

Evaluate Status of Pacific Lamprey in the Clearwater River Drainage, Idaho

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**EVALUATE STATUS OF PACIFIC LAMPREY IN THE CLEARWATER RIVER
DRAINAGE, IDAHO**

ANNUAL REPORT 2002

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ABSTRACT

In 2002 Idaho Department of Fish and Game continued investigation into the status of Pacific lamprey populations in Idaho's Clearwater River drainage. Trapping, electrofishing, and spawning ground redd surveys were used to determine Pacific lamprey distribution, life history strategies, and habitat requirements in the South Fork Clearwater River, Lochsa River, Selway River, and Middle Fork Clearwater River subbasins. Five-hundred forty-one ammocoetes were captured electroshocking 70 sites in the South Fork Clearwater River, Lochsa River, Selway River, Middle Fork Clearwater River, Clearwater River, and their tributaries in 2002. Habitat utilization surveys in Red River support previous work indicating Pacific lamprey ammocoete densities are greater in lateral scour pool habitats compared to riffles and rapids. Presence-absence survey findings in 2002 augmented 2000 and 2001 indicating Pacific lamprey macrothemia and ammocoetes are not numerous or widely distributed. Pacific lamprey distribution was confined to the lower reaches of Red River below rkm 8.0, the South Fork Clearwater River, Lochsa River (Ginger Creek to mouth), Selway River (Race Creek to mouth), Middle Fork Clearwater River, and the Clearwater River (downstream to Potlatch River).

INTRODUCTION

The Pacific lamprey *Lampetra tridentata* is facing the same migratory hazards and habitat degradation as other anadromous fish species in Idaho. Because this fish is not recognized as a sport or game fish species, little attention has been given to its status.

The ecological interaction of Snake River Pacific lamprey populations and other riverine species is thought to contribute to Snake River basin overall aquatic productivity. Pacific lamprey ammocoetes provide Snake River basin white sturgeon *Acipenser transmontanus* populations with an important food source which potentially contributes to Snake River white sturgeon population productivity (Galbreath 1979). Pacific lamprey adults are a source of marine derived nutrients in the Snake River basin. Aquatic and avian predator utilization of ammocoetes and macrothemia potentially results in reduced predation impact to outmigrating juvenile salmon *Oncorhynchus* spp. and steelhead trout *O. mykiss* in the lower Snake River migrational corridor. Pacific lamprey, chinook salmon, and summer steelhead trout, rear in Snake River basin stream habitats, however, the ecological relationship interactions of the three species in the basin are little known. Basic life history, distribution, and remaining population status are urgently needed to fully understand this species and to begin intensive management before populations decline to critical, unrecoverable threshold in Idaho.

Pacific lamprey ammocoetes are eyeless upon hatching and filter feed 4-7 years before undergoing transformation into macrothemia. Transformation changes include formation of an oral disc and eyes among other morphological processes. Following transformation Pacific lamprey migrate to the ocean and parasitically feed on a wide range of marine aquatic organisms (Scott and Crossman 1973) for an estimated 1-2 years prior to returning to freshwater to spawn. The Clearwater River drainage of north central Idaho is an important study area as both Pacific lamprey ammocoetes and macrothemia have been captured in South Fork Clearwater River (S.F. CLEARWATER RIVER) anadromous fish smolt traps since 1992.

Understanding Pacific lamprey larval fish population composition, migrational behavior, and habitat needs will provide basic information to better manage Pacific lamprey. Without this knowledge, the opportunity for preservation of critical habitat may be lost. This project will add to our knowledge of Pacific lamprey and provide critical information to minimize future degradation of habitat.

PROJECT AREA

The Clearwater River drainage is located in north central Idaho and encompasses approximately 2.5 million hectares. The major tributaries include the Potlatch, S.F. Clearwater, N.F. Clearwater, M.F. Clearwater, Selway, and Lochsa rivers (Figure 1).

Hydroelectric dam construction in the Clearwater River drainage has impacted salmon, steelhead, and Pacific lamprey populations. The Pacific Power and Light

Lewiston Dam, was constructed in 1927 at Clearwater River rkm 1.8. The dam was originally constructed with two upstream passage ladders, but obstructed steelhead trout passage somewhat and salmon passage severely. In the 1927-1940 period when the problem was detected and remedied, spring chinook salmon and fall chinook salmon populations were reduced to remnant numbers and subsequently never recovered (White 1954). The impacts of the Lewiston Dam to Pacific lamprey macrothemia and ammocoetes downstream migrants and upstream migrating adults are unknown. Dworshak Dam, constructed in 1972 on the North Fork Clearwater River (rkm 1.8) was constructed without an upstream passage ladder. Anadromous salmon, steelhead, and Pacific lamprey populations upstream of the project are now considered extinct. Harpster Dam constructed in 1910 on the S.F. Clearwater River blocked salmon and steelhead trout upstream migration in the 1949-1963 period, however, impacts to Pacific lamprey are unknown. Steelhead trout migration was possible, although limited, over the dam from 1935 to 1949. High flows destroyed the fishway in 1949 eliminating adult salmonid passage until the dam was removed in 1963. Adult Pacific lamprey passage may have occurred during this entire period as adult Pacific lamprey have the ability to climb above water surface levels (G. Starke, U.S. Army Corps of Engineers, personal communications). Pacific lamprey returns following removal of the dam could have provided recolonization stock for the S.F. Clearwater River drainage.

The land ownership of the Clearwater River basin is U. S. Forest Service, Bureau of Land Management, and other Federal Lands (58.0%), State of Idaho (6.0%), Timber Company Land (8.0%), Nez Perce Tribe (4.0%), and Private (24.0%). Land use in the Clearwater River drainage is primarily agricultural or livestock pasture grazing in the lower and central basin and forestry related in the headwater reaches. Mining predominantly occurred in the S.F. Clearwater River drainage.

The S.F. Clearwater River drains 300,440 hectares. The upper S.F. Clearwater River (Figure 2.) watershed has several large meadow complexes with low stream gradients and fine substrates. The mid and lower S.F. Clearwater River reaches are predominantly canyon confined and boulder substrate dominated. The current land ownership of the S.F. Clearwater River watershed is U.S. Forest Service (68%), private (28%), Nez Perce Tribe (0.9%), Bureau of Land Management (2%), and State of Idaho (0.7%). Extensive mining from the 1860's to the mid-1900's occurred in four S.F. Clearwater River tributaries, Crooked River, Red River, American River, and Newsome Creek.

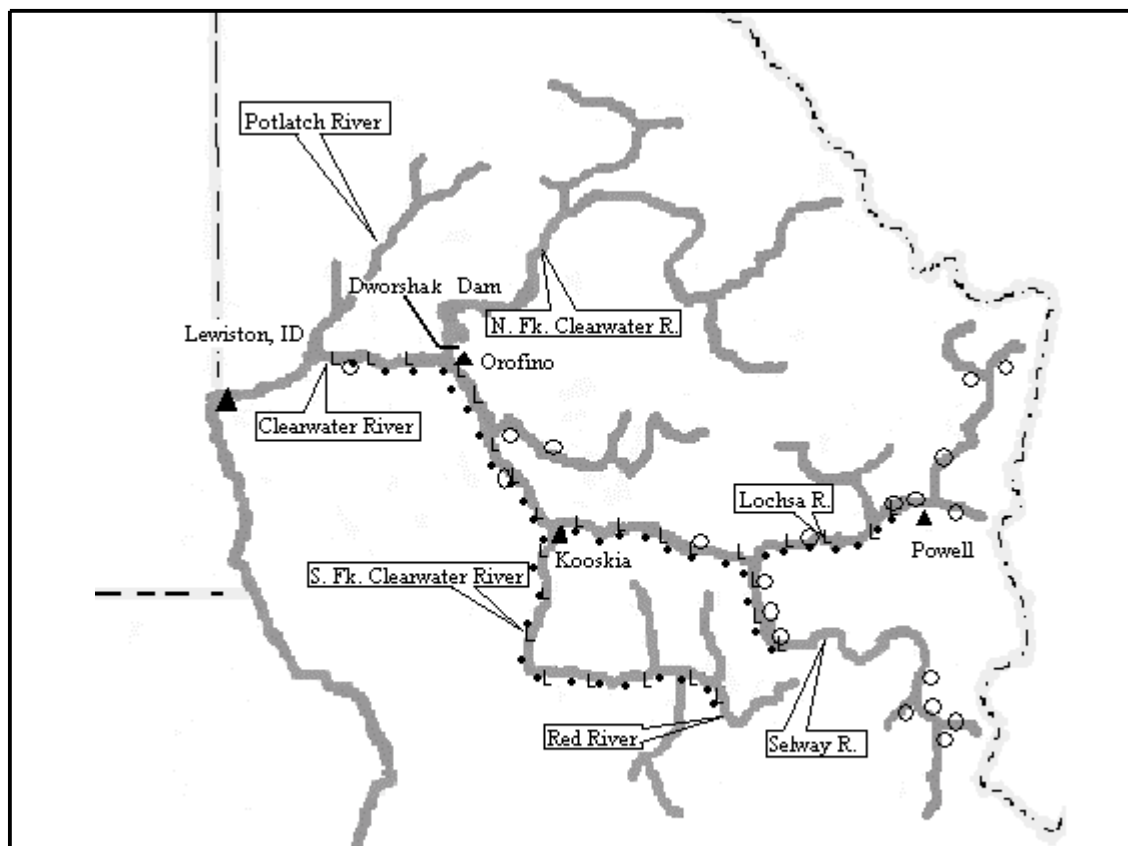


Figure 1. Geographic location of Pacific lamprey investigations in the Clearwater River drainage, ID, 2000-2002. L • • • L = Pacific lamprey distribution.

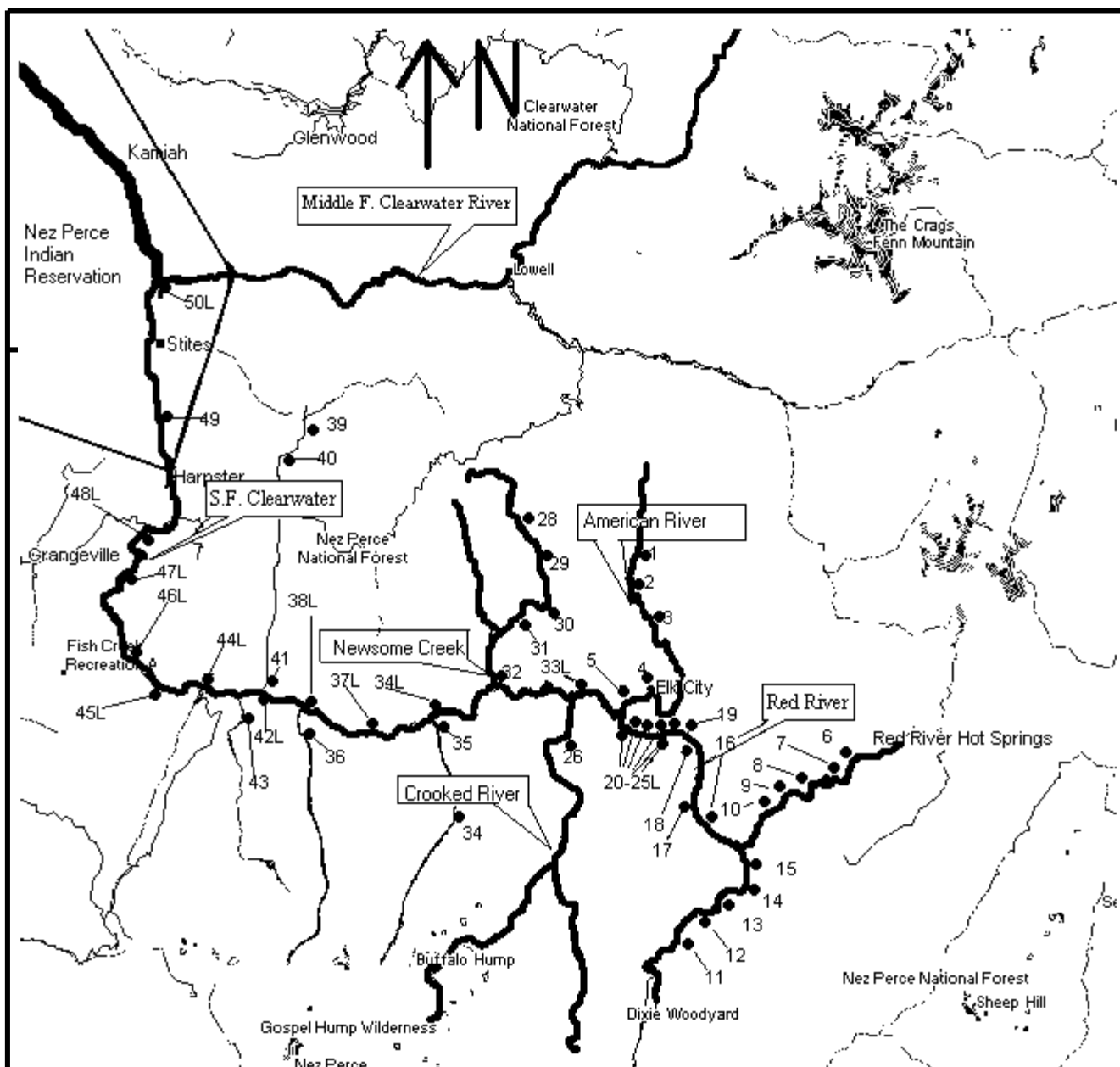


Figure 2. Geographic location of Pacific lamprey investigations in the South Fork Clearwater River drainage, ID, 2000-2002. L = lamprey captured; • = Presence absence survey site.

OBJECTIVES

1. Determine life history characteristics of Pacific lamprey ammocoetes and macrothalmia in the Clearwater River drainage.
2. Determine habitat requirements of Pacific lamprey in the Clearwater River drainage.
3. Determine distribution of Pacific lamprey in the Clearwater River drainage.
4. Develop and implement strategies to protect Pacific lamprey adult, juvenile, and larval habitat.

METHODS

Electroshocking with an ABP-2 electrofisher was used to capture fish in the stream channel. Any Pacific lamprey mortalities were retained for statolith banding age determination, following procedures described by (Beamish and Medland 1988). Presence-absence surveys were completed in the Red River, S.F. Clearwater River, S.F. Clearwater River tributaries, Selway River, Lochsa River and tributaries, Potlatch River, and the Middle Fork of the Clearwater River (Figure 1).

Determination of habitat usage was focused in the Red River drainage. We segmented Red River into one-kilometer sections from its mouth upstream to the uppermost bridge crossing (rkm 41). We prioritized eight Red River habitat sampling locations based on random selection of kilometer section and then sampled the first 100 meters of each selected section. The habitat in each of the sampled sections was classified as to type (Table 1). The first riffle, pool, glide, etc., was electroshocked from its downstream boundary upstream without repeating sampling in identical habitat types. Water depth, water velocity, substrate composition, and canopy cover were measured and recorded at the site of individual captures.

Three downstream migrant traps currently operated by Idaho Department of Fish and Game (IDFG) in the S.F. Clearwater River drainage were used to monitor Pacific lamprey downstream movements. The Crooked River scoop trap (rkm 1.0) was replaced with a 1.5 m rotary screen trap in 2002 and operated from April 4 to October 31. A 1.50 m diameter rotary screen trap on American River (rkm 3.0) was operated from April 12 to October 31. Another 1.50 m diameter rotary screen trap on Red River (rkm 5.0) was operated from April 10 to October 31.

All captured Pacific lamprey ammocoetes and macrothalmia were anesthetized, and total lengths and body weights measured. Individuals were then recovered in fresh water and released near the site of capture. Outmigrant estimates at traps were made using (Beamish and Levings 1991) trap-area fished methods.

Table 1. Habitat unit and substrate classification for sampling sites in the Clearwater River drainage, ID, 2000-02.

Habitat Units	I.D.	Substrate Classification
Falls	FLL	Substrate Type (mm)
		Large Boulder >512
Cascades	CAS	Small Boulder 256-512
		Cobble 64-256
Rapids		Coarse Gravel 16-64
Typical	RTT	Medium Gravel 8-16
Boulders	RBB	Fine Gravel 2-8
Bedrock	RBD	Course Sand 0.5-2
		Fine Sand 0.062-0.50
Riffles		Silt/Organic 0.004-0.062
Typical	RIF	
Pocket-water	RIP	
Glide	GLD	
Pools		
Lateral Scour Pool	LSP	
Straight Scour Pool	SCP	
Plunge Pool	PPP	
Dammed Pool	DMP	
Alcove	ALC	

In 2002 visual redd surveys for spawning adult Pacific lamprey were conducted from May 1 to July 1 on 0.5 kilometer of Red River and its tributaries.

Pacific lamprey ammocoete and macrothemia collection and passage information at Lower Granite Dam was obtained from the Washington Department of Fish and Wildlife personnel to determine the magnitude and timing of Pacific lamprey downstream migration. Mortality samples of macrothemia and ammocoetes were collected to obtain genetic material and assess the general size of juvenile and larval Pacific lamprey captured.

RESULTS

During 2002, no Pacific lamprey ammocoetes or macrothemia were captured in the Crooked River or American River rotary screen traps. One-hundred twenty-five

Pacific lamprey ammocoetes and 20 macrothalmia were captured in the Red River rotary screen trap. The average total length of the ammocoetes was 140 mm and the average total length for macrothalmia was 143 mm (Figure 3).

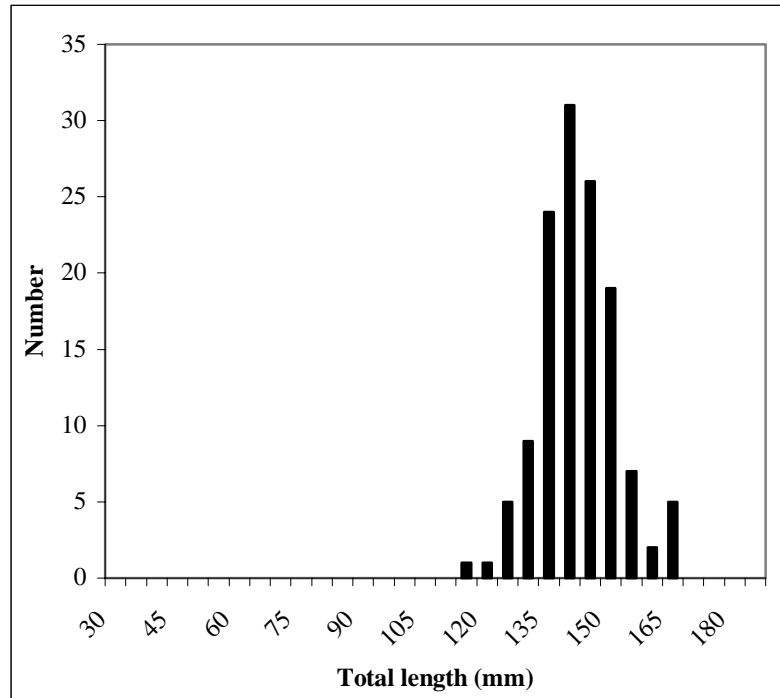


Figure 3. Total length frequency of (N=130) Pacific lamprey ammocoetes captured in the Red River migrant trap, ID, 2002.

Based on trap-area fished, a total of 875 ammocoetes and 140 macrothalmia were estimated to have migrated past the Red River trap in 2002, compared to 307 ammocoetes and seven macrothalmia in 2001, and 175 ammocoetes and 14 macrothalmia in 2000.

A total of 274 Pacific lamprey ammocoetes were captured by electroshocking in Red River. No macrothalmia were captured electroshocking in Red River. Pacific lamprey ammocoetes were found in seven sections of Red River up to rkm 7.5. No Pacific lamprey ammocoetes or macrothalmia were captured in Red river sample sites at rkm 8.0, 9.0, and 10. The largest Pacific lamprey ammocoete captured electroshocking in the S.F. Clearwater River drainage in 2002 was 155 mm (TL) and the smallest Pacific lamprey ammocoete captured measured 77 mm (TL). No macrothalmia were captured electroshocking in the S.F. Clearwater River drainage in 2002.

More Pacific lamprey ammocoetes were captured in Red River sampling lateral scour pool habitat than any other single habitat type (Table 2), however, no alcove habitat was sampled in 2001 or 2002 where the greatest density of 253.3/100 m² was found in 2000. Individuals were mostly found inhabiting sand and silt substrates in calm water

sites adjacent to overhanging riparian canopy cover or in low velocity pockets behind boulders. Pacific lamprey ammocoetes were captured in water depths ranging from 0.1 – 1.0 m, however, they were predominantly captured in depths <0.60 m.

Two Pacific lamprey marked at Red River rkm 3.4 in 2000, were recaptured in 2001 within 40.0 m of the original capture location (Table 3). No marked Pacific lamprey ammocoetes were recaptured in 2002. The orange elastomer marks observed in 2001 retained clarity of when the ammocoetes were marked in 2000.

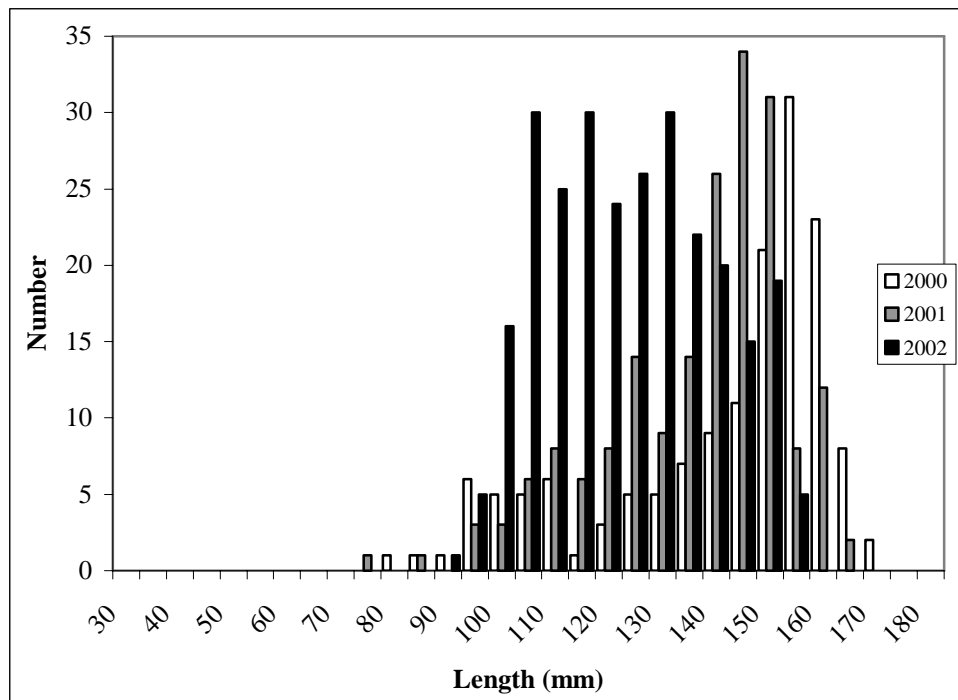


Figure 4. Total length frequency of Pacific lamprey ammocoetes and macrothemia (N=151, 2000; N= 186, 2001; N= 268, 2002) captured by electroshocking in Red River, ID, 2000-02.

Although numerous potential spawning sites were identified, no adult Pacific lamprey or redds were observed during 2002 surveys. Redd surveys were restricted to a 0.5 km reach at Red River rkm 43.0 due to the suspected low number of adult spawners in the S.F. Clearwater River drainage.

No Pacific lamprey were found sampling the Selway River above Whitecap Creek, Selway River tributaries, Lochsa River tributaries, M.F. Clearwater River

tributaries, or Potlatch River. Pacific lamprey distribution in the Clearwater River drainage was limited to lower 7.5 km of Red River, the S.F. Clearwater River, Selway River (Race Creek to mouth), Lochsa River (Ginger Creek to mouth), M.F. Clearwater River, and the Clearwater River. One-hundred seven Pacific lamprey ammocoetes were sampled in the S.F. Clearwater River, 64 in the Selway River, and 60 in the Lochsa River (Figures 5, 6, and 7). The largest ammocoete captured in the Clearwater River drainage was captured in Red River (155 mm TL) and the smallest was captured in the Clearwater River (25 mm TL).

Table 2. Habitat locations of Pacific lamprey larvae in randomly sampled units in Red River, ID, 2000-02.

Habitat Type	Lamprey Captured	Total Area Fished m ²	Total Time Fished (Min)	Lamprey/100m ²	C.P.U.E. (Lamprey/Min)
Lateral Scour Pool	342	1283.4	1461	26.648	0.234
Riffle	15	603.5	726	2.486	0.021
Riffle with pockets (pocket water)	57	1269.8	825	4.489	0.069
Rapids with boulders	10	357.3	305	2.799	0.033
Alcove (non random)	19	7.5	20	253.333	0.950
TOTALS:	443	3521.5	3337	--	--

Table 3. Presence-absence surveys of Pacific lamprey larvae in Red River, South Fork Clearwater River, Selway River, and Lochsa River, ID, 2001-02.

2001	Lamprey Captured	Total Area Fished m ²	Total Time Fished (Min)	Lamprey/100m ²	C.P.U.E. (Lamprey/Min)
Red River (4 sites)	100	22.5	49	444.4	2.04
Recapture Survey (1 site)	69	--	102	--	0.68
S.F. Clearwater River (15 sites)	256	116.2	187	220.3	1.37
Totals	425	138.7	338	--	--
2002					
Selway River (2 sites)	61	10	29	610.0	2.10
Lochsa River (3 sites)	54	12	33	450.0	1.64
Totals	115	22	62	--	--

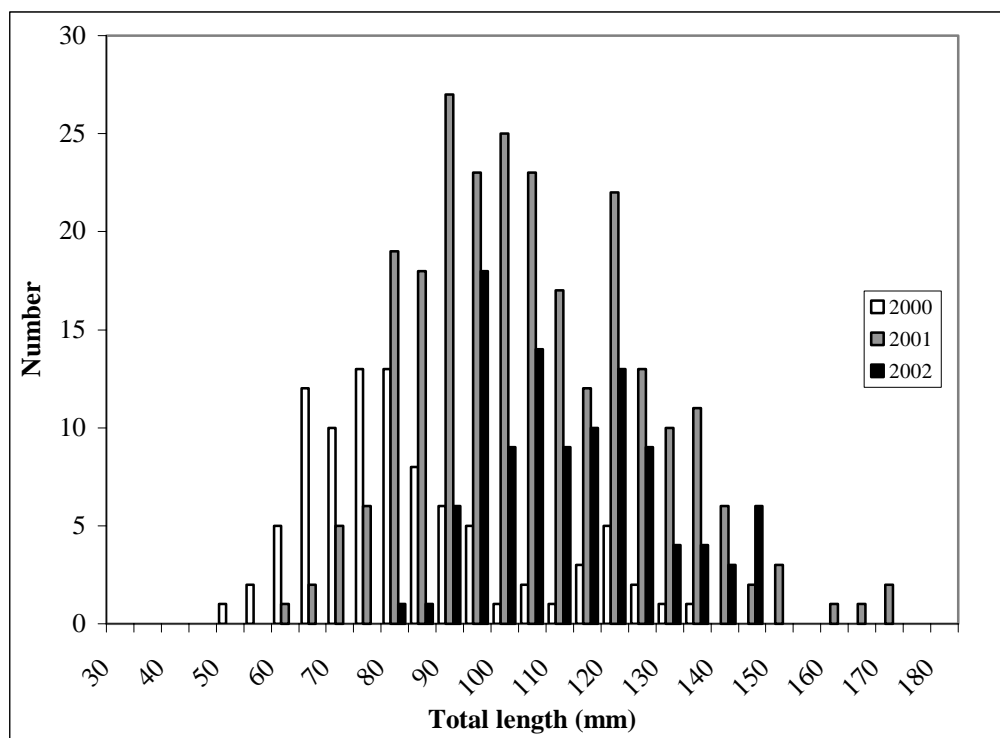


Figure 5. Total length frequency of Pacific lamprey ammocoetes and macrothalmia (N=91, 2000; N=253, 2001; N=107, 2002) captured by electroshocking in S.F. Clearwater River, ID, 2000-02.

Downstream migration of ammocoetes and macrothalmia in Red River occurs predominantly at night from mid-March to May 31, with a limited number captured in September and October (Figure 8). Out of the total (N=821) Pacific lamprey ammocoetes captured April 1 to October 31, 1993-2001 87% occurred between April 1 and May 31. In 1996 a total of 25 Pacific lamprey ammocoetes were captured in the March 13 to March 31 period, which is important information indicating an unknown portion of downstream migration occurs prior to the general April 1 – October 31 trapping period.

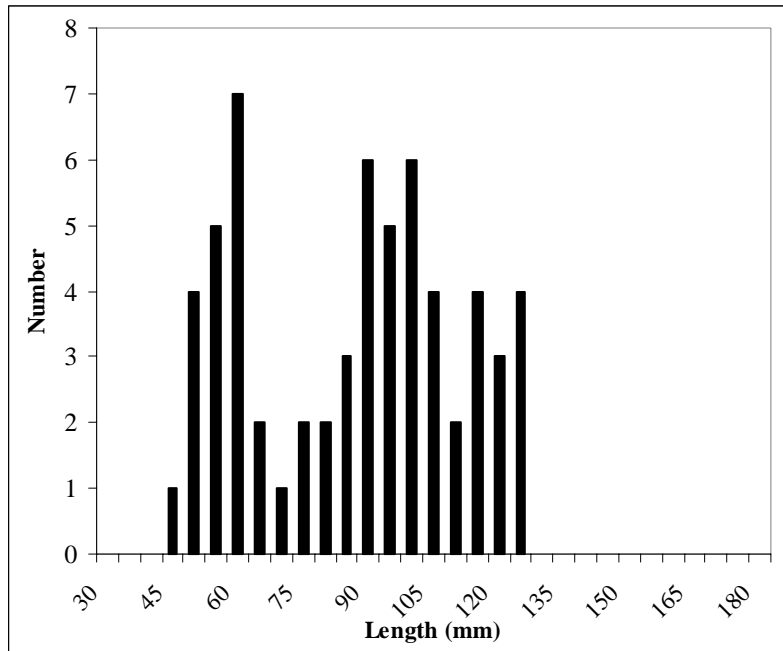


Figure 6. Total length frequency of Pacific lamprey ammocoetes (N=61) captured electroshocking in the Selway River, ID, 2002.

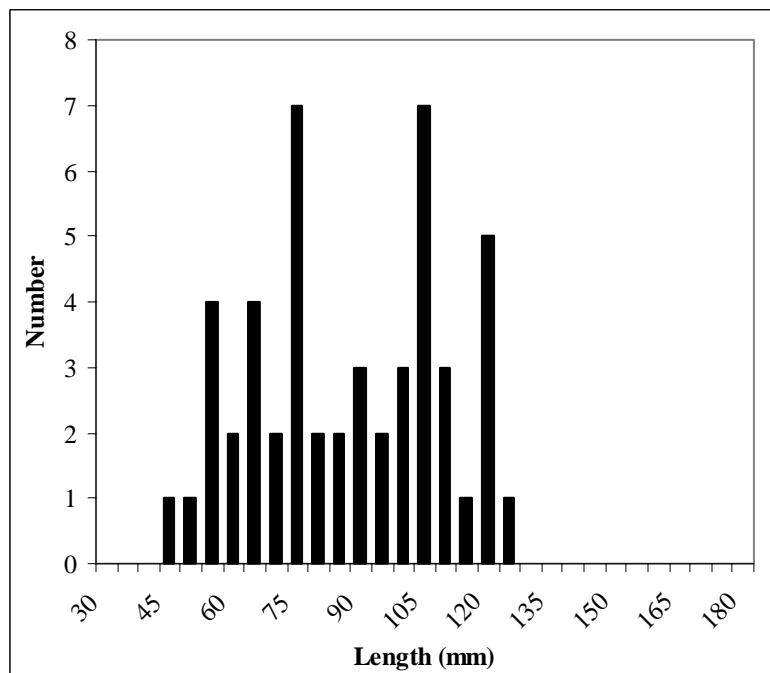


Figure 7. Total length frequency of Pacific lamprey ammocoetes (N= 50) captured electroshocking in the Lochsa River, ID, 2002.

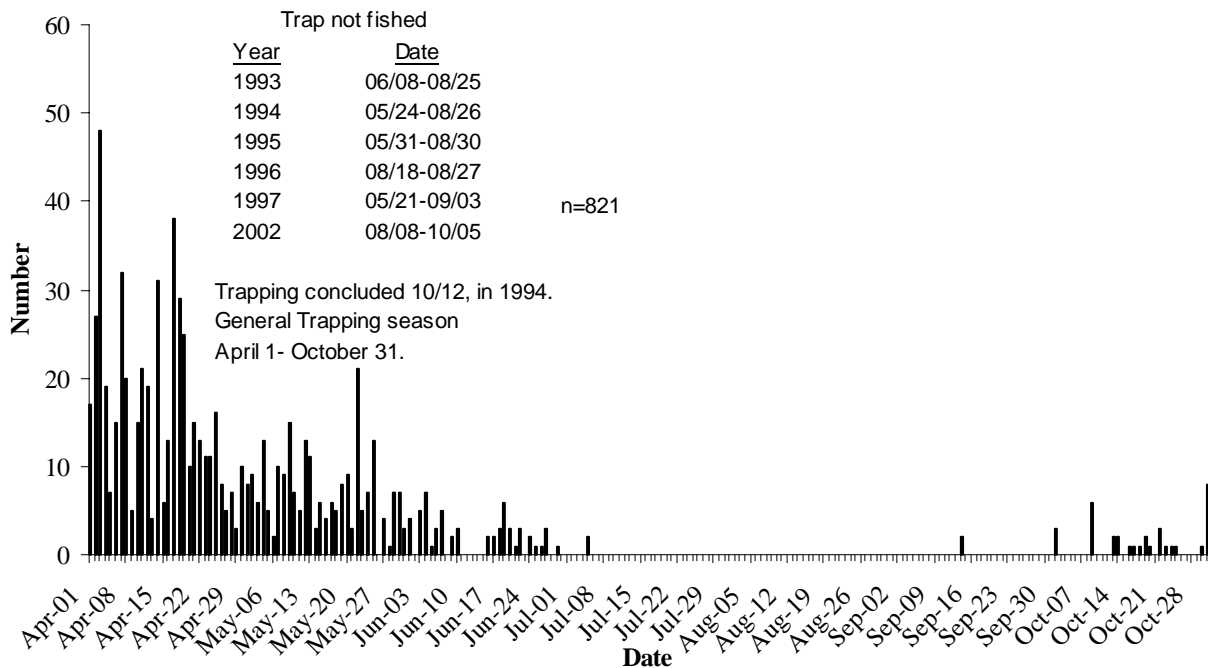


Figure 8. Pacific lamprey ammocoetes and macrothalmia captured April 1-October 31, 1993-2002 in Red River trap (rkm 5.0), ID.

The length and weight relationship of Pacific lamprey ammocoetes captured in Red River and S.F. Clearwater River indicates that weight increases exponentially with length (Figures 9 and 10). The majority of Red River Pacific lamprey ammocoetes and macrothalmia captured were greater than 120 mm TL, however, ammocoetes and macrothalmia electroshocked in the S.F. Clearwater River were predominantly <120 mm TL (Figure 10).

Pacific lamprey juvenile and larval passage information obtained from Washington Department of Fish and Wildlife at Lower Granite Dam in 2002 supports the 2000-2001 assessment indicating that the majority of ammocoetes and macrothalmia pass the project between March 1 and July 1.

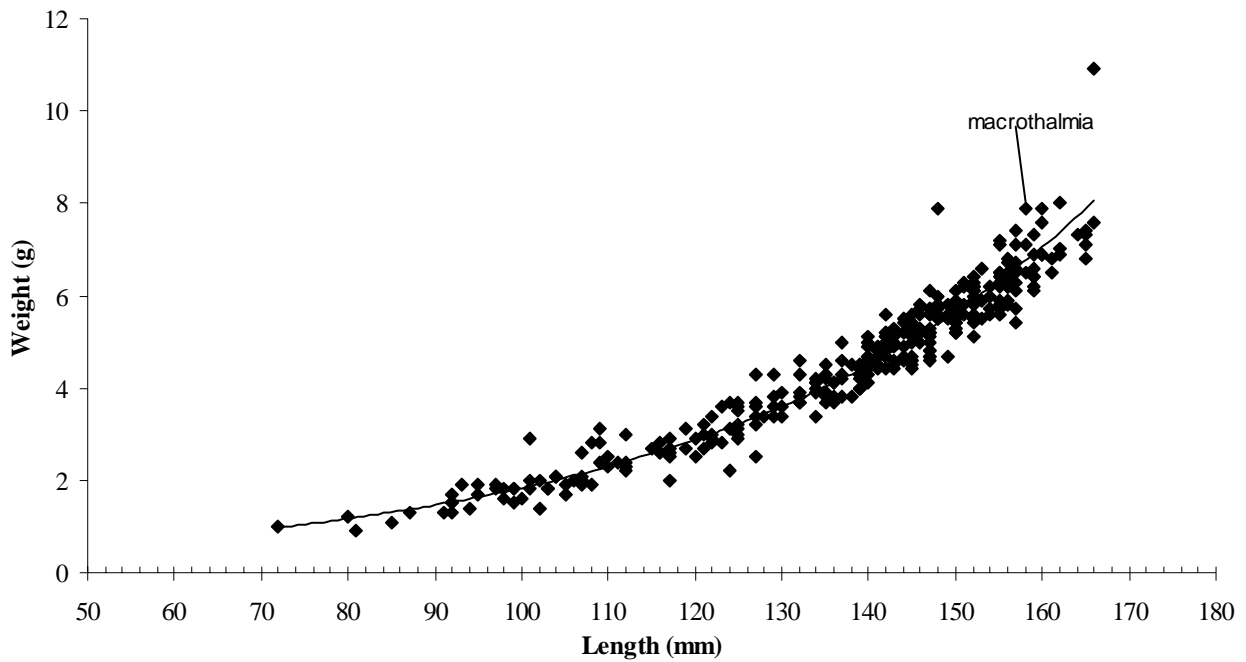


Figure 9. Pacific lamprey ammocoete and macrothalmia (electroshocked) length and weight relationship, (N=333) Red River, ID, 2000-01.

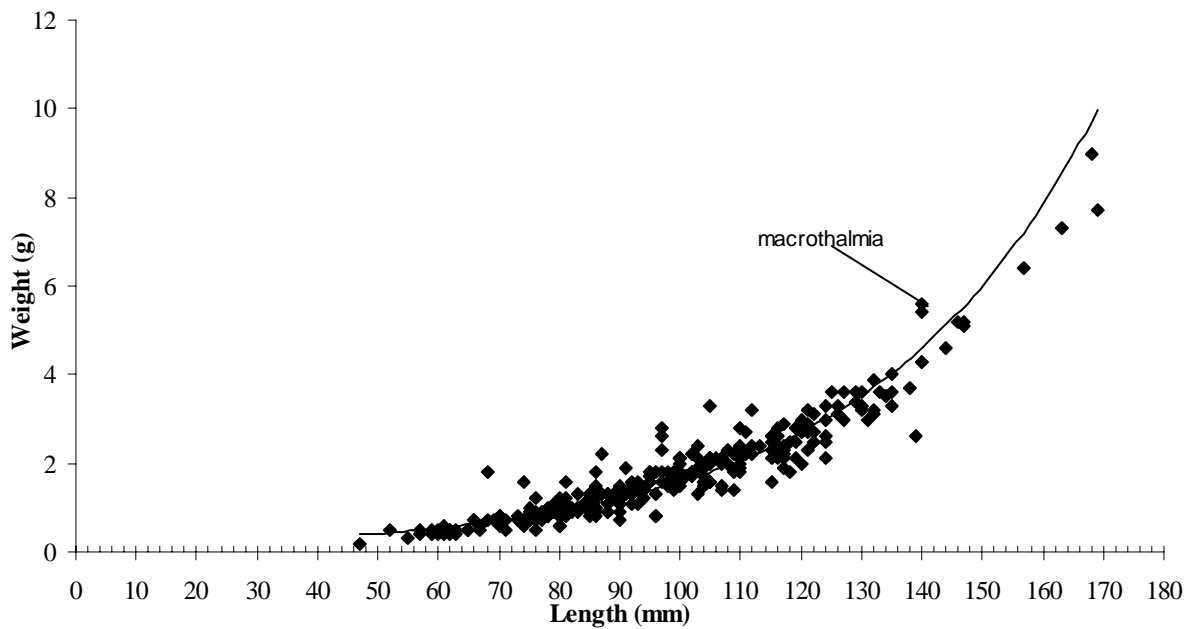


Figure 10. Pacific lamprey ammocoete and macrothalmia (electroshocked) length and weight relationship, (N=301) South Fork Clearwater River, ID, 2000-01.

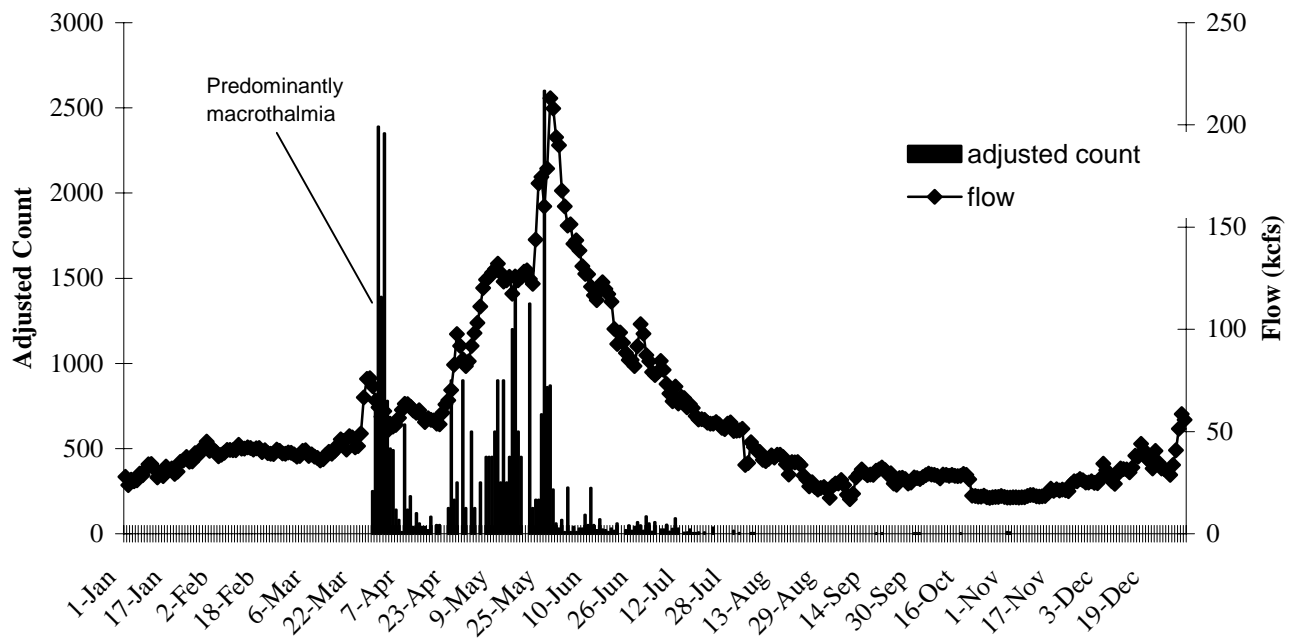


Figure 11. Pacific lamprey ammocoete and macrothalmia adjusted bypass/collection count and Snake River flows, Lower Granite Dam, WA, 1998.

DISCUSSION

It is not known if Pacific lamprey densities observed in 2000-02 reflect overall low population numbers in the S.F. Clearwater River drainage. The number of spawning adults in the S.F. Clearwater River basin is suspected to have totaled fewer than 50 Pacific lamprey annually 1998-2001. The S.F. Clearwater River estimated spawning adult escapement is based on Lower Granite dam passage of less than 320 adults in the 1998-2001 period and assumption of even distribution of Pacific lamprey adults into the Grande Ronde, Imnaha, Salmon, and Clearwater Rivers with one-half of Clearwater River drainage spawners returning to the S.F. Clearwater River.

Presence-absence sampling in 2000-2002 in the S.F. Clearwater River basin indicates distribution of Pacific lamprey in the basin is restricted to the mainstem S.F. Clearwater River and the lower Red River. Suitable habitat remains in the upper Red River, Newsome Creek, American River, and Crooked River, but Pacific lamprey ammocoetes and macrothemia were not found. Pacific lamprey ammocoete distribution in the Selway River and Lochsa River drainages was limited to mainstem reaches. Of the 70 sites sampled in the Clearwater River basin in 2002, only 15 produced Pacific lamprey. Population numbers are minimal and distribution restricted to the remaining preferred habitat in the entire Clearwater River basin.

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APPENDIX A

Table A1. Pacific lamprey length, weight, and mark information from Red River, ID, 2002.

Date	Km/	Habitat	Area	Time	Lamprey	Lamprey	Length	Weight	Mark ¹	Phase ²
Electrofished	Reach	Type	Fished (m ²)	Fished (Min.)	Captured	Measured	(mm)	(g)		
8/10/2002	06/03	RIP	288.62	224	43	43	126	2.6	NO MARK	U
8/10/2002	06/03	RIP					114	2.5	NO MARK	U
8/10/2002	06/03	RIP					150	5.6	NO MARK	U
8/10/2002	06/03	RIP					137	3.9	NO MARK	U
8/10/2002	06/03	RIP					149	5.2	NO MARK	U
8/10/2002	06/03	RIP					152	5.1	NO MARK	U
8/10/2002	06/03	RIP					130	3.6	NO MARK	U
8/10/2002	06/03	RIP					115	2.2	NO MARK	U
8/10/2002	06/03	RIP					105	1.4	NO MARK	U
8/10/2002	06/03	RIP					146	5.0	NO MARK	U
8/10/2002	06/03	RIP					126	3.0	NO MARK	U
8/10/2002	06/03	RIP					140	4.1	NO MARK	U
8/10/2002	06/03	RIP					116	2.0	NO MARK	U
8/10/2002	06/03	RIP					145	4.7	NO MARK	U
8/10/2002	06/03	RIP					131	3.7	NO MARK	U
8/10/2002	06/03	RIP					123	2.7	NO MARK	U
8/10/2002	06/03	RIP					100	1.6	NO MARK	U
8/10/2002	06/03	RIP					140	4.5	NO MARK	U
8/10/2002	06/03	RIP					132	3.8	NO MARK	U
8/10/2002	06/03	RIP					119	2.3	NO MARK	U
8/10/2002	06/03	RIP					104	1.8	NO MARK	U
8/10/2002	06/03	RIP					95	1.4	NO MARK	U
8/10/2002	06/03	RIP					116	2.2	NO MARK	U
8/10/2002	06/03	RIP					124	3.0	NO MARK	U
8/10/2002	06/03	RIP					134	3.4	NO MARK	U
8/10/2002	06/03	RIP					134	3.3	NO MARK	U
8/10/2002	06/03	RIP					129	3.2	NO MARK	U
8/10/2002	06/03	RIP					105	1.9	NO MARK	U
8/10/2002	06/03	RIP					124	2.8	NO MARK	U
8/10/2002	06/03	RIP					111	2.2	NO MARK	U
8/10/2002	06/03	RIP					136	3.2	NO MARK	U
8/10/2002	06/03	RIP					104	1.8	NO MARK	U
8/10/2002	06/03	RIP					130	3.3	NO MARK	U
8/10/2002	06/03	RIP					150	5.4	NO MARK	U
8/10/2002	06/03	RIP					125	2.9	NO MARK	U
8/10/2002	06/03	RIP					123	2.9	NO MARK	U
8/10/2002	06/03	RIP					111	2.3	NO MARK	U
8/10/2002	06/03	RIP					105	1.9	NO MARK	U
8/10/2002	06/03	RIP					117	2.8	NO MARK	U
8/10/2002	06/03	RIP					126	3.2	NO MARK	U
8/10/2002	06/03	RIP					136	4.0	NO MARK	U
8/10/2002	06/03	RIP					130	3.6	NO MARK	U
8/10/2002	06/03	RIP					134	3.8	NO MARK	U
8/11/2002	06/03	LSP	110.95	162	169	168	153	5.7	NO MARK	U
8/11/2002	06/03	LSP					120	2.6	NO MARK	U

1. RCO-Right center orange

2. T-transformed; U-transformed

Table A1. (con't).

Date	Km/	Habitat	Area	Time	Lamprey	Lamprey	Length	Weight	Mark ¹	Phase ²
Electrofished	Reach	Type	Fished (m ²)	Fished (Min.)	Captured	Measured	(mm)	(g)		
8/11/2002	06/03	LSP					110	2.2	NO MARK	U
8/11/2002	06/03	LSP					129	3.0	NO MARK	U
8/11/2002	06/03	LSP					111	2.7	NO MARK	U
8/11/2002	06/03	LSP					134	3.7	NO MARK	U
8/11/2002	06/03	LSP					116	2.6	NO MARK	U
8/11/2002	06/03	LSP					111	2.2	NO MARK	U
8/11/2002	06/03	LSP					125	3.1	NO MARK	U
8/11/2002	06/03	LSP					114	2.1	NO MARK	U
8/11/2002	06/03	LSP					127	3.4	NO MARK	U
8/11/2002	06/03	LSP					112	1.6	NO MARK	U
8/11/2002	06/03	LSP					120	2.7	NO MARK	U
8/11/2002	06/03	LSP					134	3.8	NO MARK	U
8/11/2002	06/03	LSP					137	4.1	NO MARK	U
8/11/2002	06/03	LSP					126	na	NO MARK	U
8/11/2002	06/03	LSP					147	4.6	NO MARK	U
8/11/2002	06/03	LSP					136	4.5	NO MARK	U
8/11/2002	06/03	LSP					135	3.8	NO MARK	U
8/11/2002	06/03	LSP					121	2.7	NO MARK	U
8/11/2002	06/03	LSP					104	1.7	NO MARK	U
8/11/2002	06/03	LSP					108	1.9	NO MARK	U
8/11/2002	06/03	LSP					114	2.1	NO MARK	U
8/11/2002	06/03	LSP					99	1.9	NO MARK	U
8/11/2002	06/03	LSP					110	2.4	NO MARK	U
8/11/2002	06/03	LSP					106	2.2	NO MARK	U
8/11/2002	06/03	LSP					128	3.0	NO MARK	U
8/11/2002	06/03	LSP					141	4.6	NO MARK	U
8/11/2002	06/03	LSP					149	4.8	NO MARK	U
8/11/2002	06/03	LSP					139	4.3	NO MARK	U
8/11/2002	06/03	LSP					146	4.4	NO MARK	U
8/11/2002	06/03	LSP					142	4.6	NO MARK	U
8/11/2002	06/03	LSP					109	2.0	NO MARK	U
8/11/2002	06/03	LSP					104	1.9	NO MARK	U
8/11/2002	06/03	LSP					121	2.9	NO MARK	U
8/11/2002	06/03	LSP					109	2.0	NO MARK	U
8/11/2002	06/03	LSP					138	4.5	NO MARK	U
8/11/2002	06/03	LSP					90	1.4	NO MARK	U
8/11/2002	06/03	LSP					113	2.3	NO MARK	U
8/11/2002	06/03	LSP					106	1.7	NO MARK	U
8/11/2002	06/03	LSP					145	4.6	NO MARK	U
8/11/2002	06/03	LSP					143	4.7	NO MARK	U
8/11/2002	06/03	LSP					145	5.0	NO MARK	U
8/11/2002	06/03	LSP					129	3.3	NO MARK	U
8/11/2002	06/03	LSP					108	1.8	NO MARK	U
8/11/2002	06/03	LSP					103	1.6	NO MARK	U
8/11/2002	06/03	LSP					148	5.0	NO MARK	U

1 RCO-Right center orange

2 T-transformed; U-transformed

Table A1.(con't.)

Date	Km/	Habitat	Area	Time	Lamprey	Lamprey	Length	Weight	Mark ¹	Phase ²
Electrofished	Reach	Type	Fished (m ²)	Fished (Min.)	Captured	Measured	(mm)	(g)		
8/11/2002	06/03	LSP					109	2.0	NO MARK	U
8/11/2002	06/03	LSP					120	3.0	NO MARK	U
8/11/2002	06/03	LSP					112	2.3	NO MARK	U
8/11/2002	06/03	LSP					117	2.6	NO MARK	U
8/11/2002	06/03	LSP					111	2.1	NO MARK	U
8/11/2002	06/03	LSP					114	2.5	NO MARK	U
8/11/2002	06/03	LSP					106	2.5	NO MARK	U
8/11/2002	06/03	LSP					107	1.8	NO MARK	U
8/11/2002	06/03	LSP					104	1.8	NO MARK	U
8/11/2002	06/03	LSP					96	1.6	NO MARK	U
8/11/2002	06/03	LSP					111	2.1	NO MARK	U
8/11/2002	06/03	LSP					107	1.7	NO MARK	U
8/11/2002	06/03	LSP					121	2.7	NO MARK	U
8/11/2002	06/03	LSP					140	5.1	NO MARK	U
8/11/2002	06/03	LSP					105	2.0	NO MARK	U
8/11/2002	06/03	LSP					143	4.2	NO MARK	U
8/11/2002	06/03	LSP					103	1.9	NO MARK	U
8/11/2002	06/03	LSP					118	2.8	NO MARK	U
8/11/2002	06/03	LSP					125	3.2	NO MARK	U
8/11/2002	06/03	LSP					137	4.6	NO MARK	U
8/11/2002	06/03	LSP					110	2.5	NO MARK	U
8/11/2002	06/03	LSP					112	2.6	NO MARK	U
8/11/2002	06/03	LSP					117	2.8	NO MARK	U
8/11/2002	06/03	LSP					141	4.2	NO MARK	U
8/11/2002	06/03	LSP					119	3.3	NO MARK	U
8/11/2002	06/03	LSP					102	1.7	NO MARK	U
8/11/2002	06/03	LSP					105	2.1	NO MARK	U
8/11/2002	06/03	LSP					131	3.7	NO MARK	U
8/11/2002	06/03	LSP					113	2.1	NO MARK	U
8/11/2002	06/03	LSP					126	3.6	NO MARK	U
8/11/2002	06/03	LSP					139	3.6	NO MARK	U
8/11/2002	06/03	LSP					130	--	NO MARK	U
8/11/2002	06/03	LSP					131	3.9	NO MARK	U
8/11/2002	06/03	LSP					111	2.1	NO MARK	U
8/11/2002	06/03	LSP					129	3.4	NO MARK	U
8/11/2002	06/03	LSP					120	2.9	NO MARK	U
8/11/2002	06/03	LSP					108	1.8	NO MARK	U
8/11/2002	06/03	LSP					122	2.4	NO MARK	U
8/11/2002	06/03	LSP					97	1.6	NO MARK	U
8/11/2002	06/03	LSP					124	3.2	NO MARK	U
8/11/2002	06/03	LSP					119	2.7	NO MARK	U
8/11/2002	06/03	LSP					129	3.3	NO MARK	U
8/11/2002	06/03	LSP					102	1.6	NO MARK	U
8/11/2002	06/03	LSP					105	2.1	NO MARK	U
8/11/2002	06/03	LSP					98	1.5	NO MARK	U

1 RCO-Right center orange

2 T-transformed; U-transformed

Table A1. (con't).

Date	Km/	Habitat	Area	Time	Lamprey	Lamprey	Length	Weight		
Electrofished	Reach	Type	Fished (m ²)	Fished (Min.)	Captured	Measured	(mm)	(g)	Mark ¹	Phase ²
8/11/2002	06/03	LSP					111	2.4	NO MARK	U
8/11/2002	06/03	LSP					115	2.5	NO MARK	U
8/11/2002	06/03	LSP					106	1.9	NO MARK	U
8/11/2002	06/03	LSP					99	1.5	NO MARK	U
8/11/2002	06/03	LSP					108	2.0	NO MARK	U
8/11/2002	06/03	LSP					94	1.7	NO MARK	U
8/11/2002	06/03	LSP					107	2.2	NO MARK	U
8/11/2002	06/03	LSP					104	1.9	NO MARK	U
8/11/2002	06/03	LSP					99	1.8	NO MARK	U
8/11/2002	06/03	LSP					113	2.7	NO MARK	U
8/11/2002	06/03	LSP					97	2.0	NO MARK	U
8/11/2002	06/03	LSP					142	5.2	NO MARK	U
8/11/2002	06/03	LSP					128	3.9	NO MARK	U
8/11/2002	06/03	LSP					107	2.0	NO MARK	U
8/11/2002	06/03	LSP					134	4.1	NO MARK	U
8/11/2002	06/03	LSP					105	2.1	NO MARK	U
8/11/2002	06/03	LSP					148	5.6	NO MARK	U
8/11/2002	06/03	LSP					108	2.2	NO MARK	U
8/11/2002	06/03	LSP					128	3.3	NO MARK	U
8/11/2002	06/03	LSP					144	4.6	NO MARK	U
8/11/2002	06/03	LSP					130	3.7	NO MARK	U
8/11/2002	06/03	LSP					131	3.9	NO MARK	U
8/11/2002	06/03	LSP					123	3.1	NO MARK	U
8/11/2002	06/03	LSP					109	2.0	NO MARK	U
8/11/2002	06/03	LSP					136	4.1	NO MARK	U
8/11/2002	06/03	LSP					100	1.7	NO MARK	U
8/11/2002	06/03	LSP					106	2.1	NO MARK	U
8/11/2002	06/03	LSP					110	2.4	NO MARK	U
8/11/2002	06/03	LSP					94	1.4	NO MARK	U
8/11/2002	06/03	LSP					96	1.8	NO MARK	U
8/11/2002	06/03	LSP					100	1.8	NO MARK	U
8/11/2002	06/03	LSP					119	2.8	NO MARK	U
8/11/2002	06/03	LSP					100	1.8	NO MARK	U
8/11/2002	06/03	LSP					134	4.1	NO MARK	U
8/11/2002	06/03	LSP					132	4.0	NO MARK	U
8/11/2002	06/03	LSP					150	5.4	NO MARK	U
8/11/2002	06/03	LSP					111	2.3	NO MARK	U
8/11/2002	06/03	LSP					103	1.8	NO MARK	U
8/11/2002	06/03	LSP					97	1.6	NO MARK	U
8/11/2002	06/03	LSP					124	3.2	NO MARK	U
8/11/2002	06/03	LSP					97	1.5	NO MARK	U
8/11/2002	06/03	LSP					113	2.2	NO MARK	U
8/11/2002	06/03	LSP					103	2.0	NO MARK	U
8/11/2002	06/03	LSP					107	2.2	NO MARK	U
8/11/2002	06/03	LSP					105	2.2	NO MARK	U

1 RCO-Right center orange

2 T-transformed; U-untransformed

Table A1. (con't).

Date	Km/	Habitat	Area	Time	Lamprey	Lamprey	Length	Weight	Mark ¹	Phase ²
Electrofished	Reach	Type	Fished (m ²)	Fished (Min.)	Captured	Measured	(mm)	(g)		
8/11/2002	06/03	LSP					106	2.0	NO MARK	U
8/11/2002	06/03	LSP					137	4.6	NO MARK	U
8/11/2002	06/03	LSP					149	5.1	NO MARK	U
8/11/2002	06/03	LSP					134	4.0	NO MARK	U
8/11/2002	06/03	LSP					102	2.1	NO MARK	U
8/11/2002	06/03	LSP					139	4.4	NO MARK	U
8/11/2002	06/03	LSP					95	1.5	NO MARK	U
8/11/2002	06/03	LSP					na	na	NO MARK	U
8/11/2002	06/03	LSP					126	3.1	NO MARK	U
8/11/2002	06/03	LSP					147	5.1	NO MARK	U
8/11/2002	06/03	LSP					137	4.3	NO MARK	U
8/11/2002	06/03	LSP					134	4.1	NO MARK	U
8/11/2002	06/03	LSP					142	4.7	NO MARK	U
8/11/2002	06/03	LSP					125	2.8	NO MARK	U
8/11/2002	06/03	LSP					95	1.6	NO MARK	U
8/11/2002	06/03	LSP					132	3.7	NO MARK	U
8/11/2002	06/03	LSP					105	2.0	NO MARK	U
8/11/2002	06/03	LSP					104	1.9	NO MARK	U
8/11/2002	06/03	LSP					111	2.3	NO MARK	U
8/11/2002	06/03	LSP					103	1.9	NO MARK	U
8/11/2002	06/03	LSP					104	1.8	NO MARK	U
8/11/2002	06/03	LSP					119	2.6	NO MARK	U
8/11/2002	06/03	LSP					132	3.9	NO MARK	U
8/11/2002	06/03	LSP					101	1.7	NO MARK	U
8/11/2002	06/03	LSP					97	1.3	NO MARK	U
8/11/2002	06/03	LSP					115	2.4	NO MARK	U
8/11/2002	06/03	LSP					118	2.4	NO MARK	U
8/11/2002	06/03	LSP					100	1.5	NO MARK	U
8/11/2002	06/03	LSP					102	1.6	NO MARK	U
8/11/2002	06/03	LSP					102	1.6	NO MARK	U
8/11/2002	06/03	LSP					112	2.2	NO MARK	U
8/11/2002	06/03	LSP					103	2.0	NO MARK	U
8/13/2002	07/04	RIP	165.4	193	9	8	132	3.8	NO MARK	U
8/13/2002	07/04	RIP					139	4.1	NO MARK	U
8/13/2002	07/04	RIP					155	5.7	NO MARK	U
8/13/2002	07/04	RIP					114	2.4	NO MARK	U
8/13/2002	07/04	RIP					119	2.5	NO MARK	U
8/13/2002	07/04	RIP					113	2.6	NO MARK	U
8/13/2002	07/04	RIP					128	3.4	NO MARK	U
8/13/2002	07/04	RIP					128	3.5	NO MARK	U
8/22/2002	07/04	LSP	106.9	156	5	5	130	3.5	NO MARK	U
8/22/2002	07/04	LSP					111	2.4	NO MARK	U
8/22/2002	07/04	LSP					153	5.8	NO MARK	U
8/22/2002	07/04	LSP					142	4.8	NO MARK	U
8/22/2002	07/04	LSP					129	3.4	NO MARK	U

1 RCO-Right center orange

2 T-transformed; U-untransformed

Table A1. (con't).

Date	Km/	Habitat	Area	Time	Lamprey	Lamprey	Length	Weight	Mark ¹	Phase ²
Electrofished	Reach	Type	Fished (m ²)	Fished (Min.)	Captured	Measured	(mm)	(g)		
8/24/2002	07/04	RIF	104.0	204	2	0	na	na	NO MARK	U
8/24/2002	07/04	RIF					na	na	NO MARK	U
8/25/2002	05/07	LSP	196.5	356	36	34	123	2.8	NO MARK	U
8/25/2002	05/07	LSP					150	5.0	NO MARK	U
8/25/2002	05/07	LSP					139	3.8	NO MARK	U
8/25/2002	05/07	LSP					149	4.7	NO MARK	U
8/25/2002	05/07	LSP					127	3.0	NO MARK	U
8/25/2002	05/07	LSP					145	4.7	NO MARK	U
8/25/2002	05/07	LSP					129	3.5	NO MARK	U
8/25/2002	05/07	LSP					148	4.6	NO MARK	U
8/25/2002	05/07	LSP					135	4.0	NO MARK	U
8/25/2002	05/07	LSP					116	2.5	NO MARK	U
8/25/2002	05/07	LSP					149	5.0	NO MARK	U
8/25/2002	05/07	LSP					134	3.9	NO MARK	U
8/25/2002	05/07	LSP					143	4.7	NO MARK	U
8/25/2002	05/07	LSP					123	2.7	NO MARK	U
8/25/2002	05/07	LSP					127	3.3	NO MARK	U
8/25/2002	05/07	LSP					110	2.3	NO MARK	U
8/25/2002	05/07	LSP					140	4.3	NO MARK	U
8/25/2002	05/07	LSP					123	3.0	NO MARK	U
8/25/2002	05/07	LSP					148	5.5	NO MARK	U
8/25/2002	05/07	LSP					124	3.1	NO MARK	U
8/25/2002	05/07	LSP					127	3.3	NO MARK	U
8/25/2002	05/07	LSP					148	4.6	NO MARK	U
8/25/2002	05/07	LSP					119	2.8	NO MARK	U
8/25/2002	05/07	LSP					126	3.2	NO MARK	U
8/25/2002	05/07	LSP					125	3.1	NO MARK	U
8/25/2002	05/07	LSP					125	3.2	NO MARK	U
8/25/2002	05/07	LSP					115	2.9	NO MARK	U
8/25/2002	05/07	LSP					105	2.0	NO MARK	U
8/25/2002	05/07	LSP					119	2.8	NO MARK	U
8/25/2002	05/07	LSP					131	3.7	NO MARK	U
8/25/2002	05/07	LSP					117	2.6	NO MARK	U
8/25/2002	05/07	LSP					122	2.9	NO MARK	U
8/25/2002	05/07	LSP					124	3.1	NO MARK	U
8/25/2002	05/07	LSP					114	2.1	NO MARK	U
8/27/2002	05/07	RIF	78.0	72	10	10	125	3.1	NO MARK	U
8/27/2002	05/07	RIF					140	4.4	NO MARK	U
8/27/2002	05/07	RIF					147	4.7	NO MARK	U
8/27/2002	05/07	RIF					124	2.9	NO MARK	U
8/27/2002	05/07	RIF					118	2.9	NO MARK	U
8/27/2002	05/07	RIF					117	2.4	NO MARK	U
8/27/2002	05/07	RIF					144	4.7	NO MARK	U
8/27/2002	05/07	RIF					121	2.7	NO MARK	U
8/27/2002	05/07	RIF					126	2.9	NO MARK	U
8/27/2002	05/07	RIF					153	5.6	NO MARK	U

1. RCO – right center orange

2. T- transformed; U- untransformed

Table A2. Pacific lamprey length, weight, and mark information for S.F.Clearwater River, ID, 2002.

Date	Km/	Habitat	Area	Time	Lamprey	Lamprey	Length	Weight		
Electrofished	Reach	Type	(m ²)	(Min)	Captured	Measured	(mm)	(g)	Mark ¹	Phase ²
9/5/2002	49/na	LSP	~10.0	12	44	44	145	4.8	NO MARK	U
9/5/2002	49/na	LSP					142	4.5	NO MARK	U
9/5/2002	49/na	LSP					134	4.3	NO MARK	U
9/5/2002	49/na	LSP					104	1.5	NO MARK	U
9/5/2002	49/na	LSP					105	1.8	NO MARK	U
9/5/2002	49/na	LSP					135	2.5	NO MARK	U
9/5/2002	49/na	LSP					143	4.4	NO MARK	U
9/5/2002	49/na	LSP					95	--	NO MARK	U
9/5/2002	49/na	LSP					139	4.1	NO MARK	U
9/5/2002	49/na	LSP					128	4.0	NO MARK	U
9/5/2002	49/na	LSP					120	--	NO MARK	U
9/5/2002	49/na	LSP					121	3.2	NO MARK	U
9/5/2002	49/na	LSP					142	--	NO MARK	U
9/5/2002	49/na	LSP					109	1.9	NO MARK	U
9/5/2002	49/na	LSP					112	2.0	NO MARK	U
9/5/2002	49/na	LSP					134	3.8	NO MARK	U
9/5/2002	49/na	LSP					120	2.5	NO MARK	U
9/5/2002	49/na	LSP					122	2.6	NO MARK	U
9/5/2002	49/na	LSP					97	1.3	NO MARK	U
9/5/2002	49/na	LSP					119	2.1	NO MARK	U
9/5/2002	49/na	LSP					103	1.1	NO MARK	U
9/5/2002	49/na	LSP					92	0.9	NO MARK	U
9/5/2002	49/na	LSP					100	1.2	NO MARK	U
9/5/2002	49/na	LSP					129	3.0	NO MARK	U
9/5/2002	49/na	LSP		8			130	2.6	NO MARK	U
9/5/2002	49/na	LSP					137	4.0	NO MARK	U
9/5/2002	49/na	LSP					116	2.7	NO MARK	U
9/5/2002	49/na	LSP					125	3.5	NO MARK	U
9/5/2002	49/na	LSP					115	2.2	NO MARK	U
9/5/2002	49/na	LSP					141	4.7	NO MARK	U
9/5/2002	49/na	LSP					100	1.6	NO MARK	U
9/5/2002	49/na	LSP					132	3.8	NO MARK	U
9/5/2002	49/na	LSP					142	4.5	NO MARK	U
9/5/2002	49/na	LSP					107	1.6	NO MARK	U
9/5/2002	49/na	LSP					116	2.6	NO MARK	U
9/5/2002	49/na	LSP					139	3.2	NO MARK	U
9/5/2002	49/na	LSP					123	2.8	NO MARK	U
9/5/2002	49/na	LSP					118	2.8	NO MARK	U
9/5/2002	49/na	LSP					123	2.9	NO MARK	U
9/5/2002	49/na	LSP					117	2.4	NO MARK	U
9/5/2002	49/na	LSP					116	2.8	NO MARK	U
9/5/2002	49/na	LSP					87	0.9	NO MARK	U
9/5/2002	49/na	LSP					91	1.0	NO MARK	U
9/5/2002	49/na	LSP					89	1.0	NO MARK	U

1 RCO-Right center orange

2 T-transformed; U-untransformed

Table A2. (con't).

Date	Km/ Electrofished	Habitat Type	Area		Time		Lamprey Captured	Lamprey Measured	Length (mm)	Weight (g)	Mark ¹	Phase ²
			Fished (m ²)	Fished (Min)								
9/6/2002	40/na	LSP	10.0	13		63	63	92	1.2	NO MARK		U
9/6/2002	40/na	LSP						95	1.6	NO MARK		U
9/6/2002	40/na	LSP						107	2.3	NO MARK		U
9/6/2002	40/na	LSP						117	2.8	NO MARK		U
9/6/2002	40/na	LSP						88	1.0	NO MARK		U
9/6/2002	40/na	LSP						110	2.5	NO MARK		U
9/6/2002	40/na	LSP						95	1.4	NO MARK		U
9/6/2002	40/na	LSP						101	2.0	NO MARK		U
9/6/2002	40/na	LSP						94	--	NO MARK		U
9/6/2002	40/na	LSP						100	2.1	NO MARK		U
9/6/2002	40/na	LSP						120	2.6	NO MARK		U
9/6/2002	40/na	LSP						103	1.9	NO MARK		U
9/6/2002	40/na	LSP						92	1.3	NO MARK		U
9/6/2002	40/na	LSP						122	2.8	NO MARK		U
9/6/2002	40/na	LSP						111	2.0	NO MARK		U
9/6/2002	40/na	LSP						93	1.4	NO MARK		U
9/6/2002	40/na	LSP						104	1.8	NO MARK		U
9/6/2002	40/na	LSP						105	2.0	NO MARK		U
9/6/2002	40/na	LSP						112	2.4	NO MARK		U
9/6/2002	40/na	LSP						125	3.1	NO MARK		U
9/6/2002	40/na	LSP						77	0.8	NO MARK		U
9/6/2002	40/na	LSP						124	2.5	NO MARK		U
9/6/2002	40/na	LSP						128	--	NO MARK		U
9/6/2002	40/na	LSP						97	--	NO MARK		U
9/6/2002	40/na	LSP						89	0.8	NO MARK		U
9/6/2002	40/na	LSP						95	--	NO MARK		U
9/6/2002	40/na	LSP						104	1.6	NO MARK		U
9/6/2002	40/na	LSP						89	1.4	NO MARK		U
9/6/2002	40/na	LSP						111	2.3	NO MARK		U
9/6/2002	40/na	LSP						92	--	NO MARK		U
9/6/2002	40/na	LSP						95	1.7	NO MARK		U
9/6/2002	40/na	LSP						92	1.4	NO MARK		U
9/6/2002	40/na	LSP						107	2.0	NO MARK		U
9/6/2002	40/na	LSP						85	1.2	NO MARK		U
9/6/2002	40/na	LSP						112	2.5	NO MARK		U
9/6/2002	40/na	LSP						114	2.8	NO MARK		U
9/6/2002	40/na	LSP						98	1.7	NO MARK		U
9/6/2002	40/na	LSP						108	1.8	NO MARK		U
9/6/2002	40/na	LSP						104	--	NO MARK		U
9/6/2002	40/na	LSP						91	1.0	NO MARK		U
9/6/2002	40/na	LSP						117	--	NO MARK		U
9/6/2002	40/na	LSP						98	1.6	NO MARK		U
9/6/2002	40/na	LSP						109	2.2	NO MARK		U
9/6/2002	40/na	LSP						89	--	NO MARK		U
9/6/2002	40/na	LSP						111	--	NO MARK		U

1 RCO-Right center orange

2 T-transformed; U-untransformed

Table A2. (con't).

Date	Km/	Habitat	Area Fished	Time Fished	Lamprey Captured	Lamprey Measured	Length	Weight	Mark ¹	Phase ²
Electrofished	Reach	Type	(m ²)	(Min)			(mm)	(g)		
9/6/2002	40/na	LSP					100	2.0	NO MARK	U
9/6/2002	40/na	LSP					102	--	NO MARK	U
9/6/2002	40/na	LSP					105	--	NO MARK	U
9/6/2002	40/na	LSP					91	--	NO MARK	U
9/6/2002	40/na	LSP					114	--	NO MARK	U
9/6/2002	40/na	LSP					119	--	NO MARK	U
9/6/2002	40/na	LSP					105	--	NO MARK	U
9/6/2002	40/na	LSP					101	--	NO MARK	U
9/6/2002	40/na	LSP					113	--	NO MARK	U
9/6/2002	40/na	LSP					101	--	NO MARK	U
9/6/2002	40/na	LSP					118	--	NO MARK	U
9/6/2002	40/na	LSP					92	--	NO MARK	U
9/6/2002	40/na	LSP					91	--	NO MARK	U
9/6/2002	40/na	LSP					92	--	NO MARK	U
9/6/2002	40/na	LSP					110	--	NO MARK	U
9/6/2002	40/na	LSP					110	--	NO MARK	U
9/6/2002	40/na	LSP					96	--	NO MARK	U
9/6/2002	40/na	LSP					123	--	NO MARK	U

1 RCO-Right center orange

2 T-transformed; U-untransformed

Table A3. Pacific lamprey length, weight, and mark information for Selway River, ID, 2002.

Date	Km/ Reach	Habitat Type	Area		Time		Lamprey Captured	Lamprey Measured	Length (mm)	Weight (g)	Mark ¹	Phase ²
			Fished (m ²)	Fished (Min.)								
9/7/2002	150m up frm. Gedney Crk.	LSP	5.0	16		16		16	50	0.3	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							43	0.3	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							59	0.4	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							49	0.3	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							52	0.3	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							82	0.8	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							112	2.0	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							77	0.8	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							82	0.9	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							75	0.8	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							75	0.7	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							84	0.9	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							78	0.8	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							90	1.3	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							86	1.0	NO MARK	U
9/7/2002	150m up frm. Gedney Crk.	LSP							69	0.7	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP	5.0	13		45		45	52	0.3	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							54	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							58	0.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							61	0.5	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							49	0.2	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							58	0.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							94	1.2	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							51	0.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							61	0.6	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							56	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							56	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							59	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							55	0.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							57	0.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							47	0.2	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							97	1.5	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							125	2.7	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							111	1.7	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							116	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							105	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							105	1.9	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							99	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							100	1.7	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							122	2.7	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP							107	1.7	NO MARK	U

1 RCO-Right center orange

2 T-transformed; U-untransformed

Table A3. (con't).

Date	Km/	Habitat	Area	Time	Lamprey	Lamprey	Length	Weight	Mark ¹	Phase ²
Electrofished	Reach	Type	Fished (m ²)	Fished (Min.)	Captured	Measured	(mm)	(g)		
9/8/2002	100m up frm. Jnsn. Bar	LSP					118	2.2	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					92	1.1	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					98	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					124	2.9	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					116	2.7	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					124	2.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					101	1.6	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					98	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					88	1.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					87	1.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					114	--	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					91	1.5	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					89	1.2	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					103	1.6	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					89	1.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					96	1.5	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					91	1.6	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					111	2.3	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					95	1.4	NO MARK	U
9/8/2002	100m up frm. Jnsn. Bar	LSP					106	1.5	NO MARK	U

1. RCO-Right center orange

2. T-transformed; U-untransformed

Table A4. Pacific lamprey length, weight, and mark information for Lochsa River, ID, 2002.

Date	Km/	Habitat	Area	Time	Lamprey	Lamprey	Length	Weight	Mark ¹	Phase ²
Electrofished	Reach	Type	Fished (m ²)	Fished (Min.)	Captured	Measured	(mm)	(g)		
7/26/2002	.2km dwn. Gngr. Crk.	LSP	5.0	9	4	4	~>100,<180	--	NO MARK	U
7/26/2002	.2km dwn. Gngr. Crk.	LSP					~>100,<180	--	NO MARK	U
7/26/2002	.2km dwn. Gngr. Crk.	LSP					~>100,<180	--	NO MARK	U
7/26/2002	.2km dwn. Gngr. Crk.	LSP					~>100,<180	--	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP	5.0	12.5	12	12	118	2.9	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					96	1.7	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					107	2.7	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					75	1.4	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					109	2.3	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					102	2.4	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					53	--	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					116	2.2	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					117	--	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					88	--	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					109	2.4	NO MARK	U
7/27/2002	.1km up Castle Crk.	LSP					90	2.0	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP	2.0	11	38	38	105	1.9	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					120	3.0	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					79	0.9	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					63	0.6	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					71	0.7	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					63	0.7	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					105	2.1	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					71	0.9	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					99	1.7	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					75	0.9	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					104	1.9	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					46	0.2	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					65	0.7	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					68	0.8	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					92	1.6	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					122	3.5	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					54	0.4	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					104	1.9	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					119	2.7	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					105	2.1	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					57	0.8	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					98	1.6	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					89	1.4	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					73	0.7	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP					94	1.5	NO MARK	U

1 RCO-Right center orange

2 T-transformed; U-untransformed

Table A4. (con't).

Date Electrofished	Km/ Reach	Habitat Type	Area		Time		Lamprey Captured	Lamprey Measured	Length (mm)	Weight (g)	Mark ¹	Phase ²
			Fished (m ²)	Fished (Min.)								
7/28/2002	.1km dwn. Fire Crk.	LSP							56	0.5	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							84	1.0	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							85	1.2	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							105	1.9	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							112	2.4	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							63	--	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							67	0.8	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							77	0.9	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							71	0.9	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							51	0.2	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							45	0.2	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							74	0.8	NO MARK	U
7/28/2002	.1km dwn. Fire Crk.	LSP							52	0.3	NO MARK	U
9/26/2002	.1km dwn. Fire Crk.	na	na	na		6	6		39	--	NO MARK	U
9/26/2002	.1km dwn. Fire Crk.	na							40	--	NO MARK	U
9/26/2002	.1km dwn. Fire Crk.	na							40	--	NO MARK	U
9/26/2002	.1km dwn. Fire Crk.	na							44	--	NO MARK	U
9/26/2002	.1km dwn. Fire Crk.	na							39	--	NO MARK	U
9/26/2002	.1km dwn. Fire Crk.	na							46	--	NO MARK	U

1. RCO – Right center orange

2. T – Transformed; U - Untransformed

Table A5. Pacific lamprey presence-absence surveys in S.F. Clearwater River drainage, ID, 2002.

DATE	TIME	STREAM	RKM/DESCRIPT.	E.FISHED					
				AIR TEMP (°C)	STREAM TEMP (°C)	TIME (min)	LAMPREY CAPTURED	DEPTH AVE.(m)	SHADE (%)
6/13/2002	1120	Am. R.	.75km abv. trlhd. 443	na	10.0	7.5	0	0.750	not taken
6/13/2002	1235	Am. R.	.37km abv.trlhd. 443	na	12.0	5.0	0	0.363	not taken
6/14/2002	1050	W. Fk. Am. R.	.6mi. blw. Table Mdw.	na	6.0	9.0	0	0.288	100
6/14/2002	1328	Am. R.	100m S. of cmpgrd.	na	14.0	8.0	0	0.538	not taken
6/14/2002	1421	Am. R.	2km USFS rd. 443	na	15.0	6.0	0	0.638	not taken
6/14/2002	1522	Am. R.	1km blw. brdg. rd. 443	na	na	7.0	0	0.500	not taken
6/15/2002	1000	Little Elk	.1km blw. rd. 686.1	na	10.0	6.0	0	0.325	100
6/15/2002	1155	Am. R.	50m blw. rd. 1189 brdg.	na	14.0	8.0	0	0.375	not taken
6/15/2002	1404	Am. R.	1km blw. rd. 1189 brdg.	na	16.5	6.0	0	0.463	not taken
6/15/2002	1527	Am. R.	1km blw. Buffalo Gulch	na	15.5	6.0	0	0.288	not taken
7/2/2002	1109	Am. R.	2km up frm. mouth	20.0	14.0	7.0	0	0.425	not taken
8/8/2002	915	Am. R.	.5km up frm. mouth	7.0	11.0	6.0	0	0.275	not taken
9/5/2002	1026	S. F. C. R.	.2km abv. Cougar Crk.	16.0	14.5	12.0	24	<1.00, > .200	not taken
9/6/2002	950	S. F. C. R.	.3km abv. Nlsn. Cmpgrd.	14.5	14.0	13.0	50	est. .400	not taken

Table A6. Pacific lamprey presence-absence survey habitat descriptors in S.F. Clearwater River drainage, ID, 2002.

STREAM	RKM/DESCRIPT.	E. FISHED	DOMINANT SUBSTRATE					
		AREA (m ²)	SILT/ORG.	SAND	GRVL.	COBBLE	SM. BLDR.	LG. BLDR. OTHER
Am. R.	.75km abv. Trlhd. 443	5.0	3*		4*	2*	1*	
Am. R.	.37km abv.trlhd. 443	4.5	3*	1*	2*			
W. Fk. Am. R.	.6mi. blw. Table Mdw.	8.0		1*		2*		
Am. R.	100m S. of cmpgrd.	5.0		1*	2*			
Am. R.	2km USFS rd. 443	5.0	1*		2*			
Am. R.	1km blw. brdg. rd. 443	5.0			1*	2*		
Little Elk	.1km blw. rd. 686.1	5.0	3*	1*	2*			
Am. R.	50m blw. rd. 1189 brdg.	5.0		1*				
Am. R.	1km blw. rd. 1189 brdg.	5.0	2*	1*	2*			
Am. R.	1km blw. Buffalo Gulch	5.0		2*	1*	3*		
Am. R.	2km up frm. mouth	5.0		1*	3*	2*		
Am. R.	.5km up frm. mouth	5.0	3*	2*	1*			
S. F. C. R.	.2km abv. Cougar Crk.	10.0	10	90				
S. F. C. R.	.3km abv. Nlsn. Cmpgrd.	10.0	30			10	55	5

1* is the most abundant, 2* being the second most abundant, etc.

Table A7. Pacific lamprey presence-absence surveys in Selway River drainage, ID, 2002.

DATE	TIME	STREAM	RKM/DESCRIPT.	AIR TEMP (°C)	STREAM TEMP (°C)	E.FISHED		DEPTH AVE.(m)	SHADE (%)
						TIME (min)	LAMPREY CAPTURED		
7/11/2002	1044	Whitecap Crk.	1.5km up mouth	19.0	13.0	6	0	0.263	not taken
7/11/2002	1214	Selway R.	1.6km abv. Whitecap Crk. Brdg.	25.0	16.0	6	0	0.363	not taken
7/11/2002	1442	Selway R.	10m above L.Clrwtr R.	24.0	17.0	7	0	0.288	not taken
7/12/2002	1010	Selway R.	1.4km above L.Clrwtr R.	32.0	14.0	6	0	0.350	not taken
7/12/2002	1122	Deep Crk.	1km up frm. mouth	23.0	15.0	7	0	0.250	not taken
7/13/2002	927	Selway R.	120 m dwn. Whitecap Crk.	23.0	15.0	6	0	0.413	not taken
7/13/2002	1140	Indian Crk.	65m up from mouth	24.0	15.0	10	0	0.425	not taken
7/13/2002	1412	Lit. Clrwtr R.	140m up from mouth	23.0	15.0	7	0	0.588	100
7/13/2002	1624	Selway R.	1km abv. Magruder R.S.	23.0	16.0	6	0	0.263	not taken
7/29/2002	1010	Meadow Crk.	1km up from mouth	20.0	16.0	10	0	0.413	not taken
7/29/2002	1237	Gedney Crk.	50m up from mouth	16.0	14.0	8	0	0.325	not taken
9/7/2002	1137	Selway R.	150m abv. Gedney Crk.	15.0	16.5	16	16	0.238	not taken
9/8/2002	1113	Selway R.	100m abv. Jnsn. Bar	17.5	17.0	13	45	0.238	not taken
9/26/2002	na	Selway R.	Johnson Bar	--	15.0	--	3	--	not taken

Table A8. Pacific lamprey presence-absence survey habitat descriptors in Selway River drainage, ID, 2002.

		E. FISHED		DOMINANT SUBSTRATE					
STREAM	RKM/DESCRIPT.	AREA (m ²)	SILT/ORG.	SAND	GRVL.	COBBLE	SM. BLDR.	LG. BLDR.	OTHER
WhiteCap Crk.	1.5km up mouth	5.0		3*		2*	1*		
Selway R.	1.6km abv. WhiteCap Crk. Brdg.	5.0	2*	3*	4*	1*	5*		
Selway R.	10m above L.Clrwtr R.	5.0		2*	3*	1*			
Selway R.	1.4km above L.Clrwtr R.	5.0	2*	1*	3*				
Deep Crk.	1km up frm. mouth	5.0		2*		1*	3*		
Selway R.	120m dwn. WhiteCap Crk.	5.0	4*	1*	2*			3*	
Indian Crk.	65m up from mouth	5.0	4*		3*	2*	1*		
Lit. Clrwtr R.	140m up from mouth	5.0			3*	2*	1*	4*	
Selway R.	1km abv. Magruder R.S.	5.0		1*	2*		3*		
Meadow Crk.	1km up from mouth	5.0	2*	1*			3*		
Gedney Crk.	50m up from mouth	5.0		1*		4*	2*	3*	
Selway R.	150m abv. Gedney Crk.	5.0		20	10		55	8	7
Selway R.	100m abv. Jnsn. Bar	5.0		30		10	45	5	10
Selway R.	Johnson Bar	--	--	--	--	--	--	--	--

1* is the most abundant, 2* being the second most abundant, etc.

Table A9. Pacific lamprey presence-absence surveys in Lochsa River drainage, ID, 2002.

DATE	TIME	STREAM	RKM/DESCRIPT.	E.FISHED					
				AIR TEMP (°C)	STREAM TEMP (°C)	TIME (min)	LAMPREY CAPTURED	DEPTH AVE.(m)	SHADE (%)
7/15/2002	1010	Crooked Fk.	80m abv. Shtgn. Crk.	23.0	11.0	8.5	0	0.388	not taken
7/15/2002	1128	Shotgun Crk.	80m abv. Mouth	19.0	11.0	5.5	0	0.175	not taken
7/15/2002	1354	Brushy Fk.	Bvr. Rdg. L.O. Brdg.	21.0	15.0	6.0	0	0.350	not taken
7/16/2002	919	Lochsa R.	1km blw. Devoto Cdrs.	16.0	13.0	9.0	0	0.300	not taken
7/16/2002	1208	ColtKld. Crk.	1.4km abv. Mouth	19.0	15.0	9.0	0	0.200	not taken
7/16/2002	1514	Lochsa R	3km blw. Pwll. R.S.	27.0	17.0	6.0	0	0.263	not taken
7/25/2002	929	Lochsa R.	Whthse. Cmpgrd.	19.0	15.0	8.0	0	0.163	not taken
7/25/2002	1157	Squaw Crk.	.3km abv. mouth	25.0	14.0	5.0	0	0.300	not taken
7/25/2002	1403	Lochsa R	1.5km blw. Sqw. Crk.	22.0	18.0	4.0	0	0.188	not taken
7/26/2002	957	Lochsa R	.2km blw. mi.146	22.0	18.0	8.0	0	0.313	not taken
7/26/2002	1201	Lochsa R	.2km blw. Gngr. Crk.	26.0	18.0	9.0	4	0.288	not taken
7/27/2002	936	Lochsa R	.1km abv. Cstl. Crk.	17.0	17.0	12.5	12	0.350	not taken
7/28/2002	1144	Lochsa R	.1km blw. Fire Crk.	25.0	17.5	11.0	38	0.388	not taken
9/26/2002	na	Lochsa R	.1km Fire Crk.	na	12.5	na	6	na	not taken
7/30/2002	1341	P.O. Crk.	80m abv. hwy.12 brdg.	20.0	15.0	7.5	0	0.225	not taken

Table A10. Pacific lamprey presence-absence survey habitat descriptors in Lochsa River drainage, ID, 2002.

STREAM	RKM/DESCRIPT.	E. FISHED	DOMINANT SUBSTRATE						
		AREA (m ²)	SILT/ORG.	SAND	GRVL.	COBBLE	SM. BLDR.	LG. BLDR.	OTHER
Crooked Fk.	80m abv. Shtgn. Crk.	5.0		2*		3*		1*	
Shotgun Crk.	80m abv. Mouth	1.0			3*	2*	1*		
Brushy Fk.	Bvr. Rdg. L.O. Brdg.	5.0		2*			1*	3*	
Lochsa R.	1km blw. Devoto Cdrs.	5.0	2*	1*	3*		4*		
ColtKld. Crk.	1.4km abv. Mouth	5.0	1*	2*			3*	4*	
Lochsa R.	3km blw. Pwll. R.S.	5.0		2*		1*	3*		
Lochsa R.	Whthse. Cmpgrd.	5.0	1*			3*	2*		
Squaw Crk.	.3km abv. mouth	5.0		1*	3*	2*			
Lochsa R.	1.5km blw. Sqw. Crk.	1.0			3*	1*	2*		
Lochsa R.	.2km blw. mi.146	5.0	4*	2*		1*			
Lochsa R.	.2km blw. Gngr. Crk.	5.0	3*	3*		1*	2*		
Lochsa R.	.1km abv. Cstl. Crk.	5.0		1*	2*			2*	
Lochsa R.	.1km blw. Fire Crk.	est. 2.0	1*	2*					
Lochsa R.	just blw. Fire Crk.	na							
P.O. Crk.	80m abv. hwy.12 brdg.	5.0			1*	3*		2*	

1* is the most abundant, 2* being the second most abundant, etc.

Table A11. Pacific lamprey presence-absence surveys in Potlatch River drainage, ID, 2002.

DATE	TIME	STREAM	RKM/DESCRIPT.	E.FISHED					
				AIR TEMP (°C)	STREAM TEMP (°C)	TIME (min)	LAMPREY CAPTURED	DEPTH AVE.(m)	SHADE (%)
6/20/2002	1119	Potlatch R.	1mi. S. of Julietta	na	13.0	5	0	0.350	not taken
6/20/2002	1257	Potlatch R.	btwn Julietta & Kendrick	na	20.0	5	0	0.488	not taken
6/20/2002	1441	Potlatch R.	1.1km E. of Kendrick	na	22.0	5	0	0.638	not taken
6/20/2002	1704	Potlatch R.	80m blw. Rd. 1963	na	20.0	5	0	0.275	not taken
6/20/2002	1514	Potlatch R.	Deary-Kendrick hwy. brdg.	na	22.0	5	0	est .200	not taken
6/21/2002	1144	Potlatch R.	Ptlch. rd. brdg. E. of Kndrk.	na	19.0	6	0	0.488	not taken
6/24/2002	1531	Potlatch R.	Boulder Crk. Cmpgrd.	na	22.0	4	0	0.275	not taken
6/25/2002	1432	Big Bear Crk.	2.5km blw. Mscw.-Dry. hwy.	25.0	25.0	6	0	0.238	not taken
6/26/2002	1531	E.F.Ptlch. R.	2.5km abv. Mouth	30.0	24.0	7	0	0.250	not taken
6/26/2002	1322	E.F.Ptlch. R.	abv. Rd. 4707	30.0	18.0	5	0	0.350	not taken
6/27/2002	1132	Potlatch R.	2.5km abv. E. Fork	27.0	24.0	6	0	0.488	not taken
6/27/2002	1340	Potlatch R.	60m abv. Moose Crk.	27.0	23.0	5	0	0.475	not taken
6/27/2002	1443	Potlatch R.	1.5km abv. Jackson Crk.	27.0	20.0	7	0	0.438	not taken
7/1/2002	1224	Potlatch R.	1.5km blw. Pine Crk.	23.0	19.0	10	0	0.375	not taken
7/1/2002	1544	Potlatch R.	.4km blw. Juliaetta	23.0	24.0	7	0	0.450	not taken

Table A12. Pacific lamprey presence-absence survey habitat descriptors in Potlatch River drainage, ID, 2002.

STREAM	RKM/DESCRIPT.	E. FISHED	DOMINANT SUBSTRATE					
		AREA (m ²)	SILT/ORG.	SAND	GRVL.	COBBLE	SM. BLDR.	LG. BLDR. OTHER
Potlatch R.	1mi. S. of Julietta	5.0	3*		4*	2*	1*	
Potlatch R.	btwn Julietta & Kendrick	10.0		4*		1*	3*	2*
Potlatch R.	1.1km E. of Kendrick	5.0		2*	1*			
Potlatch R.	80m blw. Rd. 1963	5.0	3*		4*	2*	1*	
Potlatch R.	Deary-Kendrick hwy. brdg.	est. 5.0					1*	
Potlatch R.	Ptlch. rd. brdg. E. of Kndrk.	5.0	3*				2*	1*
Potlatch R.	Boulder Crk. Cmpgrd.	5.0	2*	1*				
Big Bear Crk.	2.5km blw. Mscw.-Dry. hwy.	5.0	3*		4*	2*	1*	
E.F.Ptlch. R.	2.5km abv. Mouth	5.0	1*		3*	2*		
E.F.Ptlch. R.	Abv. Rd. 4707	est. 5.0	1*					
Potlatch R.	2.5km abv. E. Fork	5.0	4*		3*	2*	1*	
Potlatch R.	60m abv. Moose Crk.	5.0	2*	3*	1*			
Potlatch R.	1.5km abv. Jackson Crk.	5.0	2*	3*	1*	4*		
Potlatch R.	1.5km blw. Pine Crk.	10.0			2*	1*		
Potlatch R.	.4km blw. Juliaetta	5.0				3*	2*	1*

1* is the most abundant, 2* being the second most abundant, etc.

Table A13. Habitat descriptors at locations of Pacific lamprey habitat sampling in Red River, ID, 2002.

				UNIT MEASUREMENTS						
HABITAT UNIT				LAMPREY	Length	Slope	Max Depth	Channel	Wetted	Area
(Km from Mouth)	DATE	TIME	CAPTURED	(m)	%	(m)	AVG (m)	AVG (m)	AVG (m)	(m ²)
LSP	LATERAL SCOUR POOL									
6.300-6.412	10-Aug-02	16:19 PM	169	19.5	0.25	0.80	17.6	6.1	119.0	
7.420-7.431	12-Aug-02	13:18 PM	5	11.0	0.50	0.60	17.4	10.4	113.9	
5.711-5.727	23-Aug-02	11:00 AM	36	15.5	0.50	0.50	15.0	13.0	201.5	
RIF	RIFFLE									
7.431-7.444	12-Aug-02	14:07 PM	2	13.0	0.75	0.60	17.3	15.5	268.2	
5.727-5.733	23-Aug-02	13:17 PM	10	6.0	1.00	0.35	15.8	13.0	205.4	
RIP	RIFFLE WITH POCKETS									
6.300-6.332	8-Aug-02	14:05 PM	43	32.0	0.50	0.50	17.6	15.7	470.3	
5.727-5.733	12-Aug-02	11:03 AM	9	25.0	0.50	0.65	18.0	15.5	388.2	

Table A14. Channel descriptions for habitat units surveyed for Pacific lamprey in Red River, ID, 2002.

HABITAT UNIT	Flow Velocity at Substrate (3, left to right bnk.) (m/s)			Flow Velocity 60% from substrate (3, left to right bnk.) (m/s)			STREAM SHADE					
	(Km from Mouth)	25%	50%	75%	25%	50%	75%	LEFT BNK	CNTR UP	CNTR DWN	RIGHT BNK	TOTAL
LSP												
6.300-6.412	0.120	0.360	0.050	0.130	0.400	0.030	0.0	3.0	1.5	7.5	12.0	
7.420-7.431	0.240	0.250	0.290	0.290	0.290	*	19.5	0.0	0.0	3.0	22.5	
5.711-5.727	0.351	0.277	0.040	0.472	0.414	0.151	7.5	1.5	0.0	22.5	31.5	
RIF												
7.431-7.444	0.285	0.378	0.348	*	*	*	1.5	0.0	0.0	1.5	3.0	
5.727-5.733	0.440	0.600	0.040	0.520	*	*	1.5	0.0	0.0	16.5	18.0	
RIP												
6.300-6.332	0.180	0.240	0.320	*	*	*	7.5	0.0	0.0	3.0	10.5	
5.727-5.733	0.194	0.030	0.220	*	0.033	*	9.0	0.0	1.5	7.5	18.0	
* Water too shallow for velocity to be taken												
** Flow less than lower limit of standard speed rotor												

Table A15. Stream substrate descriptions at habitat unit sample sites in Red River, ID, 2002.

HABITAT UNIT (Km from Mouth)	SUBSTRATE COMPOSITION %									BED
	LG.	SM.		COARSE	MED.	FINE	COARSE	FINE	SILT/	
	BLDR	BLDR	COBBLE	GRVL.	GRVL	GRVL	SAND	SAND	ORG.	ROCK
LSP										
6.300-6.412	0.5	6.5	39.0	12.0	9.0	6.0	11.0	14.0	2.0	
7.420-7.431	11.0	15.0	38.0	16.0	6.0	6.0	4.0	2.0	2.0	
5.711-5.727	3.0	23.0	33.0	16.0	6.0	6.0	5.0	4.0	4.0	
RIF										
7.431-7.444	4.0	9.0	31.0	15.0	11.0	8.0	11.0	5.0	6.0	
5.727-5.733	3.0	7.0	38.0	17.0	11.0	9.0	8.0	5.0	2.0	
RIP										
6.300-6.332	7.0	10.0	46.0	13.0	6.0	5.0	5.0	3.0	5.0	
5.727-5.733	5.0	7.5	46.0	15.0	7.0	7.0	6.0	4.0	2.5	