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**Pennsylvania Fish & Boat Commission  
Bureau of Fisheries  
Fisheries Management Division**

Two Lick Creek, Sections 01, 02, and 03 (818D) Management Report

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Fisheries Management Database Name: TWO LICK CK  
Lat/Lon: 402855791138

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### **Introduction**

Reestablishment of viable fisheries to waters plagued by decades of acid mine drainage has become more common in the southwest over the last 15 years. Stony Creek, Kiskiminetas River, Casselman River, Conemaugh River, and Little Conemaugh River are a few that have followed this track. A combination of improved mining regulations, improved mine drainage treatment, abandoned mine drainage mitigation, and time have factored into these scenarios. We can now add another water in the form of Two Lick Creek (818D, Indiana County) to this list of at least partially recovered waters. There was evidence of a fishery recovery beginning on Two Lick Creek at the last survey of 1993 (Miko and Lorson 1994), with our survey of 2004 further solidifying that fact.

Two Lick Creek began to show signs of water quality recovery in the late 1970's after several decades of severe mine drainage destruction. Much of the recovery was due to regulatory efforts to improve mining discharges, along with construction of Two Lick Reservoir that included sealing of abandoned mines (Bob Eppely, Blacklick Creek Watershed Association (BCWA), personal communication.) By 1980 water quality had improved, but still iron and acidity levels were quite high and limiting aquatic life. Two large mine drainage treatment systems were constructed around 1980 at the Penn Hills 2 and Dixon Run 3 mines draining into the lake. Two Lick Reservoir pH was 4.0 in 1980 and increased to 6.5 in 2002. More recently, three passive mine

drainage treatment systems have been installed upstream of Clymer, PA in Section 01 under the direction of BCWA.

\*\* In 1999 the Stanford Mining Company responsible for operation and treatment operations at the Penn Hills 2 and Dixon Run 3 mines filed for bankruptcy. This threatened a backslide to pre-1980 water quality conditions in the watershed. Fortunately, a partnership was developed between BCWA, DEP, and Edison Mission Energy-Homer City to continue treatment at these two sites since 1999.

Two Lick Creek traverses a total of 44.4 km from its source at the confluence of the North and South Branches of Two Lick Creek (River Mile (RM) 27.6) at Wandin Junction, PA in northeastern Indiana County. Two Lick Creek has been divided into three sections for fish management purposes (Figures 1 and 2). Section 01 has a length of 12.9 km and lies upstream of Two Lick Reservoir (303 ha) (Table 1). Section 02 flows from the Reservoir and passes just south of Indiana, PA for 12.6 km to the confluence with Yellow Creek (RM 6.5). The 10.5 km Section 03 flows from Yellow Creek downstream to the mouth on Blacklick Creek (RM 10.72) at Josephine, PA. The Department of Environmental Protection (DEP) Chapter 93 Water Use Protection category for Two Lick Creek is Trout Stocking (TSF).

Previous surveys on Two Lick Creek were conducted by Weirich et al. (1985); Hoskin (1991); and Miko and Lorson (1994). At the time of the 1993 survey, Sections 01 and 03 were severely impacted by mine drainage. Section 02 was moderately impacted in 1993 and had a limited fishery. A catchable trout Delayed Harvest stretch in Section 02 was pursued after the 1993 survey, but landowner agreement was not achieved. Smallmouth bass fingerling stocking in Section 02 was also recommended from the 1993 survey and took place for 1994 and 1995 at 50/ac. The purpose of this survey was to 1) document the existing water quality and fishery of Sections 01 to 03; 2) update PFBC management strategies for Two Lick Creek; and 3) provide our data to other entities involved with operations in the watershed.

### **Methods**

One site each in Sections 01 and 03 were surveyed in 2004 to characterize the sections. Site 0101 was located at the T-758 (Grace Church Road) bridge at latitude 40°38'44", longitude 79°02'13" (RM 20.13). Site 0301 was located at the T-596 (Neal Road) bridge at latitude 40°30'45", longitude 79°10'02" (RM 3.95). Two sites were sampled in Section 02. Site 0201 was located at the SR 0954 bridge at latitude 40°35'29", longitude 79°08'24" (RM 11.80). Site 0202 was located at the SR 3035

bridge at latitude 40°33'46", longitude 79°09'55" (RM 8.40). All four sampled sites in 2004 were at the same locations as those in 1993. Sites 0201 and 0202 were also sampled in 1985.

Physical, chemical, social, Rapid Bioassessment Protocol (RBP) habitat, fish occurrence, and relative fish abundance data were collected for Two Lick Creek, Sections 01-03. Categories for the RBP Habitat Scores are 151 to 200 as Optimal, 101 to 150 as Suboptimal, 51 to 100 as Marginal, and 0 to 50 as Poor. Fish sampling was accomplished with a Coffelt model BP-1C backpack electrofisher operated at 125 volts AC and 150 watts for 200 m at Site 0101, 365 m at Site 0201, 323 m at Site 0202, and 100 m at Site 0301. Total electrofishing effort was 48 minutes at Site 0101, 80 minutes at Site 0201, 69 minutes at Site 0202, and 26 minutes at Site 0301. A Petersen population estimate was done at Site 0201 as part of the statewide wild trout streams use and harvest survey (Carline and Diefenbach 2004). The assessment was conducted on July 20 and August 18 and 26, 2004 according to *Procedures for Stream and River Inventory Information Input* (Marcinko et al. 1986).

## Results

### Section 01

Social data from Section 01 included 100% of the stream within 300 m of a road and 43 parking spaces/km (Table 2). Ownership was at 100% private and open to fishing with Human Population Density classed as Rural (34 persons/km<sup>2</sup>).

Water quality measures from Site 0101 (RM 20.13) in 2004 were a pH of 7.1 and alkalinity of 44 mg/l (Table 3). This was an increase over the same parameters in 1993 at 6.4 and 7 mg/l, respectively. Conductivity, hardness, and dissolved solids were comparable between sampling in 2004 and 1993. RBP habitat total score was 145 placing this site in the suboptimal category.

Site 0101 species occurrence for 2004 totaled 14 species (Table 4). Bluntnose minnow *Pimephales notatus* was the only species categorized as abundant for relative abundance. Quality size rock bass *Ambloplites rupestris* were also collected (one each in the 175, 200, and 225 mm length groups). Game fish included in the total were 3 hatchery brown trout *Salmo trutta* (one each in the 200, 225, and 300 mm length groups) and 2 smallmouth bass *Micropterus dolomieu* (one each in the 125 and 300 mm length groups) (Table 5). Largemouth bass *Micropterus salmoides* was the only species collected in 1993 sampling, with one individual captured in the 175 mm length group.

**Section 02**

Social data from Section 02 included 83% of the stream within 300 m of a road and 18 parking spaces/km (Table 2). Ownership was at 79% private and open to fishing, 1% public and open to fishing, 5% public closed to fishing, and 15% private and closed to fishing; with Human Population Density classed as Suburban (96 persons/km<sup>2</sup>).

Two sites in Section 02 were sampled in 1985, 1993, and 2004. Water quality parameters of pH and alkalinity increased over this time period at Site 0201 (RM 11.8) (Table 6). Site 0201 pH ranged from 5.4 in 1985 to 6.9 in 1993 to 7.3 in 2004. Alkalinity for the three sample years was 2, 8, and 36 mg/l, respectively. Conductivity, hardness, and dissolved solids measures varied among the sample years. RBP habitat total score was 165 placing this site in the Optimal category.

Fish species occurrence at Site 0201 totaled 4 in 1985, 11 in 1993, and 11 in 2004 (Table 7). Blacknose dace, mottled sculpin, white sucker, and johnny darter were in the relative abundance category of abundant in 2004 at this site. Game fish species were collected in 1993 and 2004. Four game fish species from 1993 included brook trout (wild and hatchery), brown trout (wild and hatchery), largemouth bass, and rainbow trout (wild). Two game fish species were collected in 2004 as brown trout and smallmouth bass. Based on one electrofishing pass in 1985 and 1993 and the first electrofishing pass in 2004, there were no legal size game fish collected in 1985, three in 1993, and fourteen in 2004 (Tables 8 and 9). Wild brown trout were collected at this site in 1993 and 2004 with a total of 2 and 91, respectively (Table 8). Two legal length brown trout ( $\geq 175$  mm) were collected in 1993 and 14 in 2004. Four of the wild brown trout in 2004 ranged from 300 to 525 mm. Young of the year and adult smallmouth bass were also collected at this site in 2004.

A Petersen mark-recapture estimate was conducted for brown trout at Site RM 11.8 in 2004. Total estimated brown trout biomass at Site 0201 was 10.41 kg/ha (Table 8a).

Water quality at Site 0202 (RM 8.4) was comparable between 1985 and 1993 with pH at 6.6 and alkalinity of 12 and 13 mg/l (Table 10). Both pH and alkalinity increased for the 2004 sampling to 7.6 and 48, respectively. Conductivity, hardness, and dissolved solids were similar over the three sample years. RBP habitat total score was 156 placing this site in the Optimal category.

Total fish species changed little over the time period at Site 0202 as 9 were collected in 1985, 9 in 1993, and 10 in 2004



(Table 11). Largemouth bass was the only game fish species sampled at this site in 1985. Game fish sampled in 1993 included brown trout (hatchery), largemouth bass, and rainbow trout (wild and hatchery). Brown trout (wild and hatchery), largemouth bass, and smallmouth bass were the game fish species collected in 2004. There were no legal size game fish collected in 1985, five in 1993, and forty-four in 2004 (Tables 12 and 13). Wild brown trout were collected at this site only in 2004 with a total of 30 (Table 12). Nineteen legal length brown trout ( $\geq 175$  mm) were collected in 2004. Thirteen of the wild brown trout in 2004 ranged from 300 to 525 mm. Juvenile and adult smallmouth bass were also collected at this site in 2004.

### **Section 03**

Social data from Section 03 included 52% of the stream within 300 m of a road and 3 parking spaces/km (Table 2). Ownership was at 65% private and open to fishing, and 35% public and open to fishing; with Human Population Density classed as Suburban (42 persons/km<sup>2</sup>).

Water quality parameters increased substantially at Site 0301 (RM 3.95) from 1993 to 2004 (Table 14). The pH was 4.2 and alkalinity was 0 mg/l in 1993, whereas in 2004 pH and alkalinity were 6.2 and 15 mg/l, respectively. Conductivity, hardness, and dissolved solids were all reduced in 2004 compared to 1993. RBP habitat total score was 131 placing this site in the Suboptimal category.

There were no fish collected from Site 0301 in 1993 (Table 15). Six fish species were collected at this site in 2004, with the highest number of individuals being creek chub rated as common for relative abundance.

### **Discussion**

Substantial water quality changes were again documented during our survey in 2004 above and below Two Lick Reservoir at Sections 01, 02, and 03. Section 01 and 02 pH (above Two Lick Reservoir to the mouth of Yellow Creek) had improved from a range of 6.4 to 6.9 in 1993, to a range from 7.1 to 7.6 in 2004. Section 03 (from mouth of Yellow Creek to the mouth) pH increased from 4.2 in 1993 to 6.2 in 2004. We must bear in mind that our 2004 numbers would have been positively influenced by a high water year with more surface runoff and less mine drainage influence overall. Water quality should be sampled again during a dry year. Alkalinity can also be used as a gauge of fish production potential. Alkalinity from 17 to 120 mg/l was directly related to total trout production in streams (Scarnecchia and Bergerson 1987). Section 01 and 02 alkalinity

ranged from 36 to 48 mg/l in 2004, and Section 03 alkalinity was 15 mg/l. Hence, Sections 01 and 02 are at an alkalinity level to produce increased fish biomass.

Another gauge of a reduction in pollution load is species occurrence. There were no fish species collected in 1985 that were classed as intolerant to pollution from the two sites sampled in Section 02. Site 0101 in 2004 yielded one species considered intolerant to pollution (McCormick et al. 2001) as the northern hog sucker *Hypentelium nigricans*. Site 0201 in 1993 had two intolerant to pollution species in brook trout *Salvelinus fontinalis* and rainbow trout *Oncorhynchus mykiss*. Site 0202 also had rainbow trout collected in 1993. Site 0301 had the intolerant to pollution species mimic shiner *Notropis volucellus* collected in 2004. Hence, instream water quality had improved by 1993 in Section 02 and by 2004 in Sections 01 and 03 to where some pollution intolerant species could survive.

Additionally, the percentage of tolerant to pollution species in Section 02 decreased from 1985 to 2004 suggesting a reduced pollution load. All four species (100%) collected from Site 0201 in 1985 and 7 of the 9 species (78%) at Site 0202 were classed as tolerant to pollution. In 2004, 6 of 11 species (54%) at Site 0201 and 3 of 11 species (27%) at Site 0202 were tolerant to pollution species. Reduction in pollution from 1993 to 2004 in Section 01 was evidenced from the number of species collected. Section 01, Site 0101 had one species in 1993 and 14 species in 2004. Section 03, Site 0301 had zero species in 1993 and 6 species in 2004.

Several summary statements can be made regarding Two Lick Creek after our 2004 sampling. Overall water quality improved via a reduction in mine drainage impacts at all four sites surveyed across Sections 01, 02, and 03. As a result of improved water quality, the number of species sampled increased dramatically at Site 0101 (1 in 1993 and 14 in 2004) and at Site 0301 (zero in 1993 and 6 in 2004). A naturally reproducing population of smallmouth bass is present in Section 01, and a naturally reproducing population of brown trout and smallmouth bass is present in Section 02. A fishery, with some quality size individuals, is available for brown trout (hatchery), smallmouth bass, and rock bass in Section 01. A quality fishery is available for brown trout (wild and hatchery), smallmouth bass, and rock bass in Section 02. Care must be exercised from anglers accessing Two Lick for fishing as there is posted property and landowner concerns for access. Anglers wishing to fish Two Lick Creek must get landowner permission before proceeding.

Several groups have stocked brook, brown, or rainbow trout of either fingerling size or catchable size over the last 12 or so

years in Two Lick Creek. More recently, the Two Lick Trout Club has stocked mostly brown trout in Section 02, along with a few rainbow trout. The stocked brown trout have added positively to the brown trout fishery in Section 02 at Site 0202. At this site, we estimated 57 legal length wild brown trout ( $\geq 175$  mm) per km and 69 legal length hatchery brown trout per km. The combined total biomass estimate for brown trout (wild and hatchery) at Site 0202 was 30.57 kg/ha, whereas at Site 0201 there were only wild brown trout estimated at 10.41 kg/ha.

The PFBC considered stocking fingerling rainbow trout in Section 02 to supplement the fishery, but has opted to not stock to allow for the wild brown trout and smallmouth bass populations to develop. Also, the PFBC will not supplementally stock in Section 01. The Two Lick Trout Club or another group may consider stocking catchable or fingerling size brown trout in other portions of Two Lick Creek below and above the reservoir to provide additional angling recreation. The club also has posted an informal catch and release artificial lures only regulation on the lower portion of Section 02.

Three mine drainage treatment systems above Clymer, PA in Section 01, and treatment at Penn Hills 2 and Dixon Run 3 mines draining into the lake appear to be the major players toward water quality improvement in the Two Lick Creek watershed. It is anticipated that fish populations will continue to respond positively to improved water quality in Sections 01 and 02, as the carrying capacity of this river is not yet met. There continues to be some mine drainage problems within the Two Lick Creek watershed. Two more major mine discharges to the lake and stream remain to be dealt with. One discharge in the lower portion of Section 02 and impacting Section 03 stands as a next priority. Work on this one, plus ongoing improvements to lower Yellow Creek could improve water quality and fish populations in Section 03. Work should continue to eliminate mine drainage since a variety of fish species and fishing for brown trout, smallmouth bass, and rock bass is now available in the watershed. Sources of silt and sewage should also be investigated now that mine drainage has been reduced considerably.

### **Management Recommendations**

1. Two Lick Creek has recovered substantially from mine drainage pollution to the point of providing angling recreation in Sections 01 and 02 that was not available previously. These sections should continue to be managed for wild brown trout, smallmouth bass, and rock bass with statewide regulations. There is also a hatchery brown trout component to the fishery.
2. Section 03 is in the recovery mode from mine drainage impacts. Continued work in the watershed will lead to a smallmouth bass and rock bass fishery developing in this section. The PFBC will consider restoration stocking of these two species when pH reaches 6.5 or better and alkalinity remains above 10 mg/l.
3. The Department of Environmental Protection (DEP) Chapter 93 Water Use Protection category for Two Lick Creek, Section 02 of Trout Stocking (TSF) should be upgraded to Coldwater Fishes (CWF). Section 01 and 03 should remain TSF.
4. A copy of this report should be provided to PFBC John Arway; PFBC Steve Kepler; Tom Proch, Aquatic Biologist, Pennsylvania Department of Environmental Protection, 400 Waterfront Drive, Pittsburgh, PA 15222; Pam Milavec, Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation, 122 South Center Avenue, P.O. Box 149, Ebensburg, PA 15931; Thomas Clark, Indiana County Watershed Specialist, 750 East Pike, Indiana, PA 15701; Robert Eppely, Blacklick Creek Watershed Association, 52 Oakland Avenue, Homer City, PA 15748; Ken Sink Chapter Trout Unlimited, 750 East Pike, Indiana, PA 15701.



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**Table 1.** Section catalog for Two Lick Creek (818D), Indiana County, 2004.

Section Number	Section Length (Km)	Limits	Management Designation
01	12.9	UPS: Confluence of South Branch and North Branch (RM = 27.6)  DNS: Two Lick Reservoir (RM = 19.4)	Natural Yield-Impaired
02	12.6	UPS: Two Lick Reservoir (RM = 14.4)  DNS: Confluence with Yellow Creek (RM = 6.5)	Natural Yield-Wild Trout
03	10.5	UPS: Confluence with Yellow Creek (RM = 6.5)  DNS: Mouth (RM = 0.0)	Natural Yield-Impaired

**Table 2.** Social information from Two Lick Creek, Sections 01, 02, and 03 (818D) for August 2004. Current Sectioning date was 07/01/93.

Section Social Parameter	Section 01	Section 02	Section 03
Percent Road Accessibility Within 100 Meters	70	37	16
Percent Road Accessibility Within 300 Meters	100	83	52
Percent Road Accessibility Within 500 Meters	100	100	80
Parking: Number Of parking Places Per Km Of Section Length (number/Km)	43	18	3
Property Owners: Riparian Owners And Percentage Owned	Private Open To Fishing-100%	Public Closed to Fishing- 5%, Private Closed to Fishing- 15%, Private Open to Fishing- 79%, Municipalities, Townships, Counties, etc.- 1%	Private Open to Fishing- 65%, Army Corps of Engineers- 35%
Human Population Density (Census Year 2000)	34 - Num/SqKm	96 - Num/SqKm	42 -Num/SqKm

**Table 3.** Time series site chemistries from Two Lick Creek, Section 01 (818D) at site river mile 20.13 with Site Latitude 403844 Longitude 790213.

Chemical Test	Test Units	Values 09/23/93	Values 08/26/04
pH Field Colorimetric	SU	6.4	7.1
Specific Conductance	UMHOS	415	380
Total Alkalinity Field Mixed Indicator	MG/L	7	44
Total Dissolved Solids	MG/L	279	259
Total Hardness Field EDTA	MG/L	116	118
Water Temperature	C	18	17



**Table 4.** Fish collected from Two Lick Creek, Section 01 (818D) at site river mile 20.13 with Site Latitude 403844 Longitude 790213 using Electrobackpack gear in 1993 and 2004.

Common Name	Scientific Name	Survey	Survey
		Date	Date
		9/23/93	8/26/04
Blacknose Dace	<i>Rhinichthys atratulus</i>		X
Blackside Darter	<i>Percina maculata</i>		X
Bluegill	<i>Lepomis macrochirus</i>		X
Bluntnose Minnow	<i>Pimephales notatus</i>		X
Brown Trout - Hatchery	<i>Salmo trutta</i>		X
Johnny Darter	<i>Etheostoma nigrum</i>		X
Largemouth Bass	<i>Micropterus salmoides</i>	X	
Northern Hog Sucker	<i>Hypentelium nigricans</i>		X
Pumpkinseed	<i>Lepomis gibbosus</i>		X
Rainbow Darter	<i>Etheostoma caeruleum</i>		X
Rock Bass	<i>Ambloplites rupestris</i>		X
Rosyface Shiner	<i>Notropis rubellus</i>		X
Smallmouth Bass	<i>Micropterus dolomieu</i>		X
Yellow Bullhead	<i>Ameiurus natalis</i>		X
Yellow Perch	<i>Perca flavescens</i>		X
<i>Total Species</i>		1	14

**Table 5.** Length/frequency distribution for all species enumerated from Two Lick Creek, Section 01 (818D) sampled in 1993 and 2004. Site located at River Mile 20.13 with a site Lat/Lon of 403844/790213.

Species and Length Group	1993		2004	
	Total Catch	Number Per Km	Total Catch	Number Per Km
<b>BROWN TROUT - HATCHERY</b>				
200	-	-	1	5
225	-	-	1	5
300	-	-	1	5
TOTALS	0	0	3	15
<b>ROCK BASS</b>				
175	-	-	1	5
200	-	-	1	5
225	-	-	1	5
TOTALS	0	0	3	15
<b>SMALLMOUTH BASS</b>				
125	-	-	1	5
300	-	-	1	5
TOTALS	0	0	2	10
<b>LARGEMOUTH BASS</b>				
175	1	5	-	-
TOTALS	1	5	0	0

**Table 6.** Time series (1985, 1993, and 2004) site chemistries from Two Lick Creek, Section 02 (818D) at site river mile 11.8 with Site Latitude 403529 Longitude 790824.

Chemical Test	Test Units	Values 06/25/85	Values 09/22/93	Values 07/20/04
pH Field Colorimetric	SU	5.4	6.9	7.3
Specific Conductance	UMHOS	240	420	335
Total Alkalinity Field Mixed Indicator	MG/L	2	8	36
Total Dissolved Solids	MG/L	--	284	225
Total Hardness Field EDTA	MG/L	102	131	92
Water Temperature	C	16	21	18

**Table 7.** Fish collected from Two Lick Creek, Section 02 (818D) at site river mile 11.8 with Site Latitude 403529 Longitude 790824 using Electrobackpack gear in 1985, 1993, and 2004.

Common Name	Scientific Name	Survey Date 6/25/85	Survey Date 9/22/93	Survey Date 7/20/04
Blacknose Dace	<i>Rhinichthys atratulus</i>		X	X
Bluegill	<i>Lepomis macrochirus</i>	X		X
Bluntnose Minnow	<i>Pimephales notatus</i>	X	X	X
Brook Trout	<i>Salvelinus fontinalis</i>		X	
Brook Trout - Hatchery	<i>Salvelinus fontinalis</i>		X	
Brown Trout	<i>Salmo trutta</i>		X	X
Brown Trout - Hatchery	<i>Salmo trutta</i>		X	
Central Stoneroller	<i>Campostoma anomalum</i>		X	X
Creek Chub	<i>Semotilus atromaculatus</i>	X	X	X
Golden Shiner	<i>Notemigonus crysoleucas</i>		X	
Johnny Darter	<i>Etheostoma nigrum</i>		X	X
Largemouth Bass	<i>Micropterus salmoides</i>		X	
Mottled Sculpin	<i>Cottus bairdi</i>			X
Rainbow Trout	<i>Oncorhynchus mykiss</i>		X	
Rock Bass	<i>Ambloplites rupestris</i>			X
Smallmouth Bass	<i>Micropterus dolomieu</i>			X
White Sucker	<i>Catostomus commersoni</i>	X	X	X
	<i>Total Species</i>	4	11	11



**Table 8.** Time series total catch and number per Km data for wild brown trout from Two Lick Creek, Section 02 (818D) at site river mile 11.8 with Site Latitude 403529 Longitude 790824.

Length Group	6/25/85		9/22/93		7/20/04	
	Total Catch	Number per Km	Total Catch	Number per Km	Total Catch	Number per Km
<b>BROWN TROUT - WILD</b>						
50	-	-	-	-	51	140
75	-	-	-	-	16	44
150	-	-	-	-	10	27
175	-	-	1	3	3	8
200	-	-	1	3	1	3
225	-	-	-	-	1	3
250	-	-	-	-	2	5
275	-	-	-	-	3	8
300	-	-	-	-	1	3
350	-	-	-	-	1	3
375	-	-	-	-	1	3
525	-	-	-	-	1	3
<b>Totals:</b>	0	0	2	6	91	250

**Table 8a.** Estimated abundance and biomass of brown trout from Two Lick Creek, Section 02, Site 0201 at RM 11.8 (818D) using a Petersen estimator on 7/20/04.

Size Group	Population Estimate	Low 95% CI	High 95% CI	Estimated Number/Ha	Estimated Kg/Ha	Estimated Number/Km
50	208	115	416	263	0.64	570
75	111	45	276	140	0.88	304
125	1			1	0.04	3
150	14	7	31	18	0.77	38
175	8			10	0.68	22
200	2			3	0.24	5
225	1			1	0.16	3
250	3			4	0.69	8
275	5	2	13	6	1.5	14
300	3			4	1.15	8
350	1			1	0.61	3
375	1			1	0.73	3
525	1			1	2.32	3
<b>Totals:</b>	<b>359</b>			<b>453</b>	<b>10.41</b>	<b>984</b>
<b>Estimated Abundance Over 175 mm:</b>				<b>31</b>	<b>8.08</b>	<b>69</b>
<b>Estimated Abundance Over 225 mm:</b>				<b>18</b>	<b>7.16</b>	<b>42</b>
<b>Estimated Abundance Over 350 mm:</b>				<b>3</b>	<b>3.66</b>	<b>9</b>

**Table 9.** Time series total catch and number per Km data for other species enumerated from Two Lick Creek, Section 02 (818D) for 1985, 1993, and 2004. Site located at River Mile 11.8 with a site Lat/Lon of 403529/790824.

Species and Length Group	6/25/85		9/22/93		7/20/04	
	Total Catch	Number per Km	Total Catch	Number per Km	Total Catch	Number per Km
<b>BLUEGILL</b>						
50	1	3	-	-	-	-
Totals	1	3	0	0	0	0
<b>RAINBOW TROUT - WILD</b>						
50	-	-	1	3	-	-
150	-	-	2	6	-	-
TOTALS	0	0	3	9	0	0
<b>BROOK TROUT - WILD</b>						
200	-	-	1	3	-	-
TOTALS	0	0	1	3	0	0
<b>BROWN TROUT - HATCHERY</b>						
200	-	-	1	3	-	-
TOTALS	0	0	1	3	0	0
<b>BROOK TROUT - HATCHERY</b>						
225	-	-	1	3	-	-
TOTALS	0	0	1	3	0	0
<b>LARGEMOUTH BASS</b>						
100	-	-	2	6	-	-
TOTALS	0	0	2	6	0	0
<b>ROCK BASS</b>						
125	-	-	-	-	1	3
175	-	-	-	-	1	3
TOTALS	0	0	0	0	2	6
<b>SMALLMOUTH BASS</b>						
75	-	-	-	-	1	3
200	-	-	-	-	1	3
225	-	-	-	-	1	3
TOTALS	0	0	0	0	3	9

**Table 10.** Time series site chemistries from Two Lick Creek, Section 02 (818D) at site river mile 8.4 with Site Latitude 403346 Longitude 790955 for 1985, 1993, and 2004.

Chemical Test	Test Units	Values 06/25/85	Values 09/23/93	Values 08/18/04
pH Field Colorimetric	SU	6.6	6.6	7.6
Specific Conductance	UMHOS	444	491	475
Total Alkalinity Field Mixed Indicator	MG/L	12	13	48
Total Dissolved Solids	MG/L		330	320
Total Hardness Field EDTA	MG/L	120	144	111
Water Temperature	C	22	17	20



**Table 11.** Fish collected from Two Lick Creek, Section 02 (818D) at site river mile 8.4 with Site Latitude 403346 Longitude 790955 using electrobackpack gear in 1985, 1993, and 2004.

Common Name	Scientific Name	Survey Date 6/25/85	Survey Date 9/23/93	Survey Date 8/18/04
Blacknose Dace	<i>Rhinichthys atratulus</i>	X	X	X
Bluegill	<i>Lepomis macrochirus</i>	X		
Bluntnose Minnow	<i>Pimephales notatus</i>	X	X	
Brown Bullhead	<i>Ameiurus nebulosus</i>	X		
Common Carp	<i>Cyprinus carpio</i>	X		
Brown Trout	<i>Salmo trutta</i>			X
Brown Trout - Hatchery	<i>Salmo trutta</i>		X	X
Central Stoneroller	<i>Campostoma anomalum</i>			X
Creek Chub	<i>Semotilus atromaculatus</i>	X	X	X
Johnny Darter	<i>Etheostoma nigrum</i>		X	
Largemouth Bass	<i>Micropterus salmoides</i>	X	X	X
Mottled Sculpin	<i>Cottus bairdi</i>			X
Pumpkinseed	<i>Lepomis gibbosus</i>	X	X	X
Rainbow Trout	<i>Oncorhynchus mykiss</i>		X	
Rainbow Trout - Hatchery	<i>Oncorhynchus mykiss</i>		X	
Rock Bass	<i>Ambloplites rupestris</i>			X
Smallmouth Bass	<i>Micropterus dolomieu</i>			X
White Sucker	<i>Catostomus commersoni</i>	X	X	X
	<i>Total Species</i>	9	10	10

**Table 12.** Time series total catch and number per Km data for wild brown trout from Two Lick Creek, Section 02 (818D) at site river mile 8.4 with Site Latitude 403346 Longitude 790955.

Length Group	6/25/85		9/23/93		8/18/04	
	Total Catch	Number per Km	Total Catch	Number per Km	Total Catch	Number per Km
<b>BROWN TROUT - WILD</b>						
75	-	-	-	-	3	9
100	-	-	-	-	8	25
200	-	-	-	-	3	9
225	-	-	-	-	3	9
300	-	-	-	-	2	6
325	-	-	-	-	1	3
350	-	-	-	-	3	9
375	-	-	-	-	2	6
400	-	-	-	-	2	6
525	-	-	-	-	2	6
600	-	-	-	-	1	3
<b>Totals:</b>	0	0	0	0	30	91

**Table 13.** Time series total catch and number per Km data for other species enumerated from Two Lick Creek, Section 02 (818D) for 1985, 1993, and 2004. Site located at River Mile 8.4 with a site Lat/Lon of 403346/790955.

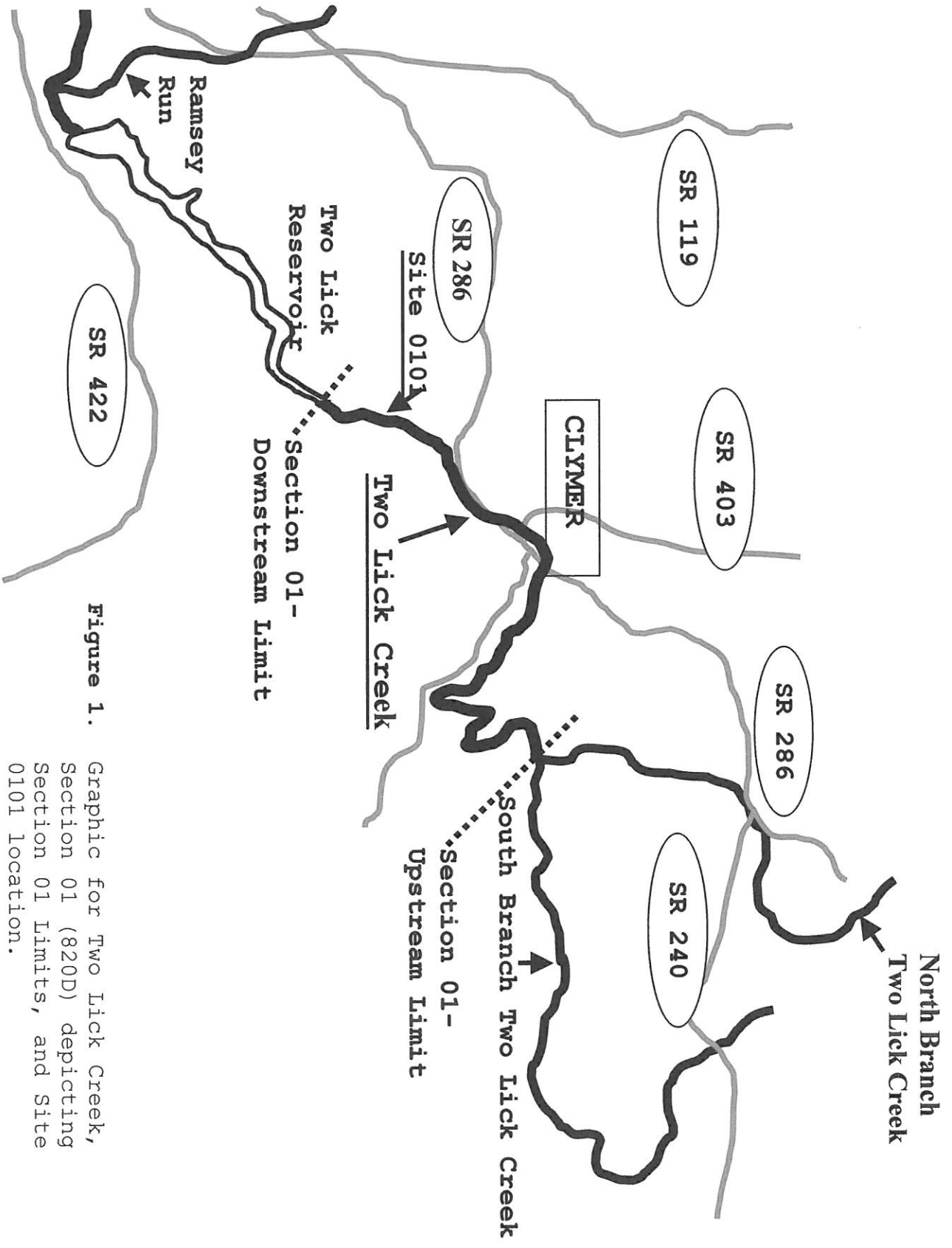
Species and Length Group	6/25/85		9/22/93		7/20/04	
	Total Catch	Number per Km	Total Catch	Number per Km	Total Catch	Number per Km
<b>BLUEGILL</b>						
75	1	3	-	-	-	-
Totals	1	3	0	0	0	0
<b>RAINBOW TROUT - WILD</b>						
175	-	-	1	3	-	-
TOTALS	0	0	1	3	0	0
<b>RAINBOW TROUT - HATCHERY</b>						
250	-	-	1	3	-	-
TOTALS	0	0	1	3	0	0
<b>BROWN TROUT - HATCHERY</b>						
200	-	-	2	6	-	-
250	-	-	-	-	1	3
275	-	-	-	-	3	9
300	-	-	-	-	5	15
325	-	-	-	-	4	12
350	-	-	1	3	2	6
400	-	-	-	-	1	3
425	-	-	-	-	2	6
450	-	-	-	-	4	12
475	-	-	-	-	1	3
TOTALS	0	0	3	9	23	69
<b>PUMPKINSEED</b>						
75	2	6	-	-	-	-
100	2	6	-	-	-	-
TOTALS	4	12	0	0	0	0
<b>BROWN BULLHEAD</b>						
150	1	3	-	-	-	-
200	1	3	-	-	-	-
225	1	3	-	-	-	-
250	1	3	-	-	-	-
TOTALS	4	12	0	0	0	0
<b>ROCK BASS</b>						
175	-	-	-	-	1	3
TOTALS	0	0	0	0	1	3
<b>SMALLMOUTH BASS</b>						
100	-	-	-	-	3	9
125	-	-	-	-	1	3
150	-	-	-	-	3	9
175	-	-	-	-	2	6
200	-	-	-	-	2	6
225	-	-	-	-	6	19
250	-	-	-	-	1	3
350	-	-	-	-	2	6
TOTALS	0	0	0	0	20	61

**Table 14.** Time series site chemistries from Two Lick Creek, Section 03 (818D) at site river mile 3.95 with Site Latitude 403045 Longitude 791002.

Chemical Test	Test Units	Values 09/23/93	Values 08/18/04
pH Field Colorimetric	SU	4.2	6.2
Specific Conductance	UMHOS	617	470
Total Alkalinity Field Mixed Indicator	MG/L	0	15
Total Dissolved Solids	MG/L	415	317
Total Hardness Field EDTA	MG/L	Interference	128
Water Temperature	C	17	20

**Table 15.** Fish collected from Two Lick Creek, Section 03 (818D) at site river mile 3.95 with Site Latitude 403045 Longitude 791002 using Electrobackpack gear in 1993 and 2004.

Common Name	Scientific Name	Survey Date 9/22/93	Survey Date 8/18/04
Blacknose Dace	<i>Rhinichthys atratulus</i>	No	X
Creek Chub	<i>Semotilus atromaculatus</i>	Fish	X
Green Sunfish	<i>Lepomis cyanellus</i>	Collected	X
Mimic Shiner	<i>Notropis volucellus</i>	In	X
Pumpkinseed	<i>Lepomis gibbosus</i>	1993	X
White Sucker	<i>Catostomus commersoni</i>		X
<i>Total Species</i>		0	6



**Figure 1.** Graphic for Two Lick Creek, Section 01 (820D) depicting Section 01 Limits, and Site 0101 location.



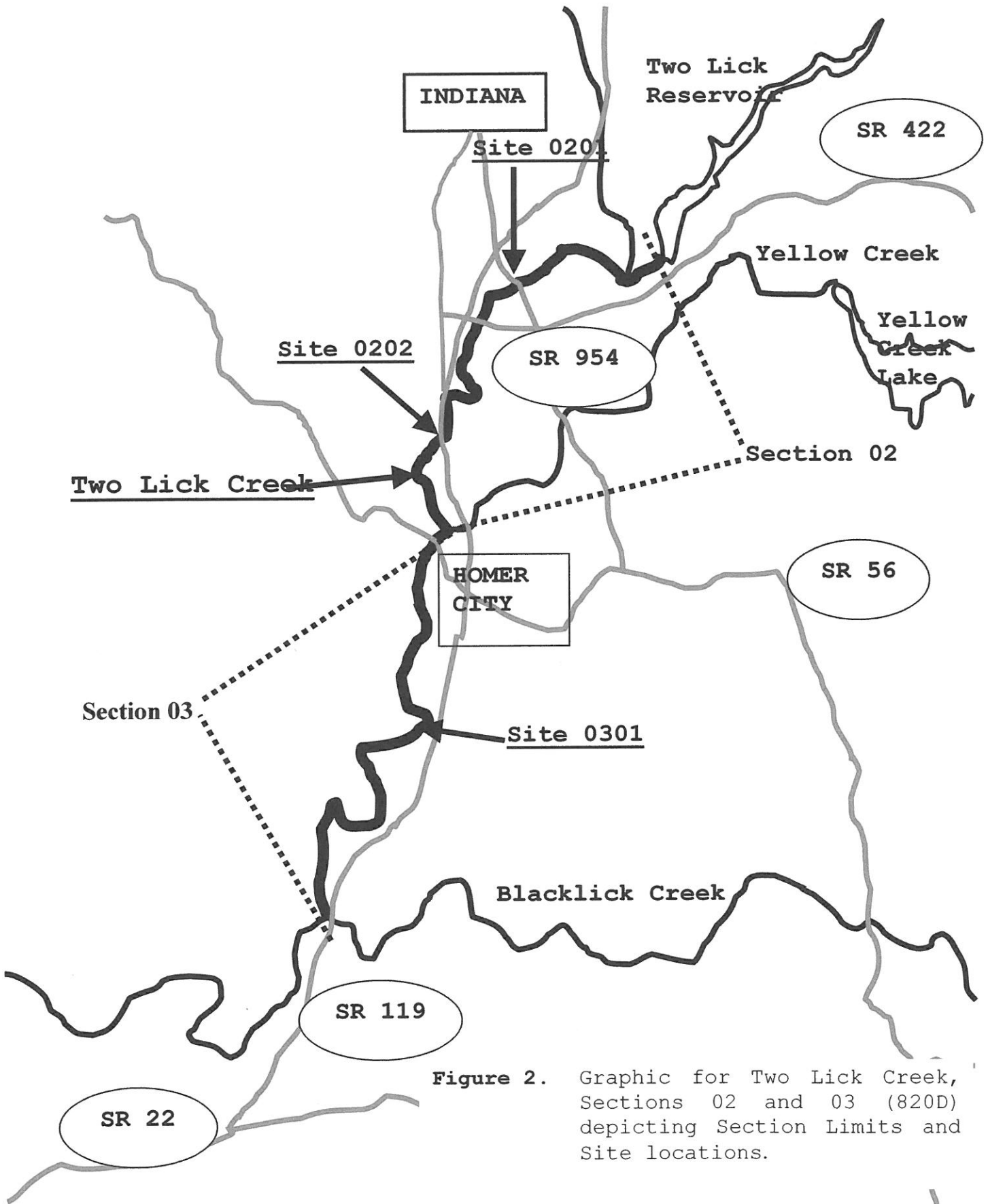


Figure 2. Graphic for Two Lick Creek, Sections 02 and 03 (820D) depicting Section Limits and Site locations.

WW Unit Leader Action: \_\_\_\_\_ Date: \_\_\_\_\_

CW Unit Leader Action: \_\_\_\_\_ Date: \_\_\_\_\_

Reestablishment of viable fisheries to waters plagued by decades of acid mine drainage has become more common in the southwest over the last 15 years. Stony Creek, Kiskiminetas River, Casselman River, Conemaugh River, and Little Conemaugh River are a few that have followed this track. A combination of improved mining regulations, improved mine drainage treatment, abandoned mine drainage mitigation, and time have factored into these scenarios. We can now add another water in the form of Two Lick Creek (818D, Indiana County) to this list of at least partially recovered waters. There was evidence of a fishery recovery beginning on Two Lick Creek at the last survey of 1993, with our survey of 2004 further solidifying that fact.

Several summary statements can be made regarding Two Lick Creek after our 2004 sampling. Overall water quality improved via a reduction in mine drainage impacts at all four sites surveyed across Sections 01, 02, and 03. As a result of improved water quality, the number of species sampled increased dramatically at Site 0101 (1 in 1993 and 14 in 2004) and at Site 0301 (0 in 1993 and 6 in 2004). A naturally reproducing population of smallmouth bass is present in Section 01, and a naturally reproducing population of brown trout and smallmouth bass is present in Section 02. A fishery, with some quality size individuals, is available for brown trout (hatchery), smallmouth bass, and rock bass in Section 01. A quality fishery is available for brown trout (wild and hatchery), smallmouth bass, and rock bass in Section 02. Care must be exercised from anglers accessing Two Lick for fishing as there is posted property and landowner concerns for access. Anglers wishing to fish Two Lick Creek must get landowner permission before proceeding.

PA FISH AND BOAT COMMISSION  
COMMENTS AND RECOMMENDATIONS  
July 9, 2007

**WATER:** Two Lick Creek Indiana County  
Sections 01, 02, and 03, (818D)

**EXAMINED:** July, August 2004

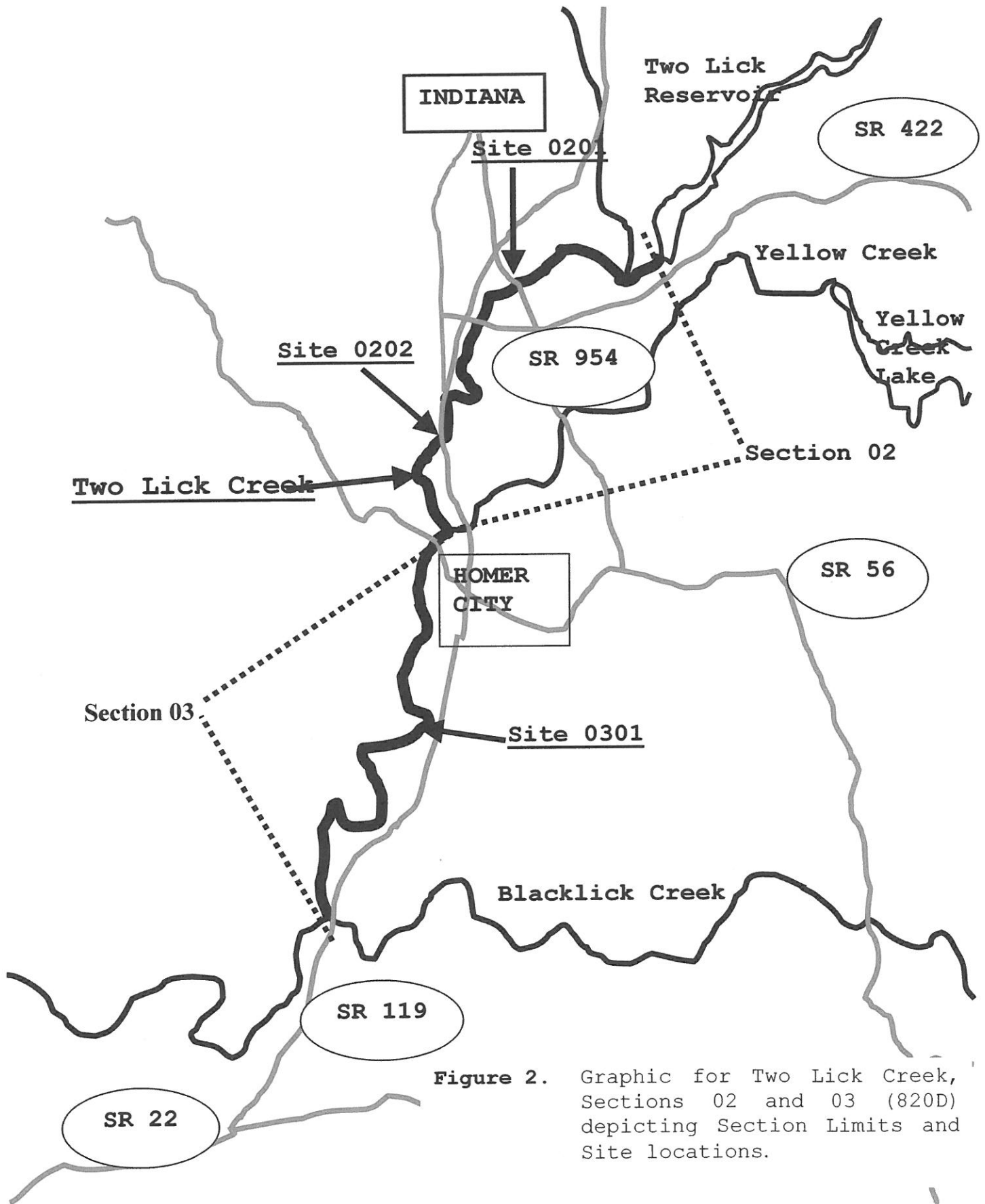
**BY:** Rick Lorson and Gary Smith

Bureau Director Action: \_\_\_\_\_ Date: \_\_\_\_\_

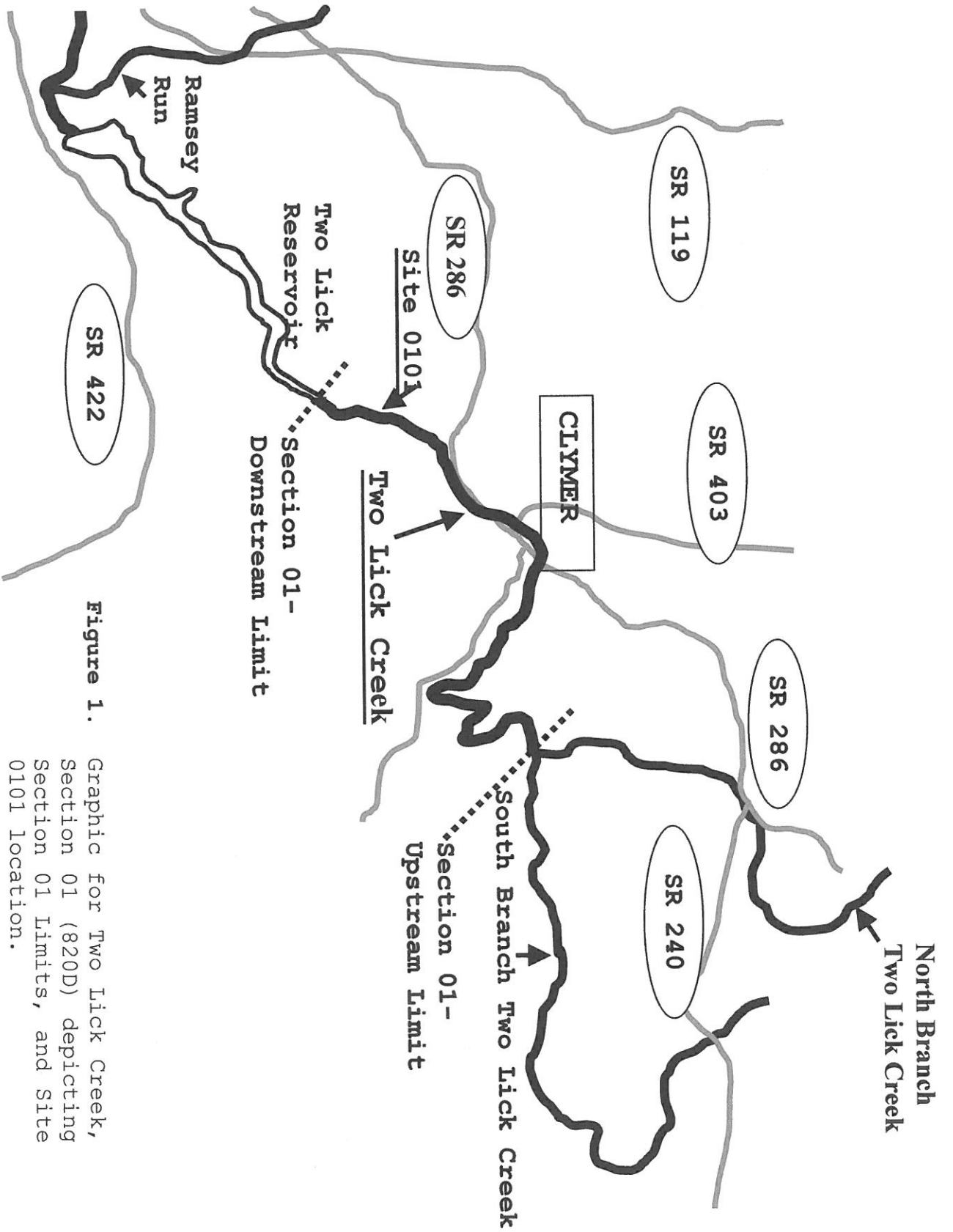
Division Chief Action: \_\_\_\_\_ Date: \_\_\_\_\_

### Management Recommendations

1. Two Lick Creek has recovered substantially from mine drainage pollution to the point of providing angling recreation in Sections 01 and 02 that was not available previously. These sections should continue to be managed for wild brown trout, smallmouth bass, and rock bass with statewide regulations. There is also a hatchery brown trout component to the fishery.
2. Section 03 is in the recovery mode from mine drainage impacts. Continued work in the watershed will lead to a smallmouth bass and rock bass fishery developing in this section. The PFBC will consider restoration stocking of these two species when pH reaches 6.5 or better and alkalinity remains above 10 mg/l.
3. The Department of Environmental Protection (DEP) Chapter 93 Water Use Protection category for Two Lick Creek, Section 02 of Trout Stocking (TSF) should be upgraded to Coldwater Fishes (CWF). Section 01 and 03 should remain TSF.
4. A copy of this report should be provided to PFBC John Arway; PFBC Steve Kepler; Tom Proch, Aquatic Biologist, Pennsylvania Department of Environmental Protection, 400 Waterfront Drive, Pittsburgh, PA 15222; Pam Milavec, Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation, 122 South Center Avenue, P.O. Box 149, Ebensburg, PA 15931; Thomas Clark, Indiana County Watershed Specialist, 750 East Pike, Indiana, PA 15701; Robert Eppely, Blacklick Creek Watershed Association, 52 Oakland Avenue, Homer City, PA 15748; Ken Sink Chapter Trout Unlimited, 750 East Pike, Indiana, PA 15701.



**Figure 2.** Graphic for Two Lick Creek, Sections 02 and 03 (820D) depicting Section Limits and Site locations.



**Figure 1.**

Graphic for Two Lick Creek, Section 01 (820D) depicting Section 01 Limits, and Site 0101 location.