

Pigeon River and Lake Gage
Steuben and LaGrange Counties
Supplemental Trout Evaluations

Date of Survey: April 28 – September 30, 2007

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Introduction: Trout are not native to Indiana's inland waters. Between 1930 and 1942, federally reared small fingerling trout were stocked in selected waters and in the spring of 1943, the first legal-size trout were released. Proponents of trout fishing, including the Northeast Indiana Trout Association (NEITA) encouraged the Division of Fish and Game to build a trout rearing station. This public support resulted in the construction of the Curtis Creek Trout Rearing Station. Since 1956, this facility has provided trout for annual stockings in Indiana's inland waters.

During the late 1970's and early 1980's both rainbow and brown trout were reared for Indiana's inland program. However, it became more difficult each season to secure a reliable disease free source for brown trout eggs. By 1984, the Indiana Division of Fish and Wildlife switched entirely to the London strain of rainbow trout which was obtained from the London, Ohio State Fish Hatchery in Ohio.

Throughout the years, Indiana has successfully maintained our own London rainbow trout brood. These fish are held at the Avoca State Fish Hatchery in southern Indiana and replacement brood fish are supplemented into the mix from Indiana and Ohio hatcheries as needed. In the late fall, the brood are trucked to Curtis Creek for spawning and returned to Avoca immediately thereafter. After spawning, the eggs are transported to the Fawn River State Fish hatchery, located approximately 10 miles east of Curtis Creek, where they are hatched and reared until they reach approximately 2 inches. At that time they are returned to Curtis Creek where are raised for 12 to 13 months to stocking size (> 7 in).

In 2004, Indiana hatchery personnel began to question the efficiency and escalating cost of maintaining our own trout brood and spawning these fish. As an alternative, hatchery biologists

decided to purchase rainbow trout eggs from the Troutlodge Hatchery in the state of Washington for a trial study. Troutlodge is a private hatchery that has been in business for 60 years and has a reputation for providing high quality, disease free eyed eggs at a competitive price. The trial consisted of purchasing 10,000 eye eggs from Troutlodge, rearing the hatched fish to stocking size and designing a project to determine their relative contribution to the fishery following stocking.

Objective: The objective of this survey was to compare the catchability of Indiana's traditionally stocked London strain of rainbow trout with the Troutlodge strain at one lake and one river. This work was conducted under work plan 300FW1F10D40618.

Methods: Marked fish were used to test the catchability of two strains of rainbow trout stocked at two locations on the Pigeon River. During the first week of April 2007, 900 London strain and 900 Troutlodge strain rainbow trout were marked by removing the right pectoral (RP) or left pectoral (LP) fin respectively. Fin clipping took place at Curtis Creek Trout Rearing Station using fish reared on site. These fish were anesthetized with MS-222 and held at Curtis Creek for a minimum of 21 days, according to the label, before being stocked into the Pigeon River in Steuben and LaGrange Counties. Stocking sites included County Road 175N and 1200E, treated as one location due to their close proximity and Ontario Dam tailwater. County Road 175 N and 1200E were each stocked with 150 London and 150 Troutlodge strain trout. Ontario Dam tailwater was stocked with 600 London and 600 Troutlodge strain trout. Stocking was conducted two days prior to the opening of the stream season.

On April 28-opening day, biologists interviewed anglers at these sites. Interviews were conducted from the 6 am opening time until noon. Information collected included number in fishing party, time fished, number of trout harvested by clip, number of trout caught and released, and how many anglers were in the vehicle they traveled in. Within one hour of the season opening time, a vehicle count was also made at each crossing on the Pigeon River within the trout stocking reach so that the number of opening morning anglers could be estimated.

Marked fish were also used to test the catchability of these two strains of rainbow trout stocked into Lake Gage, Steuben County. During the first week of March, 2007 biologists marked 1,600 London strain and 1,600 Troutlodge strain rainbow trout with an RP and LP fin clip respectively under the protocol referenced above. These trout were stocked into Lake Gage on March 30, 2007.

Four anglers volunteered to keep a fishing log on their 2007 Lake Gage trout fishing trips. Log information included date and number of RP, LP and non-clipped trout caught, including those caught and released. Anglers were asked to record the length of the first 10 trout, by mark that they caught each month (10 LP, 10 RP and 10 non-clipped trout per month). Anglers were also asked to record the method of fishing (trolling, daytime bait-casting or night fishing).

Results: During the Pigeon River opening morning creel survey, 57 anglers were interviewed at the CR175N/1200E locations. These anglers harvested 34 London strain, 31 Troutlodge strain and 12 brown trout (Table 1). One rainbow and 6 brown trout were also caught and released. The brown trout were from a NEITA funded stocking. London and Troutlodge trout were harvested at a rate of 0.22 and 0.20 fish per hour respectively. The overall trout catch, including those caught and released, was 0.42/hour.

Fifty anglers were interviewed during the opening morning creel below Ontario Dam. Twenty-six London and 25 Troutlodge trout were harvested. London and Troutlodge trout were harvested at a rate of 0.16 and 0.15 fish per hour respectively. Twenty additional rainbow trout were caught and released. The overall trout catch was 0.43/hour, similar to that observed at the CR175N/1200E location.

Combined, 107 anglers harvested 60 London rainbows (0.19/hr) and 56 Troutlodge rainbows (0.17/hr). In previous years, opening morning trout creel surveys at various locations on the Pigeon River have recorded rainbow trout harvest ranging from 0.21 to 0.70 trout per hour. Although the overall harvest was relatively low due to high water and tough fishing conditions, the harvest per hour was similar for the two strains being evaluated with London rainbows represented 51.5% of the harvest compared to 48.5% for Troutlodge fish.

The average length of an opening morning fishing trip was 3 hours compared to 2.1 hours in the early 1980's. In 2007, it was estimated that 603 anglers were fishing on the Pigeon River on opening morning. Estimates in the early 1980's suggest that approximately 850 anglers fished the Pigeon River on opening morning.

Lake Gage anglers reported catching 394 age 1 rainbow trout from the March 30, 2007 stocking. Two-hundred (50.8%) were London strain while 194 (49.2%) were Troutlodge (Table 2). While Troutlodge fish represented 61% and 55% of the May and June catch, Londons represented 61% and 59% of the August and September catch respectively (Table 3). An additional 64 age 2 or older holdover trout were also caught. Age 1 London and Troutlodge trout and age 2 or older holdover trout represented 43.6%, 42.4% and 14.0% of the seasons catch respectively.

The average length of a London strain rainbow trout ranged from 9.4 inches in May to 12.9 inches in September (Table 4). Troutlodge fish ranged from 8.6 inches in May to 13.0 inches in September. Although the London strain trout initially grew faster, both strains were comparable size by August. It is also interesting to note that the majority of the trout growth occurred by early July. London strain holdover trout ranged from 12 to 20.5 inches and average 15.4 inches. Based on the growth pattern observed for the age 1 trout, it appears that the 12-14 inch non-marked trout observed late in the season were from the previous year stocking of hatchery discards. These are surplus fish reared at Fawn River Hatchery that are not needed for production at Curtis Creek.

Trolling, daytime bait-casting fishing and nighttime fishing comprised 49%, 43% and 8% of the reported catch respectively. Trolling accounted for 100% of the May catch and 77% of the June catch. Volunteers reported that trolling, even with downriggers, became very slow in July, August and September. Although suspended fish were commonly marked on the depth-fish finder, they were slow to bite. Some of the volunteers would begin the fishing day by trolling, however, once a school of trout was located, anglers would position the boat over the school and proceeded to bait or jig fish. In September, this approach out produced trolling 7 to 1. Although the nighttime trout catch from the volunteers only made up 8% of the reported catch, personal

observations and reports from other Fisheries Section staff suggest that nighttime trout fishing remains relatively popular.

Midway through the season, it was decided to periodically record temperature and dissolved oxygen profiles from Lake Gage (Table 5). The preferred trout layer is generally considered to have a maximum water temperature of 70 degrees F with a minimum concentration of 6 parts per million (ppm) of dissolved oxygen. The trout layer recorded on August 16 was approximately 10 feet thick which forces trout to abandon the upper and lower areas of the water column. This is typical of our natural lakes, especially on the deep coldwater lakes. However, based on the catch recorded by one of the volunteers on August 16, trout will feed in cold water with a minimum of approximately 3 ppm of dissolved oxygen. This was also noted at Clear Lake two seasons ago. Anglers who fished in the northern basin of Clear Lake, which maintained a layer of cold water with a dissolved oxygen concentration of at least 3 ppm, continued to catch trout, while the trout quit biting in the southern basin where dissolved oxygen dropped below 3 ppm. As a rule, stressed fish do not feed.

Summary: Based on this evaluation, the initial contributions to the stream and lake sport fisheries are similar for the London and Troutlodge rainbow strains. Although the year to year holdover capability of the Troutlodge strain is not being evaluated in Indiana at this time, information from the literature and personal communications from other state agencies suggests that this strain should be able to holdover as well as other rainbow trout strains.

It is recommended that Indiana continue to pursue the use of the Troutlodge strain, eventually eliminating the need for an in-state brood supply.

Thanks to Bill LaVigne, Tom Johnson, Al Hope and Dick Ditmars for maintain their fishing logs which made this evaluation possible. A special thanks to Bill LaVigne for collecting the temperature and oxygen profile data, not only at Gage but from other lakes as well.

Literature Cited:

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Table 1. Fishing pressure, harvest and catch of trout from two locations on the Pigeon River from the 6 am opener through noon, April 28, 2007.

Location	# Anglers	Hours Fished	# London Strain Harvested	# London Strain Harvested Per Hour	# Troutlodge Strain Harvested	# Troutlodge Strain Harvested Per Hour	# of Browns Harvested	# Browns Harvested Per Hour	# of Rainbows C&R	# of Browns C&R
CR 175N. & 1200E	57	156.0	34	0.22	31	0.20	12	0.08	1	6
Ontario Dam	50	165.2	26	0.16	25	0.15	0	0	20	0
Total	107	321.2	60	0.19	56	0.17	12	*	21	6

Total rainbow trout catch per hour, including those caught and release was 0.42 at CR174N/1200 E. and 0.43 below the Ontario Dam.

Of the fin clipped fish, London rainbows represented 51.5% of the harvest compared to 48.5% for Troutlodge fish.

Average length of a fishing trip was 2.74 hours at CR 175 N/1200E and 3.30 hours below Ontario.

*No brown trout were available below the Ontario Dam

Table 2. Number and Percentage of Fin Clipped age 1 London and Troutlodge Strain Rainbow Trout Caught From Lake Gage, May through September 2007.

Month	# of London Strain Rainbow Trout Caught, RP Fin Clip	Percent	# of Troutlodge Strain Rainbow Trout Caught, LP Fin Clip	Percent	Total
May	39	38.6	62	61.4	101
June	35	44.3	44	55.7	79
July	21	55.3	17	44.7	38
Aug	16	61.5	10	38.5	26
Sept	89	59.3	61	40.7	150
Total	200	50.8	194	49.2	394

Includes trout caught and released.

Table 3. Number and Percentage of Fin Clipped age 1 London and Troutlodge Strain Rainbow Trout and age 2 and Older London Strain Rainbow Trout Caught From Lake Gage, May through September 2007.

Month	# of London Strain Rainbow Trout Caught, RP Fin Clip	Percent	# of Troutlodge Strain Rainbow Trout Caught, LP Fin Clip	Percent	# of age 2 & Older London Strain Rainbow Trout Caught, No Fin Clip	Percent	Total
May	39	36.1	62	57.4	7	6.5	108
June	35	39.8	44	50.0	9	10.2	88
July	21	47.7	17	38.6	6	13.6	44
Aug	16	50.0	10	31.3	6	18.8	32
Sept	89	47.8	61	32.8	36	19.4	186
Total	200	43.6	194	42.4	64	14.0	458

Table 4. Length Range and Average Length (inches) of Fin Clipped age 1 London and Troutlodge Strain Rainbow Trout and age 2 and Older London Strain Rainbow Trout Caught From Lake Gage, May through September 2007.

Month	Length Range of London Strain Rainbow Trout	Average Length (n)	Length Range of Troutlodge Strain Rainbow Trout	Average Length (n)	Length Range of age 2 and Older London Strain Rainbow Trout	Average Length (n)
May	7.0 – 12.0	9.4 (25)	7.0 – 13.5	8.6 (38)	14.5 – 17.5	15.5 (7)
June	11.5 – 13.0	12.2 (31)	11.5 – 13.0	11.4 (30)	15.0 – 16.5	15.3 (9)
July	11.0 – 13.0	12.5 (18)	11.5 – 14.0	13.7 (16)	12.0 – 16.5	14.6 (5)
Aug	12.0 – 13.5	12.8 (16)	12.0 – 14.0	13.0 (10)	15.5 – 20.5	16.6 (6)
Sept	12.0 – 15.5	12.9 (20)	12.0 – 14.0	13.0 (20)	12.5 – 17.5	15.3 (20)

(n) number measured

Table 5. Temperature and dissolved oxygen profiles for Lake Gage, 2007.

Date	8/16/07		Date	9/17/07		Date	10/4/07	
Time	12:01 pm		Time	12:30 pm		Time	3:00 pm	
Air Temp	78.8 F		Air Temp	61.4		Air Temp	80.8	
Water Depth	Temp F	D.O. ppm	Water Depth	Temp F	D.O. ppm	Water Depth	Temp F	D.O. ppm
Surface	79.6	7.78	Surface	68.1	8.63	Surface	69.0	8.87
2	79.7	7.74	2	68.2	8.61	2	68.8	8.80
4	79.6	7.73	4	68.2	8.68	4	68.1	8.86
6	79.5	7.56	6	68.2	8.64	6	67.3	8.98
8	79.5	7.85	8	68.2	8.76	8	67.7	8.97
10	79.4	7.94	10	68.1	8.7	10	67.7	9.00
12	79.3	7.92	12	68.1	8.73	12	67.6	8.98
14	79.3	7.89	14	68.0	8.73	14	67.5	8.89
16	79.3	7.90	16	68.0	8.63	16	67.5	8.84
18	78.4	7.93	18	67.9	8.67	18	67.4	8.81
20	73.8	9.74	20	67.9	8.84	20	67.3	8.81
22	70.0	9.65	22	67.8	8.75	22	67.1	8.51
24	66.5	10.05	24	67.6	8.69	24	66.3	8.10
26	61.5	9.90	26	64.4	7.73	26	65.8	7.83
28	56.8	9.19	28	62.3	7.20	28	63.0	6.40
30	54.6	8.91	30	55.8	6.04	30	56.1	4.08
32	53.0	7.99	32	53.5	5.17	32	53.1	2.67
34	47.4	4.92	34	51.1	3.64	34	50.8	1.76
36	47.2	4.39	36	49.5	2.80	36	49.7	1.00
38	47.0	4.35	38	48.3	1.80	38	48.8	0.51
40	46.1	2.69	40	47.4	1.28	40	48.1	0.23
42	-	-	42	47.0	1.06	42	47.4	0.12
44	-	-	44	46.6	0.90	44	47.0	0.09
46	-	-	46	46.2	0.43	46	46.6	0.09
48	-	-	48	46.0	0.26	48	46.3	0.08
50	45.1	1.80	50	45.7	0.42	50	46.0	0.08
52	-	-	52	45.5	0.24	52	45.8	0.08
54	-	-	54	45.3	0.10	54	45.7	0.07
56	-	-	56	45.3	0.09	56	45.5	0.07
58	-	-	58	45.1	0.08	58	45.3	0.08
60	44.5	0.06	60	45.0	0.09	60	45.2	0.08
62	-	-	62	44.9	0.09	62	45.1	0.08
64	-	-	64	44.8	0.09	64	45.0	0.07
66	-	-	66			66	44.9	0.08
68	44.2	0.04	68			68		
70	-		70			70		

Preferred trout layer in bold.

Maximum 70 F., Minimum dissolved oxygen 6.0 ppm