

2. The current designated use(s) of the watershed or segment.

The current designated use of this segment is Trout Stocking Fishery (TSF).

3. The requested designated use(s) of the watershed of segment.

The requested designated use of this segment is High Quality Trout Stocking Fishery (HQ-TSF).

4. Available technical data on instream conditions for the following: water chemistry, the aquatic community (benthic macroinvertebrates and/or fishes), or insteam habitat. If such data are not included, provide a description of the data sources investigated.

Water Chemistry

After studying the data, we have concluded that the Lycoming County main stem section of the Loyalsock Creek meets the water quality criteria for the HQ-TSF designations. Our one concern was that acid mine drainage in the headwaters of the Loyalsock might cause unacceptable levels of pH, iron, and dissolved aluminum. Since 1999, three passive treatment facilities for acid mine drainage have been constructed in the headwaters so that pH, iron, and dissolved aluminum levels are within acceptable limits.

There are water chemistry data available from several sources.

- From 1975 through 2005, the US Geological Survey has collected and analyzed water samples from where State Route 973 crosses the Loyalsock Creek in Loyalsockville. All water quality parameters are available except iron. A table of these data can be found in Appendix: Chemistry, pages 1 – 3. A summary of the data can be found at the bottom of the table.

- From 1975 through May 2001, the Williamsport offices of PA DEP also collected and analyzed water samples on a monthly basis from where State Route 973 crosses the Loyalsock Creek in Loyalsockville (WQN0408). This data are available on the EPA STORET Legacy Data Center and the Modernized STORET database. Data from this source for field pH (00400), temperature (00010), and dissolved oxygen (00300) can be found in Appendix: Chemistry, pages 4 – 9.

- From 1975 through April 1997, the Williamsport offices of PA DEP collected and analyzed water samples from the Hillsgrove Bridge (WQN0428) in Sullivan County. This location is less than five miles upstream from the Lycoming/Sullivan County border, and only three small tributaries enter the Loyalsock between that sampling location and the Lycoming country line. Water chemistry data for pH, iron, and dissolved aluminum at this location can be found in Appendix: Chemistry, pages 10 – 12.

- From 1975 though 2006, the Loyalsock Creek Watershed Association has collected and analyzed water samples for temperature, pH and dissolved oxygen at 8 stations along the Lycoming County main stem section. A map of the sampling locations (stations 109 – 116) can be found in Appendix: Chemistry, page 13. An Excel electronic copy of these data can be obtained from the LCWA president, Carol Kafer, at ckafer@pct.edu.

Biological Assessment Qualifier

In the mid-to-late 1980's, the Williamsport offices of PA DEP also collected macroinvertebrate samples from where State Route 973 crosses the Loyalsock Creek in Loyalsockville (WQN0408). These data are available on the EPA STORET Legacy Data Center and the Modernized STORET database.

This section of the Loyalsock appears to have enough sensitive macroinvertebrate species to qualify for a high quality designation. Please see the letter of support from Dr. Mel Zimmerman, Director of the Williamsport Clean Water Institute in Appendix: Letters of Support.

5. A description of existing and proposed point and non-point source discharges and their impact on water quality and/or the aquatic community. The names, locations, and permit numbers of point source discharges and a description of the types and locations of non-point source discharges should be listed.

The Northcentral Regional office of the PA DEP has prepared a current map of point source discharges within the watershed. Name, locations, and permit numbers of point source discharges are listed on the map. A copy of the map can be found in Appendix: Maps. A digital copy of the map is available from ckafer@pct.edu.

The LCWA has been working to document non-point discharges. During the summer of 2003, the LCWA used Growing Greener Grant funds to hire interns to literally float down the entire Loyalsock. They documented sources of erosion, impediments to flow, riparian health, and sources of pollution at 65 locations. There are no livestock farms along the Lycoming County Mainstream section of the Loyalsock Creek. Corn and soybean farming occurs downstream from Loyalsockville. Pollution from farm runoff is likely to be minimal, because riparian buffer zones separate the farm fields from the creek.

Private residents and two commercial campgrounds that rely on private septic systems can be found within the section. A bacteriological study of the Loyalsock Creek conducted from 1990 through 1993 concluded that the "Fecal coliform pollution on the Loyalsock Creek appears to be limited and correctable".*

* Bacteriological Study of the Loyalsock Creek 1990/92/93, William Parsons, Assistant Regional Director, Northcentral Field Operations Office, Dept. of Environmental Resources.

From: Carol Kafer [ckafer@pct.edu]
Date: November 26, 2007
To: Michelle Tate
Re: Additional Information for our EQB Petition to Upgrade the Loyalsock Creek (Lycoming County) from TSF to HQ-TSF (25 Pa Code 93.9l)

This information pertains to Section 23.1 (5) (v) of the EQB's Policy for Procession Petitions. We were asked to provide a description of the "proposed point and nonpoint source discharges and their impact on water quality and / or the aquatic community."

Mr. Lyman R. Adams, Environmental Program Manager of the Watershed Management Program in Williamsport, Lycoming Country, has provided the following information. The only programs that could be currently processing newly proposed discharges to the Loyalsock are in Mr. Adams' Watershed Program, and he is aware of only one project.

To make certain, Mr. Adams has contacted the permitting chiefs of the WQ and Mining Programs in Lycoming County. The permitting chief for the Mining Programs, Mr. John Varner, states that "that there are no surface mine permit applications pending in Lycoming or Sullivan Counties". The chiefs of the WQ program, Dana Boob and Ralph White, have also indicated that they have no pending significant cases.

As for Mr. Adams' program, he has only one pending stormwater application. Here is his assessment on impact on water quality:

> "The NCRO Watershed Program currently has a pending Ch 102 NPDES General Permit application (PAG 2004106009) for Construction Activities (Earthmoving and Erosion/Sedimentation Control) and Stormwater Discharge from the proposed Montour Crossing commercial shopping center project, to be located approximately 1.5 miles above the mouth of the Loyalsock. The stormwater discharge will be from approximately 60 acres of roof top and parking lot impervious area. The main proposed control of this SW discharge involves detention in vegetated inlet areas distributed throughout the parking lot, and then in a large SW detention basin. As long as there are good management practices utilized for prevention of petroleum product build up, and quick action on spills, and proper operation and maintenance of the detention structures, the discharge of this stormwater should not cause any violation of the WQ standards.

6. Information regarding any of the qualifiers for designation as High Quality waters (HQ) or Exceptional Value waters (EV) in 93.4B (relating to qualifying as High Quality or Exceptional Value waters) used a basis for the requested designation.

Based on a 2007 list from the PA Fish and Boat Commission there are 22 streams in the Loyalsock Creek watershed in Lycoming County that support a wild trout population. Wild trout from the tributaries can utilize habitat in the main stem. This provides a source of native trout to repopulate the main stem and an environment for exceptional fishing.

Loyalsock Creek also provides exceptional recreational opportunities for swimming, tubing, and kayaking.

Loyalsock Creek has exceptional ecological significance, because it is one of only four streams in the West Branch watershed with breeding Eastern Hellbender populations. See letter of support from Dr. Peter Petokas and information Appendix: Hellbenders.

Loyalsock Creek is the Southeast Gateway to the Pennsylvania Wilds and contributes to Lycoming County's Recreation, Parks, Open-Space/Greenways Plan.

7. A general description of land use and development patterns and development pattern in the watershed. Examples include the amount or percentage of public lands (including ownership) and the amount or percentage of land use types (such as residential, commercial, industrial, agricultural and the like).

30% - Pennsylvania State Forest (Tiadaghton State Forest)
Pennsylvania State Gamelands 134 and 298

Of the Remaining land:

80% Timber, parks, schools, churches & cemeteries
17.7% Agriculture
1.8% Residential
0.5% Lakes, reservoirs, commercial/industrial

A data table approximating land use percentages can be found in Appendix: Maps.

8. The names of all municipalities through which the watershed or segment flows, including an official contact name and address.

Borough of Montoursville
617 North Loyalsock Ave.
Montoursville, PA 17754
570. 368.2486

Loyalsock Township
Township Building
2501 East Third Street, Williamsport, PA 17701
570.323.6151

Fairfield Township
Township Building
834 Fairfield Church Road, Montoursville, PA 17754
570.433.4212

Upper Fairfield Township
4090 Rt 87 Highway
Montoursville, PA 17754
570.435.0488

Eldred Township
5558 Warrensville Rd.
Montoursville, PA 17754
570.435.2606

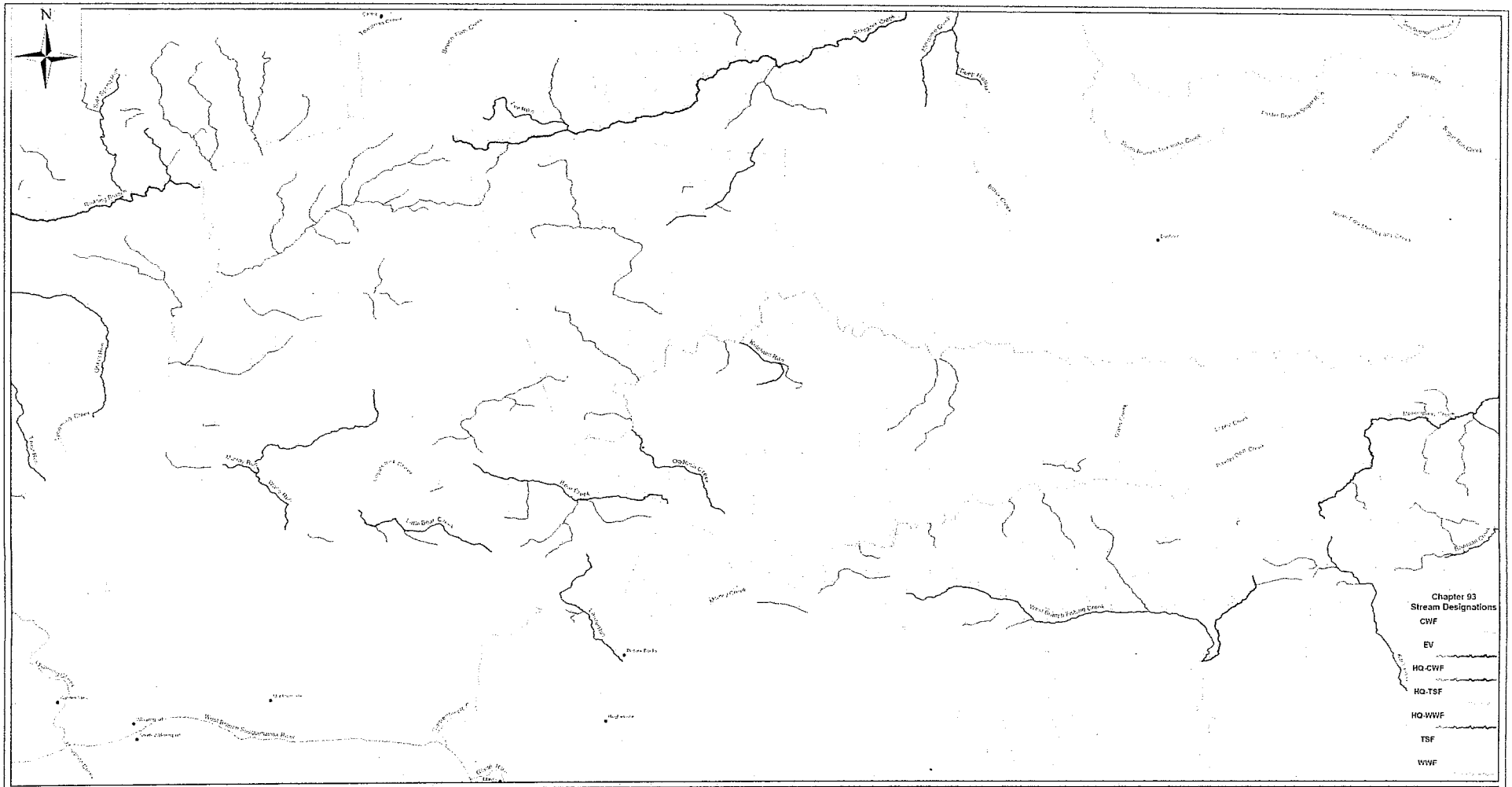
Gamble Township
P.O. Box 2234
Williamsport, PA 17703
570.323.3794

Plunkett's Creek Township
179 Dunwoody Rd.
Williamsport, PA 17701
570.478.2231

9. Location information relevant to items 4-8 (except for contact names and addresses) displayed on a map, if possible.

Above information for items 4-7 can be found in the appendices.

Maps



Commonwealth of Pennsylvania
Department of Environmental Protection
Disclaimer for Data

The state shall save the Commonwealth harmless from any suits, claims, or actions arising out of the use of the data files or accompanying documentation, or arising out of any defects in the data files or accompanying documentation.

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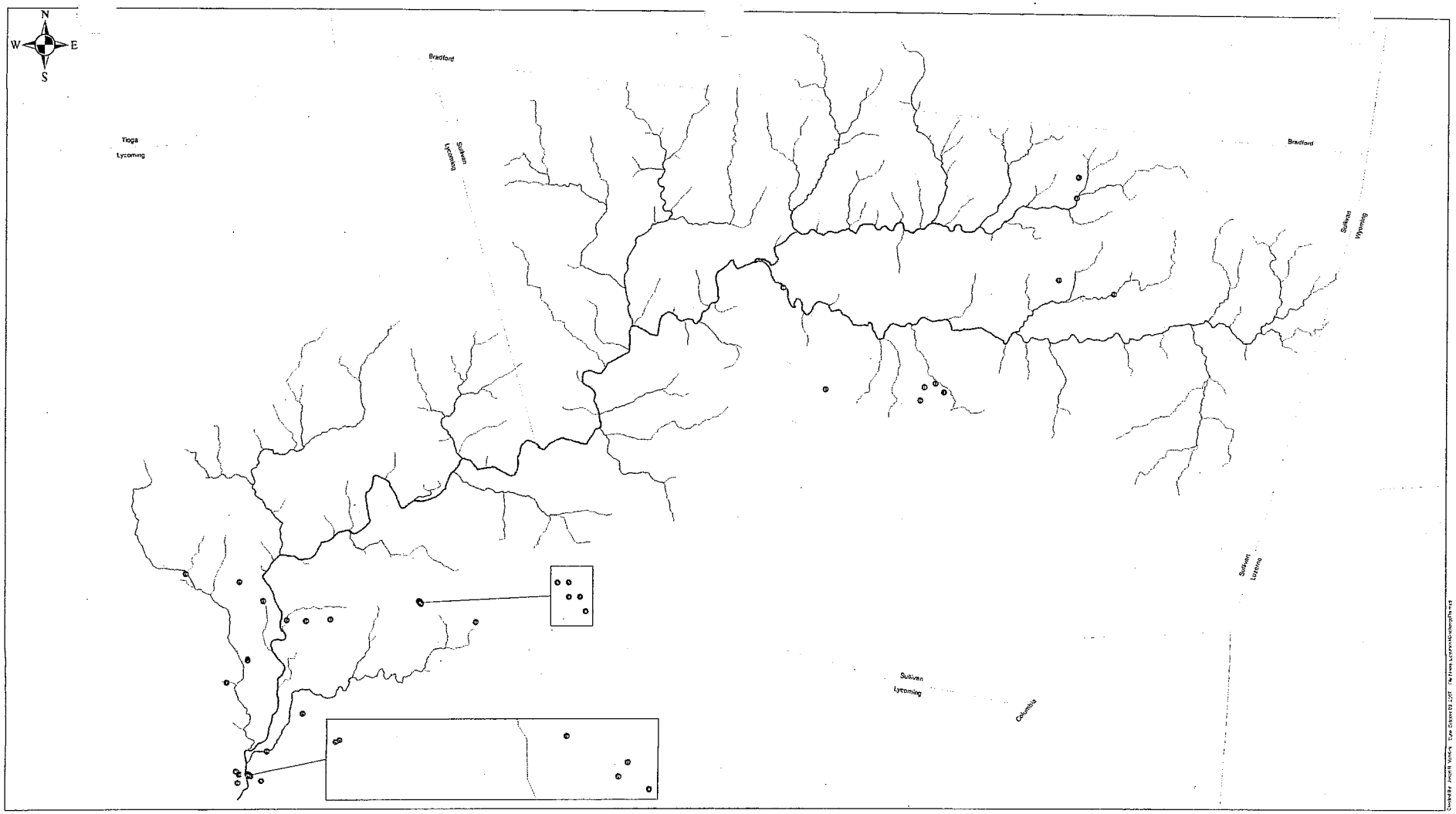
Geographic Information Systems

Northcentral Regional Office

Loyalsock Creek Watershed

0 1 2 4 6 8 10 Miles

Created by: Jason R. VanKirk
Date: August 23, 2007
Source: NCRO GIS Data - LoyalsockCreekWS.mxd
Created in ArcGIS 9.2 using ArcMap



- Water Pollution Control Facilities

ID	Facility Name	Sub Facility Name	Facility Kind	Permit Number
0	TEXTRON LYCOMING	OUTFALL 001: MONTOURSVILLE	STORMWATER-INDUSTRIAL	PAR804829
1	TIMOTHY ULMER SFTF	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0043818
2	TIMOTHY ULMER SFTF	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0043818
3	LAPORTE PA STATE POLICE BARRACK SEW SYS	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0029718
4	BRDAD ST TERMINAL	SW OUTFALL 001	STORMWATER-INDUSTRIAL	PAR804844
5	LAUCHLE LUMBER SWI	OUTFALL 001 SWI	STORMWATER-INDUSTRIAL	PAR234825
6	LAUCHLE LUMBER SWI	OUTFALL 002 SWI	STORMWATER-INDUSTRIAL	PAR234825
7	LAUCHLE LUMBER SWI	OUTFALL 003 SWI	STORMWATER-INDUSTRIAL	PAR234825
8	LAUCHLE LUMBER SWI	OUTFALL 004 SWI	STORMWATER-INDUSTRIAL	PAR234825
9	LAUCHLE LUMBER SWI	OUTFALL 005 SWI	STORMWATER-INDUSTRIAL	PAR234825
10	LOAG SEW SYS STP	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0043118
11	TAGGARTON VIEW MHP	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0113624
12	DAVID ENGLE SFTF	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0043094
13	CARL MOLAR SDSTP	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0043142
14	CHERRY TWP BOARD OF SUPERVISOR	OUTFALL 001	SEWAGE PUBLICLY OWNED (MUNI)	PA0114073
15	LAKE SINCLAIRS SEWAGE SYSTEM	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0043153
16	SULLIVAN CNTY SCH DIST TRMT PLT	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0029831
17	WISNOWSKI, PATRICK J SFTF	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0113123
18	WALMART	OUTFALL 001	SEWAGE PUBLICLY OWNED (MUNI)	PA0113151
19	LAPORTE UNITED METHODIST HOME SEW SYS	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0111853
20	MONTOURSVILLE ASPHALT PLT 15	OUTFALL 001 SW	STORMWATER-INDUSTRIAL	PAR804818
21	GATEWAY STORE 8 REST	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0225362
22	EAGLES MERE BORO AUTH SEWER SYS AND STP'S	OUTFALL 003 FOREST INN STP'SS	SEWAGE PUBLICLY OWNED (MUNI)	PA0026262
23	BUEHLER SRS TP	OUTFALL 001 345 QUAKER RD	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0045138
24	WINTER, GARY,LARY,BARRY,TARRY	TREATED EFFLUENT	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0112978
25	SAND HILL TERMINAL	SW OUTFALL 002	STORMWATER-INDUSTRIAL	PAR804845
26	SAND HILL TERMINAL	SW OUTFALL 001	STORMWATER-INDUSTRIAL	PAR804845
27	MONTOUR AUTO SER CO	OIL SEPARATOR	INDUSTRIAL WASTE	02047
28	MONTOUR AUTO SER CO	RECHARGY WELL	INDUSTRIAL WASTE	02047
29	MONTOUR AUTO SER CO	OUTFALL 001	INDUSTRIAL WASTE	02047
30	CAMRT	OUTFALL 001	INDUSTRIAL WASTE	PA0114260
31	JOE DEGREGORIO SEW SYS	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0043893
32	DUSHORE STW AUTH	OUTFALL 001	SEWAGE PUBLICLY OWNED (MUNI)	PA0027722
33	THOMAS HENRY G	TRTD STP	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	23928
34	THOMAS HENRY G SEWER SYS	OUTFALL 001	SEWAGE NON-PUBLICLY OWNED (NON-MUNI)	PA0043875
35	PRECISION LUMBER PROD SULLIVAN	OUTFALL 001 SW	STORMWATER-INDUSTRIAL	PAR234840

- Coal Mining Ops

ID	Facility Name
0	F FALCON COAL & CONST

Loyalsock Creek Discharge Points

% Land Use Type in The Loyalsock Creek Watershed in Lycoming County (LC)

Data current as of 3 Oct 2007

Land Use

USGS Quadrangal Name + Date

Land Use Type	Bodines 1965 (PR 1973)	Barbours 1995	Hillsgrove 1995	Montoursville North 1999	Huntersville 1965 (PR 1986)	Picture Rocks 1978 (PI 1983)	Montoursville South 1994	Total
Residential	0.8%	3.0%	1.0%	2.9%	1.5%	0.2%	14.0%	1.8%
Commercial	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	5.0%	0.1%
Industrial	0.1%	0.0	0.1%	0.1%	0.1%	0.1%	5.0%	0.1%
Agriculture	22.6%	3.9%	3.8%	38.9%	19.3%	3.6%	6.0%	17.7%
Other (Timber, Parks, Schools, Church, Cemetery)	75 %	93 %	95 %	58 %	79 %	94.5%	70.0 %	80.0 %
Lakes/Reservoirs	1.4%	—	—	—	—	1.5%	—	0.3%
# of impoundments	23	20	11	81	26	6	26	165
# of buildings	270	383	398	2,097	516	19		3,709
(old)	(136)				(240)	(14)		
(new)	(40)				(140)	-		
(shed/barn)	(94)				(136)	(5)		
# of grids covering LCW in LC ÷ grids on Quad @	72/144	117/145	6/147	110.5/145	94/144	14/147	1/144	545.5/1,016
% of Quad covering LCW in LC	50%	80.7%	4.1%	76.2%	65.3%	9.5%	0.7%	53.7%
Acres of LCW in LC on Quad	17,352	28,197	1,446	26,631	22,654	3,374	241	99,895 = 156 mi²

Roads

NB: old building indicates building on original dated Quad.
New building indicates building on photorevised dated Quad.

Each Quad made up of 144 to 147 grids of 34,704 to 35,427 acres

Acre: 43,560 ft²

Chemistry

Chemistry Data collected by the USGS at State Route 973 in Loyalsockville on the Loyalsock Creek

Sample	Time													
Datetime	datum			pH,	pH,								Alum-	
				water,	water,	Ammonia							inum,	
		Temper-	Dis-	unfltrd	unfltrd	water,	Arsenic	Cadmium	Copper,	Lead,	Nickel,	Zinc,	water,	Alum-
		ature,	solved	field,	lab,	unfltrd	water,	water,	water,	water,	water,	water,	unfltrd	inum,
		water,	oxygen,	std	std	mg/L	unfltrd	unfltrd	fltrd,	fltrd,	fltrd,	fltrd,	recover	water,
		deg C	mg/L	units *	units	as N	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	-able,	fltrd,
													ug/L	ug/L *
Identifiers		-10	-300	-400	-403	-610	-1002	-1027	-1040	-1049	-1065	-1090	-1105	-1106
4/29/1975 10:20	EDT	10				< 0.010								
10/27/1975 15:15	EST	13		7		0.02								
11/17/1975 15:30	EST	8	12	6.5		< 0.020								
12/3/1975 10:00	EST	3	13.4	6.4		< 0.002								
1/14/1976 9:25	EST	0				0.02								
2/25/1976 12:45	EST					0.03								
3/3/1976 12:20	EST					0.02								
4/19/1976 11:50	EST	19	10	7.5		0.04								
5/10/1976 9:00	EDT					0.03								
6/17/1976 12:45	EDT	23	8.8	7.4		0.05								
7/7/1976 11:50	EDT	20	9	7.3		0.04								
8/16/1976 12:00	EDT	21		1.8		0.03								
10/11/1979 9:00	EDT	8.5		7			0	0						
12/6/1979 14:30	EST	3.5		6.8										
1/9/1980 11:10	EST	0.1		6.7										
2/5/1980 14:00	EST	0.5		6.8										
3/5/1980 15:00	EST	0.5		7.2										
3/31/1980 10:00	EST	5		7.1										
4/29/1980 16:00	EDT	9		6.8										
5/30/1980 10:00	EDT	17.5		6.2										
6/27/1980 16:45	EDT	27.5		6.4										
7/24/1980 8:10	EDT	19.5		6.6										
8/18/1980 10:00	EDT	20.5		6.6										
9/26/1980 8:40	EDT	17		6.7										

													Alum-	
				pH,	pH,								inum,	
				water,	water,	Ammonia							water,	Alum-
		Temper-	Dis-	unfltrd	unfltrd	water,	Arsenic	Cadmium	Copper,	Lead,	Nickel,	Zinc,	unfltrd	inum,
		ature,	solved	field,	lab,	unfltrd	water,	water,	water,	water,	water,	water,	recover	water,
		water,	oxygen,	std	std	mg/L	unfltrd	unfltrd	fltrd,	fltrd,	fltrd,	fltrd,	-able,	fltrd,
		deg C	mg/L	units *	units	as N	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L *
		ature,	solved	field,	lab,	unfltrd	water,	water,	water,	water,	water,	water,	recover	water,
		water,	oxygen,	std	std	mg/L	unfltrd	unfltrd	fltrd,	fltrd,	fltrd,	fltrd,	-able,	fltrd,
		deg C	mg/L	units *	units	as N	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L *
5/20/1981 14:15	EDT	14.5		6.6	6.9									
6/18/1981 11:00	EDT	19.5		6.9	6.8									
7/13/1981 14:00	EDT	27		7.1	6.8									
8/10/1981 9:10	EDT	23		7.4	7.3									
9/15/1981 16:45	EDT	20		7	7.1									
4/8/2002 13:30	EDT	6.8	12.4	7.7	6.9	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	20
6/3/2002 10:45	EDT	17.8	10.5	7.8	6.9	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	29
8/8/2002 15:00	EDT	22.8	10	8.7	7.5	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	26
11/14/2002 13:15	EST	7.9	12.8	7.5	6.6	0.04			< 4	< 1.0	< 4.0	< 5.0	M	28
3/18/2003 13:00	EST	1.7	14.6	7.2	6.6	< 0.020			< 4	< 1.0	< 4.0	M	400	65
5/8/2003 13:00	EDT	14.3	10.8	7.6	6.5	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	11
7/24/2003 12:30	EDT	20.7	9.5	7.8	7.6	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	24
9/3/2003 12:30	EDT	16.5	9.7	7.3	7	< 0.020			< 4	< 1.0	< 4.0	M	100	46
10/2/2003 11:30	EDT	11.6	11.3	7.5	6.7	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	26
12/4/2003 13:45	EST	1.4	13.9	7.3	7.1	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	24
4/5/2004 11:30	EDT	4.3	13.3	7.5	7.2	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	18
6/1/2004 13:15	EDT	16.7	10.8	8	7.4	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	21
8/4/2004 12:30	EDT	20.1	9.8	7.3	6.8	0.05			< 4	< 1.0	< 4.0	< 5.0	M	36
11/9/2004 11:45	EST	6.3	13.4	7.8	7	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	< 10
1/25/2005 14:30	EST	0	16.3	7.1	7.2	0.15			< 4	< 1.0	< 4.0	< 5.0	M	16
3/15/2005 11:30	EST	2.4	15.1	7	7.3	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	12
5/19/2005 11:45	EDT	15.3	11.8	7.5	7.6	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	< 10
7/21/2005 12:00	EDT	25.2	9.6	8.3	7.8	< 0.020			< 4	< 1.0	< 4.0	< 5.0	M	< 10
9/29/2005 11:15	EDT	17.5	9.8	7.6	7.4	0.02			< 4	< 1.0	< 4.0	< 5.0	< 10	< 10

													Alum-	
				pH,	pH,								inum,	
				water,	water,	Ammonia							water,	Alum-
		Temper-	Dis-	unfltrd	unfltrd	water,	Arsenic	Cadmium	Copper,	Lead,	Nickel,	Zinc,	unfltrd	inum,
		ature,	solved	field,	lab,	unfltrd	water,	water,	water,	water,	water,	water,	recover	water,
		water,	oxygen,	std	std	mg/L	unfltrd	unfltrd	fltrd,	fltrd,	fltrd,	fltrd,	-able,	fltrd,
		deg C	mg/L	units *	units	as N	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L *
		ature,	solved	field,	lab,	unfltrd	water,	water,	water,	water,	water,	water,	recover	water,
		water,	oxygen,	std	std	mg/L	unfltrd	unfltrd	fltrd,	fltrd,	fltrd,	fltrd,	-able,	fltrd,
		deg C	mg/L	units *	units	as N	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L *
		deg C	mg/L	units *	units	as N	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L *
Maximum Value		27.5	16.3	8.7	7.8	0.15			<4	<1.0	<4.0	<5.0	400	65
Minumum Value		0	8.8	1.8	6.5	<0.020							100	<10

Loyalsockville Field pH Data (400)

Date	Field pH	Date	Field pH	Date	Field pH	Date	Field pH
22-May-62	7.000	30-Apr-75	6.100	1-Dec-80	7.500	5-Aug-85	6.900
29-Nov-62	6.600	25-Jun-75	6.500	10-Mar-81	6.700	16-Sep-85	7.000
18-Feb-63	6.600	14-Jul-75	6.200	5-May-81	6.650	19-Sep-85	7.400
14-May-63	7.000	13-Aug-75	8.100	1-Jun-81	7.100	9-Oct-85	6.900
19-Aug-63	7.000	4-Sep-75	6.300	6-Jul-81	7.400	5-Nov-85	6.600
12-Nov-63	7.000	27-Oct-75	7.000	5-Aug-81	7.300	3-Dec-85	6.200
11-Feb-64	6.500	17-Nov-75	6.500	1-Sep-81	7.500	10-Feb-86	6.500
12-May-64	7.000	3-Dec-75	6.400	1-Oct-81	7.900	3-Mar-86	6.200
5-Aug-64	7.000	19-Apr-76	7.500	16-Nov-81	7.700	14-Apr-86	6.800
4-Nov-64	7.000	17-Jun-76	7.400	4-Jan-82	7.700	5-May-86	6.500
1-Feb-65	7.000	7-Jul-76	7.300	23-Feb-82	7.400	9-Jun-86	6.700
3-May-65	7.300	16-Aug-76	1.800	7-Apr-82	7.200	9-Jul-86	6.600
9-Aug-65	7.800	16-Sep-76	6.800	4-May-82	7.100	5-Aug-86	6.900
28-Oct-65	7.500	13-Oct-76	6.500	1-Jun-82	7.600	4-Sep-86	6.600
27-Jan-66	6.800	4-Nov-76	7.700	7-Jul-82	7.900	8-Sep-86	7.600
25-Apr-66	7.100	6-Dec-76	6.500	4-Aug-82	7.500	9-Oct-86	6.700
5-Jul-66	6.700	4-Jan-77	6.500	11-Aug-82	6.600	17-Nov-86	6.500
6-Oct-66	7.200	10-Mar-77	6.500	1-Sep-82	7.600	8-Dec-86	6.400
8-Jan-67	6.200	15-Jun-77	7.400	18-Nov-82	7.300	13-Jan-87	6.800
28-Mar-67	6.800	12-Jul-77	7.300	20-Dec-82	7.300	2-Feb-87	6.500
20-Jun-67	6.800	25-Aug-77	7.200	3-Jan-83	7.400	3-Mar-87	6.500
3-Oct-67	7.100	15-Sep-77	7.500	15-Feb-83	7.400	14-Apr-87	7.200
27-Mar-68	6.600	22-Feb-78	6.600	2-Mar-83	7.400	6-May-87	6.700
18-Jun-68	7.200	24-Apr-78	7.500	5-Apr-83	6.700	3-Jun-87	6.600
4-Sep-68	7.700	4-May-78	7.350	25-May-83	7.200	6-Jul-87	7.900
3-Dec-68	6.700	1-Jun-78	7.900	1-Jun-83	7.100	6-Aug-87	7.400
12-Mar-69	6.800	2-Aug-78	7.900	5-Jul-83	7.200	22-Sep-87	7.000
4-Jun-69	6.900	12-Sep-78	7.000	2-Aug-83	7.200	1-Oct-87	7.400
4-Sep-69	6.300	12-Oct-78	7.400	12-Sep-83	6.800	3-Nov-87	7.200
3-Dec-69	6.900	1-Nov-78	7.300	4-Oct-83	7.700	1-Dec-87	7.300
4-Mar-70	8.400	4-Dec-78	7.400	1-Nov-83	6.500	4-Jan-88	7.100
11-Jun-70	6.900	29-Jan-79	7.400	3-Jan-84	7.600	4-Feb-88	6.600
2-Sep-70	7.000	6-Feb-79	6.900	21-Feb-84	5.800	8-Mar-88	7.200
11-Dec-70	6.700	12-Mar-79	7.200	14-Mar-84	7.400	5-Apr-88	7.000
12-Mar-71	7.700	4-Apr-79	7.400	2-Apr-84	7.100	16-May-88	6.800
8-Jun-71	7.300	1-May-79	7.450	2-May-84	6.000	1-Jun-88	7.500
14-Sep-71	7.000	19-Jun-79	7.100	7-Jun-84	7.900	6-Jul-88	7.600
29-Nov-71	7.100	5-Jul-79	7.300	5-Jul-84	7.800	2-Aug-88	6.900
1-Mar-72	6.600	6-Sep-79	7.400	8-Aug-84	7.400	13-Sep-88	6.400
31-May-72	7.000	30-Oct-79	6.900	5-Sep-84	7.500	13-Sep-88	6.400
13-Aug-72	6.200	13-Dec-79	7.400	3-Oct-84	8.100	3-Oct-88	6.800
7-Sep-72	7.000	3-Jan-80	7.400	15-Nov-84	6.500	2-Nov-88	7.000
27-Nov-72	6.900	21-Feb-80	7.100	6-Dec-84	6.700	5-Dec-88	6.800
5-Mar-73	6.800	19-Mar-80	7.000	7-Jan-85	6.600	3-Jan-89	7.300
17-Jun-73	7.200	6-May-80	7.100	13-Feb-85	7.300	2-Feb-89	7.100
30-Aug-73	7.100	2-Jun-80	7.400	7-Mar-85	6.800	1-Mar-89	6.300
2-Dec-73	7.600	10-Jul-80	7.100	4-Apr-85	6.600	10-Apr-89	6.900
5-Feb-74	6.900	13-Aug-80	6.700	13-May-85	7.000	3-May-89	6.900
4-Jun-74	6.900	1-Oct-80	7.500	4-Jun-85	6.700	1-Jun-89	6.900
16-Sep-74	16.000	6-Nov-80	6.800	30-Jul-85	6.700	12-Jul-89	6.500

Date	Field pH	Date	Field pH	Date	Field pH
3-Aug-89	6.300	5-Apr-94	6.700	6-Jul-98	7.710
14-Sep-89	6.800	10-May-94	6.500	12-Aug-98	7.310
14-Sep-89	6.800	8-Jun-94	6.600	5-Oct-98	7.500
2-Oct-89	6.500	6-Jul-94	6.900	15-Mar-99	7.560
6-Nov-89	6.400	3-Aug-94	6.600	3-May-99	7.730
7-Dec-89	6.900	1-Sep-94	7.200	12-Jul-99	7.670
2-Jan-90	6.500	18-Oct-94	7.400	15-Nov-99	7.180
1-Feb-90	6.600	1-Nov-94	7.200	2-Feb-00	8.060
12-Mar-90	6.700	5-Jan-95	7.900	13-Mar-00	7.060
4-Apr-90	6.800	9-Feb-95	7.360	26-Apr-00	7.980
1-May-90	6.200	1-Mar-95	7.550	12-Jun-00	8.100
5-Jun-90	6.200	19-Apr-95	7.480	16-Oct-00	8.110
5-Jul-90	6.400	18-May-95	7.290	12-Dec-00	7.050
1-Aug-90	6.200	5-Jun-95	7.500	3-Jan-01	7.260
2-Oct-90	6.600	13-Jun-95	7.760	12-Mar-01	7.300
10-Oct-90	7.000	5-Jul-95	7.680	3-May-01	7.400
10-Oct-90	7.000	1-Aug-95	7.960		
13-Nov-90	5.200	18-Sep-95	7.430		
5-Dec-90	6.400	2-Oct-95	7.310		
2-Jan-91	5.900	6-Nov-95	6.680		
4-Feb-91	5.800	6-Dec-95	6.450		
5-Mar-91	6.200	4-Jan-96	7.080		
8-Apr-91	6.200	8-Feb-96	7.060		
2-May-91	5.900	13-Mar-96	6.620		
4-Jun-91	5.900	3-Apr-96	7.740		
8-Jul-91	5.900	20-May-96	7.740		
1-Aug-91	5.900	11-Jun-96	6.860		
4-Sep-91	7.100	1-Jul-96	7.520		
1-Oct-91	6.200	20-Aug-96	6.620		
4-Nov-91	6.200	3-Sep-96	6.600		
4-Dec-91	5.700	2-Oct-96	6.550		
6-Jan-92	6.800	7-Nov-96	6.630		
3-Feb-92	6.800	9-Dec-96	7.550		
1-Sep-92	6.500	6-Jan-97	6.600		
5-Oct-92	7.300	3-Feb-97	7.790		
5-Nov-92	6.700	5-Mar-97	7.170		
1-Dec-92	7.100	2-Apr-97	6.570		
4-Jan-93	7.200	5-May-97	6.850		
1-Feb-93	7.300	9-Jun-97	6.730		
17-Mar-93	7.000	22-Jul-97	7.330		
5-Apr-93	6.800	5-Aug-97	7.520		
3-May-93	6.800	3-Sep-97	6.160		
2-Jun-93	6.900	2-Oct-97	6.600		
3-Aug-93	6.600	4-Nov-97	7.820		
5-Oct-93	6.900	3-Dec-97	7.560		
2-Nov-93	6.700	2-Feb-98	7.390		
1-Dec-93	6.800	16-Mar-98	7.750		
5-Jan-94	7.300	2-Apr-98	7.340		
24-Feb-94	7.000	26-May-98	7.910		
7-Mar-94	6.800	2-Jun-98	7.570		

Date	Temp (C)	Date	Temp (C)	Date	Temp (C)	Date	Temp (C)
22-May-62	21.000	4-Sep-75	17.000	5-Aug-81	22.700	3-Dec-85	1.500
29-Nov-62	3.000	27-Oct-75	13.000	1-Sep-81	21.000	10-Feb-86	0.900
18-Feb-63	0.500	17-Nov-75	8.000	1-Oct-81	12.500	3-Mar-86	2.200
14-May-63	14.000	3-Dec-75	3.000	16-Nov-81	6.000	14-Apr-86	11.500
19-Aug-63	18.000	14-Jan-76	0.000	2-Dec-81	6.000	5-May-86	13.800
12-Nov-63	8.000	19-Apr-76	19.000	4-Jan-82	4.000	9-Jun-86	17.500
11-Feb-64	0.000	17-Jun-76	23.000	23-Feb-82	3.800	9-Jul-86	22.500
12-May-64	14.500	7-Jul-76	20.000	7-Apr-82	4.000	5-Aug-86	20.000
5-Aug-64	24.000	16-Aug-76	21.000	4-May-82	12.000	4-Sep-86	18.000
4-Nov-64	14.000	16-Sep-76	20.000	1-Jun-82	19.000	8-Sep-86	16.000
1-Feb-65	0.000	13-Oct-76	11.000	4-Aug-82	22.000	9-Oct-86	13.800
3-May-65	14.000	4-Nov-76	6.000	11-Aug-82	19.600	17-Nov-86	4.500
9-Aug-65	23.000	25-Aug-77	21.000	1-Sep-82	20.000	8-Dec-86	4.500
28-Oct-65	8.500	22-Feb-78	0.000	18-Nov-82	4.000	13-Jan-87	2.000
27-Jan-66	0.000	24-Apr-78	9.000	20-Dec-82	3.000	2-Feb-87	1.000
25-Apr-66	15.000	4-May-78	11.500	3-Jan-83	3.000	3-Mar-87	2.000
5-Jul-66	27.000	1-Jun-78	22.000	15-Feb-83	1.000	14-Apr-87	11.000
6-Oct-66	8.000	2-Aug-78	22.500	2-Mar-83	8.000	6-May-87	12.000
8-Jan-67	1.000	21-Aug-78	22.500	5-Apr-83	10.000	3-Jun-87	19.500
28-Mar-67	8.000	12-Sep-78	20.000	25-May-83	11.300	6-Jul-87	23.000
20-Jun-67	21.000	12-Oct-78	14.000	1-Jun-83	15.000	6-Aug-87	23.000
3-Oct-67	15.500	1-Nov-78	9.000	5-Jul-83	24.000	22-Sep-87	14.500
27-Mar-68	8.000	29-Jan-79	2.000	2-Aug-83	23.000	1-Oct-87	14.000
18-Jun-68	14.000	6-Feb-79	0.000	12-Sep-83	24.000	3-Nov-87	8.500
4-Sep-68	17.000	12-Mar-79	1.000	4-Oct-83	17.000	1-Dec-87	6.000
3-Dec-68	6.000	4-Apr-79	6.000	1-Nov-83	8.000	4-Jan-88	1.000
12-Mar-69	4.000	1-May-79	11.000	1-Dec-83	7.000	4-Feb-88	0.500
4-Jun-69	19.000	19-Jun-79	16.000	3-Jan-84	4.500	8-Mar-88	3.500
4-Sep-69	20.000	5-Jul-79	16.000	21-Feb-84	3.000	5-Apr-88	8.000
4-Mar-70	3.000	6-Aug-79	23.000	14-Mar-84	3.000	16-May-88	16.500
11-Jun-70	21.000	6-Sep-79	22.000	2-Apr-84	9.000	1-Jun-88	21.000
2-Sep-70	19.000	30-Oct-79	8.000	2-May-84	9.000	6-Jul-88	22.000
11-Dec-70	-2.000	13-Nov-79	6.500	7-Jun-84	23.000	2-Aug-88	25.000
12-Mar-71	4.000	13-Dec-79	4.000	5-Jul-84	19.000	13-Sep-88	16.000
8-Jun-71	22.000	3-Jan-80	4.000	8-Aug-84	24.000	13-Sep-88	16.000
14-Sep-71	20.000	21-Feb-80	0.000	5-Sep-84	18.000	3-Oct-88	15.500
29-Nov-71	7.000	19-Mar-80	8.000	3-Oct-84	9.000	2-Nov-88	6.000
1-Mar-72	3.000	6-May-80	16.000	15-Nov-84	4.000	5-Dec-88	3.000
31-May-72	18.000	10-Jul-80	24.000	6-Dec-84	0.200	3-Jan-89	1.500
13-Aug-72	20.000	13-Aug-80	24.000	7-Jan-85	0.500	2-Feb-89	5.000
7-Sep-72	18.000	16-Sep-80	19.500	7-Mar-85	0.000	1-Mar-89	0.500
27-Nov-72	8.000	1-Oct-80	18.000	4-Apr-85	2.000	10-Apr-89	6.000
5-Mar-73	5.000	6-Nov-80	6.000	13-May-85	17.500	3-May-89	9.000
4-Jun-74	18.000	1-Dec-80	5.000	4-Jun-85	14.200	1-Jun-89	18.500
23-Aug-74	24.500	6-Jan-81	1.000	30-Jul-85	20.500	12-Jul-89	20.000
30-Apr-75	9.000	10-Mar-81	5.000	5-Aug-85	21.000	3-Aug-89	20.500
16-May-75	15.000	2-Apr-81	13.000	16-Sep-85	14.000	14-Sep-89	20.000
25-Jun-75	23.000	5-May-81	13.000	19-Sep-85	18.000	14-Sep-89	20.000
14-Jul-75	21.000	1-Jun-81	20.000	9-Oct-85	12.500	2-Oct-89	16.000
13-Aug-75	24.000	6-Jul-81	22.000	5-Nov-85	8.500	6-Nov-89	12.000

Date	Temp (C)	Date	Temp (C)	Date	Temp (C)
7-Dec-89	0.500	24-Feb-94	2.000	2-Apr-98	11.000
2-Jan-90	1.500	7-Mar-94	4.500	26-May-98	19.700
1-Feb-90	4.000	5-Apr-94	8.000	2-Jun-98	20.100
12-Mar-90	12.000	10-May-94	14.000	6-Jul-98	20.500
4-Apr-90	7.500	8-Jun-94	19.500	12-Aug-98	23.400
1-May-90	16.500	6-Jul-94	24.500	5-Oct-98	13.600
5-Jun-90	17.500	3-Aug-94	23.500	1-Dec-98	8.100
5-Jul-90	27.000	1-Sep-94	19.000	07-Jan-99	0.300
1-Aug-90	21.000	18-Oct-94	12.000	15-Mar-99	4.600
2-Oct-90	15.500	1-Nov-94	13.000	03-May-99	13.500
10-Oct-90	17.000	5-Jan-95	2.500	12-Jul-99	21.800
10-Oct-90	17.000	9-Feb-95	2.000	27-Sep-99	16.500
13-Nov-90	5.000	1-Mar-95	3.000	15-Nov-99	6.600
5-Dec-90	4.000	19-Apr-95	11.000	02-Feb-00	0.100
2-Jan-91	2.000	18-May-95	14.000	13-Mar-00	3.100
4-Feb-91	3.500	5-Jun-95	20.000	26-Apr-00	11.300
5-Mar-91	5.000	13-Jun-95	17.000	12-Jun-00	20.600
8-Apr-91	14.500	5-Jul-95	21.000	01-Aug-00	21.500
2-May-91	13.000	1-Aug-95	24.500	16-Oct-00	14.300
4-Jun-91	19.500	18-Sep-95	16.500	12-Dec-00	2.200
8-Jul-91	25.000	2-Oct-95	17.500	03-Jan-01	0.200
1-Aug-91	23.000	6-Nov-95	7.000	12-Mar-01	3.800
4-Sep-91	20.000	6-Dec-95	2.000	03-May-01	17.900
1-Oct-91	14.500	4-Jan-96	0.500		
4-Nov-91	6.500	8-Feb-96	1.000		
4-Dec-91	5.000	13-Mar-96	3.700		
6-Jan-92	4.000	3-Apr-96	7.000		
3-Feb-92	2.000	20-May-96	20.300		
4-Mar-92	6.000	11-Jun-96	22.200		
1-Apr-92	5.000	1-Jul-96	21.100		
1-Jun-92	15.000	20-Aug-96	22.600		
6-Jul-92	22.500	3-Sep-96	21.300		
3-Aug-92	21.000	2-Oct-96	14.800		
1-Sep-92	20.000	7-Nov-96	11.700		
5-Oct-92	13.500	9-Dec-96	4.300		
5-Nov-92	9.000	6-Jan-97	6.200		
1-Dec-92	7.000	3-Feb-97	1.000		
4-Jan-93	5.000	5-Mar-97	4.000		
1-Feb-93	1.500	2-Apr-97	6.400		
17-Mar-93	1.500	5-May-97	12.200		
5-Apr-93	5.000	9-Jun-97	18.600		
3-May-93	15.000	22-Jul-97	24.100		
2-Jun-93	12.500	5-Aug-97	22.000		
6-Jul-93	26.000	3-Sep-97	19.400		
3-Aug-93	24.000	2-Oct-97	13.000		
2-Sep-93	24.000	4-Nov-97	7.900		
5-Oct-93	13.000	3-Dec-97	2.700		
2-Nov-93	6.500	6-Jan-98	3.800		
1-Dec-93	5.000	2-Feb-98	2.300		
5-Jan-94	2.000	16-Mar-98	2.800		

Loyalsockville Disolve Oxygen Data (300)

ıte	D. Oxygen	Date	D. Oxygen	Date	D. Oxygen	Date	D. Oxygen
2-May-62	9.200	13-Aug-75	8.600	5-Jul-83	9.200	5-Apr-88	12.000
18-Feb-63	13.800	17-Nov-75	12.000	12-Sep-83	8.400	16-May-88	9.200
14-May-63	8.000	3-Dec-75	13.400	4-Oct-83	10.200	1-Jun-88	9.400
19-Aug-63	8.200	19-Apr-76	10.000	1-Nov-83	12.400	6-Jul-88	9.000
12-Nov-63	10.000	17-Jun-76	8.800	21-Feb-84	12.500	2-Aug-88	9.300
11-Feb-64	14.600	7-Jul-76	9.000	14-Mar-84	0.000	13-Sep-88	9.800
12-May-64	10.800	16-Sep-76	8.600	2-May-84	11.000	13-Sep-88	9.800
5-Aug-64	8.000	13-Oct-76	11.100	7-Jun-84	10.800	3-Oct-88	10.400
4-Nov-64	12.000	25-Aug-77	10.600	5-Jul-84	9.800	2-Nov-88	13.300
1-Feb-65	14.800	24-Apr-78	11.800	8-Aug-84	9.000	5-Dec-88	15.800
3-May-65	9.600	4-May-78	10.800	5-Sep-84	10.500	3-Jan-89	14.000
9-Aug-65	7.800	1-Jun-78	8.600	3-Oct-84	11.700	2-Feb-89	15.800
28-Oct-65	11.000	2-Aug-78	8.900	15-Nov-84	13.600	1-Mar-89	14.600
27-Jan-66	13.000	21-Aug-78	9.400	6-Dec-84	14.300	10-Apr-89	12.000
25-Apr-66	16.000	12-Sep-78	9.000	7-Jan-85	14.100	3-May-89	11.200
5-Jul-66	9.000	12-Oct-78	8.000	7-Mar-85	14.700	1-Jun-89	9.600
6-Oct-66	8.000	1-Nov-78	12.400	4-Apr-85	13.700	12-Jul-89	9.400
8-Jan-67	12.000	4-Dec-78	8.000	13-May-85	9.600	3-Aug-89	10.100
28-Mar-67	12.000	29-Jan-79	10.000	4-Jun-85	10.400	14-Sep-89	8.200
20-Jun-67	11.000	12-Mar-79	11.000	30-Jul-85	9.000	14-Sep-89	8.200
3-Oct-67	10.000	4-Apr-79	10.000	5-Aug-85	9.100	2-Oct-89	9.700
27-Mar-68	19.000	19-Jun-79	9.000	16-Sep-85	9.300	6-Nov-89	11.000
18-Jun-68	10.000	5-Jul-79	10.000	19-Sep-85	9.400	7-Dec-89	15.000
4-Sep-68	9.000	6-Aug-79	9.700	9-Oct-85	10.900	2-Jan-90	14.200
3-Dec-68	11.000	6-Sep-79	10.000	3-Dec-85	13.600	1-Feb-90	13.400
12-Mar-69	13.000	30-Oct-79	10.000	10-Feb-86	14.500	12-Mar-90	12.400
4-Jun-69	10.000	3-Jan-80	10.000	3-Mar-86	13.500	4-Apr-90	13.800
4-Sep-69	9.000	21-Feb-80	14.200	5-May-86	11.200	1-May-90	11.700
3-Dec-69	15.000	19-Mar-80	11.000	9-Jun-86	8.000	5-Jun-90	12.000
4-Mar-70	14.000	6-May-80	12.000	5-Aug-86	9.300	5-Jul-90	8.600
11-Jun-70	9.000	2-Jun-80	11.000	4-Sep-86	9.700	1-Aug-90	11.200
2-Sep-70	10.000	10-Jul-80	10.000	8-Sep-86	9.300	2-Oct-90	11.000
11-Dec-70	11.000	13-Aug-80	7.700	9-Oct-86	10.800	10-Oct-90	9.600
12-Mar-71	12.000	6-Nov-80	12.400	17-Nov-86	13.100	10-Oct-90	9.600
8-Jun-71	13.000	5-May-81	10.800	8-Dec-86	12.200	13-Nov-90	12.600
14-Sep-71	9.000	1-Jun-81	9.600	13-Jan-87	14.100	5-Dec-90	16.400
29-Nov-71	11.000	5-Aug-81	9.400	2-Feb-87	14.200	2-Jan-91	15.800
1-Mar-72	12.000	16-Nov-81	11.100	3-Mar-87	14.200	4-Feb-91	19.000
31-May-72	10.000	4-Jan-82	14.000	14-Apr-87	11.800	5-Mar-91	16.000
13-Aug-72	7.800	23-Feb-82	13.800	6-May-87	11.400	8-Apr-91	10.200
7-Sep-72	10.000	4-May-82	11.400	3-Jun-87	10.200	2-May-91	11.300
27-Nov-72	10.000	1-Jun-82	9.600	6-Jul-87	11.200	4-Jun-91	9.300
5-Mar-73	9.500	7-Jul-82	11.000	6-Aug-87	9.700	1-Aug-91	8.800
17-Jun-73	11.000	4-Aug-82	9.100	22-Sep-87	9.500	4-Sep-91	8.500
30-Aug-73	12.500	11-Aug-82	9.100	1-Oct-87	10.500	1-Oct-91	12.800
2-Dec-73	12.000	1-Sep-82	9.500	3-Nov-87	12.600	4-Nov-91	16.800
5-Feb-74	12.000	20-Dec-82	13.500	1-Dec-87	12.000	4-Dec-91	12.900
4-Jun-74	9.400	3-Jan-83	14.000	4-Jan-88	16.400	6-Jan-92	14.000
3-Aug-74	9.800	2-Mar-83	12.800	4-Feb-88	14.800	1-Apr-92	16.000
16-May-75	9.200	25-May-83	9.000	8-Mar-88	14.000	1-Jun-92	10.600

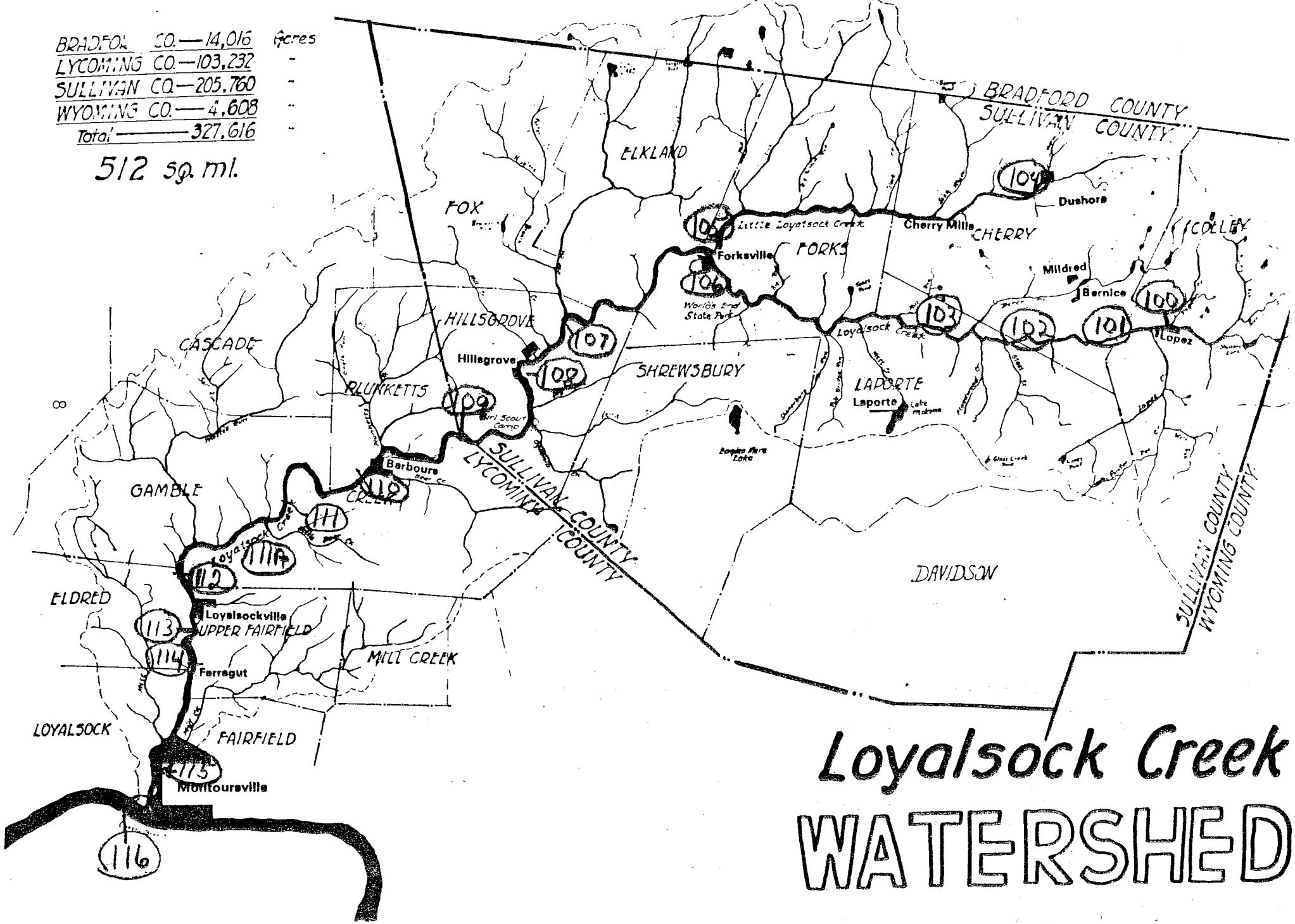
Loyalsockville Disolve Oxygen Data (300)

ate	D. Oxygen	Date	D. Oxygen
6-Jul-92	12.200	2-Oct-97	11.400
3-Aug-92	13.200	4-Nov-97	11.800
1-Sep-92	10.000	3-Dec-97	12.400
5-Oct-92	10.000	6-Jan-98	9.400
4-Jan-93	16.500	2-Feb-98	13.400
1-Feb-93	16.900	16-Mar-98	13.200
17-Mar-93	17.600	2-Apr-98	16.300
3-May-93	10.800	26-May-98	9.200
2-Jun-93	15.800	2-Jun-98	9.700
6-Jul-93	8.400	6-Jul-98	9.300
3-Aug-93	8.700	12-Aug-98	8.600
5-Oct-93	11.600	5-Oct-98	9.600
2-Nov-93	16.200	1-Dec-98	12.000
1-Dec-93	13.600	07-Jan-99	15.600
7-Mar-94	14.000	15-Mar-99	15.400
5-Apr-94	14.500	03-May-99	10.900
10-May-94	12.200	12-Jul-99	8.800
3-Aug-94	9.600	27-Sep-99	10.400
1-Sep-94	11.400	15-Nov-99	12.400
18-Oct-94	12.400	02-Feb-00	14.000
1-Nov-94	11.500	13-Mar-00	13.000
5-Jan-95	14.800	26-Apr-00	12.000
9-Feb-95	14.800	12-Jun-00	8.100
1-Mar-95	15.100	01-Aug-00	8.600
19-Apr-95	12.700	16-Oct-00	11.370
18-May-95	12.200	12-Dec-00	14.600
5-Jun-95	10.000	03-Jan-01	16.530
13-Jun-95	10.600	12-Mar-01	14.600
5-Jul-95	10.200	03-May-01	12.540
1-Aug-95	8.900		
18-Sep-95	10.000		
6-Nov-95	14.400		
6-Dec-95	15.000		
8-Feb-96	14.000		
13-Mar-96	13.200		
3-Apr-96	12.100		
20-May-96	11.100		
11-Jun-96	10.500		
1-Jul-96	9.200		
20-Aug-96	9.500		
2-Oct-96	11.400		
7-Nov-96	12.900		
9-Dec-96	13.200		
6-Jan-97	12.600		
3-Feb-97	14.200		
5-Mar-97	13.800		
2-Apr-97	12.300		
5-May-97	12.400		
9-Jun-97	9.700		
22-Jul-97	0.000		

HILLSGROVE: PH (STANDARD UNITS)								
Date	pH	Date	pH	Date	pH	Date	pH	
10-Sep-75	6.8	21-Jan-88	6.6	1-Jul-91	6.88	14-Mar-95	6.07	
18-Feb-76	7.8	23-Feb-88	6.4	6-Aug-91	6.62	24-Apr-95	6.55	
24-Aug-76	7.4	1-Mar-88	6.5	9-Sep-91	6.56	4-May-95	6.68	
18-Nov-76	7.8	28-Apr-88	6.7	7-Oct-91	6.37	7-Jun-95	6.66	
4-May-77	7.6	3-May-88	6.7	6-Nov-91	6.31	12-Jul-95	6.29	
30-Aug-77	7	14-Jun-88	6.9	9-Dec-91	6.38	14-Aug-95	7.95	
23-May-78	8.5	5-Jul-88	6.9	13-Jan-92	6.32	20-Sep-95	6.36	
1-Aug-79	8	8-Aug-88	6.9	18-Feb-92	6.31	3-Oct-95	6.81	
14-Nov-79	6.4	12-Sep-88	7.2	3-Mar-92	6.84	7-Nov-95	6.42	
26-Aug-80	8.5	12-Sep-88	7.2	20-Apr-92	7.6	22-Apr-96	6.21	
24-Nov-80	7.9	20-Oct-88	6.6	7-May-92	6.54	20-May-96	6.66	
25-Feb-81	6.9	14-Nov-88	6.8	16-Jun-92	6.94	6-Jun-96	6.25	
26-May-81	7.3	6-Dec-88	6.6	6-Jul-92	6.65	11-Jul-96	6.84	
18-Nov-81	7.2	1-Feb-89	8.2	4-Aug-92	6.55	5-Sep-96	7.5	
24-May-82	6.3	28-Mar-89	6.5	17-Sep-92	6.33	17-Oct-96	8.3	
3-Aug-82	7.2	22-May-89	7.6	6-Oct-92	5.55	5-Nov-96	6.49	
8-Nov-82	6.9	20-Jun-89	7.5	16-Nov-92	6.53	11-Dec-96	7.29	
8-Feb-83	6.8	10-Aug-89	8.3	1-Dec-92	5.34	20-Feb-97	6.21	
11-May-83	6.9	14-Sep-89	6.8	25-Jan-93	5.04	24-Mar-97	8.13	
4-Aug-83	7.2	14-Sep-89	6.8	23-Feb-93	6.03	23-Apr-97	6.52	
21-Nov-83	6.7	4-Dec-89	6.3	22-Mar-93	7.37	12-May-97	7.33	
1-Feb-84	6.6	3-Jan-90	7.7	19-Apr-93	5.86	16-Jun-97	6.29	
7-May-84	6.8	7-Feb-90	6.9	10-May-93	6.1	8-Jul-97	6.56	
8-Aug-84	6.6	15-Mar-90	7.11	9-Jun-93	6.11	6-Aug-97	6.14	
7-Nov-84	6.6	19-Apr-90	7.08	6-Jul-93	6.08	16-Sep-97	8.36	
5-Dec-84	6.6	23-May-90	6.46	16-Aug-93	5.92	20-Oct-97	6.33	
4-Feb-85	6.7	7-Jun-90	7.54	1-Sep-93	5.88	5-Nov-97	5.76	
22-May-85	6.7	5-Jul-90	6.45	7-Oct-93	7.22	8-Dec-97	6.03	
6-Aug-85	6.6	16-Aug-90	7.68	18-Nov-93	5.21	26-Jan-98	7.32	
16-Sep-85	7	4-Sep-90	6.5	22-Mar-94	6.05	9-Feb-98	6.34	
12-Nov-85	6.6	4-Sep-90	6.5	20-Apr-94	7.14	28-Apr-98	6.2	
12-Feb-86	6.5	3-Oct-90	6.31	17-May-94	6.59	18-May-98	5.94	
5-May-86	6.8	1-Nov-90	6.52	9-Jun-94	6.58	22-Jun-98	7.82	
7-Aug-86	6.4	29-Nov-90	7.1	6-Jul-94	6.37	16-Jul-98	6.14	
8-Sep-86	7.4	3-Dec-90	6.33	30-Aug-94	7.09	5-Aug-98	6.28	
17-Nov-86	6.4	10-Jan-91	6.69	12-Sep-94	6.5			
9-Feb-87	6.6	20-Feb-91	6.79	25-Oct-94	6.49			
4-May-87	6.8	11-Mar-91	6.32	7-Nov-94	6.22			
10-Aug-87	6.4	8-May-91	7.34	19-Dec-94	6.42			
3-Nov-87	6.4	6-Jun-91	7.11	11-Jan-95	7.71			
				21-Feb-95	6.42			

HILLSGROVE: IRON, DISSOLVED (UG/L AS FE)						
Date	ug/l as Fe	Date	ug/l as Fe	Date	ug/l as Fe	
5-Jul-90	74	25-Jan-94	23	20-Oct-97	28	
3-Oct-90	75	16-Feb-94	49	5-Nov-97	24	
1-Nov-90	35	22-Mar-94	141	8-Dec-97	21	
3-Dec-90	23	20-Apr-94	66	26-Jan-98	33	
10-Jan-91	38	17-May-94	22	9-Feb-98	119	
20-Feb-91	53	9-Jun-94	27	30-Mar-98	20	
11-Mar-91	42	6-Jul-94	37	28-Apr-98	20	
8-Apr-91	60	30-Aug-94	95	18-May-98	28	
8-May-91	112	12-Sep-94	34	22-Jun-98	20	
6-Jun-91	41	25-Oct-94	25	16-Jul-98	20	
1-Jul-91	40	7-Nov-94	34	5-Aug-98	20	
6-Aug-91	20	19-Dec-94	30			
9-Sep-91	65	11-Jan-95	28			
7-Oct-91	15	21-Feb-95	14			
6-Nov-91	44	14-Mar-95	36			
9-Dec-91	24	24-Apr-95	14			
13-Jan-92	37	4-May-95	93			
18-Feb-92	47	7-Jun-95	38			
3-Mar-92	31	12-Jul-95	60			
20-Apr-92	49	14-Aug-95	24			
7-May-92	12	20-Sep-95	33			
16-Jun-92	11	3-Oct-95	18			
6-Jul-92	39	7-Nov-95	16			
4-Aug-92	10	22-Apr-96	22			
17-Sep-92	21.4	20-May-96	11			
6-Oct-92	40	6-Jun-96	31			
16-Nov-92	58	11-Jul-96	22			
1-Dec-92	28	5-Aug-96	10			
25-Jan-93	27	5-Sep-96	20			
23-Feb-93	10	17-Oct-96	10			
22-Mar-93	34	5-Nov-96	28			
19-Apr-93	31	11-Dec-96	14			
10-May-93	20	20-Feb-97	16			
9-Jun-93	20	24-Mar-97	19			
6-Jul-93	10	23-Apr-97	10			
16-Aug-93	52	12-May-97	10			
1-Sep-93	40	16-Jun-97	19			
7-Oct-93	34	8-Jul-97	10			
18-Nov-93	51	6-Aug-97	10			
6-Dec-93	53	16-Sep-97	16			

HILLSGROVE: ALUMINUM, DISSOLVED (UG/L AS AL)					
Date	Aluminum (ug/l as Al)	Date	Aluminum (ug/l as Al)	Date	Aluminum (ug/l as Al)
22-May-89	135	17-Sep-92	251.3	6-Jun-96	1200
20-Jun-89	135	6-Oct-92	96.7	11-Jul-96	31.2
10-Aug-89	135	16-Nov-92	138.4	5-Aug-96	30.4
18-Oct-89	135	1-Dec-92	110	5-Sep-96	31.1
1-Nov-89	135	25-Jan-93	61	17-Oct-96	34.3
4-Dec-89	135	23-Feb-93	51.5	5-Nov-96	57.8
3-Jan-90	135	22-Mar-93	54	11-Dec-96	57.5
7-Feb-90	135	19-Apr-93	105	20-Feb-97	29.3
15-Mar-90	135	10-May-93	42.3	24-Mar-97	52.6
19-Apr-90	427	9-Jun-93	27.4	23-Apr-97	35.4
23-May-90	135	6-Jul-93	37.6	12-May-97	51.3
7-Jun-90	135	16-Aug-93	86.9	16-Jun-97	27.7
5-Jul-90	27.4	1-Sep-93	111	8-Jul-97	19.7
16-Aug-90	61.8	7-Oct-93	736	6-Aug-97	10
4-Sep-90	25.7	18-Nov-93	69.2	16-Sep-97	10
3-Oct-90	50.2	6-Dec-93	124	20-Oct-97	10
1-Nov-90	152	25-Jan-94	68.8	5-Nov-97	31.6
29-Nov-90	0	16-Feb-94	95.5	8-Dec-97	39
3-Dec-90	54.3	22-Mar-94	79	26-Jan-98	44.6
10-Jan-91	170	20-Apr-94	194	9-Feb-98	32.6
20-Feb-91	94.1	17-May-94	285	30-Mar-98	45.9
11-Mar-91	99.6	9-Jun-94	168	28-Apr-98	59.4
8-Apr-91	55.3	6-Jul-94	45.9	18-May-98	35.2
8-May-91	77.2	30-Aug-94	198	22-Jun-98	22.2
6-Jun-91	55.4	12-Sep-94	71.7	16-Jul-98	14.4
1-Jul-91	65.4	25-Oct-94	136	5-Aug-98	12.6
6-Aug-91	20	7-Nov-94	15.2		
9-Sep-91	24.9	19-Dec-94	124		
7-Oct-91	23	11-Jan-95	92.9		
6-Nov-91	21.7	21-Feb-95	54.4		
9-Dec-91	84.4	14-Mar-95	67.4		
13-Jan-92	49.7	24-Apr-95	41.2		
18-Feb-92	39.57	4-May-95	42.4		
3-Mar-92	48.1	7-Jun-95	1342		
20-Apr-92	54.3	12-Jul-95	80		
7-May-92	40.17	14-Aug-95	31.8		
16-Jun-92	23.7	20-Sep-95	196.5		
6-Jul-92	22.7	3-Oct-95	1040		
4-Aug-92	260	7-Nov-95	96.1		
22-Apr-96	10				
20-May-96	56.8				



Loyalsock Creek WATERSHED

Hellbenders

How can I help?

Eastern Hellbender salamanders are NOT poisonous! Although they have many small sharp teeth, they do NOT bite! They are slippery and difficult to handle, but they are tough, so do NOT be afraid to pick one up to return it to where it was caught.

Remember:

- While kayaking, canoeing, swimming, or fishing, do not move rocks! Hellbenders need these hiding places.
- If a hellbender is caught while fishing, disengage the hook or cut the line close to the hook and release it.
- Hellbenders are protected in Pennsylvania. Leave them in the wild.

If you would like to report a hellbender sighting or simply would like more information, please contact:

Dr. Peter Petokas
Clean Water Institute
Lycoming College
Williamsport, PA 17701
Ph. 570-321-4006
Email: petokas@lycoming.edu

You may visit this website for online reporting and more information on current research: **www.lycoming.edu/~petokas**

Groups Supporting Hellbender Conservation

The **Cryptobranchid Interest Group (CIG)** is dedicated to the funding and support of research and conservation for hellbenders and other giant salamanders. With the help of private donations from people all over the world, they have helped field researchers in their pursuit to better understand the natural history of these amazing giant amphibians. Visit the CIG website at **www.caudata.org/cig**

The **Pennsylvania Fish and Boat Commission (PFBC)** is responsible for the management of all of Pennsylvania's amphibian and reptile species. PFBC supports basic research on the Eastern Hellbender in order to develop effective policy and management objectives. Visit the PFBC website at **http://sites.state.pa.us/PA_Exec/Fish_Boat**

The Hellbender in Pennsylvania

The Eastern Hellbender (*Cryptobranchus alleganiensis*) is one of the largest salamanders in North America, attaining lengths of up to 29 inches. They require clear, fast-flowing streams with abundant rocks large enough to hide under. Hellbenders are totally aquatic, never leaving the water, and are generally active only at night when they leave their retreats to search for food.

Adult Eastern Hellbender

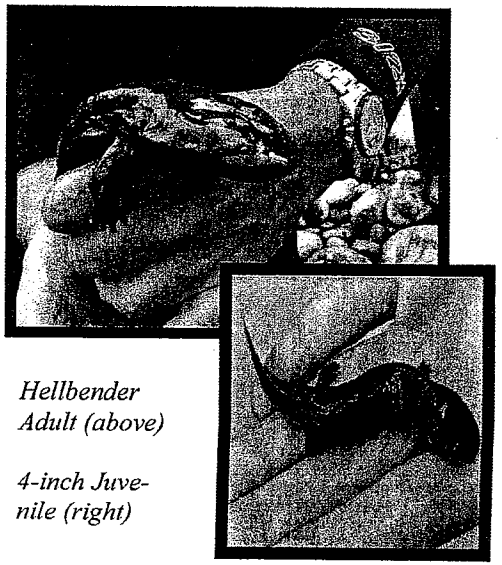
Eastern Hellbenders occur in rivers and streams throughout much of the Commonwealth, but they do not occur in the Delaware River watershed. The PA Fish and Boat Commission regulates the taking of amphibians and they no longer allow hellbenders to be taken or possessed without a special permit. The Eastern Hellbender is not listed as threatened or endangered in Pennsylvania at this time.

Printed September 1, 2007

Photo by Mike Pinder

Biology

Appearance — Hellbenders have a flattened head and body, and sinuous skin folds along the side of the body to provide a large surface area for gas exchange. They have a pair of small eyes on top of the head, a pair of nostrils on the snout, a pair of large gill clefts called spiracles behind the head, and a lateral line system similar to fish.



Hellbender Adult (above)

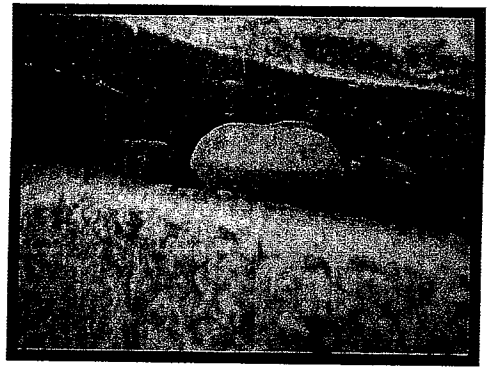
4-inch Juvenile (right)

Reproduction — Hellbender males excavate a cavity beneath a large rock and defend it against other males. Females deposit their eggs inside the cavities in late August and early September. The males fertilize the eggs externally then guard them until they hatch out about two months later. The newly-hatched larvae have external gills and are about 1-1/2 inches in length.

Ecology

Range — The Eastern Hellbender occurs from southern New York to northern Georgia, and from the central Appalachians westward to Missouri.

Habitat — Hellbenders prefer shallow, clear, fast-flowing streams with abundant rock cover. They live singly beneath rocks and only rarely are two hellbenders found together. Adults will fight and wound each other with their small, sharp teeth. Most fighting appears to be in defense of cover rocks and/or nest sites. Predation on adult hellbenders is not common due to their large size and nocturnal habit, but juveniles may be eaten by predatory birds, fish, and larger hellbenders.



Adult Hellbender inside Rock Crevice

Food — Adult hellbenders typically eat crayfish, but will also take small fish and aquatic insects when available. Gilled larvae feed on aquatic insects, but as they develop into juveniles they begin feeding on tiny crayfish.

Research & Education

Scientists and students from Lycoming College are conducting studies of distribution, ecology, and health of the Eastern Hellbender in tributaries of the Susquehanna River in Pennsylvania.

Populations — Hellbenders are being tagged for long-term monitoring of population health. The presence of juveniles in most populations suggests that they are self-sustaining.

H.S. Students Learn about Hellbenders (above)

25-inch Adult (right)

Distribution — Hellbenders still occur in many of the Pennsylvania streams where they were historically present, but they are much less common now due to habitat degradation from sediment pollution and acid mine drainage.

Health — Individuals are sometimes found with unhealed wounds, missing limbs, parasites, or skin infections, but most Hellbenders in the Susquehanna River Basin appear to be healthy.

Photos by Peter Petokas

By JESSICA LAMEY
ilamey@sungazette.com

Living in Central Pennsylvania is a creature so unique, so prehistoric looking, it's hard to believe that it exists. Some say its grotesque, others become intrigued by its mysterious nature.

The eastern hellbender is the one of the largest species of salamander in the world and the only salamander of its size in North America.

A hellbender can grow to lengths of 29 inches and weigh up to 5 pounds. Only the giant salamander found in China and Japan is larger. Those can grow up to 5 feet long and weigh up to 100 pounds.

The hellbender is thought to live anywhere from 30 to 50 years, possibly longer, and is believed to have existed for millions of years.

Hellbenders are native to streams within the Allegheny, Ohio and Susquehanna river drainages of Pennsylvania.

Disbelief? It's true, but the reason the hellbender isn't seen or commonly known is that it is a very shy and secretive animal. It is fully aquatic and can be found in clean flowing rivers and streams that have lots of large rocks or boulders.

"They live in streams that have a moderate gradient ... a really good flow to the current," says Dr. Peter Petokas, a biologist at Lycoming College who has studied the animals in this area for two years. "For that reason you would not find them in the slower streams that are typical along the coast."

"Hellbenders have a flattened body, paddle-like tail and small eyes. They have lungs, but breathe entirely through their skin and almost never leave the water. They have fleshy folds of skin on the sides and backs of their arms and legs that are filled with capillaries. These folds are used for oxygen uptake," said Dr. W. Jeffrey Humphries of Clemson University in South Carolina.

Humphries said they were first described by Sonninni (Sonninni and Latreille, 1801) and called, in French, "la salamandre des monts Alleganis."

Here they are most active at night, or just when the sun just goes down. Petokas said in this area they usually are active for the first couple hours after sundown. However scientists found in other states that the hellbender is most active during the day.

"Otherwise they remain hidden underneath large rocks and in rock crevices," Petokas said.

Their diet consists of mostly crayfish, worms and insects, and sometimes small fish like minnows.

Humphries says hellbenders have few predators as adults, except humans, but young hellbenders are eaten by fish, snakes and other hellbenders.

Local hellbender researcher Jim Rogers holds an adult caught May 18 in Loyalsock Creek. The creature was 24 inches long – the longest yet found by Rogers and Dr. Peter Petokas of Lycoming College. In inset, Petokas holds a small juvenile caught in July. It measured 5.5 inches long.

What the ...?

Hellbenders – prehistoric creatures living right in PA

They are unique and, in essence, harmless. They are at the top the food chain," Petokas said.

"A lot of anglers in the past and today catch and kill them with mistaken belief that they eat trout. Actually, the hellbender has a very specialized diet," Dr. Arthur C. Hules, professor of herpetology at Indiana State University. "Out of all the animals I examined, I have never seen one contain any type of game fish."

Most fishermen or outdoorsmen have never seen one because of where they live and how well they are camouflaged with mudbrown to olive coloration and wetrock appearance.

"Most people have never heard of a hellbender because you really have to be looking to find one. Fishermen are the only people who regularly run into them, because they will bite nightcrawlers and other bait. They are also not very common anymore, so even if people are within their range, they're not likely to see one unless they really look," Humphries said.

"It's hard to tell when they are in water because they don't move much," Petokas said. "If anything, fishermen should be happy to have hellbenders around, as they are a great indication of a very healthy stream," Humphries said. All three biologists said if one is caught while fishing, it should be returned to the water unharmed.

Breeding, growth

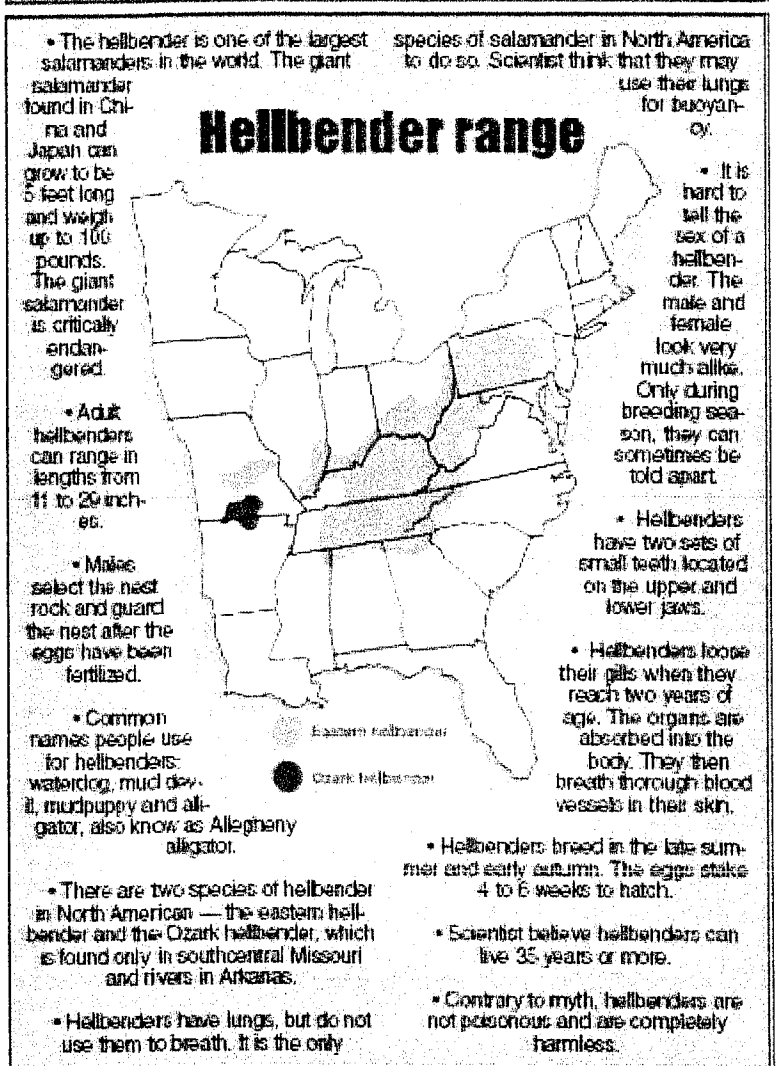
Petokas said he conducted hellbender surveys in the North Branch of the Susquehanna River for the state's Department of Environmental Conservation and has worked with the animals casually for about 15 years total. He says the animals breed during the last week of August and the first two weeks of September.

"During the breeding season, they become more active during the day. The males tend to congregate into to groups around rocks, in attempt to entice females," he said. "The male selects the nest rock under which to breed."

He said the males guard the eggs after they are fertilized and will fight viciously for the females. He has seen scars on some the hellbenders from biting and fighting.

The females deposit between 200 to 500 marblesized eggs.

Hellbender facts
(Cryptobranchus alleganiensis alleganiensis)



"They develop into larvae after 60 days of incubation. In about November, the larvae will appear in the streams," Petokas said. "When they first hatch out they are an inch long, and by the summer they are 3inches."

It takes four or five years for a larva to grow to about 12 inches and become a sexually mature adult.

Hules said the juveniles live in the stream gravel, where they feed on larval insects and other small water creatures.

Hellbender reproduction has biologists worried here and other places where the animals live.

"We are finding reproduction here but we are not finding big adults," Petokas said. "We don't know what is happening because we are finding dead ones but we don't know why they are dying."

"Hellbenders probably used to be extremely common in most streams in the Appalachians, but today they are mainly only found in remote areas, such as national forests," Humphries said.

Petokas said in Missouri and Arkansas, they had populations of 500 animals in a place and now there are none.

"We were down there this summer and they are not reproducing," he said.

Petokas and his partner Jim Rodgers have witnessed hellbenders with skin disorders, sores and wounds that won't heal and skin tumors.

"Those hellbenders are in serious trouble," Petokas said.

Myths and legends

Humphries said the major myth about the hellbender is that they are poisonous.

"That is a very common misconception. They may be distasteful but there is no evidence that they are poisonous," Petokas said.

"Another legend is the misconception is that they bite. Very rarely has anyone ever been bitten by one," he said.

The hellbender has two rows of teeth in the upper part of the mouth and one row on the bottom. They are very small sharp. They grab their prey with their teeth and swallow it whole.

"They have a very thick mucus and when you catch them they increase the mucus secretion," Petokas said. "They can become very slippery."

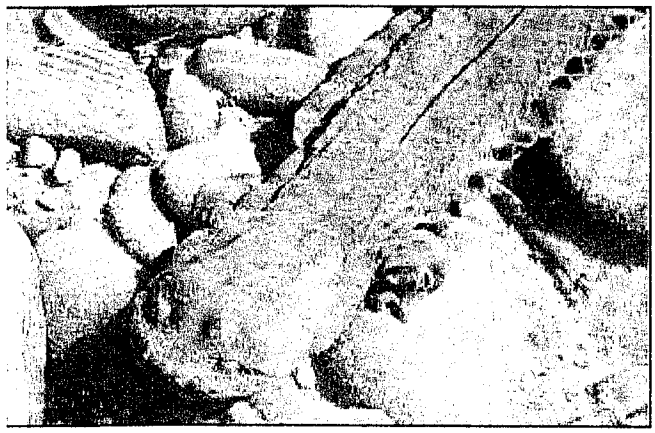
"In reality, their skin secretions are somewhat toxic, but they're not dangerous unless you put a hellbender in your mouth," Humphries said.

Another common misconception is that they crawl on land.

"Most people think they come out of the water and crawl on the rocks, but they don't. They are always on the bottom," Petokas said.

Hellbender bones have been found in middens — the trash deposits left around American Indian villages. Scientists think they could have been used as food.

"There is no other possible use we can think of. It's not like a turtle shell that can be used for a rattle or a bowl." Petokas said.



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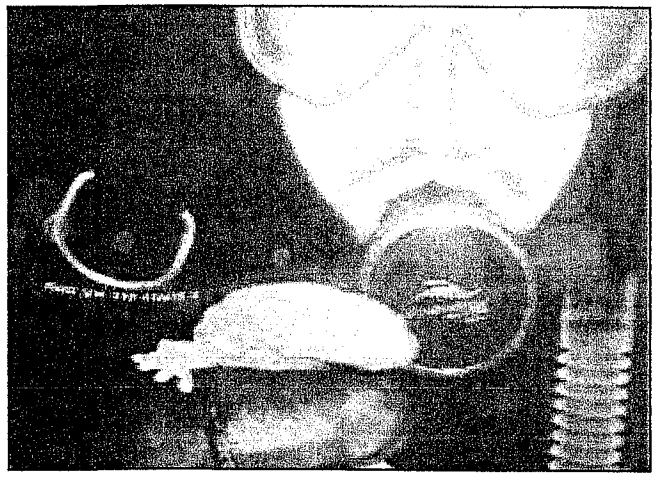

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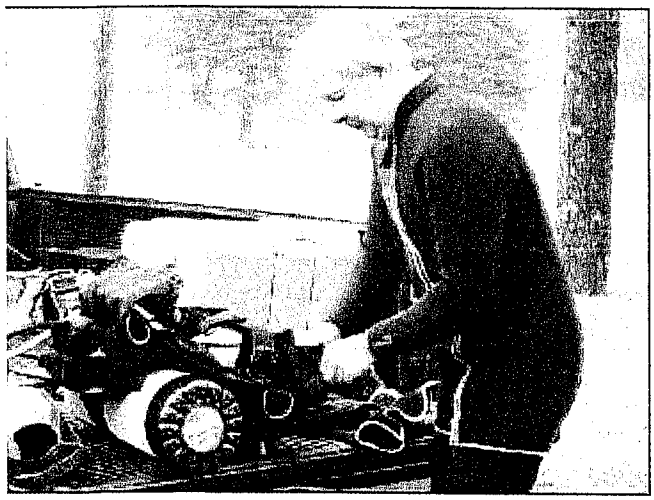


Hellbenders have folds of skin on their sides, top photo, that enhance the exchange of oxygen and carbon dioxide in water. In center photo, local researcher Jim Rogers holds a small adult captured while scuba diving Nov. 4. Above, Dr. Peter Petokas, a biologist at Lycoming College, readies his diving equipment on Monday for a hellbender search in Loyalsock Creek. Hellbender larvae hatch this time of year, requiring researchers to scour cold creeks to find evidence of reproduction, which has declined sharply.

He said he has heard of some people who do eat them today or in the recent past.

He said he recently received an e-mail from colleagues saying they found a family living in the mountains who eat hellbenders. It said they fileted the flanks off the backs and cook them.

A retired professor at St. Bonaventure University in New York wrote in a letter that when he first came to the university in the 1950s, they held a hellbender feast once a year.

The hellbenders are commonly referred to as a mudpuppy, but that is incorrect. The mudpuppy is another species of salamander.

"There are no mudpuppies where you guys are. They are found in the Allegheny and Ohio drainages, but never got into the Susquehanna," Hules said. "On rare occasion, some may have caught one (mudpuppy) but it is not native to Susquehanna."

Mudpuppies are recognized by red frilly external gills. Hellbenders do not have gills and are much larger than mudpuppies.

Environmental issues

The hellbender population is becoming very vulnerable in our state.

"They are found basically in good quality streams, rivers with minimum sedimentation, good water quality and moderate current," Hules said. "The temperature can vary from cold to lukewarm type.

"The main danger for hellbenders in Pennsylvania is specifically the incredible pollution of rivers and streams," he said.

He said industrial waste, acid mine drainage, land development and impoundments are all harmful to hellbenders. Impound-ments or construction of dams can increase in sedimentation rates in a stream. If the stream becomes heavy with silt, the rocks the hellbenders live under can become buried.

Hules said studies show that in some places the numbers of hellbenders are down 50 to 60 percent. That has happened probably in the last 15 years. Also their range has been reduced about 60 to 70 percent.

Populations are known to have declined drastically over the last century, mainly due to habitat degradation – siltation from agriculture and home building is probably the biggest problem," Humphries said. "Historically, damming of many rivers in the eastern U.S. destroyed thousands of miles of hellbender habitat. Today, overcollection for the pet trade may also be a major issue."

"You can walk a stream for a mile or two or three and not find any ... If the habitat is good, then you will find them," Petokas said. "They are kind of restricted by the quality of habitat in a lot of the streams in this part of Pennsylvania."

He said most streams around here are cobble streams, in which the stones are about the size of your fist. The hellbender needs big stones or boulders ."

They (adults) need the big stones, the big stones are very important," he said. "The juveniles live in the cobble."

Hules found that it is most common that there is an aging population with no signs of young animals.

"In some studying, I don't find anything but big adults. You can go to a stream with no reproduction in 10 or 20 years. It still looks like a healthy population, but what you are doing you are getting old individuals ... As they die, there is no recruitment."

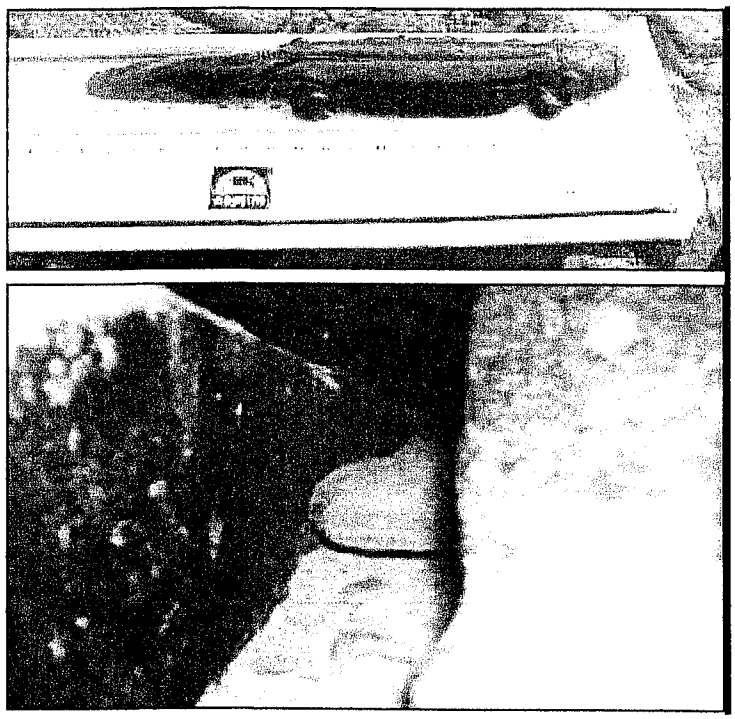
Petokas and Rodgers are among the few people studying hellbenders who are finding juveniles.

Out in the Midwest, the Ozark hellbender is now listed as an endangered species. In this state a lack of quality habitat and lack of breeding are of special concern.

The hellbender does not have federal protection, but some are trying to change that.

"They were definitely much more abundant going back to the 1930s and very way back to the 1800s," Petokas said. 'You could go out and in one spot catch 10 and the next day catch 10 more in same spot."

It is possible for a person to turn over one rock and find a hellbender, he said, "but we could go to the same places and turn 500 rocks and never find one.



A hellbender is stretched out on a measuring board, top photo. At 24 inches, it was unusually large, even for the second-largest salamander species in the world. Above, a hellbender's head pokes out from a crevice between two large rocks. The photo gives a good idea of why the mudbrown, bottom-dwelling creatures are seldom seen even by experienced outdoors folks.

Hellbender facts

(Cryptobranchus alleganiensis alleganiensis)

- The hellbender is one of the largest salamanders in the world. The giant salamander found in China and Japan can grow to be 5 feet long and weigh up to 100 pounds. The giant salamander is critically endangered.

- Adult hellbenders can range in lengths from 11 to 29 inches.

- Males select the nest rock and guard the nest after the eggs have been fertilized.

- Common names people use for hellbenders: waterdog, mud devil, mudpuppy and alligator, also know as Allegheny alligator.

- There are two species of hellbender in North American — the eastern hellbender and the Ozark hellbender, which is found only in southcentral Missouri and rivers in Arkanas.

- Hellbenders have lungs, but do not use them to breath. It is the only species of salamander in North America to do so.

Protection and studies

They do not have any federal protection," Humphries said.

"They should be in a category of at least special concern," Dr. Petokas said.

In this state, especially, there is virtually no protection.

"Currently a licensed fishermen can take two hellbenders a day. There is no reason to do it and we are battling that," Dr. Petokas said.

Petokas and Rodgers working to obtain a grant from the state Fish and Boat Commission to study the hellbender's distribution and status in the tributaries of the West Branch of the Susquehanna.

The two use scuba diving equipment to find and study hellbenders.

They can live in up to 30 feet of water in what Petokas calls scour holes, which most of the time are found around bridges. Such holes contain large rocks and bedrock, the perfect hiding place for hellbenders.

"The water can be anywhere from 6 inches to 30 feet deep." Petokas said. "Adults we find here in the deeper water. In New York, that's not true; we find them where it can only be a foot deep."

According to the grant application "occurrence, distribution, and habitat and water quality data will be collected, along with population demographic data and an assessment of reproductive success and recruitment. Project results will provide information needed for management and conservation of the eastern hellbender in Pennsylvania."

The studies are being planned for June through September of 2006.

The hellbenders found in the field studies will be characterized by population size, density, age structure, sex ratio and recruitment.

The hellbenders that are captured in the study will be fitted with a "passive integrated transponder," which is a tiny chip, and tags. They will use GPS coordinates to record movement and population.

"They're completely harmless and are a really important part of ·er ecosystems. If you see one, consider yourself very lucky," ·mphries said.

"I think people who live within the range of this 'living dinosaur' should be really proud that they're still doing pretty well in some streams. Just like many other species, though, we really need to pay more attention to our environment and make sure they remain here for our kids and grandkids to see."

Scientist think that they may use their lungs for buoyancy.

• It is hard to tell the sex of a hellbender. The male and female look very much alike. Only during breeding season, they can sometimes be told apart.

• Hellbenders have two sets of small teeth located on the upper and lower jaws.

• Hellbenders loose their gills when they reach two years of age. The organs are absorbed into the body. They then breath thorough blood vessels in their skin.

• Hellbenders breed in the late summer and early autumn. The eggs stake 4 to 6 weeks to hatch.

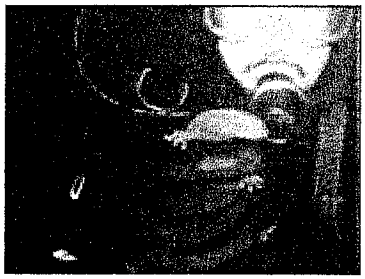
• Scientist believe hellbenders can live 35 years or more.

• Contrary to myth, hellbenders are not poisonous and are completely harmless.

JESSICA LAWEY/Sun-Gazette

Jim "Toolbox" Reynolds of Forksville, left, and Dr. Peter Petokas, right, a biologist at Lycoming College, head across Loyalsock Creek Monday to a pool about 11 feet deep where they found several hellbenders. It was cold work in their wetsuits and scuba gear. The water was 38 degrees.

Lycoming Researcher Receives Grant to Study Hellbenders



Jim Rogers, recent grad, holds a "hellbender"

They are ugly and prehistoric-looking, but the eastern "hellbender" salamander may be a harbinger of the health of the Susquehanna River basin.

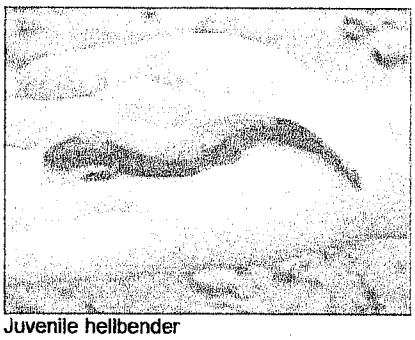
Dr. Peter Petokas, a research biologist with the Clean Water Institute at Lycoming College, has received a $49,000 grant from the Pennsylvania Fish and Boat Commission to study this giant salamander that is only found in the drainage areas of the Allegheny, Ohio, and Susquehanna Rivers. The hellbender—also known as the waterdog, mud devil, mudpuppy and Allegheny alligator—is the largest salamander in North America, growing to a length of 27 inches.

Petokas will use the grant money for a two-year project that will identify areas in the streams where hellbender populations occur; assess these habitats; establish long-term monitoring of hellbender populations; and compile comprehensive, detailed, and meaningful information useful in the development of a hellbender management and conservation plan for the Susquehanna River West Branch watershed, and potentially for the Commonwealth of Pennsylvania.

Adult hellbender

"What we learn about species like hellbenders...is important in itself, but expanding our knowledge about these animals can have larger implications for humans as well," said PFBC Executive Director Dr. Doug Austen in a press release. "Many animals are sensitive to changes in habitat, water and air quality, and thus can be good indicators of environmental health. The condition of fish and wildlife populations is often an early indicator of pollution that affects us all."

Hellbenders may have existed for millions of years. They are thought to live from 20 to 30 years but these shy and secretive salamanders are very difficult to spot.



Juvenile hellbender

Petokas has been interested in the hellbender for a long time. He and Lycoming College graduate Jim Rogers have conducted informal research on hellbenders over the past two years – locating areas where hellbenders occur and their preferred habitat in North-Central Pennsylvania streams.

With the $49,000 grant, they can formalize the research. "For Lycoming students, this is an incredible opportunity to do original research and discover a river native that few people have heard of," said Dr. Mel Zimmerman, Director of the Clean Water Institute.

Read the Sun-Gazette feature on hellbenders!

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Photos: Peter Petokas

Check our Biology Dept and the Clean Water Institute.

How can I help?

Eastern Hellbender salamanders are NOT poisonous! Although they have many small sharp teeth, they do NOT bite! They are slippery and difficult to handle, but they are tough, so do NOT be afraid to pick one up to return it to where it was caught.

Remember:

- While kayaking, canoeing, swimming, or fishing, do not move rocks! Hellbenders need these hiding places.
- If a hellbender is caught while fishing, disengage the hook or cut the line close to the hook and release it.
- Hellbenders are protected in Pennsylvania. Leave them in the wild.

If you would like to report a hellbender sighting or simply would like more information, please contact:

Dr. Peter Petokas
Clean Water Institute
Lycoming College
Williamsport, PA 17701

Ph. 570-321-4006

Email: petokas@lycoming.edu

You may visit this website for online reporting and more information on current research: **www.lycoming.edu/~petokas**

Groups Supporting Hellbender Conservation

The **Cryptobranchid Interest Group (CIG)** is dedicated to the funding and support of research and conservation for hellbenders and other giant salamanders. With the help of private donations from people all over the world, they have helped field researchers in their pursuit to better understand the natural history of these amazing giant amphibians. Visit the CIG website at **www.caudata.org/cig**

The **Pennsylvania Fish and Boat Commission (PFBC)** is responsible for the management of all of Pennsylvania's amphibian and reptile species. PFBC supports basic research on the Eastern Hellbender in order to develop effective policy and management objectives. Visit the PFBC website at **http://sites.state.pa.us/PA_Exec/Fish_Boat**

The Hellbender in Pennsylvania

The Eastern Hellbender (*Cryptobranchus alleganiensis*) is one of the largest salamanders in North America, attaining lengths of up to 29 inches. They require clear, fast-flowing streams with abundant rocks large enough to hide under. Hellbenders are totally aquatic, never leaving the water, and are generally active only at night when they leave their retreats to search for food.

Adult Eastern Hellbender

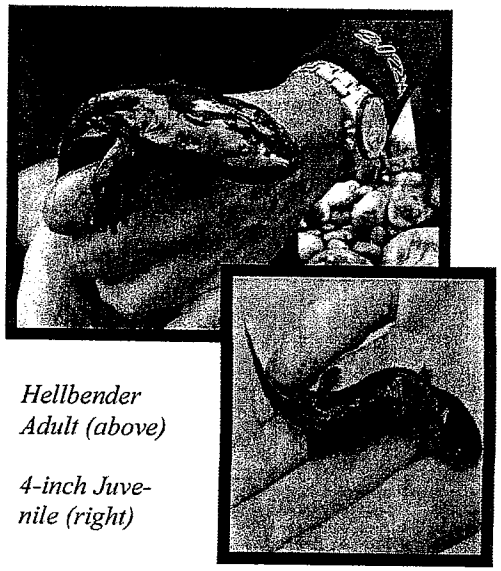
Eastern Hellbenders occur in rivers and streams throughout much of the Commonwealth, but they do not occur in the Delaware River watershed. The PA Fish and Boat Commission regulates the taking of amphibians and they no longer allow hellbenders to be taken or possessed without a special permit. The Eastern Hellbender is not listed as threatened or endangered in Pennsylvania at this time.

Printed September 1, 2007

Photo by Mike Pinder

Biology

Appearance — Hellbenders have a flattened head and body, and sinuous skin folds along the side of the body to provide a large surface area for gas exchange. They have a pair of small eyes on top of the head, a pair of nostrils on the snout, a pair of large gill clefts called spiracles behind the head, and a lateral line system similar to fish.



Hellbender Adult (above)

4-inch Juvenile (right)

Reproduction — Hellbender males excavate a cavity beneath a large rock and defend it against other males. Females deposit their eggs inside the cavities in late August and early September. The males fertilize the eggs externally then guard them until they hatch out about two months later. The newly-hatched larvae have external gills and are about 1-1/2 inches in length.

Ecology

Range — The Eastern Hellbender occurs from southern New York to northern Georgia, and from the central Appalachians westward to Missouri.

Habitat — Hellbenders prefer shallow, clear, fast-flowing streams with abundant rock cover. They live singly beneath rocks and only rarely are two hellbenders found together. Adults will fight and wound each other with their small, sharp teeth. Most fighting appears to be in defense of cover rocks and/or nest sites. Predation on adult hellbenders is not common due to their large size and nocturnal habit, but juveniles may be eaten by predatory birds, fish, and larger hellbenders.

Adult Hellbender inside Rock Crevice

Food — Adult hellbenders typically eat crayfish, but will also take small fish and aquatic insects when available. Gilled larvae feed on aquatic insects, but as they develop into juveniles they begin feeding on tiny crayfish.

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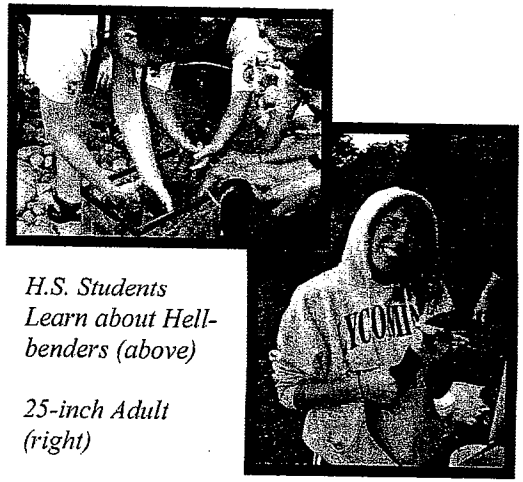

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By JESSICA LAMEY
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"They live in streams that have a moderate gradient ... a really good flow to the current," says Dr. Peter Petokas, a biologist at Lycoming College who has studied the animals in this area for two years. "For that reason you would not find them in the slower streams that are typical along the coast."

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They are unique and, in essence, harmless. They are at the top the food chain," Petokas said.

"A lot of anglers in the past and today catch and kill them with mistaken belief that they eat trout. Actually, the hellbender has a very specialized diet," Dr. Arthur C. Hules, professor of herpetology at Indiana State University. "Out of all the animals I examined, I have never seen one contain any type of game fish."

Most fishermen or outdoorsmen have never seen one because of where they live and how well they are camouflaged with mudbrown to olive coloration and wetrock appearance.

"Most people have never heard of a hellbender because you really have to be looking to find one. Fishermen are the only people who regularly run into them, because they will bite nightcrawlers and other bait. They are also not very common anymore, so even if people are within their range, they're not likely to see one unless they really look," Humphries said.

"It's hard to tell when they are in water because they don't move much," Petokas said. "If anything, fishermen should be happy to have hellbenders around, as they are a great indication of a very healthy stream," Humphries said. All three biologists said if one is caught while fishing, it should be returned to the water unharmed.

Breeding, growth

Petokas said he conducted hellbender surveys in the North Branch of the Susquehanna River for the state's Department of Environmental Conservation and has worked with the animals casually for about 15 years total. He says the animals breed during the last week of August and the first two weeks of September.

"During the breeding season, they become more active during the day. The males tend to congregate into to groups around rocks, in attempt to entice females," he said. "The male selects the nest rock under which to breed."

He said the males guard the eggs after they are fertilized and will fight viciously for the females. He has seen scars on some the hellbenders from biting and fighting.

The females deposit between 200 to 500 marblesized eggs.

Hellbender facts
(Cryptobranchus alleganiensis alleganiensis)

• The hellbender is one of the largest salamanders in the world. The giant salamander found in China and Japan can grow to be 5 feet long and weigh up to 100 pounds. The giant salamander is critically endangered.

• Adult hellbenders can range in lengths from 11 to 29 inches.

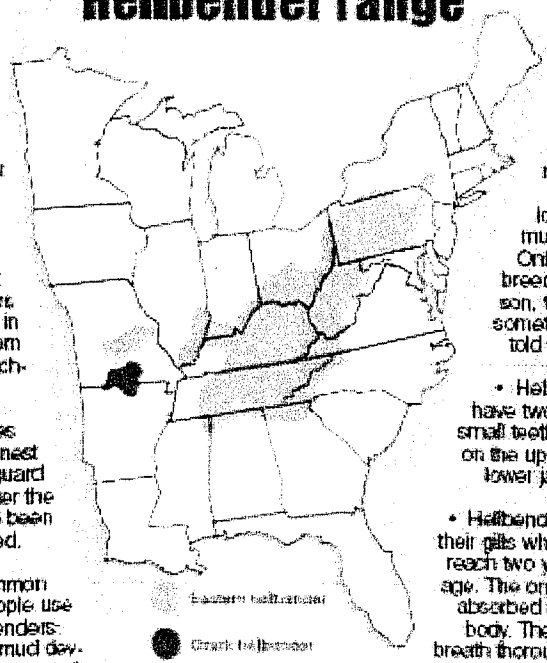
• Males select the nest rock and guard the nest after the eggs have been fertilized.

• Common names people use for hellbenders: waterdog, mud devil, mudpuppy and alligator, also know as Alleghany alligator.

• There are two species of hellbender in North American — the eastern hellbender and the Ozark hellbender, which is found only in southcentral Missouri and rivers in Arkansas.

• Hellbenders have lungs, but do not use them to breath. It is the only species of salamander in North America to do so. Scientist think that they may use their lungs for buoyancy.

Hellbender range



• It is hard to tell the sex of a hellbender. The male and female look very much alike. Only during breeding season, they can sometimes be told apart.

• Hellbenders have two sets of small teeth located on the upper and lower jaws.

• Hellbenders loose their gills when they reach two years of age. The organs are absorbed into the body. They then breath thorough blood vessels in their skin.

• Hellbenders breed in the late summer and early autumn. The eggs take 4 to 6 weeks to hatch.

• Scientist believe hellbenders can live 35 years or more.

• Contrary to myth, hellbenders are not poisonous and are completely harmless.

"They develop into larvae after 60 days of incubation. In about November, the larvae will appear in the streams," Petokas said. "When they first hatch out they are an inch long, and by the summer they are 3inches."

It takes four or five years for a larva to grow to about 12 inches and become a sexually mature adult.

Hules said the juveniles live in the stream gravel, where they feed on larval insects and other small water creatures.

Hellbender reproduction has biologists worried here and other places where the animals live.

"We are finding reproduction here but we are not finding big adults," Petokas said. "We don't know what is happening because we are finding dead ones but we don't know why they are dying."

"Hellbenders probably used to be extremely common in most streams in the Appalachians, but today they are mainly only found in remote areas, such as national forests," Humphries said.

Petokas said in Missouri and Arkansas, they had populations of 500 animals in a place and now there are none.

"We were down there this summer and they are not reproducing," he said.

Petokas and his partner Jim Rodgers have witnessed hellbenders with skin disorders, sores and wounds that won't heal and skin tumors.

"Those hellbenders are in serious trouble," Petokas said.

Myths and legends

Humphries said the major myth about the hellbender is that they are poisonous.

"That is a very common misconception. They may be distasteful but there is no evidence that they are poisonous," Petokas said.

"Another legend is the misconception is that they bite. Very rarely has anyone ever been bitten by one," he said.

The hellbender has two rows of teeth in the upper part of the mouth and one row on the bottom. They are very small sharp. They grab their prey with their teeth and swallow it whole.

"They have a very thick mucus and when you catch them they increase the mucus secretion," Petokas said. "They can become very slippery."

"In reality, their skin secretions are somewhat toxic, but they're not dangerous unless you put a hellbender in your mouth," Humphries said.

Another common misconception is that they crawl on land.

"Most people think they come out of the water and crawl on the rocks, but they don't. They are always on the bottom," Petokas said.

Hellbender bones have been found in middens — the trash deposits left around American Indian villages. Scientists think they could have been used as food.

"There is no other possible use we can think of. It's not like a turtle shell that can be used for a rattle or a bowl." Petokas said.

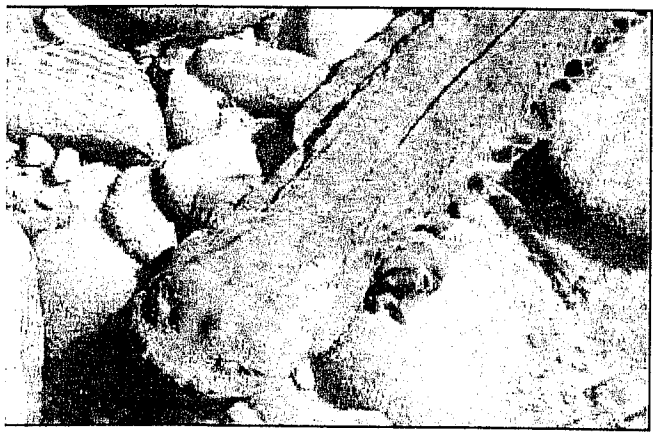


PHOTO PROVIDED

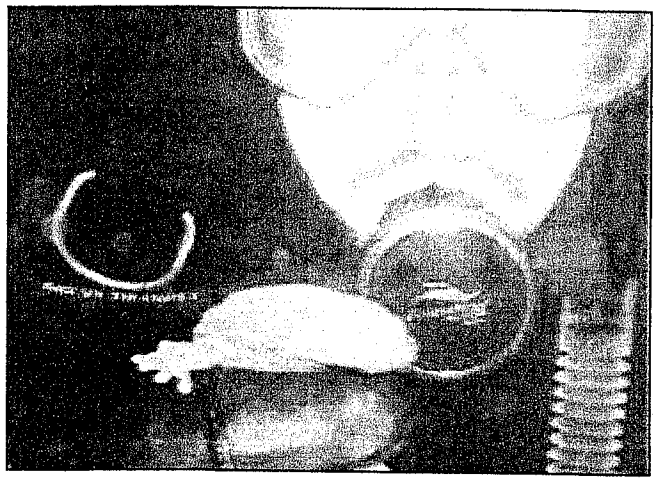
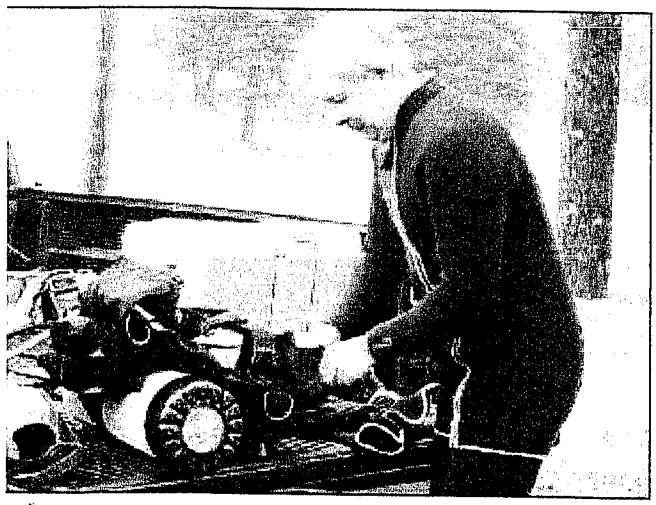


PHOTO PROVIDED



Hellbenders have folds of skin on their sides, top photo, that enhance the exchange of oxygen and carbon dioxide in water. In center photo, local researcher Jim Rogers holds a small adult captured while scuba diving Nov. 4. Above, Dr. Peter Petokas, a biologist at Lycoming College, readies his diving equipment on Monday for a hellbender search in Loyalsock Creek. Hellbender larvae hatch this time of year, requiring researchers to scour cold creeks to find evidence of reproduction, which has declined sharply.

He said he has heard of some people who do eat them today or in the recent past.

He said he recently received an e-mail from colleagues saying they found a family living in the mountains who eat hellbenders. It said they fileted the flanks off the backs and cook them.

A retired professor at St. Bonaventure University in New York wrote in a letter that when he first came to the university in the 1950s, they held a hellbender feast once a year.

The hellbenders are commonly referred to as a mudpuppy, but that is incorrect. The mudpuppy is another species of salamander.

"There are no mudpuppies where you guys are. They are found in the Allegheny and Ohio drainages, but never got into the Susquehanna," Hules said. "On rare occasion, some may have caught one (mudpuppy) but it is not native to Susquehanna."

Mudpuppies are recognized by red frilly external gills. Hellbenders do not have gills and are much larger than mudpuppies.

Environmental issues

The hellbender population is becoming very vulnerable in our state.

"They are found basically in good quality streams, rivers with minimum sedimentation, good water quality and moderate current," Hules said. "The temperature can vary from cold to lukewarm type.

"The main danger for hellbenders in Pennsylvania is specifically the incredible pollution of rivers and streams," he said.

He said industrial waste, acid mine drainage, land development and impoundments are all harmful to hellbenders. Impound-ments or construction of dams can increase in sedimentation rates in a stream. If the stream becomes heavy with silt, the rocks the hellbenders live under can become buried.

Hules said studies show that in some places the numbers of hellbenders are down 50 to 60 percent. That has happened probably in the last 15 years. Also their range has been reduced about 60 to 70 percent.

Populations are known to have declined drastically over the last century, mainly due to habitat degradation – siltation from agriculture and home building is probably the biggest problem," Humphries said. "Historically, damming of many rivers in the eastern U.S. destroyed thousands of miles of hellbender habitat. Today, overcollection for the pet trade may also be a major issue."

"You can walk a stream for a mile or two or three and not find any ... If the habitat is good, then you will find them," Petokas said. "They are kind of restricted by the quality of habitat in a lot of the streams in this part of Pennsylvania."

He said most streams around here are cobble streams, in which the stones are about the size of your fist. The hellbender needs big stones or boulders ."

They (adults) need the big stones, the big stones are very important," he said. "The juveniles live in the cobble."

Hules found that it is most common that there is an aging population with no signs of young animals.

"In some studying, I don't find anything but big adults. You can go to a stream with no reproduction in 10 or 20 years. It still looks like a healthy population, but what you are doing you are getting old individuals ... As they die, there is no recruitment."

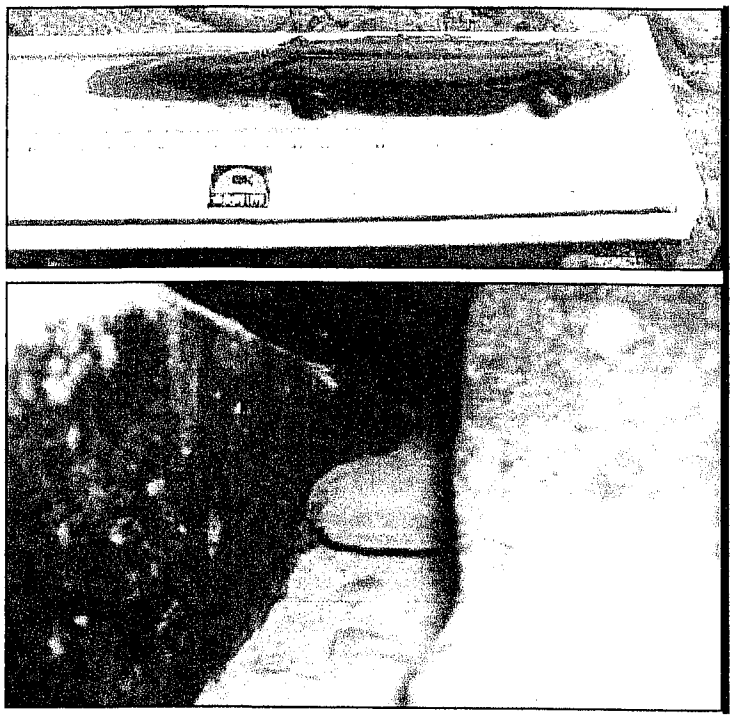
Petokas and Rodgers are among the few people studying hellbenders who are finding juveniles.

Out in the Midwest, the Ozark hellbender is now listed as an endangered species. In this state a lack of quality habitat and lack of breeding are of special concern.

The hellbender does not have federal protection, but some are trying to change that.

"They were definitely much more abundant going back to the 1930s and very way back to the 1800s," Petokas said. 'You could go out and in one spot catch 10 and the next day catch 10 more in same spot."

It is possible for a person to turn over one rock and find a hellbender, he said, "but we could go to the same places and turn 500 rocks and never find one.



A hellbender is stretched out on a measuring board, top photo. At 24 inches, it was unusually large, even for the second-largest salamander species in the world. Above, a hellbender's head pokes out from a crevice between two large rocks. The photo gives a good idea of why the mudbrown, bottom-dwelling creatures are seldom seen even by experienced outdoors folks.

Hellbender facts

(Cryptobranchus alleganiensis alleganiensis)

- The hellbender is one of the largest salamanders in the world. The giant salamander found in China and Japan can grow to be 5 feet long and weigh up to 100 pounds. The giant salamander is critically endangered.

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- Hellbenders have lungs, but do not use them to breath. It is the only species of salamander in North America to do so.

Protection and studies

They do not have any federal protection," Humphries said.

"They should be in a category of at least special concern," Dr. Petokas said.

In this state, especially, there is virtually no protection.

"Currently a licensed fishermen can take two hellbenders a day. There is no reason to do it and we are battling that," Dr. Petokas said.

Petokas and Rodgers working to obtain a grant from the state Fish and Boat Commission to study the hellbender's distribution and status in the tributaries of the West Branch of the Susquehanna.

The two use scuba diving equipment to find and study hellbenders.

They can live in up to 30 feet of water in what Petokas calls scour holes, which most of the time are found around bridges. Such holes contain large rocks and bedrock, the perfect hiding place for hellbenders.

"The water can be anywhere from 6 inches to 30 feet deep." Petokas said. "Adults we find here in the deeper water. In New York, that's not true; we find them where it can only be a foot deep."

According to the grant application "occurrence, distribution, and habitat and water quality data will be collected, along with population demographic data and an assessment of reproductive success and recruitment. Project results will provide information needed for management and conservation of the eastern hellbender in Pennsylvania."

The studies are being planned for June through September of 2006.

The hellbenders found in the field studies will be characterized by population size, density, age structure, sex ratio and recruitment.

The hellbenders that are captured in the study will be fitted with a "passive integrated transponder," which is a tiny chip, and tags. They will use GPS coordinates to record movement and population.

"They're completely harmless and are a really important part of ər ecosystems. If you see one, consider yourself very lucky," mphries said.

"I think people who live within the range of this 'living dinosaur' should be really proud that they're still doing pretty well in some streams. Just like many other species, though, we really need to pay more attention to our environment and make sure they remain here for our kids and grandkids to see."

Scientist think that they may use their lungs for buoyancy.

• It is hard to tell the sex of a hellbender. The male and female look very much alike. Only during breeding season, they can sometimes be told apart.

• Hellbenders have two sets of small teeth located on the upper and lower jaws.

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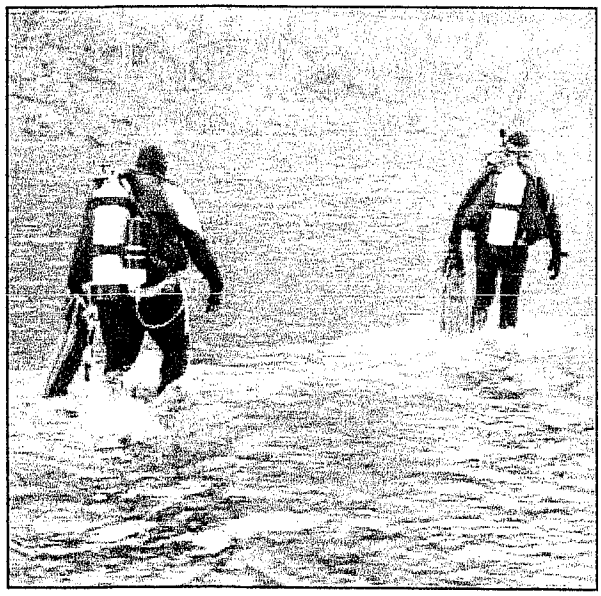
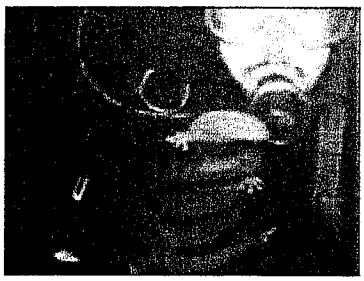


JESSICA LAWEY/Sun-Gazette

Jim "Toolbox" Reynolds of Forksville, left, and Dr. Peter Petokas, right, a biologist at Lycoming College, head across Loyalsock Creek Monday to a pool about 11 feet deep where they found several hellbenders. It was cold work in their wetsuits and scuba gear. The water was 38 degrees.

Lycoming Researcher Receives Grant to Study Hellbenders



Jim Rogers, recent grad, holds a "hellbender"

They are ugly and prehistoric-looking, but the eastern "hellbender" salamander may be a harbinger of the health of the Susquehanna River basin.

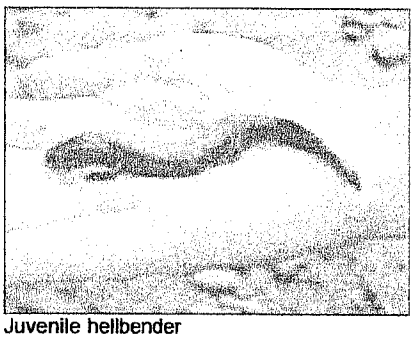
Dr. Peter Petokas, a research biologist with the Clean Water Institute at Lycoming College, has received a $49,000 grant from the Pennsylvania Fish and Boat Commission to study this giant salamander that is only found in the drainage areas of the Allegheny, Ohio, and Susquehanna Rivers. The hellbender—also known as the waterdog, mud devil, mudpuppy and Allegheny alligator—is the largest salamander in North America, growing to a length of 27 inches.

Petokas will use the grant money for a two-year project that will identify areas in the streams where hellbender populations occur; assess these habitats; establish long-term monitoring of hellbender populations; and compile comprehensive, detailed, and meaningful information useful in the development of a hellbender management and conservation plan for the Susquehanna River West Branch watershed, and potentially for the Commonwealth of Pennsylvania.

Adult hellbender

"What we learn about species like hellbenders...is important in itself, but expanding our knowledge about these animals can have larger implications for humans as well," said PFBC Executive Director Dr. Doug Austen in a press release. "Many animals are sensitive to changes in habitat, water and air quality, and thus can be good indicators of environmental health. The condition of fish and wildlife populations is often an early indicator of pollution that affects us all."

Hellbenders may have existed for millions of years. They are thought to live from 20 to 30 years but these shy and secretive salamanders are very difficult to spot.



Juvenile hellbender

Petokas has been interested in the hellbender for a long time. He and Lycoming College graduate Jim Rogers have conducted informal research on hellbenders over the past two years – locating areas where hellbenders occur and their preferred habitat in North-Central Pennsylvania streams.

With the $49,000 grant, they can formalize the research. "For Lycoming students, this is an incredible opportunity to do original research and discover a river native that few people have heard of," said Dr. Mel Zimmerman, Director of the Clean Water Institute.

Read the Sun-Gazette feature on hellbenders!

###

Photos: Peter Petokas

Check our Biology Dept and the Clean Water Institute.

Eastern Hellbender Information

In recent years we have witnessed increasing development that reflects a lack of uniformity in municipal ordinances and inconsistency with county plans. This political situation often fails to protect the delicate balances that are vital to the health of an aquatic environment. That health is reflected in physical, chemical and biological parameters necessary to sustain populations of organisms critical to the various ways Loyalsock Creek serves Pennsylvania's residents and visitors to the state.

One of the specific reasons for requesting redesignation is to protect the unique physical, chemical and biological habitat of one of the world's largest salamanders. This is the hellbender (*Cryptobranchus alleganiensis*). We have recently become aware of a growing body of evidence that a segment of Loyalsock Creek for which we request redesignation is critical habitat for this amphibian of special ecological significance. Presence of the hellbender can be considered an indicator of good quality waters – waters that other species, including ourselves, rely on for health, safety and welfare.

It is clear that hellbenders are gone from much of their original range east of the Rockies. Currently they are only found in the drainage areas of the Allegheny, Ohio, and Susquehanna Rivers. High quality streams with good hellbender habitat are primarily in Georgia, Tennessee, North Carolina, Virginia, and West Virginia (http://www.hellbenders.org/conservation.html). However, several good streams also remain in some parts of Pennsylvania – Loyalsock Creek being prime among them.

Siltation of streams because of agriculture, urbanization, poor forestry practices, and road-building are the major culprits leading to the degradation of many hellbender streams. Runoff of soil into streams smothers bottom dwelling organisms, breaking down the fragile ecosystems on which stream life depends. One could say that as the hellbender thrives (or suffers) so do trout and those who fish for them, waterfowl and those who watch or hunt them.

In 2004, the Amphibian and Reptile Technical Committee of the Pennsylvania Biological Survey (http://webspace.ship.edu/tjmare/herp.htm) composed a list of 36 species of conservation concern. Species were listed for a number of reasons, including evidence of declining populations, restricted and/or patchy distribution, and susceptibility to threats such as habitat destruction or over collecting. There are fourteen amphibian species of concern in Pennsylvania. One of these is the hellbender (http://webspace.ship.edu/tjmare/amphibList.htm). The web site for this group notes in their online herpetological atlas that a significant proportion of the world's breeding population of hellbenders is found in Pennsylvania. There is evidence of decline because of this creature's sensitivity to poor water quality.

Hellbenders are equally rare in other states. Illinois, for example lists the hellbender as endangered (http://www.chicagoherp.org/laws/levelI.htm#ENDANGERED). A subspecies of the Loyalsock Creek's hellbender is listed by the US Fish & Wildlife Service (USFWS) as an endangered species candidate – priority 3, high magnitude (http://ecos.fws.gov/speciesProfile/SpeciesReport.do?spcode=D032). Such candidate species have been sufficiently studied that the U.S. Fish and Wildlife Service has decided they be proposed for threatened or endangered status. The pace at which new listings are completed depends upon the funding appropriated by Congress to the listing and classification portions of the USFWS budget. Pennsylvania should not wait until its stream habitats are so degraded our hellbenders – our bellwethers of healthy streams - are gone.

Loyalsock Creek is one of the few places in Pennsylvania for a breeding population of these hellbenders. This statement is supported by evidence collected by Dr. Peter Petokas, a research biologist with The Clean Water Institute at Lycoming College (http://srv2.lycoming.edu/~petokas/ & http://www.lycoming.edu/whatsnew/releases/2006/Hellbender.htm & http://www.lycoming.edu/whatsnew/releases/2006/HellbenderGrant.htm).

Dr. Petokas collected juvenile specimens, indicating breeding occurred in this location. He reports that hellbender specimens have been collected in a Loyalsock Creek segment between the Interstate 180 bridge (Montoursville) and Forksville, noting the majority of such specimens appeared in the Loyalsockville area.

Dr. Petokas has said these amphibians are restricted by the quality of habitat. Adults require clear-water streams with moderate gradients and large stones and boulders in the substrate. The main stem of the Loyalsock Creek has these characteristics. See photos of such habitat in Loyalsock Creek, including the segment for which this petition is submitted.
http://www.lycoming.edu/biologydept/cwi/images/loyalsock%20creek2.JPG
http://www.lycoming.edu/biologydept/cwi/images/loyalsock%20creek1.JPG
http://www.lycoming.edu/biologydept/cwi/images/loyalsock%20creek.JPG
Without the regulatory protection of an upgraded designation, this habitat and the species reliant on it will likely disappear.

Dr. Petokas received a $49,000 grant from the Pennsylvania Fish and Boat Commission for a two-year project that will identify areas in the streams where hellbender populations occur; assess these habitats; establish long-term monitoring of hellbender populations; and compile comprehensive, detailed, and meaningful information useful in the development of a hellbender management and conservation plan for the Susquehanna River West Branch watershed, and potentially for the Commonwealth of Pennsylvania. There are already sufficient data on hellbender populations in Loyalsock Creek to warrant greater regulatory protection for its habitat.

Dr. Doug Austen, Pennsylvania Fish and Boat Commission Director underscores the need to protect habitat for bellwether species such as the hellbender when he said the following. "What we learn about species like hellbenders...is important in itself, but expanding our knowledge about these animals can have larger implications for humans as well. Many animals are sensitive to changes in habitat, water and air quality, and thus can be good indicators of environmental health. The condition of fish and wildlife populations is often an early indicator of pollution that affects us all."
(http://www.lycoming.edu/whatsnew/releases/2006/HellbenderGrant.htm)

Letters of Support

LYCOMING

BIOLOGY

Department of Biology

Lycoming College
Williamsport, PA 17701
(570) 321-4004

October 1, 2007

To Whom It May Concern:

I support the Loyalsock Creek Watershed Association's application to have the Lycoming County section of Loyalsock Creek upgraded from a Trout Stocking Fishery (TSF) to a High Quality Trout Stocking Fishery (HQ-TSF). I have been conducting research on Eastern Hellbender salamander populations in Loyalsock Creek since 2005, and I am concerned that suburban sprawl and other developments will continue to degrade the Loyalsock Creek watershed and impact on an unusual and rare salamander that deserves some protection from human activities and developments. Loyalsock Creek is one of only four streams in the West Branch watershed with breeding Eastern Hellbender populations. Although it is not officially listed as Threatened or Endangered by the Commonwealther of Pennsylvania or Federal Agencies, it is listed as "A Species of Special Conservation Need" by the Pennsylvania Fish and Boat Commission. Re-designating the Loyalsock Creek from the Lycoming/Sullivan County line to the confluence with the West Branch of the Susquehanna will help protect the Eastern Hellbender and keep open a route for dispersal to other West Branch tributaries.

Sincerely yours,

Peter J. Petokas, Ph.D.
Research Associate
Clean Water Institute

LYCOMING

BIOLOGY

Department of Biology

Lycoming College
Williamsport, PA 17701
(570) 321-4004

October 5, 2007

Ms. Carol Kafer
888 Butternut Grove Road
Montoursville, PA 17754

Dear Ms. Kafer,

I am professor of biology and director of the Lycoming College Clean Water Institute (www.lycoming.edu/biologydept/cwi). I have completed a lot of assessment work (erosion, macroinvertebrates and fish) in the North Central PA watersheds.

I support the Loyalsock Creek Watershed Association's application to have the Lycoming Country section of the Loyalsock Creek upgraded from a Trout Stocking Fishery (TSF) to a High Quality Trout Stocking Fishery (HQ-TSF). Although I have sampled using the Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish, I have not sampled at several locations within this section. However, the numbers and the diversity of sensitive benthic macroinvertebrates and fish I have collected suggest that this section of the Loyalsock Creek may meet the biological assessment qualifier for a High Quality designation.

Please support the application.

Sincerely,

Dr. Mel Zimmerman,
Professor of Biology
Director, Clean Water Institute
(www.lycoming.edu/biologydept/cwi)

William R. Worobec
240 Reservoir Road
Williamsport, PA 17701

September 26, 2007

Loyalsock Creek Watershed Organization
% Wendy Etzel
244 Lower Barbours Road
Williamsport, PA 17701

RE: Reclassification of the Loyalsock Creek

To Whom It May Concern:

This letter is regarding the Loyalsock Creek Watershed Association's recent effort to have the Loyalsock Creek designated as a High Quality or Exceptional Value stream. I support this effort and encourage the association's efforts.

The Loyalsock Creek is home to numerous forms of aquatic life. It holds substantial numbers of macroinvertebrates, crustaceans, and fish. In addition, it serves as the centerpiece for various forms of aquatic recreation such as swimming, fishing, and boating. It is also one of the major tributaries to the West Branch of the Susquehanna River which, in turn, is one of the primary sources of fresh water to the Chesapeake Bay. Preserving the Loyalsock's recreational and biological integrity represents a significant undertaking that is well worth pursuing.

The Loyalsock's history has been characterized by numerous abuses such as dredging, poor mining practices, the removal and cutting of streamside vegetation, past logging practices, and development. Substantial time, money, and effort have been and continue to be devoted to ameliorating the effects of these past practices. Numerous positive results have occurred as a consequence of these activities. They are ongoing and deserve regulatory support.

The additional protection that would be afforded to the Loyalsock Creek by designating it as a High Quality or Exceptional Value stream would provide substantial assistance to those who are working to preserve, protect, and conserve this valuable, fresh water resource. I support those efforts and wish you success in your efforts.

Sincerely

William R. Worobec

Board of Supervisors of Loyalsock Township

LYCOMING COUNTY, PENNSYLVANIA

2501 E. Third Street
WILLIAMSPORT, PA. 17701-4096
Telephone: (570) 323-6151
FAX (570) 323-1437

September 19, 2007

Loyalsock Creek Watershed Association
Carol Kafer, President
Box 216
Montoursville, PA 17754

Dear Carol,

The Loyalsock Township Board of Supervisors are in favor of having the Loyalsock Creek reclassified as a High Quality / Exceptional Value Stream. As you are aware, Loyalsock Township's eastern boundary borders the waterway from its mouth north to the Eldred Township Line (approximately 4 miles of creek frontage). Because we are at the bottom of the waterway, anything that happens in the Loyalsock Watershed effects our community. The reclassification, as I understand it, would help to protect against irresponsible development along the waterway. The Loyalsock Township Supervisors believe this designation would help to protect against environmental concerns, as well as flooding and stream bank erosion problems which we are all too familiar with.

In addition to this letter the Township Supervisors may be interested in joining your watershed group. Please provide me with an application form and any other membership requirements, and I will present it to the Board. Thank you for your efforts to protect and preserve the Loyalsock Creek Watershed.

Sincerely,

Bill Burdett

Bill Burdett
Manager

LOYALSOCK TOWNSHIP

Alpine Club of Williamsport
P.O. Box 501
Williamsport, PA 17703
September 21, 2007

Dear Directors of the Loyalsock Creek Watershed Association,

Members of the Alpine Club of Williamsport have maintained the Loyalsock Trail since 1953. Boy Scouts made this trail in 1951, and most of its 59.21 miles passes through the Loyalsock Creek Watershed. The trail has scenic vistas and includes High Knob, Loyalsock Canyon Vista, Smiths Knob, and High Rock Vista. Many tributaries of Loyalsock Creek are crossed by hikers on the trail- Little Bear Creek and its tributaries Painter Run and Red Run, Snake and Shingle Runs and Hestler Branch-tributaries of Big Bear Creek, Ogdonia Run and its tributaries Falls Run, Brunnerdale Run, and Kettle Creek, Dry Run and its tributary Dutters Run, Cape Run, Ketchum Run, Double Run, Cold Run, Vinegar Run, Shanerburg Run, Pole Bridge Run, Mill Creek, High Rock Run, Big Run, Tamarack Run, Rock Run-a tributary of Little Loyalsock, Coal Run from Sones Pond, and Dutchman Run. Worlds End State Park and The Haystacks are two prominent geological places along Loyalsock Creek that are included by the Loyalsock Trail and its side trails.

Preservation of Loyalsock Creek and its cold water fishery tributaries are important to all of us. An entry in a trail register sums up the need for protection: Sept. 12, 2001-made a cell phone call to my wife at High Knob on 9/11/01, her trembling voice said this was a terrible day for America, it would change our Lives in society forever; "We need wild places to escape to more than ever."

Our culture, with its large scale factory farms, bottled water from our cold water springs, shopping malls and more must be prevented from devestating the Loyalsock Creek Watershed. Please reclassify the Loyalsock Creek as a High Quality or Exceptional Value stream.

Sincerely, Ruth Rode Co-chairman of the Loyalsock Trail

September 20, 2007

Wendy Etzel, Treasurer
Loyalsock Creek Watershed Association
244 Lower Barbours Rd.
Williamsport, PA 17701

Dear Wendy,

I have recently learned that the Loyalsock Creek Watershed Association is working on a High Quality or Exceptional Value stream designation for the Loyalsock Creek. I feel this is an excellent idea, and I am in support of your efforts.

I grew up in Montoursville and currently reside in Loyalsock Township and have fished, swam, kayaked, hunted, and enjoyed the Loyalsock and its tributaries my entire life. As a property owner on the waterway (100 acres Forks Township - Sullivan County) I believe the entire watershed should be designated High Quality or Exceptional Value. It would be my hope that your organization, with the help of PADEP, could do more to improve the water quality on the "Sock". Two areas of significant concern are the mine drainage issues in the Lopez / Mildred areas, as well as the over nutrification of the Little Loyalsock by dairy farmers. I realize some work has been done to improve the mine drainage situation and that funding is always an issue. Hopefully this designation would help to free up additional dollars to fix the problem. The Loyalsock's water quality would significantly improve if we progressively worked with the farmers between Forksville and Dushore to educate them to the programs available to create riparian buffers and filter strips along the waterway. I am certain there are other benefits in protecting the Loyalsock once the creek gets High Quality / Exceptional Value designation.

In closing I would like to thank the Loyalsock Creek Watershed Association for their efforts to protect and preserve the Loyalsock Creek. Our children and grandchildren are the beneficiaries of your good work.

Sincerely,

Bill Burdett

Organizations United for the Environment

A Susquehanna Valley Citizens Action Group

P.O. Box 193
Allenwood, PA 17810
Phone/Fax: 570-523-0010
ouenews.org

September 27, 2007

Loyalsock Creek Watershed Association
Box 216
Montoursville, PA 17754

Dear LCWA:

I write representing the members of the board of Organizations United for the Environment (OUE), a grassroots organization that, since the mid-1970s, has been working to help protect the environment in the Central Susquehanna Valley. We have become aware of the threat to Loyalsock Creek by the planned commercial development at Montour Crossing. For that reason, we write to support your Petition to change the designation of Loyalsock Creek to "Exceptional Value."

We believe that the waters of Loyalsock Creek should be given this highest level of protection for a host of reasons, and among the most prominent are these:

- It is a crucial source of water, for many uses and for many communities.
- It has a well-known wild trout population that needs permanent protection.
- It provides a host of invaluable recreational opportunities for people in the area.
- Any damage to the stream might also damage nearby historical sites that are among the most important in Central Pennsylvania.

Please convey our support for your Petition to the proper decision making bodies.

Sincerely,

Charles Sackrey
Co-Chair, OUE Board

OTZINACHSON

Carol Kafer, president
Loyalsock Creek Watershed Association
Box 216
Montoursville, PA 17557

Dear Carol,

I am writing on behalf of the Otzinachson Regional Group of the Sierra Club. We support your efforts to protect and preserve the Loyalsock by having it reclassified as a High Quality of Exceptional Value stream. This designation should help protect the stream from future degradation by adding another layer of protection. We know that the stream is threatened by such things as large scale "factory" farms and commercial development and we must all work to protect its intrinsic natural values.

Sincerely

Jack D. Miller, chair

Otzinachson Regional Group of the Sierra Club
P.O. Box 65 Lewisburg, PA 17837

JERRY S. WALLS, AICP
1950 ELDON ROAD
MONTOURSVILLE, PA 17754

November 18, 2007

Mr. Tony Shaw, Supervisor
Special Protection Watershed Program
PA DEP
Rachel Carson State Office Building
Harrisburg, PA 18120

Dear Mr Shaw:

I attended the excellent public information program arranged by Joan Sattler and Rich Adams at Lycoming College 8/28/07 on the DEP Special Protection Watershed Program. Your extensive knowledge and long involvement with special protection designations helped me better understand many of the complexities and dynamics, as well as the mechanics of the process. Thank you for leading such a noble and important stewardship responsibility.

I am writing to you as a certified Professional Planner now in semi-retirement from my former position as Executive Director of the Lycoming County Planning Commission. I recently learned that the Loyalsock Creek Watershed Association has petitioned DEP to evaluate the Loyalsock for possible Special Protection designation. I can offer an unqualified endorsement for such designation.

From a professional planning perspective the Loyalsock is a very special resource and a special place that deserves the very best stewardship we can muster. It is one of the major tributaries to the West Branch Susquehanna River. It is relatively undeveloped at this time. It is the headwaters which feeds a system of aquifers which provide crucial groundwater for the Montoursville public water system wellfield and several smaller private community water systems. Since 1975 the major parts of the Loyalsock Creek watershed have been officially mapped as scenic viewsheds, and so designated in the Lycoming County Comprehensive Plan (officially adopted by the County Planning Commission and 4 different Boards of County Commissioners). The County Planning Commission just adopted on 11/15/07 a new County Recreation, Open Space, Parks and Greenways Plan. That Plan recognizes many natural features, including water quality as a popular fishery, and open space values in the Loyalsock which deserve comprehensive land use controls and water quality protection measures.

I also see the Loyalsock from a perspective as Chairman of the Pennsylvania WILDS Planning Team (PWPT), a 12 county organization created under the PA Intergovernmental Cooperation Act, by enactment of a formal Ordinance by each of the 12 Boards of County Commissioners. All of the Lycoming County portion of the Loyalsock Watershed lies within the officially designated Pennsylvania WILDS. From

that perspective, the Governor has recognized and committed large State investments to manage the natural resources and communities of the region as a very special place which can serve as a quality of life asset for the economic development of Pennsylvania. The PWPT has developed a PA WILDS Design Guide to help enable quality design of new development that respects the character of the existing community and natural setting. I mention this because I believe it underscores in a powerful way that designation of the Loyalsock as a Special Protection Watershed can be more effective in conjunction with these other planning and official public policy measures.

One other perspective has bearing on the petition – the Loyalsock is a very important part of the Susquehanna Greenway. I can comment as one of the founders and Chairman of the Coordinating Committee of the Susquehanna Greenway Partnership comprised of 22 counties in PA. We have active Regional Lead Organizations (the Northcentral PA Conservancy leads the West Branch) who are working to mobilize and support local greenway projects. Many of those projects rely on water quality protection or will directly improve water quality through AMD cleanup. Therefore, Special Protection designation of the Loyalsock takes on a much bigger regional significance.

I am also supporting the petition as a property owner in the lower end of the Loyalsock Creek Watershed – my property drains into Mill Creek on the west side. And I can support the petition as a canoeist and fly fisherman who loves the Loyalsock. Bob McCullough and I spent lots of time trying to protect the Loyalsock and I am confident he would also support the petition. You may not have known that he died earlier this year.

If I can be of any professional assistance or gather any data for you please feel free to call me at 570-323-2760 or email me at jerry@jwallsaicp.com.

Sincerely,

Jerry S. Walls, AICP
Professional Planner

TROUT UNLIMITED
SUSQUEHANNA CHAPTER
P.O. BOX 1132, WILLIAMSPORT, PA 17703

Loyalsock Creek Watershed Association
Box 216
Montoursville, Pa. 17754

October 24, 2007

Ladies and Gentlemen,

The Susquehanna Chapter of Trout Unlimited is please to endorse and support your efforts to reclassify the Loyalsock Creek as either a High Quality or Exceptional Value waterway. We are greatly concerned about the risk of damage to the subject stream, which has been of great recreational and economic value to Lycoming County.

Many of our members have noticed an improvement in the aquatic life in the Loyalsock Creek in recent years. We need only to reflect on the disasterous low water conditions of 2007 in order to understand that the stream cannot tolerate any activities which would reduce its' water level.

We appreciate the action which you are taking to protect the Loyalsock, and would be please to receive any information concerning your progress. Keep up the good work!

Very Truly Yours,

David L. Craig
Secretary

While undertaking a physical assessment of the Loyalsock Creek in 2003, LCWA interns uncovered a rarely seen adult Hellbender.