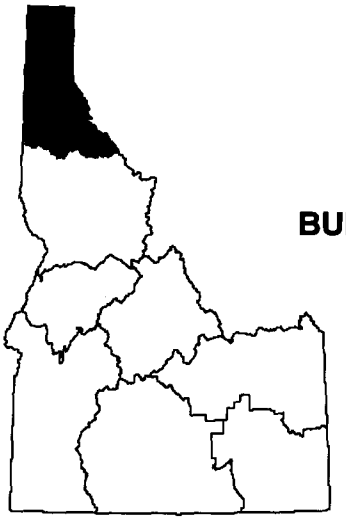
FISHERY MANAGEMENT INVESTIGATIONS

IDAHO DEPARTMENT OF FISH AND GAME
FISHERY MANAGEMENT ANNUAL REPORT

Calvin L. Groen, Director



PANHANDLE REGION
BULL TROUT REDD COUNTS
2004

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ABSTRACT

We conducted bull trout *Salvelinus confluentus* redd counts in tributaries of Priest River, Lake Pend Oreille, Kootenai River, St. Joe River, and Little North Fork of the Clearwater River in September and October 2004 to add to the long-term trend data set. These counts were used to estimate spawning run size, help with management strategies, assess restoration activities, and evaluate whether federal recovery goals were met in each of the core areas that occur in the Idaho Department of Fish and Game (IDFG) Panhandle Region.

We counted 23 bull trout redds in the Upper Priest Lake basin, 781 redds in the Lake Pend Oreille and Priest River drainage, 25 redds in the Kootenai River drainage, 79 redds in the St. Joe River drainage, and 44 redds in the Little North Fork of the Clearwater River drainage. Improving trends in bull trout redd abundance was apparent for the Lake Pend Oreille, Little North Fork Clearwater River, and St. Joe River basins whereas a decline in redd numbers was apparent in the Priest Lake basin. Redds have only been counted for three years in Idaho tributaries of the Kootenai River.

Five Federal Bull Trout Recovery core areas occur in the IDFG Panhandle. These are the Priest Lake, Lake Pend Oreille, Kootenai River, Coeur d'Alene Lake, and North Fork Clearwater River core areas. Four recovery goals must be met in each of the core areas before bull trout can be considered as recovered. Currently, none of the four of the federal recovery goals is being met in any of the bull trout core areas that occur in the IDFG Panhandle Region. If an increasing trend in bull trout abundance continues in the Lake Pend Oreille Core Area, it is believed it will meet all of its recovery goals in the near future. The Kootenai River Core Area may also reach all of its recovery goals once higher flows return to the basin. The Priest Lake and Coeur d'Alene Lake core areas do not meet any of their recovery goals and considerable efforts must occur before these bull trout populations will approach the current recovery goals.

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INTRODUCTION

Bull trout *Salvelinus confluentus* within the Klamath and Columbia River basins were listed as threatened on June 10, 1998 under the Endangered Species Act. Because of this listing, recovery plans for bull trout in specific geographic areas (recovery units) were developed by experts in the field (USFWS 2002). Each recovery unit is separated into core areas (river or lake basins), and for each core area, the plans describe conditions, define recovery criteria, and identify specific recovery actions for bull trout. The Panhandle Region of the Fish and Game encompasses part or all of the following recovery units: Clark Fork River, Kootenai River, Coeur d'Alene Lake basin, and Clearwater River. Core areas of these recovery units that occur in the Panhandle Region are Priest Lake, Lake Pend Oreille, Kootenai River, Coeur d'Alene Lake, and the North Fork Clearwater River (USFWS 2002).

The overall goal of the Bull Trout Draft Recovery Plan is to ensure the long-term persistence of self-sustaining, complex, interacting groups of bull trout distributed throughout the species' native range so that the species can be delisted (USFWS 2002). To accomplish this goal, the following recovery criteria addressing distribution, abundance, habitat, and connectivity were identified.

1. Maintain the current distribution of bull trout and restore their distribution in previously occupied areas.

2. Maintain stable or increasing trends in abundance of bull trout.

3. Restore and maintain suitable habitat conditions for all bull trout life history stages and strategies.

4. Conserve genetic diversity and provide opportunity for genetic exchange.

For core areas that occur within or overlap into the Idaho Department of Fish and Game (IDFG) Panhandle Region, the distribution and abundance recovery criteria will be met when the total number of stable local populations and the total number of adult bull trout have reached the levels indicated in Table 1.

Table 1. Abundance criteria required before bull trout can be considered as recovered in the following basins of Northern Idaho (USFWS 2002).

	Recovery Criteria		
Core Area	**Minimum Number of Local Populations That Have More Than 100 Adults**	**Minimum Number of Adults In The Entire Core Area**	**Trend In Abundance**
Priest Lake basin	5	1,000	Stable or Increasing
Lake Pend Oreille basin	6	2,500	Stable or Increasing
Kootenai River basin[a]	5	1,000	Stable or Increasing
Coeur d'Alene Lake basin	NA	1,100[b]	Stable or Increasing
North Fork Clearwater River basin[c]	11 (>100 Adults not required)	5,000	Stable or Increasing

[a] This core area includes tributaries in Idaho and Montana.

[b] This value is the desired annual spawning escapement - not the total number of adults in the core area. At least 800 must occur in the St. Joe River and 300 in the Coeur d'Alene River.

[c] Only the Little North Fork Clearwater River, a tributary of the North Fork Clearwater River basin, occurs in the Panhandle Region.

Trend recovery criteria will be met when the overall bull trout populations in specified core areas are accepted, under contemporary standards of the time, to be stable or increasing, based on at least 10 years of monitoring data.

Connectivity criteria will be met when migratory forms are present in all local populations and when intact migratory corridors among all local populations in the core area provide opportunity for genetic exchange and diversity.

Bull trout have been found to have a strong fidelity to their natal streams (Spruell et al. 1999); their redds are relatively easy to count (Pratt 1984), and redds are only a measure of the reproductive adults. These attributes make redd counts an appropriate technique for evaluating trends in adult bull trout population strength. In addition, redd counts are relatively quick and inexpensive to conduct when compared to other techniques such as weiring, netting, or electroshocking. For these reasons, the determination of the status of bull trout populations in each of the core areas will be evaluated through redd counts. Bull trout redds are being counted in each of the core areas in the IDFG Panhandle Region. These counts will not only allow us to evaluate the status of bull trout in each of the core areas as it pertains to recovery, but it will also help guide future management decisions and assess the success of recovery actions.

STUDY SITES

Bull trout redds were counted in tributaries of the Priest, Pend Oreille, Kootenai, St. Joe, and Little North Fork of the Clearwater drainages where bull trout are believed to spawn (Figures 1-6). These watersheds make up all or part of five different core areas that occur in the IDFG Panhandle Region (USFWS 2002). These core areas are Priest Lake, Lake Pend Oreille, Kootenai River, Coeur d'Alene Lake, and North Fork Clearwater River. The boundary of the Kootenai River and North Fork Clearwater River core areas include drainages outside of the Panhandle Region. Actual streams surveyed were dependent on available time and findings from previous surveys. Streams where no redds had been found over several consecutive years were often not surveyed to save time and/or allow more time to investigate new streams.

OBJECTIVES

1. Quantify bull trout redds and spawning escapement in Priest Lake, Lake Pend Oreille, Kootenai River, Coeur d'Alene Lake and North Fork Clearwater River core areas.

2. Assess whether bull trout abundance in each of the core areas meets recovery criteria outlined in the federal Bull Trout Draft Recovery Plan.

3. Explore new streams to determine if bull trout spawning is occurring there.

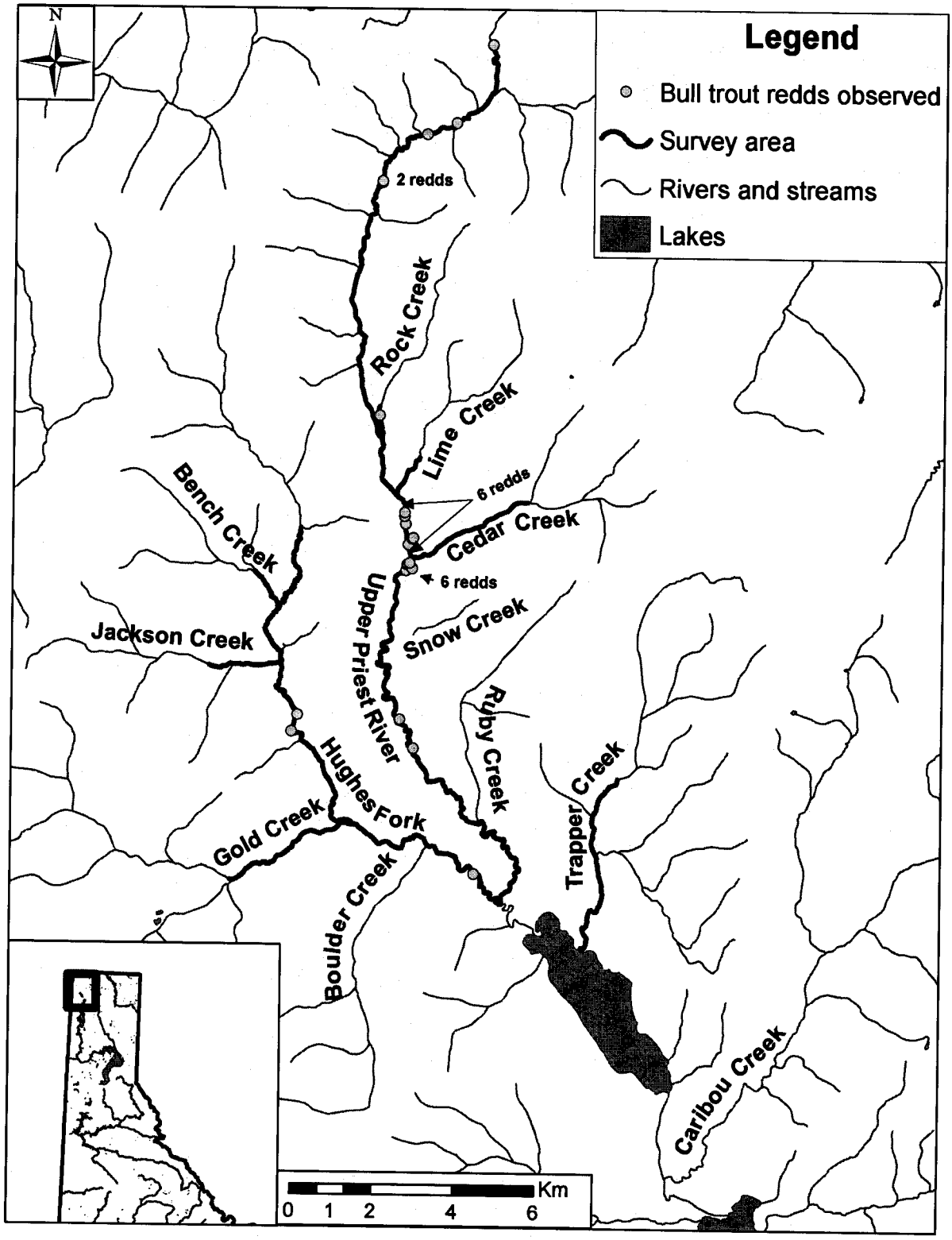

Figure 1. Stream reaches surveyed for bull trout redds in the Upper Priest Lake basin, Idaho, during September 27-30, 2004, and the locations of where redds were observed.

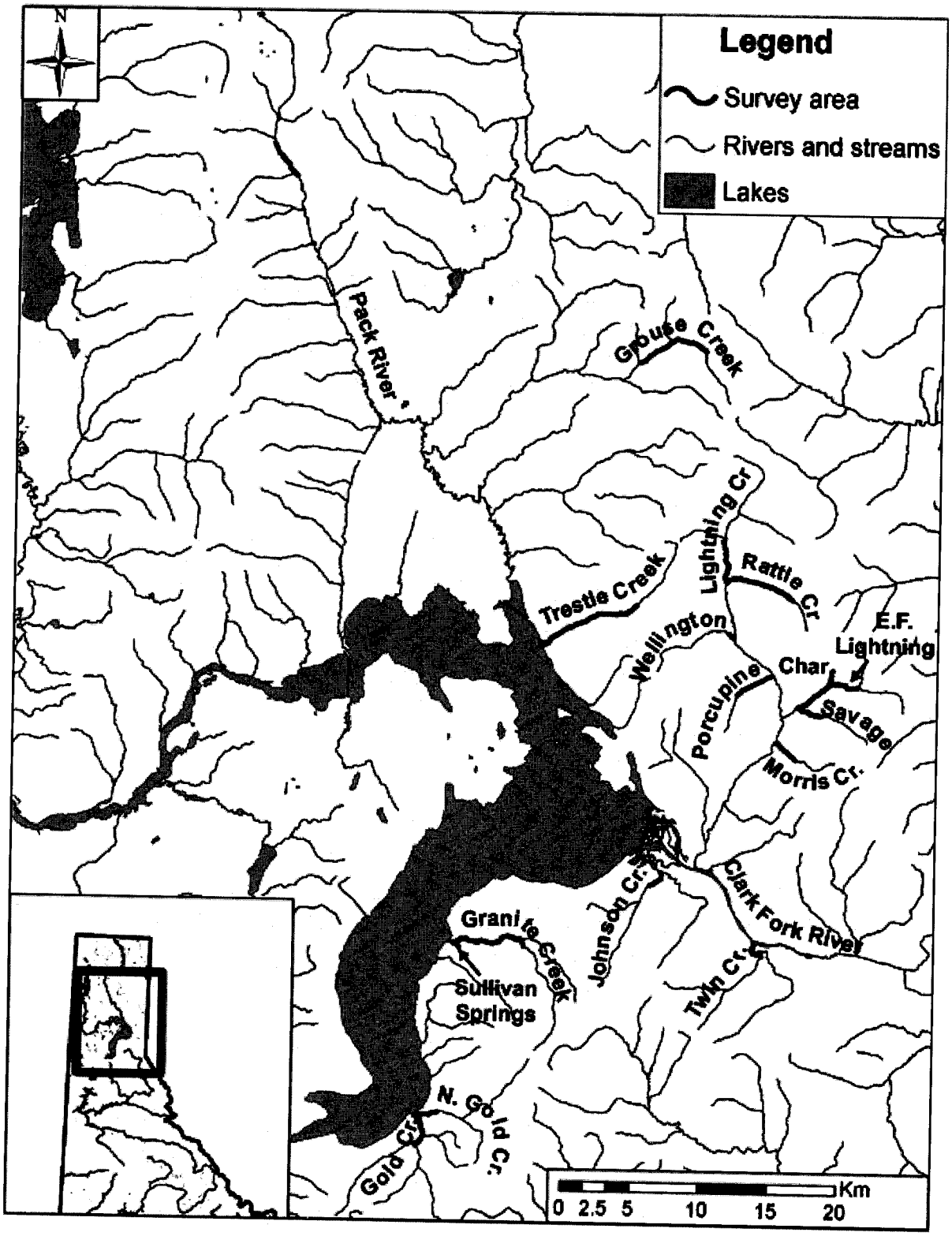

Figure 2. Stream reaches surveyed for bull trout redds in Lake Pend Oreille basin, Idaho on October 7-17, 2004.

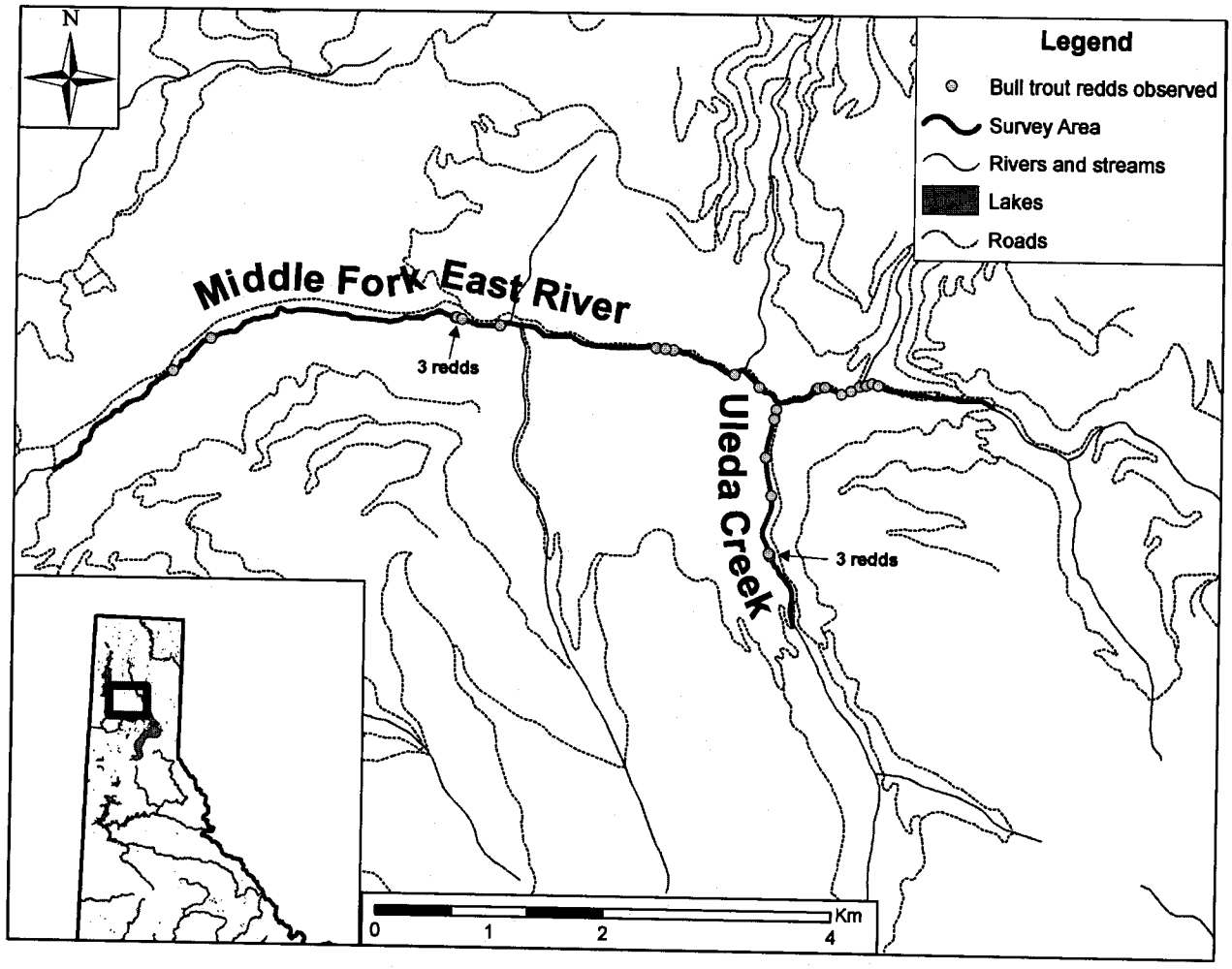

Figure 3. Stream reaches surveyed for bull trout redds in the Middle Fork East River basin, Idaho, on September 28, 2004, and the locations of where redds were observed.

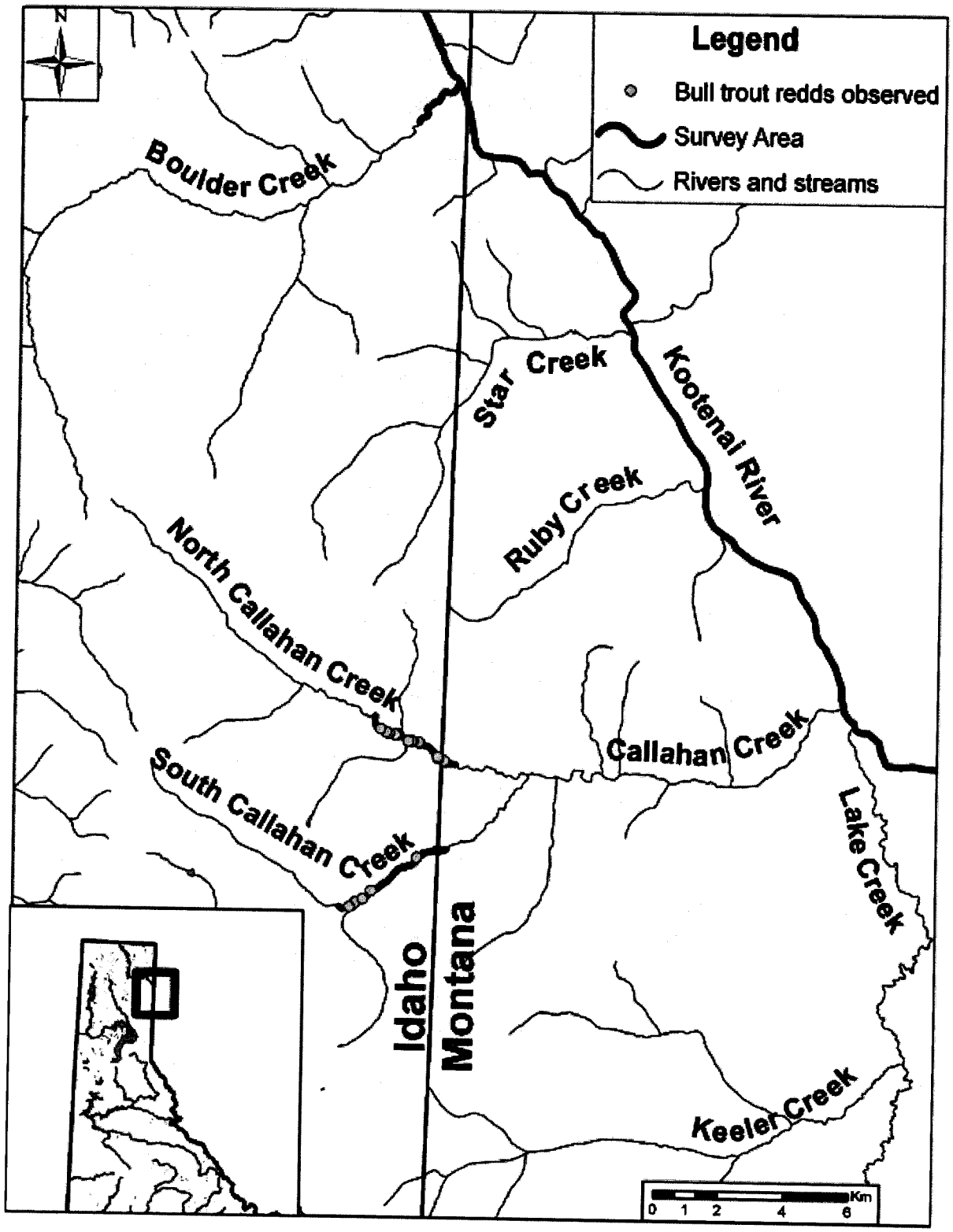

Figure 4. Stream reaches surveyed for bull trout redds in the Kootenai River basin, Idaho from September 29 and October 4, 2004, and the locations of where redds were observed.

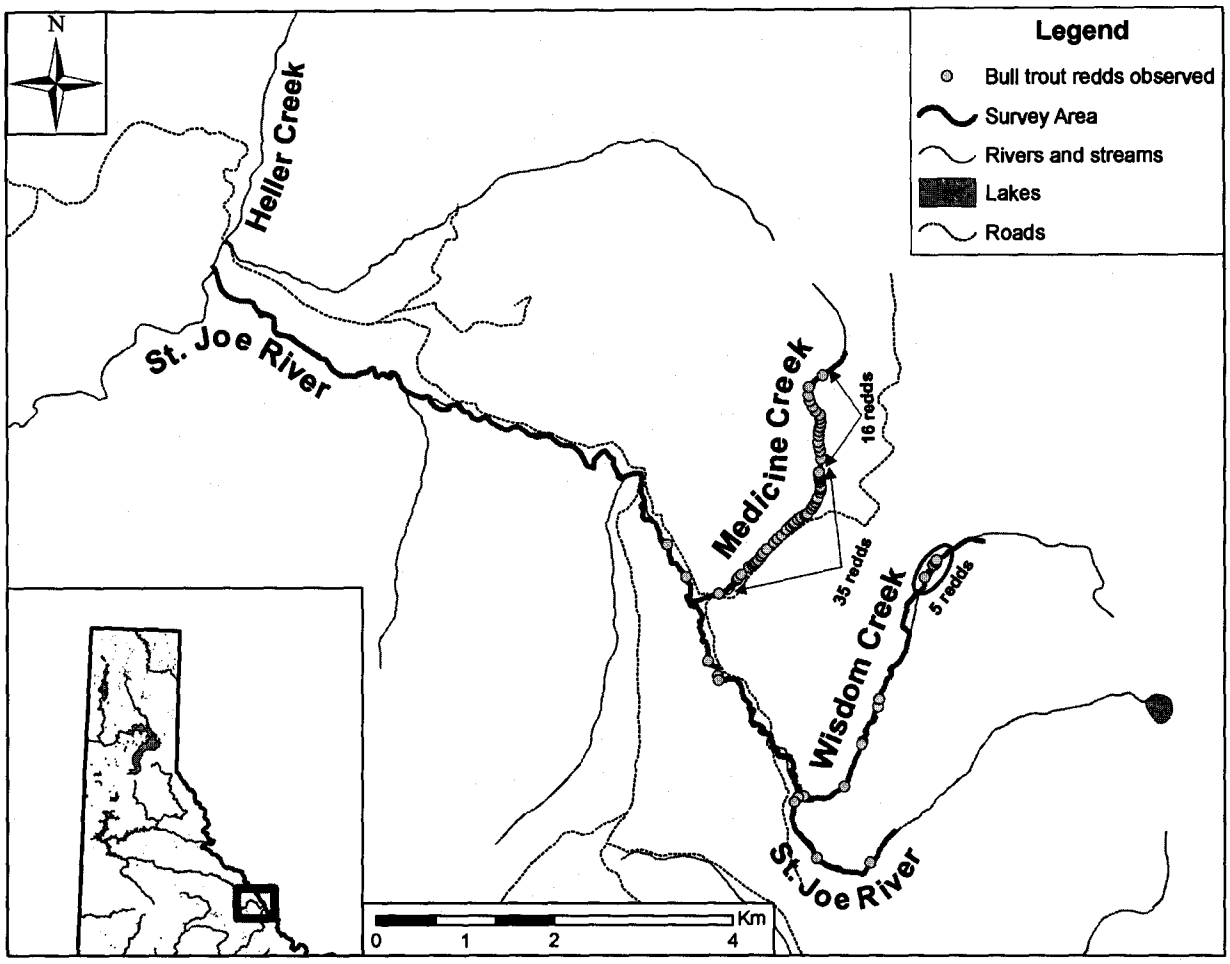

Figure 5. Stream reaches surveyed for bull trout redds in the St. Joe River, Idaho on September 22, 2004, and the locations where redds were observed.

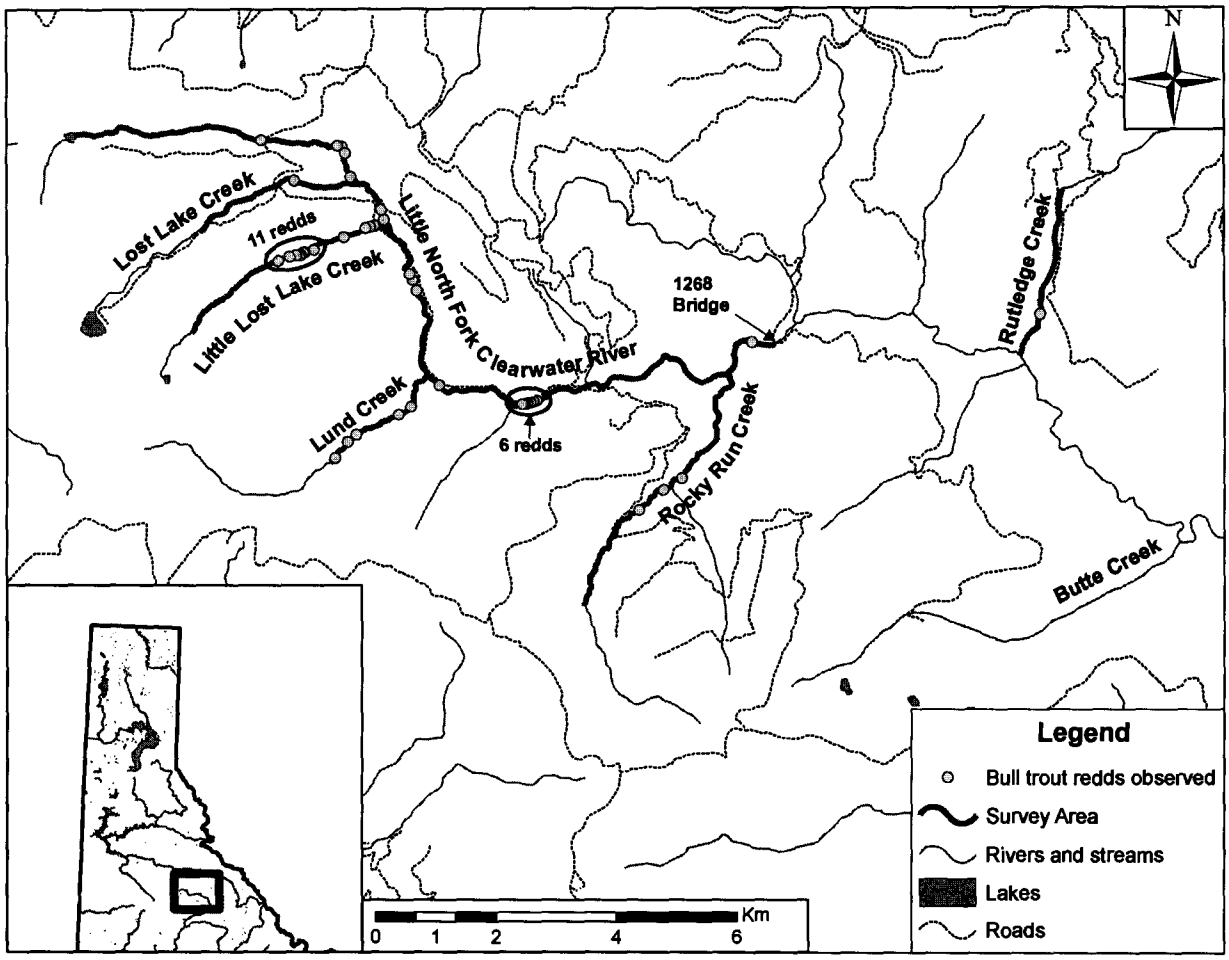

Figure 6. Stream reaches surveyed for bull trout redds in the Little North Fork Clearwater River basin, Idaho, on September 20 and 23, 2004, and the locations where redds were observed.

METHODS

Bull Trout Spawning Surveys

Bull trout redds were counted in selected tributaries of the Priest Lake, Priest River, Lake Pend Oreille, Kootenai River, St. Joe River, and Little North Fork of the Clearwater River basins where bull trout were known or believed to occur. Counts in each of these basins were summarized in the core area they occurred in. Redd counts in the Middle Fork East River, North Fork East River, and Uleda Creek (tributaries of Priest River) were added to the Lake Pend Oreille Core Area in 2003 when these bull trout were documented to spend their adult life in Lake Pend Oreille (DuPont et al. In Press b). All redds were counted at similar times (September and October) as had occurred in the past (DuPont et al. In Press c). Survey techniques and identification of bull trout redds followed the methodology described by Pratt (1984). Research has demonstrated the level of observer training and experience may influence the accuracy of redd counts (Bonneau and LaBar 1997; Dunham et al. 2001). To reduce

observer variability in bull trout redd counts, attempts were made to use only those individuals who attended a bull trout redd count training exercise on September 21, 2004. To add to our knowledge on preferred bull trout spawning areas and to help evaluate recovery efforts, the location of redds were recorded on maps and/or GPS units during redd counts. Sections of the Kootenai River and North Fork Clearwater core areas occurred outside the Panhandle Region. Redds count data for these areas were collected from the personnel responsible for conducting these surveys.

To help assess potential limiting factors, any manmade fish passage barriers noticed during the redd counts were documented. We also attempted to ascertain who the responsible parties were for the documented barriers.

Data Analysis

To estimate the spawning escapement or population abundance (depending on recovery area) of bull trout in streams, we used Downs and Jakubowski (2003) findings where on average, 2.9 adult bull trout entered tributaries of Lake Pend Oreille for every redd that was counted during annual redd count surveys. We decided to use this adult to redd ratio because this estimation came from one of the core areas in the Panhandle Region and because it is near the mid-point of two commonly used adult to redd ratios used to evaluate bull trout spawning escapement (2.2 adults/redd - Bonar et al. 1997; 3.2 adults/redd - Fraley and Shepherd 1998). Baxter and Westover (1999) and Downs and Jakubowski (2003) found that repeat spawning is common for adfluvial bull trout where 90-100% of the surviving bull trout spawned in consecutive years. For this reason we decided to use the total spawning escapement calculated from redd counts from the Priest, Pend Oreille, and Coeur d'Alene Lake core areas as an estimate for the total number of adults that occurred there. We recognize this will give us a conservative estimate, as bull trout in every tributary in the Panhandle do not spawn every year (DuPont et al., In Press b). The one exception to this is for the Little North Fork Clearwater, where research by Schriever and Schiff (2002) found that anywhere from 50-75% of the adult bull trout return to spawning grounds in consecutive years. Consequently, for the Little North Fork Clearwater we multiplied the spawning escapement by 1.33 (75% repeat spawners) to estimate how many adults occurred in the core area. The total number of adult bull trout associated with each tributary and each core area was compared to the criteria specified in the Bull Trout Draft Recovery Plan to determine the status of the different bull trout populations.

To evaluate whether the numbers of adult bull trout in each core area were stable or increasing, we used a linear regression with sample year as the independent variable and the number of redds as the dependent variable. Other studies have used regressions to evaluate whether bull trout populations were stable or increasing; however, in each of these cases they either used nonparametric techniques (Rieman and Myers 1997) or converted the redd counts using a $\log_e$ transformation (Maxell 1999). We decided not to convert the data or use nonparametric techniques because we believe it is easier for most individuals to visualize trends and understand how bull trout abundance is changing if the actual redd count data are used (no transformation or ranking of the data). Over time, if it seems other techniques are better suited to evaluate whether bull trout populations are stable or increasing, we are not opposed to changing our form of analysis.

For a simple linear regression, if the slope of the regression line is greater than or equal to zero and 10 or more years of redd count data exists, then a bull trout population can be considered stable or increasing. A significant ($P < 0.05$) slope of the regression line is preferred

before one determines that a particular population is stable or increasing; however, a statistically significant relationship is not necessary to come up with this conclusion. As the abundance of individuals in a population reaches its carrying capacity and/or stabilizes (slope of regression line near zero), it is impossible for a significant relationship to occur. When a statistically significant relationship ($P < 0.05$) does not occur, interpretation and professional judgment must be used to determine if the amount of variation seen around a regression line is too great for a particular population to be considered stable or increasing.

RESULTS

Priest Lake Core Area

A total of 23 bull trout redds were counted in the Upper Priest Lake basin from September 27-30, 2004 (Figure 1 and Table 2). The majority of these redds were counted in Upper Priest River (20 out of 23). Brook trout *Salvelinus fontinalis* and their redds have been observed in many of the streams we conduct redd counts in. In fact, a female bull trout was observed spawning with two male brook trout in the Upper Priest River. For this reason, any redds smaller than 350 mm in diameter were not included in the bull trout redd counts. We also surveyed the North Fork Indian Creek (a tributary to Priest Lake) but no redds were observed. The number of redds counted in 2004 is down from what was observed in 2003 (41 redds) and is over five times lower than what was counted in 1985 (Figure 7 and Table 2). Expanding the number of redds observed by 2.9 fish/redd, the spawning escapement of bull trout for the Upper Priest Lake basin is estimated to be 67 fish. This is considerably lower than the recovery goal of 1,000 adults for the Priest Lake basin (Table 3). A downward trend is evident in the abundance of bull trout in the Priest Lake Core Area, especially if one evaluates redds counted during 1985 and 1986 (Figure 7 and Table 4).

One manmade barrier was noted during our survey that we believe blocks upstream migration of bull trout. This barrier is a U.S. Forest Service culvert located where F.S. road 1013 crosses Gold Creek (T63N, R5W, Section 17).

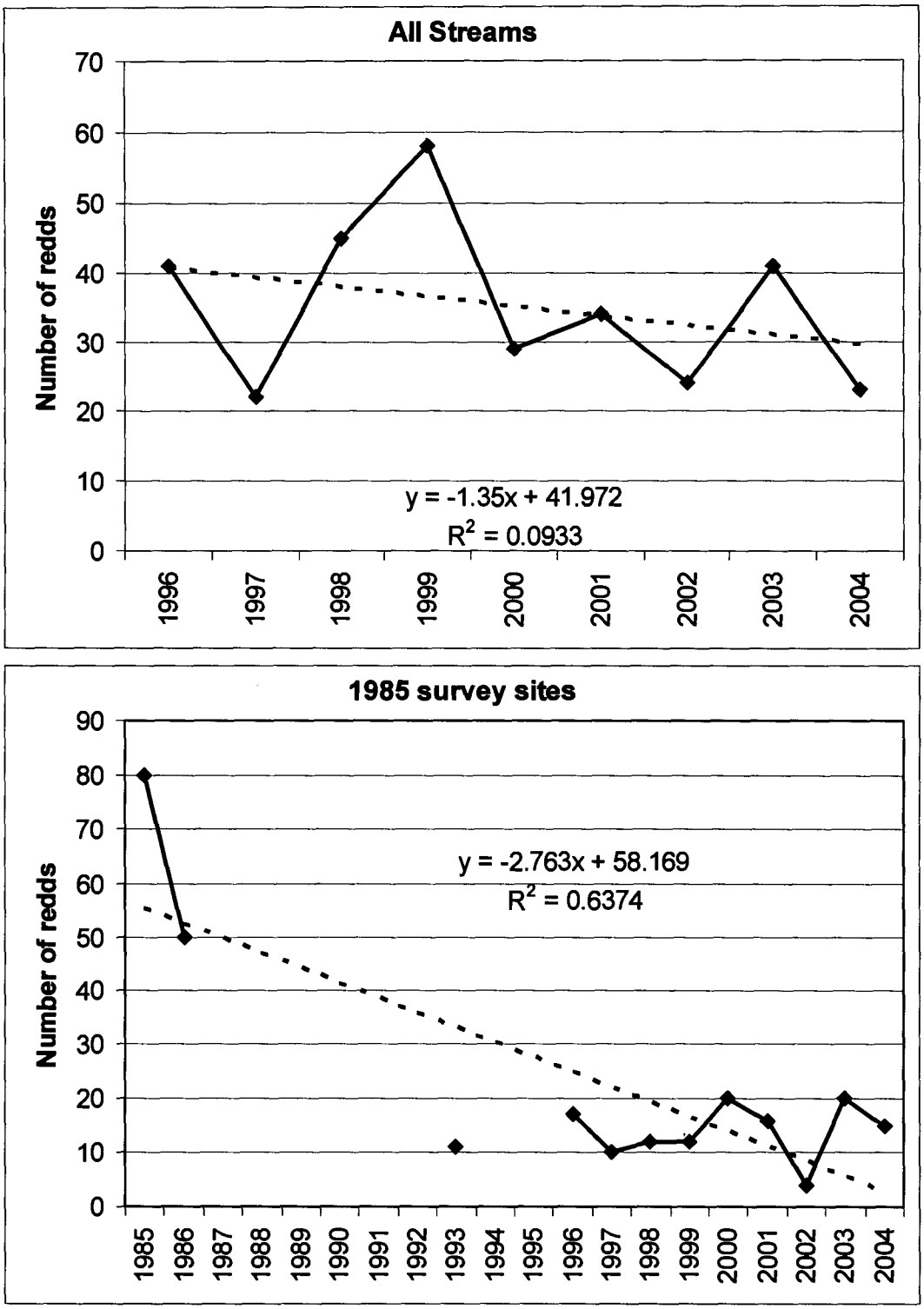

Figure 7. Linear regressions depicting trends in bull trout redd counts (all streams combined and only those sites surveyed during 1985) over time in the Priest Lake Core Area (Upper Priest Lake basin only), Idaho.

Table 2. Description of bull trout redd count transect locations, distance surveyed and number of redds counted in the Priest Lake basin, Idaho, from 1985 to 2004.

Stream	Transect Description	Length (km)	1985	1986	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Upper Priest River	Falls to Rock Cr.	12.5	—	—	—	—	—	—	15	4	15	33	7	7	17	8	5
	Rock Cr. to Lime Cr.	1.6	—	—	—	2	1	1	2	0	3	7	0	2	0	0	0
	Lime Cr. to Snow Cr.	4.2	12[a]	5[a]	—	3	4	2	8	1	10	9	9	5	1	16	12
	Snow Cr. to Hughes Cr.	11.0	—	—	—	0	0	—	0	3	7	4	2	8	3	13	2
	Hughes Cr. to Priest Lake	2.3	—	—	—	0	0	—	0	—	—	0	0	—	—	—	—
Rock Cr.	Mouth to F.S. trail 308	0.8	—	—	0	0	—	—	2	1	0	—	0	0	0	—	1
Lime Cr.	Mouth upstream 0.8 km	1.2	4[b]	1[b]	0	0	—	—	0	2	0	1	0	0	0	0	0
Cedar Cr.	Mouth upstream 1.6 km	3.4	—	—	—	0	2	1	0	1	0	0	0	0	0	0	0
Ruby Cr.	Mouth to waterfall	3.4	—	—	0	0	—	—	—	0	0	—	—	—	0	—	—
Hughes Cr.	Trail 312 to trail 311	2.5	1	17	7	3	2	0	1	4	0	1	0	0	0	1	0
	Trail 311 to F.S. road 622	4.0	35[c]	2[c]	2	0	7	1	2	0	0	0	0	0	0	1	2
	F.S. road 622 to mouth	7.1	4[d]	0[d]	—	1	—	—	2	3	1	0	2	6	1	0	1
Bench Cr.	Mouth upstream 0.8 km	1.1	1	2	0	2	2	0	1	0	0	0	0	0	0	0	0
Jackson Cr.	Mouth to F.S. trail 311	2.2	—	—	4	0	0	0	0	0	0	—	—	—	0	0	0
Gold Cr.	Mouth to culvert	3.7	24	23	5	2	6	5	3	0	1	1	9	5	2	2	0
Boulder Cr.	Mouth to waterfall	2.3	—	—	0	0	0	—	0	0	0	—	0	—	—	—	—
Trapper Cr.	Mouth upstream 5.0 km	5.0	—	—	—	4	4	2	5	3	8	2	0	1	0	0	0
Caribou Cr.	Mouth to old road crossing	2.6	—	—	—	1	0	0	0	0	0	—	—	—	—	—	—
All stream reaches combined		83.8	80[e]	48[e]	18	18	28	12[f]	41	22	45	58	29	34	24	41	23
Only those stream reaches evaluated during 1985-6		23.8[g]	80	48	14[h]	11	21[h]	8[f]	17	10	12	12	20	16	4	20	15

[a] Redds were counted from Lime Creek to Cedar Creek, which is about 1/2 the distance that is currently counted.
[b] Redds were counted from the mouth to FS road 1013, which is about 1/4 of the distance that is currently counted.
[c] About 2/3 of the distance was counted in 1985 and 1986 that is currently counted.
[d] Redds were counted from FS road 622 to the FS Road 1013, which is about 1/3 of the distance that is currently counted.
[e] Redds were counted in about 1/5 of the stream reaches where they are currently counted.
[f] Observation conditions impaired by high runoff.
[g] During 1985 and 1986 about 15 km of stream was counted.
[h] Two of the sites were not counted.

Table 3. The status of bull trout populations during 2004 in each of the core areas that occur in the Idaho Panhandle Region.

Core Area	2004 Adult Bull Trout Population Estimate	Recovery Goal	No. of Local Populations That Have More Than 100 Adults	Recovery Goal	Is This Population Stable or Increasing?	Have 10 or More Years of Data Been Collected?	Are There Streams That Have Known Manmade Barriers That Block Bull Trout Migrations?
Priest Lake	67	1000	1	5	no	yes	Yes - Gold Creek
Lake Pend Oreille	2305	2500	4	6	yes	yes	Yes – Cabinet Gorge and Albeni Falls dams
Kootenai River	465	1000	2	5	yes	yes	None in Idaho
Coeur d'Alene Lake	229	1100	1	NA	no	yes	Yes - Red Ives, Entente, Cascade and Bluebell
N.F. Clearwater River	436	5000	13[a]	11[a]	no	no	None in L.N.F. Clearwater

[a] A total of 100 adults or more are not required.

Table 4. Statistics for the linear regression of bull trout redds counted in different basins in bull trout recovery core areas included in the Idaho Panhandle Region during 2004.

Streams/Core Area	Years Evaluated	No. of Observations	R Value	R Square	P Value	Slope (Redd Coefficient)	Redd Standard Error
Upper Priest - 1985 sites	1985-2004	12	-0.798	0.637	0.002	-2.763	0.659
Upper Priest - all streams	1996-2004	9	-0.306	0.093	0.418	-1.350	1.590
Pend Oreille - index streams	1983-2004	20	0.082	0.007	0.793	1.141	3.285
Pend Oreille - index streams	1992-2004	12	0.529	0.280	0.082	13.626	6.908
Pend Oreille - all streams	1983-2004	16	-0.036	0.001	0.842	-0.725	5.318
Pend Oreille - all streams	1992-2004	12	0.819	0.671	0.001	25.740	5.705
Lightning Creek - all tributaries	1992-2004	12	0.708	0.501	0.010	6.367	2.008
Kootenai River - Idaho streams	2002-2004	3	0.277	0.077	0.822	3.000	10.392
Kootenai River - all streams	1996-2004	9	-0.047	0.002	0.895	-0.850	6.811
Kootenai River - three streams	1990-2004	15	0.527	0.278	0.045	5.225	2.334
St Joe River - index streams	1992-2004	13	0.428	0.183	0.149	1.923	1.224
St Joe River - all streams	1992-2004	13	0.064	0.004	0.850	0.291	1.367
LNF Clearwater - four streams	1996-2004	9	0.928	0.861	0.000	3.233	0.490
LNF Clearwater - all streams	2001-2004	4	0.536	0.287	0.468	2.100	2.339
NF Clearwater - all streams	2001-2004	4	0.011	0.000	0.993	0.100	6.593

Lake Pend Oreille Core Area

A total of 781 bull trout redds were counted in the Lake Pend Oreille Core Area during 2004, of which 462 (59%) were in the six index streams (Trestle, East Fork Lightning, Gold, North Gold, Johnson, and Grouse creeks) (Figure 2 and 3, and Table 5). This is the lowest percentage of redds that these six index streams have ever represented since these counts began in 1983. This is largely because Trestle Creek, which has consistently been the tributary with the most redds, had the lowest count ever and was about three or more times lower than what was counted between 2000 and 2003 (Table 5). The 781 redds counted in the Lake Pend Oreille Core Area is down from what was counted during 2002 (890) and 2003 (836), although it is above the 10 year average (679). Expanding the number of redds observed by 2.9 fish/redd, the spawning escapement of bull trout for Lake Pend Oreille Core Area is estimated to be 2,305 fish (this includes 40 fish passed upstream of Cabinet Gorge Dam) (Table 6). This is just below the recovery goal of 2,500 adults for the Lake Pend Oreille Core Area (Table 3). Five tributaries in the Pend Oreille basin had an estimated spawning escapement of 100 adults or at least 35 redds were counted (Table 5 and 6). The recovery goal states at least six populations with over 100 adults must occur in the Lake Pend Oreille Core Area (Table 3).

When the redd counts were evaluated from 1983 to 2004 (1986, 1988-91, and 1995 were not evaluated) the linear regression showed a slightly negative slope of -0.725 redds/year (Figure 8 and Table 4). However, if we only evaluate that data from 1992 to 2004 (1995 was not evaluated) a significant ($P = 0.001$) positive trend was calculated (25.7 redds/year).

Besides the dams located on the Pend Oreille River (Albeni Falls Dam) and Clark Fork River (Cabinet Gorge Dam, Noxon Rapids Dam, and Thompson Falls Dam), several other manmade migration barriers to bull trout were known to occur in the Lake Pend Oreille Core Area. This includes the city water diversion on Strong Creek, the hatchery and city water diversion on Spring Creek. Currently, spawning and rearing bull trout populations are not known to occur in Strong Creek and Spring Creek. A barrier (old log crossing) on Uleda Creek, which was a total block to upstream movement to bull trout, was blasted out in 2004 by the Idaho Department of Lands (funding was provided by the U.S. Fish and Wildlife Service). Removal of this barrier more than tripled the amount of spawning and rearing habitat in Uleda Creek. Four bull trout redds were counted upstream of this barrier in 2004.

In addition to these manmade barriers, excessive bedload deposition has caused channel intermittency on lower Lightning Creek, Rattle Creek, Savage Creek, East Fork Lightning Creek, and Granite Creek. We recognize bedload deposition is a natural process; however, we believe poor past timber management and poor road construction and maintenance practices have contributed to an increase in bedload deposition. This in turn is believed to increase the length and duration of the channel intermittency in these streams. Each of these streams support spawning and rearing bull trout populations and in the past over 100 adults historically ascended them. Plans are in progress on Granite Creek to restructure the stream in 2005 that should eliminate or reduce the intermittent flow issue.

Three different groupings of streams (all streams, index streams, and Lightning Creek tributaries) were evaluated separately to help evaluate why we are seeing improvements in the abundance of bull trout between 1992 and 2004. All three have increasing trends in redd counts since 1992, although the slope for all three is quite different (Table 4). When evaluating all streams combined (21 streams) there has been on average an increase of about 26 redds/year (slope). This averages out to about an increase of 1.2 redds/stream every year.

Table 5. Number of bull trout redds counted per stream in the Lake Pend Oreille, Idaho Core Area, from 1983 to 2004.

Stream	1983[a]	1984	1985	1986[b]	1987	1988	1989	1990	1991[c]	1992	1993	1994	1995[d]	1996	1997	1998	1999	2000	2001	2002	2003	2004
Clark Fork River	—	—	—	—	—	—	—	—	—	2	8	17	18	3	7	8	5	5	6	7	8	1
Lightning Cr.	28	9	46	14	4	—	—	—	—	11	2	5	0	6	0	3	16	4	7	8	8	9
East Fork	110	24	132	8	59	79	100	29	—	32	27	28	3	49	22	64	44	54	36	58	38	77
Savage Cr.	36	12	29	—	0	—	—	—	—	1	6	6	0	0	0	0	4	2	4	15	7	15
Char Cr.	18	9	11	0	2	—	—	—	—	9	37	13	2	14	1	16	17	11	2	8	7	14
Porcupine Cr.	37	52	32	1	9	—	—	—	—	4	6	1	2	0	0	0	4	4	0	0	5	10
Wellington Cr.	21	18	15	7	2	—	—	—	—	9	4	9	1	5	2	1	22	8	7	7	8	7
Rattle Cr.	51	32	21	10	35	—	—	—	—	10	8	0	1	10	2	15	13	12	67	33	37	34
Johnson Cr.	13	33	23	36	10	4	17	33	25	16	23	3	4	5	27	17	31	4	34	31	0	32
Twin Cr.	7	25	5	28	0	—	—	—	—	3	4	0	5	16	6	10	19	10	1	8	3	6
Morris Cr.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	0	7	1	1
Strong Creek	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	—	0
North Shore																						
Trestle Cr.	298	272	298	147	230	236	217	274	220	134	304	276	140	243	221	330	253	301	335	333	361	102
Pack River	34	37	49	25	14	—	—	—	—	65	21	22	0	6	4	17	0	8	28	22	24	31
Grouse Cr.	2	108	55	13	56	24	50	48	33	17	23	18	0	50	8	44	50	77	18	42	45	28
East Shore																						
Granite Cr.	3	81	37	37	30	—	—	—	—	0	7	11	9	47	90	49	41	25	7	57	101	149
Sullivan Springs	9	8	14	—	6	—	—	—	—	0	24	31	9	15	42	10	22	19	8	15	12	14
North Gold Cr.	16	37	52	8	36	24	37	35	41	41	32	27	31	39	19	22	16	19	16	24	21	56
Gold Cr.	131	124	111	78	62	111	122	84	104	93	120	164	95	100	76	120	147	168	127	203	126	167
Priest River																						
M. F. East River	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	8	21	20
Uleda Creek	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	4	3	7
N. F. East River																						1
Total 6 Index Streams[e]	570	598	671	290	453	478	543	503	423	333	529	516	273	486	373	597	541	623	566	691	591	462
Total of All Streams	814	881	930	412	555	478	543	503	423	447	656	631	320	608	527	726	705	732	710	890	836	781

[a] A significant portion of Grouse Creek was not counted.

[b] A significant portion of Rattle Creek and East Fork Lightning Creek were not counted.

[c] Represents partial counts due to early snowfall.

[d] Observation conditions impaired by high runoff.

[e] Index streams include Trestle, East Fork Lightning, Gold, North Gold, Johnson, and Grouse creeks.

Table 6. The estimated number of adult bull trout associated with each tributary where redds were counted in the Lake Pend Oreille, Idaho Core Area from 1983 to 2004. Stream counts shaded in gray indicate when over 100 adults were estimated to be present. Total counts shaded in gray indicate when the entire population exceeded 2,500 fish.

Stream	1983[a]	1984	1985	1986[b]	1987	1988	1989	1990	1991[c]	1992	1993	1994	1995[d]	1996	1997	1998	1999	2000	2001	2002	2003	2004[d]
Clark Fork River	—	—	—	—	—	—	—	—	—	6	23	49	52	9	20	23	15	15	17	20	23	3
Lightning Cr.	81	26	133	41	12	—	—	—	—	32	6	15	0	17	0	9	46	12	20	23	23	26
East Fork	319	70	383	23	171	229	290	84	—	93	78	81	9	142	64	186	128	157	104	168	140	223
Savage Cr.	104	35	84	—	0	—	—	—	—	3	17	17	0	0	0	0	12	6	12	44	20	44
Char Cr.	52	26	32	0	6	—	—	—	—	26	107	38	6	41	3	46	49	32	6	23	20	41
Porcupine Cr.	107	151	93	3	26	—	—	—	—	12	17	3	6	0	0	0	12	12	0	0	15	29
Wellington Cr.	61	52	44	20	6	—	—	—	—	26	12	26	3	15	6	3	64	23	20	20	23	20
Rattle Cr.	148	93	61	29	102	—	—	—	—	29	23	0	3	29	6	44	38	35	194	96	107	99
Johnson Cr.	38	96	67	104	29	12	49	96	73	46	67	9	12	15	78	49	90	12	99	90	0	93
Twin Cr.	20	73	15	81	0	—	—	—	—	9	12	0	15	46	17	29	55	29	3	23	9	17
Morris Cr.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	0	20	3	3
Strong Creek	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	—	0
North Shore																						0
Trestle Cr.	864	789	864	426	667	684	629	795	638	389	882	800	406	705	641	957	734	873	972	966	1047	296
Pack River	99	107	142	73	41	—	—	—	—	189	61	64	0	17	12	49	0	23	81	64	70	90
Grouse Cr.	6	313	180	38	162	70	145	139	96	49	67	52	0	145	23	128	145	223	52	122	131	81
East Shore																						0
Granite Cr.	9	285	107	107	87	—	—	—	—	0	20	32	26	136	261	142	119	73	20	165	293	432
Sullivan Springs	26	23	41	—	17	—	—	—	—	0	70	90	26	44	122	29	64	55	23	44	35	41
North Gold Cr.	46	107	151	23	104	70	107	102	119	119	93	78	90	113	55	64	46	55	46	70	61	162
Gold Cr.	380	360	322	226	180	322	354	244	302	270	348	476	276	290	220	348	426	487	368	589	385	484
Priest River																						0
M. F. East River	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	23	61	58
Uleda Creek	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9	12	9	20
N. F. East River	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Trap and Transport	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	35	35	35	40
Total 6 Index Streams[e]	1653	1734	1946	841	1314	1386	1575	1459	1227	966	1534	1496	792	1409	1082	1731	1569	1807	1641	2004	1714	1340
Total for All Streams	2361	2555	2697	1195	1610	1386	1575	1459	1227	1296	1902	1830	928	1763	1528	2105	2045	2123	2094	2616	2459	2305

[a] A significant portion of Grouse Creek was not counted.

[b] A significant portion of Rattle Creek and East Fork Lightning Creek were not counted.

[c] Represents partial counts due to early snowfall.

[d] Observation conditions impaired by high runoff.

[e] Index streams include Trestle, East Fork Lightning, Gold, North Gold, Johnson, and Grouse creeks.

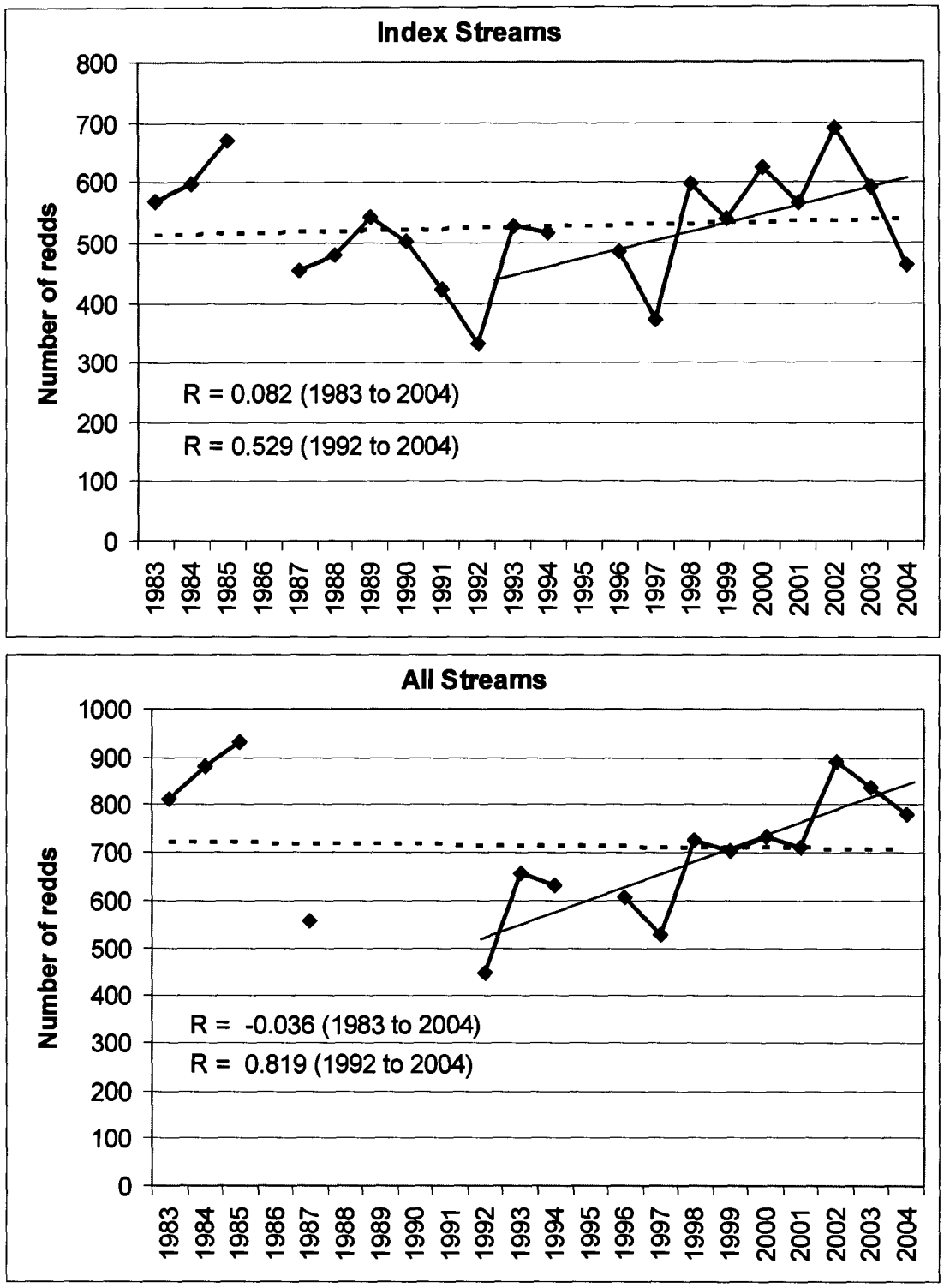

Figure 8. Linear regressions depicting trends in bull trout redd counts (six index streams and all streams combined) over time in the Lake Pend Oreille Core Area, Idaho. Dashed trend lines are for redd counts between 1983 and 2004 whereas solid trend lines are for redd counts between 1992 and 2004.

The slope for the six index streams was about 14 redds/year, which averages to about an increase of 2.3 redds/stream each year. When evaluating only the Lightning Creek tributaries (7 streams) there has been on average an increase of about six redds/year. This averages out to about an increase of 0.9 redds/stream every year.

Kootenai River Core Area

Three tributaries (North Callahan, South Callahan, and Boulder creeks) were surveyed for bull trout redds in the Idaho portion of the Kootenai River Core Area and a total of 25 redds were counted (Figure 4 and Table 7). No redds were counted in Boulder Creek. This was only the third year redds were counted in all three tributaries. The 25 redds counted during 2004 was 15 lower than what was counted in 2003. Expanding the number of redds observed by 2.9 fish/redd, the spawning escapement of bull trout for the Idaho portion of the Kootenai River Core Area in 2004 was estimated to be 73 fish.

Only three years of redd counts have occurred on these three Idaho Kootenai River tributaries making trend analysis unreliable at this point. The current three year trend is positive increasing at a rate of 3 redds per year (slope), although this trend is not significant (Table 4 and Figure 9).

In the Montana portion of the Kootenai River Core Area, 135 redds were counted during 2004 (Table 8). This converts (2.9 fish/redd) to an estimated spawning escapement to 392 fish. When combined with the Idaho spawning escapement (73 fish), the total spawning escapement for the Kootenai River Core Area comes out to 465 fish. No corrections were made for fish that do not spawn every year to come up with the total number of adult fish that occur in the Core Area. As a result, the estimated spawning escapement of 465 for the entire Kootenai River Core Area is conservative. The recovery goal is 1,000 fish (Table 3). During 1999, an estimated 664 bull trout occurred in this Montana section of the Core Area. No streams were surveyed in Idaho during this year, but based on the average number of redds counted over the past three years (28 redds), the total number of adult bull trout that occurred in the entire Kootenai River Core Area likely exceeded 750 fish.

Two local populations (spawning tributaries) were believed to have over 100 adults associated with them in the Kootenai River Core Area during 2004. These tributaries include Quartz Creek (142 adults) and O'Brien Creek (148 adults). In 2003, it was estimated that Callahan Creek had a spawning escapement of 116 adults. To reach the recovery goal there must be five populations with over 100 adults associated with it (Table 3). During 1999, five local populations were believed to have had at least 100 adults associated with them, assuming Callahan Creek followed similar trends as was observed in Montana.

Trend analysis (linear regression) of bull trout redds in Montana tributaries that have been counted consistently since 1990 indicate this population is significantly ($P = 0.045$) increasing (Table 4 and Figure 10). However, during the last three years (2002-2003) a noticeable drop in the number of redds has occurred in these streams (Figure 10). Starting in 1996, bull trout redd counts in all tributaries in Montana have been fairly consistent. Analysis of this data suggests that since 1996, the bull trout population has declined slightly (Table 4 and Figure 10). Despite the drop in redd counts over the last three years, the numbers are higher than what was observed during the mid to early 1990s and a significantly increasing trend was observed (1990-2004). Based on this information, we conclude that the bull trout population in the Kootenai River Core Area is stable or increasing.

Table 7. The number of bull trout redds counted per stream in the Idaho section of the Kootenai River Core Area, from 2001 to 2004.

Stream	Length (km)	2001	2002	2003	2004
North Callahan Creek	3.3	—	13	30	17
South Callahan Creek	4.3	—	4	10	8
Boulder Creek	1.8	2	2	0	0
All Streams	9.4	2	19	40	25

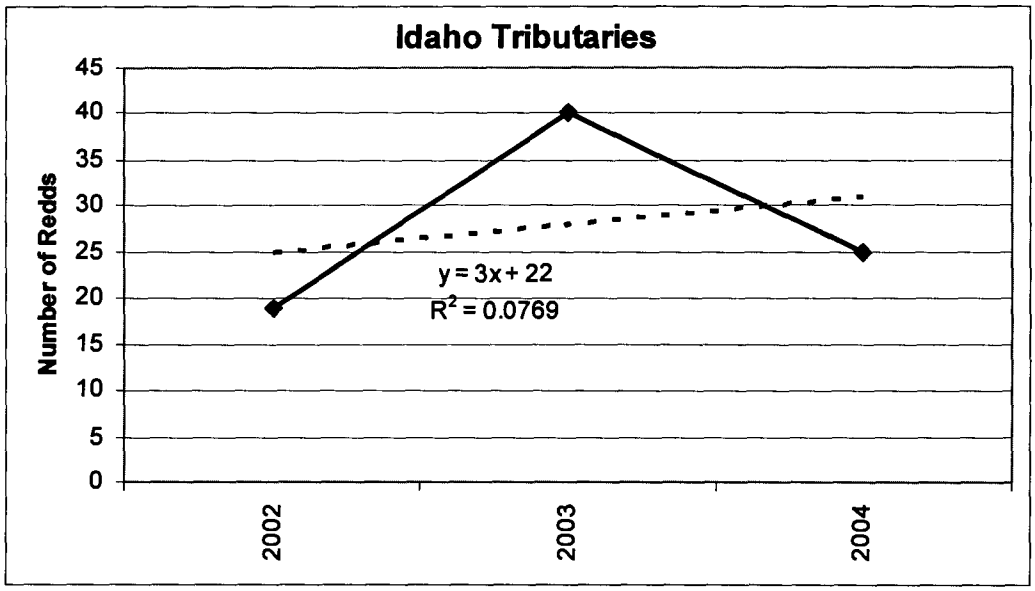

Figure 9. Linear regressions depicting trends in bull trout redd counts in tributaries in the Idaho section of the Kootenai River Core Area.

Table 8. The number of bull trout redds counted per stream in the Montana section of the Kootenai River Core Area from 1990 to 2004.

Stream	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Quartz	76	77	17	89	64	67	47	69	105	102	91	154	62[d]	55	49
O'Brien	—	25	24	6	7	22	12	36	47	37	34	47	45	46	51
Pipe	6	5	11	6	7	5	17	26	34	36[b]	30	6[a]	11	10	8
Bear	—	—	—	—	—	6	10	13	22	36	23	4[c]	17	14	6
West Fisher	—	—	—	2	0	3	4	0	8	18	23	1	1	1	21
Quartz/O'Brien/Pipe	82	107	52	101	78	94	76	131	186	175	155	207	118	111	108
All Streams	82	107	52	103	78	103	90	144	216	229	201	212	136	126	135

[a] A human built dam (stacked up cobble) was constructed downstream of the traditional spawning area.

[b] This count includes redds constructed by resident and migratory fish.

[c] Libby Creek was dewatered at the Highway 2 bridge, downstream of Bear Creek spawning sites, during the bull trout spawning run.

[d] A logjam may have been a partial barrier.

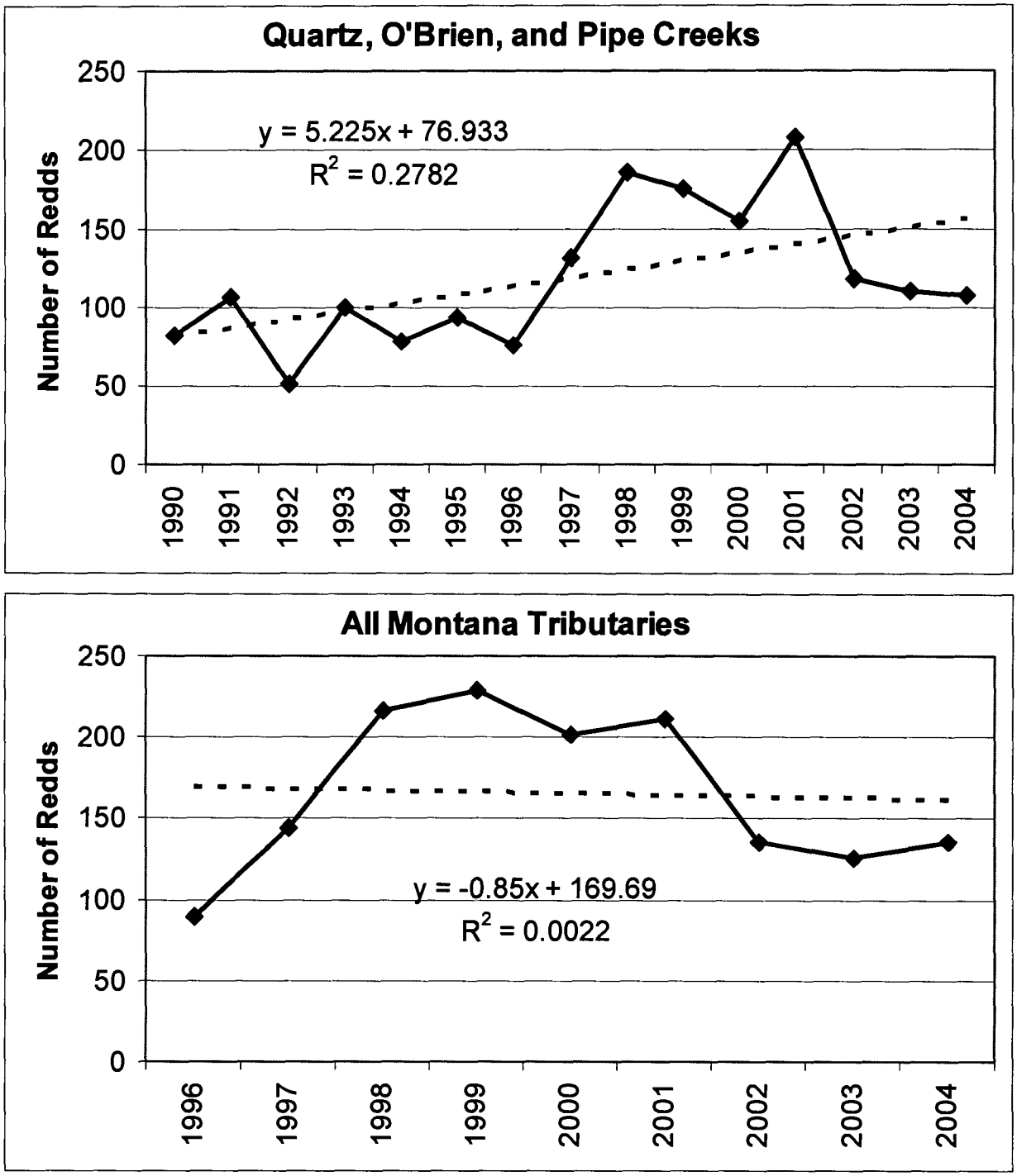

Figure 10. Linear regressions depicting trends in bull trout redd counts in select tributaries (Quartz, O'Brien, and Pipe Creeks) and all tributaries in the Montana section of the Kootenai River Core Area.

Coeur d'Alene Lake Core Area

The IDFG counted 72 redds in the three index stream reaches of the St. Joe River drainage (Table 9 and Figure 5) in 2004. The U.S. Forest Service surveyed another 10 streams and counted seven redds bringing the total number of redds counted in the St. Joe River to 79 (Table 9). This is the highest number of redds counted in the St. Joe River drainage since counts began in 1992. All these redds were counted in four different streams (Medicine Creek, Wisdom Creek, upper St. Joe River, and Heller Creek). The 52 redds counted in Medicine Creek (also a record high) represent 66% of all redds counted in the entire Coeur d'Alene Lake Core Area during 2004. No attempts were made to search for bull trout redds in the Coeur d'Alene River basin. Expanding the number of redds observed by 2.9 fish/redd, the spawning escapement of bull trout for the Coeur d'Alene Lake Core Area is estimated to be 229 fish, which is considerably lower than the recovery goal of 1,100 adults (Table 3).

A slight upward trend (non-significant P = 0.85) was calculated in the spawning escapement of bull trout in the Coeur d'Alene Lake Core Area if one evaluates all the streams surveyed (Figure 11 and Table 4). However, many of these streams have not been surveyed consistently and some of the stream reaches were surveyed by individuals inexperienced in counting redds. If we evaluate only those streams that have been consistently surveyed by experienced counters (the three index streams), a stronger upward trend is evident (Figure 11 and Table 4). This trend is not significant (P = 0.145) as the standard error about the trend line is about equal to the slope of the line (Table 4). Due to the large variation in annual redd counts and the relatively flat trend that is portrayed when we evaluate all the streams, we cannot conclude that this population is stable or increasing.

Several complete and/or partial barriers occur in streams where we believe bull trout spawning and rearing is occurring. Red Ives Creek has a diversion dam within 2 km of the mouth that is a migration barrier to at least some fish. We have had reports of a few spawning bull trout upstream of the dam but believe this dam blocks upstream migration of most bull trout. Entente Creek has a culvert barrier just upstream from where bull trout redds have been reported in the past and there appears to be suitable habitat upstream of the culvert. There are culverts that appear to be barriers on Cascade and Bluebells creeks, although juvenile bull trout have been found upstream of them. Other barriers may occur in streams that we believe have the potential to support spawning and rearing bull trout populations.

North Fork Clearwater River Core Area

Bull trout redd surveys were conducted on September 20-23, 2004 in the upper Little North Fork Clearwater River basin. During this survey, 44 redds were counted, which was only exceeded by what was counted in 2003 (Figure 6 and Table 10). We did not survey Canyon Creek during 2004 due to its remote location. Five redds were counted in Canyon Creek in 2003. Since 2001, we have started exploring new streams to better assess where bull trout are spawning in the Little North Fork Clearwater River. What we are seeing is that bull trout spawn in many different streams, but not necessarily on a consistent basis (Table 10).

To calculate the spawning escapement of bull trout in the Little North Fork Clearwater River, we first added 5 redds to the total to account for streams not surveyed in 2004. Then by expanding this corrected number of redds (49) by 2.9 fish/redd, the spawning escapement of bull trout for the upper Little North Fork Clearwater River was estimated to be 142 fish.

Table 9. The number of bull trout redds counted by stream in the St. Joe River basin, Idaho from 1992 to 2004. Counts shaded in gray are index streams that have been surveyed by the Idaho Department of Fish and Game since 1995. All other stream reaches are counted by the U.S. Forest Service and/or volunteers.

Stream Name	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Aspen Cr.	—	—	—	—	—	—	—	—	—	—	0	—	—
Bacon Cr.	0	—	—	—	—	—	—	—	—	—	—	—	—
Bad Bear Cr.	—	0	0	—	—	—	—	—	—	—	—	0	—
Bean Cr.	14	—	—	0	—	—	—	—	—	—	—	—	—
Beaver Cr.	2	2	0	0	0	0	1	0	—	0	0	0	0
Bluff Cr.- East Fork	0	—	—	—	—	—	—	—	—	—	—	—	—
California Cr.	2	4	0	2	3	0	—	—	0	0	0	0	0
Copper Cr.	—	—	0	—	0	—	—	—	—	—	0	0	0
Entente Cr.	—	—	—	—	—	—	—	0	—	—	1	0	—
Fly Cr.	1	—	—	0	0	0	2	0	—	—	1	0	0
Gold Cr. Lower mile	—	0	—	—	—	0	—	0	—	—	—	0	—
Gold Cr. Middle	—	—	—	0	—	—	—	0	—	—	—	—	—
Gold Cr. Upper	—	2	—	—	1	1	0	—	—	—	—	—	—
Gold Cr. All	—	—	—	—	—	—	—	—	—	1	0	—	0
Heller Cr.	0	0	0	0	—	1	0	0	0	—	0	0	7
Indian Cr.	0	0	—	—	—	—	—	—	—	—	—	—	—
Medicine Cr.	11	33	46	17	23	13	11	48	43	18	42	28	52
Mosquito Cr.	0	—	0	0	4	0	2	—	—	—	—	—	0
Quartz Cr.	—	—	—	—	—	—	—	—	—	—	0	—	—
Red Ives Cr.	—	0	1	1	0	1	0	0	0	0	0	0	0
Ruby Cr.	0	1	—	8	—	—	—	—	—	—	—	—	—
Sherlock Cr.	0	3	0	2	1	1	0	1	0	—	—	0	0
Simmons Cr. - Lower	—	0	0	0	—	—	—	—	—	0	—	—	—
Simmons Cr. - NF to Three Lakes	—	5	0	—	—	—	—	—	—	—	—	—	—
Simmons Cr. - Three Lakes to Rd 1278	—	3	5	5	0	0	0	0	—	—	—	—	—
Simmons Cr. - Rd 1278 to Washout	—	0	0	0	1	0	1	0	—	—	—	—	—
Simmons Cr. - Upstream of Washout	—	0	—	—	—	0	—	—	—	—	—	—	—
Simmons Cr. - East Fork	—	—	0	—	—	—	—	—	—	—	—	—	—
St. Joe River - below Tento Creek	—	—	—	—	0	—	—	—	—	—	—	—	—
St. Joe River - Spruce Tree to St. Joe Ldg.	—	—	—	0	—	—	—	—	—	—	—	—	—
St. Joe River - St. Joe Ldg to Broken Leg	—	—	—	4	—	—	—	—	—	—	—	—	—
St. Joe River - Broken Leg Cr upstream	—	—	—	0	—	—	—	—	—	—	—	—	—
St. Joe River - Bean to Heller Cr.	0	0	—	—	—	—	—	—	—	—	—	—	—
St. Joe River - Heller to St. Joe Lake	10	14	3	20	14	6	0	10	2	11	3	10	9
Three Lakes Creek	—	—	—	—	0	—	—	—	—	—	—	—	—
Timber Cr.	—	0	1	0	—	—	—	—	—	—	—	—	—
Wampus Cr.	—	0	0	—	—	—	—	—	—	—	—	—	—
Washout Cr.	—	3	0	0	0	0	—	—	—	—	—	—	—
Wisdom Cr.	1	1	4	5	1	0	4	11	3	12	9	9	10
Yankee Bar	1	0	—	—	—	0	—	—	1	0	0	0	0
Total - Index Streams	22	48	55	42	38	19	15	69	49	42	54	48	72
Total - All Streams	42	71	62	64	48	23	21	70	49	41	56	46	79
Number of streams reaches surveyed	16	23	19	21	16	17	12	13	8	9	14	14	13

[a] These counts differed from what the U.S. Forest Service counted.

[b] These counts did not include from California Creek to Medicine Creek, a reach where bull trout spawning typically occurs.

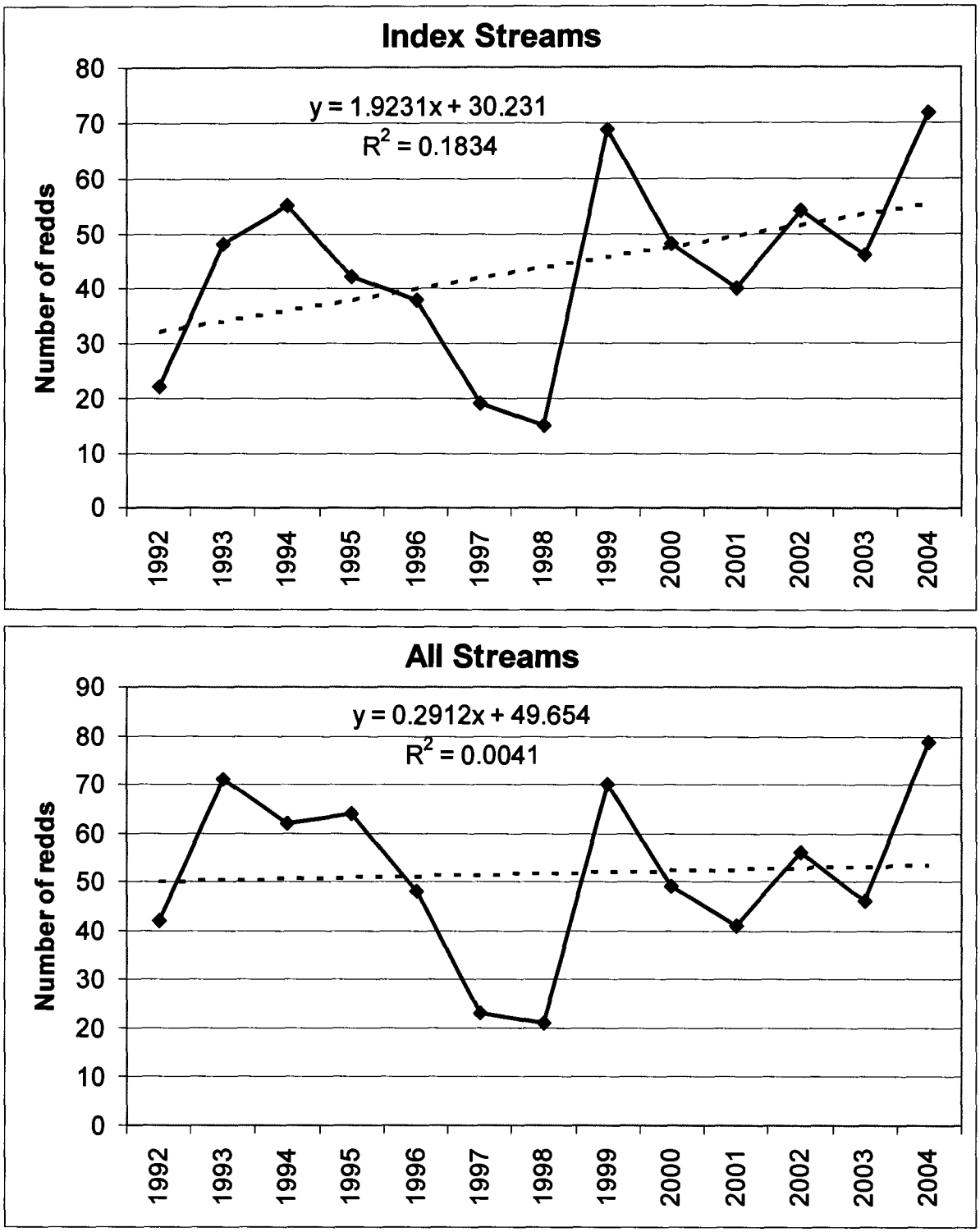

Figure 11. Linear regressions depicting trends in bull trout redd counts (three index streams and all streams combined) over time in the St. Joe River section of the Coeur d'Alene Lake Core Area, Idaho.

Table 10. Number of bull trout redds counted per stream in the Little North Fork Clearwater River basin, Idaho, from 1994 to 2004. Numbers in parentheses are redds <300 mm in diameter indicating they were made by resident bull trout.

Stream	Length (km)	1994[a]	1996	1997	1998	1999	2000	2001	2001[b]	2002	2003	2004
Buck Creek	4.8	—	—	—	—	—	—	—	—	—	5	—
Canyon Creek	5.5	—	—	—	—	—	—	—	—	—	0	—
Butte Creek	1.2	—	—	—	—	—	—	—	5	0	—	—
Rutledge Creek	2.9	—	—	—	—	—	—	—	—	—	1	1
Rocky Run Creek	4.7	—	—	—	—	—	—	—	—	5	1	3
Lund Creek	3.9	0	7	2	2	1	1	13	5	7	7 (1)	5
Little Lost Lake Creek	3.9	0	1	1	1	7	3	1	—	2 (4)	4 (3)	15 (1)
Lost Lake Creek	3.0	0	0	0	0	—	1	—	—	0	—	1
Little North Fork Clearwater River												
1268 Bridge to Lund Cr.	7.0	—	—	—	—	—	—	—	17	6	13	8
Lund Cr. to Lost Lake Cr.	3.8	—	—	3	1	9	8	3	12	5 (2)	7	4 (1)
Lost Lake Cr. to headwaters	5.4	0	2	0	0	—	5	1	—	5	5 (1)	5
All reaches surveyed in 2003	41.9	0	10	6	4	17	18	18	39	30 (6)	43 (5)	42 (2)

[a] Streams were surveyed between 9/16/1994 and 9/19/1994 - one week earlier than surveys in following years.
[b] These redds were counted by personnel from the Clearwater Region.

Fifty-four redds were counted in the Breakfast Creek and North Fork Clearwater River drainages by the IDFG Clearwater Region in 2004 (Table 11). Not all streams are surveyed in the North Fork Clearwater River drainage every year due to their remote locations. Based on previous redd counts (Table 11), it is believe that during 2004 at least 15% of the redds were not counted due to unsurveyed streams. By adding another 15% (multiply by 1.18) to this number, the estimated redd count for the North Fork Clearwater drainage was 64. By expanding this corrected number of redds (64) by 2.9 fish/redd, the spawning escapement of bull trout for the North Fork Clearwater River and Breakfast Creek drainages was estimated to be 186 fish. When combined with the upper Little North Fork Clearwater, this gives us an estimated total spawning escapement of 328 bull trout for the North Fork Clearwater River Core Area. We multiplied the spawning escapement by 1.33 (at least 25% are not repeat spawners), which gives us a total of 436 adult bull trout that occurred in the North Fork Clearwater Core Area during 2004. This is considerably lower than the recovery goal of 5,000 adult bull trout (Table 3).

It is difficult to evaluate the trend in the number of redds counted in the North Fork Clearwater Core Area. This difficulty stems from the irregularity in counting the same stream reaches throughout the years, adding new reaches, and inconsistency in counting redds that were created by resident fish. If we only look at those stream reaches that we have counted consistently in the Little North Fork Clearwater (Lund Creek, Little Lost Lake Creek, and the Little North Fork Clearwater River upstream of Lund Creek) a significant ($P < 0.001$) increasing trend is evident (Figure 12 and Table 4). From 2001-2004, the stream reaches we surveyed for redds in the Little North Fork Clearwater River and North Fork Clearwater River have been fairly consistent. When we evaluated only this data, a slight increasing trend was observed (Figure 13 and Table 4). This trend was not significant especially since this was based on four data points. As bull trout redd counts continue in a more consistent manner in the Little North Fork Clearwater River and North Fork Clearwater River basins, we will gain a clearer picture of what the trend in bull trout abundance is in this Core Area.

No natural barriers to bull trout migration were identified in the Little North Fork Clearwater River basin. However, the Clearwater Region has identified barriers in the North Fork Clearwater River that are believed to block upstream migration to bull trout in Isabella Creek (unknown cause), Quartz Creek (land slide), and Slate Creek (culvert).

Table 11. Number of bull trout redds counted per stream in the North Fork Clearwater River and Breakfast Creek basins, Idaho, from 1994 to 2004. These streams all occur in the IDFG Clearwater Region and were counted by personnel from the Clearwater Region or U.S. Forest Service.

Stream Surveyed	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
North Fork Clearwater River											
Black Canyon	—	—	—	—	—	—	—	—	—	—	—
Bostonia Creek	0	0	0	0	0	4	1	1	18	12	18
Boundary Creek	—	—	—	—	—	—	—	—	2	3	2
Collins Creek	—	—	—	—	—	—	—	0	—	—	—
Goose Creek	—	—	—	—	—	—	—	1	2	1	2
Hidden Creek	—	—	—	—	—	—	—	—	0	—	0
Isabella Creek	—	—	—	—	—	—	—	—	1	0	1
Kelley Creek - North Fork	—	—	—	—	—	—	—	14	—	—	—
Lake Creek	—	—	—	—	—	—	19	7	14	5	14
Little Moose Creek	—	—	—	—	—	—	—	0	—	—	—
Long Creek	—	—	—	—	—	—	—	—	0	8	0
Moose Creek	—	—	—	—	—	—	0	0	0	—	0
Niagra Gulch	—	—	—	—	—	—	2	5	10	3	10
Osier Creek	—	—	—	—	—	—	3	0	0	—	0
Placer Creek	3	1	2	2	2	7	4	2	6	2	6
Pollock Creek	—	—	—	—	—	—	—	—	1	—	1
Quartz Creek	—	—	—	—	—	—	—	4	0	0	0
Ruby Creek	—	—	—	—	—	0	0	—	—	—	—
Skull Creek	—	—	—	—	—	—	—	—	6	5	6
Swamp Creek	—	—	—	—	—	—	2	0	0	0	0
Upper NF	—	—	—	—	—	—	—	—	7	3	7
Vanderbilt Gulch	—	—	—	—	—	—	—	24	13	12	13
Weitas Creek	—	—	—	—	—	—	1	—	—	—	—
Windy Creek	—	—	—	—	—	2	—	—	—	—	—
Breakfast Creek											
Floodwood Creek	—	—	—	—	—	—	—	—	0	0	0
Gover Creek	—	—	—	—	—	—	—	—	1	0	1
Stony Creek	—	—	—	—	—	—	—	—	0	0	0
Total for all streams	**3**	**1**	**2**	**2**	**2**	**13**	**32**	**58**	**68**	**81**	**54**

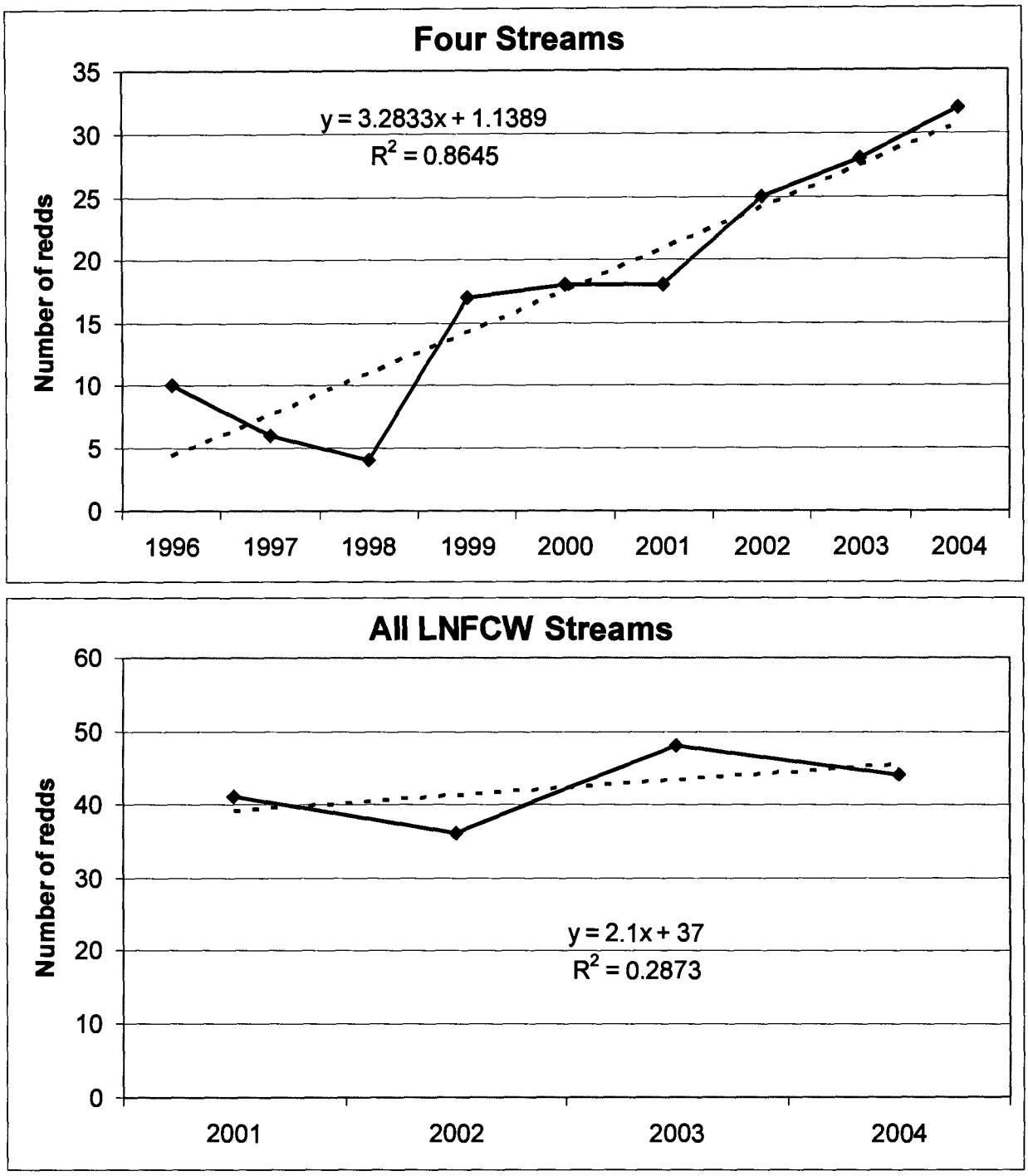

Figure 12. Linear regressions depicting trends in bull trout redd counts (four consistently counted streams and all streams combined) over time in the Little North Fork Clearwater basin, Idaho.

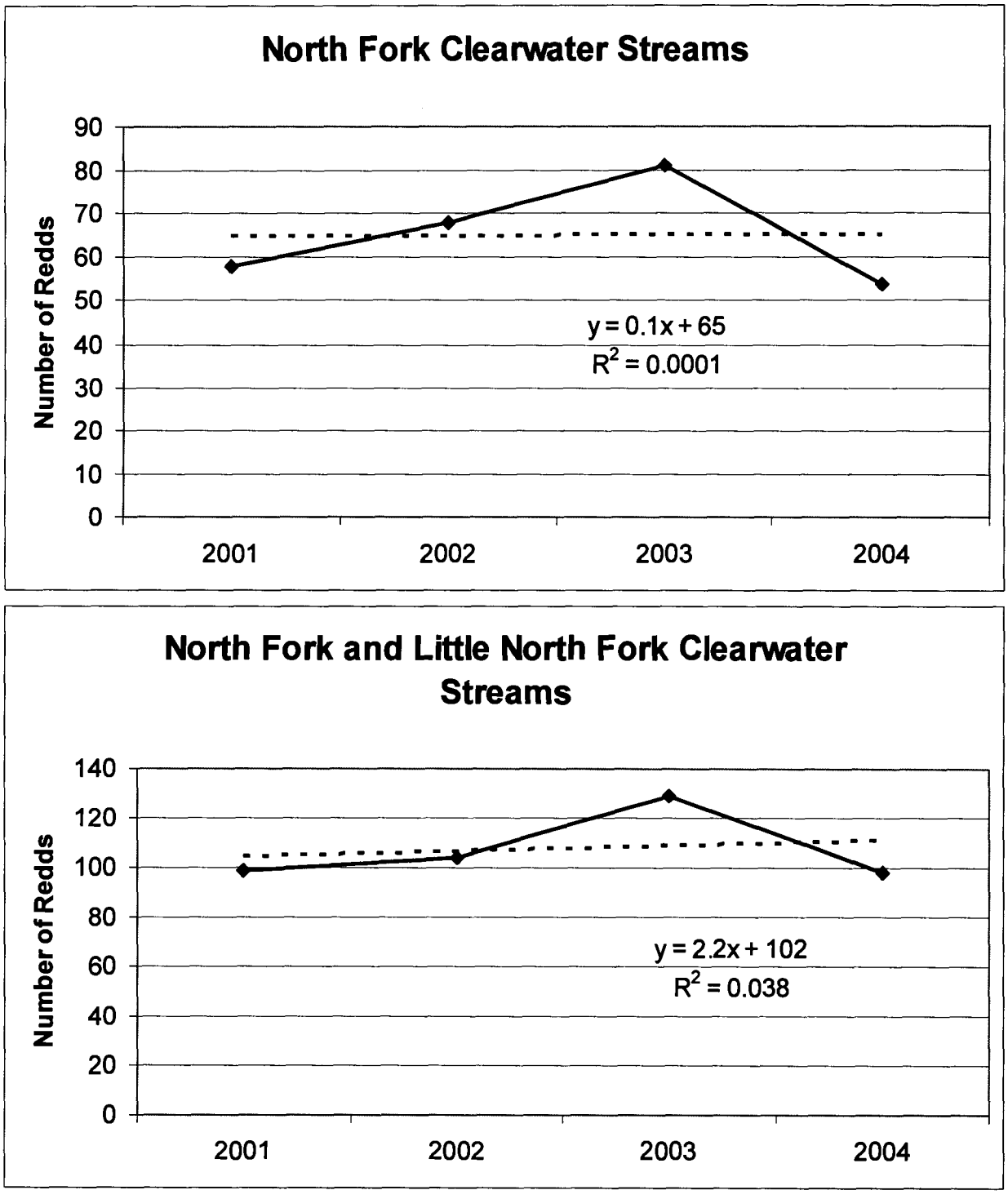

Figure 13. Linear regressions depicting trends in bull trout redd counts from 2001 to 2004 in the North Fork Clearwater River and the North Fork and Little North Fork Clearwater river, Idaho, combined.

DISCUSSION

Priest Lake Core Area

Bull trout redd counts from 1985 to 2005 indicate the bull trout population in the Upper Priest Lake basin has declined significantly. The number of bull trout spawning in these tributaries appears to be a fraction of what it was historically. Some of the smaller tributaries (Trapper, Lime, Cedar, Bench, and Jackson creeks) have not had any redds counted in them for at least two years, where only 10 years ago counts of one to four redds were common. Even in some of the larger tributaries (Gold Creek and Hughes Fork) where 20 or more redds were counted on an annual basis during the 1980s, fewer than three redds were counted in 2002, 2003, and 2004. Only Upper Priest River has had redd counts of any appreciable number (>20). This information supports work conducted on Upper Priest Lake where bull trout numbers appear to be declining significantly and only larger bull trout remain (DuPont et al. In Press a). It seems evident that the expanding population of lake trout in Upper Priest Lake poses an increasing threat to the adfluvial bull trout population (Fredericks et al. 2002; Donald and Alger 1993). If this is true, we may continue to see even further declines in the bull trout population from Upper Priest Lake. Bull trout redd counts by Mauser (1986) document this very thing on tributaries of Priest Lake where the number of redds observed in tributaries declined from double digits to zero from 1983 to 1985. This decline in redds occurred several years after a crash in the bull trout population was noticed in Priest Lake. These findings add to the urgency for significantly reducing the lake trout population in Upper Priest Lake. Delays in correcting this problem could result in significant losses to, or the extirpation of, this bull trout population.

One promising note is that after considerable declines in bull trout redd counts since the 1980s, the redd counts have remained relatively steady since 1992, albeit very low. The reason this bull trout population has not totally crashed as was observed in Priest Lake may be because of the intensive gill netting that has occurred in Upper Priest Lake since 1997 to remove lake trout. These efforts have removed over 4,000 lake trout at a rate of over 500 lake trout a year since 1997 (DuPont et al. In Press d). During 1998, it was estimated that about 75% of the lake trout (912 in all) were removed from Upper Priest Lake (Fredericks et al. 2002). Unfortunately, lake trout appear to repopulate Upper Priest Lake by migrating up from Priest Lake through the Thorofare (Fredericks et al. 2002). During lake trout removal efforts in Upper Priest Lake during 2003 and 2004, an increase in the number of bull trout between 300 and 500 mm in length was observed (DuPont et al., In Press d), indicating that juvenile bull trout survival may be increasing as a result of gill netting efforts. Continued lake trout removal and blocking migration of lake trout into Upper Priest Lake is necessary for this bull trout population to persist.

The total bull trout spawning escapement for the Priest Lake Core Area was estimated at 67 fish in 2004. This is considerably lower than the current recovery goal of 1,000 adult fish with at least five local populations having over 100 adults. Few of the tributaries of Priest Lake have been surveyed for redds since 1986 when Mauser (1986) documented the collapse of this population. Bull trout are known to still occur in some of the tributaries of Priest Lake (DuPont et al. In Press e), but probably contribute few adult fish to the entire core area. North Indian Creek, one of the few tributaries of Priest Lake where juvenile bull trout occur, was surveyed in 2004, but no redds were located.

The recovery goal of 1,000 adult fish appears to be reasonable for the Priest Lake Core Area, especially since in the early 1970s, annual harvests of over 1,000 bull trout were common with a peak harvest in 1978 of about 2,300 fish (Mauser et al. 1988). However, increases in bull trout numbers in Priest Lake tributaries are unlikely with the thriving lake trout population that

occurs in the lake. The best opportunity for restoring a healthy bull trout population is in the Upper Priest Lake basin, where it may be possible to control the lake trout population. Redd counts in 1985 only surveyed about 21% of what we believe is the high quality spawning habitat in the Upper Priest Lake basin. In this survey, 80 redds were counted. If all the high quality habitat were surveyed, about 380 redds would have been counted, assuming they were distributed similarly in the unsurveyed areas. The 380 redds when multiplied by 2.9 (adults/redd) gives us a rough estimate of 1,102 adult fish occurred in the Upper Priest Lake basin in 1985. To get back to these types of bull trout numbers, the lake trout population must be significantly reduced and maintained at a low level. Any hope of accomplishing this relies on controlling the immigration of lake trout from Priest Lake (Fredericks et al. 2002). We are unsure of what influence the expanding brook trout population in tributaries will have on restoring bull trout in the Upper Priest Lake basin.

One manmade barrier was noted during our survey that we believe blocks upstream migration of bull trout. This barrier is a U.S. Forest Service culvert located where F.S. road 1013 crosses Gold Creek (T63N, R5W, Section 17). Currently, bull trout habitat below this culvert is not fully utilized, but spawning and rearing habitat should not be artificially limited for this depressed population.

Lake Pend Oreille Core Area

Redd counts in the Lake Pend Oreille Core Area indicated this system has the most abundant and stable bull trout population in northern Idaho and possibly the state. Evaluation of the spawning tributaries since 1983 show the trend as fairly flat, although, when we evaluated only those redd counts since 1992, a significant increasing trend was evident. The 781 redds counted in 2004 was down from what was counted in the previous three years, but these redd counts still exceed what was counted in any other core area in the state.

Surveys in Trestle Creek had consistently produced the highest redd counts of all the Lake Pend Oreille tributaries until 2004. The number of redds observed in Trestle Creek in 2004 were over 3 times lower than what was observed in 2003 and was the lowest ever recorded since redd counts started in 1983. Also, for the first time, redd counts in two other tributaries (Gold and Granite creeks) exceeded what was counted in Trestle Creek. These counts in Trestle Creek were surprising as they have been consistently high and stable over the years. Trestle Creek experienced high fall flows during 2004, which made counting redds difficult and may explain for some of this decline. However, we also believe fewer bull trout entered Trestle Creek in 2004 due to findings from a PIT tag weir that was in operation during 2004. Other possible reasons for the decline in redd counts in Trestle Creek is that adult bull trout may have recognized the higher flows and difficult spawning conditions and turned back to the lake. The previous low count in Trestle Creek also occurred during a fall when high flows occurred. Many adults returning to Trestle Creek in 2004 out-migrated as juvenile during 2000-2002. Flows in northern Idaho were very low during these years. If Trestle Creek was near its carrying capacity during these years, as was suggested by Downs and Jakubowski (2003), then these lower flows could reduce the amount of living space in Trestle Creek as well as the number of bull trout it could support. Redd counts in 2005 should help answer questions on what is happening in Trestle Creek.

Despite low redd counts in Trestle Creek in 2004, we observed 10 year record high counts in six different tributaries including East Fork Lightning Creek, Savage Creek, Porcupine Creek, Pack River, Granite Creek and North Gold Creek. In fact, the number of redds observed

in non-index tributaries was the highest ever recorded (319 redds – 41% of the redds). This information is very promising as it suggests that the Lake Pend Oreille core area is getting to the point where it will remain stable even if drastic declines occur in tributaries that have been top producers in the past.

Redd counts in the Middle Fork East River and Uleda Creek were added to the Lake Pend Oreille Core Area in 2003 when these bull trout were documented to spend their adult life in Lake Pend Oreille (DuPont et al. In Press b). Redd counts first occurred in the Middle Fork East River basin in 2001; however, only a portion of the area bull trout are known to spawn in was counted. In 2002, the redd counts covered the entire stream reach where bull trout are believed to spawn; however, the counts occurred in mid-October after brook trout had begun spawning, and it was difficult to determine where the bull trout redds were. The first year we believe accurate redd counts were collected was 2003 when all known spawning areas were assessed and counts occurred on September 30 after the bull trout were finished spawning and before brook trout had begun. Future redd counts in the Middle Fork East River drainage should continue to occur near the end of September, two weeks before redd counts occur in the rest of the Lake Pend Oreille Core Area.

The significantly increasing trend in the number of redds counted since 1992 (all streams combined) is believed to be largely a response to changes in fishing regulations in Lake Pend Oreille that occurred in 1994 (harvest changed from 2 to 1 fish) and 1996 (changed to catch-and-release). If improvements in habitat were the main reason for the increasing trends, we would expect to see these increases in only a few tributaries where these habitat improvement projects have occurred. Those streams having high variability in their redd counts typically have unstable and/or degraded habitat conditions (Rieman and Myers 1997) such as Rattle Creek, Grouse Creek, Johnson Creek, and the Pack River. However, periodic increases in the number of redds counted in these streams indicate they have the potential to support strong stable bull trout populations once improvements occur. Those streams where consistently low redd counts have occurred since 1986 (Lightning, Savage, Morris and Porcupine creeks) may require considerable time and money to recover the population and/or they may have little potential to support high numbers of bull trout.

In the Lightning Creek tributaries, the number of bull trout redds has been increasing at a much slower rate than other tributaries of Lake Pend Oreille. Habitat in the Lightning Creek tributaries is believed to be degraded and of lower quality than the other bull trout tributaries in Lake Pend Oreille (PBTTAT 1998), suggesting that the abundance of bull trout in Lightning Creek were and continue to be suppressed more by the quality of the habitat than past fishing pressure. Significant efforts to protect and restore habitat in tributaries of Lake Pend Oreille have been occurring and likely have contributed to the increase in bull trout numbers we have seen since 1992 (Downs and Jakubowski 2003). These types of efforts are necessary to ensure bull trout populations will continue to increase in the Lake Pend Oreille Core Area.

Efforts are also occurring to increase the distribution and/or population strength of bull trout in the Lake Pend Oreille Core Area by addressing manmade barriers. All of the barriers believed to be suppressing bull trout abundance are being evaluated and/or efforts are being taken to correct the problem. For example, a historic stream crossing that occurred about 0.6 km upstream from the mouth of Uleda Creek, a tributary of the Middle Fork East River, was removed in 2004. Removing this barrier more than tripled the amount of available high quality spawning and rearing habitat for bull trout in this stream. Uleda Creek is probably the most important stream reach in the Middle Fork East River basin for this bull trout population as the highest densities of juvenile bull trout and no brook trout were found to occur there. Removal of

this barrier could lead to significant increases in this bull trout population, which should start being recognized after one bull trout generation (6-8 years). Work is also going on to evaluate entrainment and possibility of creating upstream fish passage over Albeni Falls Dam on the Pend Oreille River (Geist et al. 2004) and Cabinet Gorge Dam on the Clark Fork River (Lockard et al. 2003). Improvements in fish passage at these dams could result in significant increases in the bull trout population in the Lake Pend Oreille Core Area.

Funding has been secured (through AVISTA Corp.) and plans are in progress to correct an intermittent stream reach on Granite Creek (Chris Downs, IDFG, personal communication). This intermittent stretch of stream occurs about 1 km upstream from the mouth and has blocked bull trout migration to one of the top bull trout streams in the core area. In past years, bull trout were trapped and transported by this barrier. The current plans are to reconstruct this section of stream so that intermittency is no longer a problem.

Intermittent stream reaches are also a problem for bull trout migration on lower Lightning, Rattle, Savage, and East Fork Lightning creeks. The U.S. Forest Service halted new road construction and timber harvest in the Lightning Creek watershed in 1984 in an effort to help reverse this problem (Chad Baconrind, US Forest Service, personal communication). A watershed assessment of this watershed is planned and funded (AVISTA Corp.) to evaluate what can be done to reduce or eliminate these problems (Chris Downs, IDFG, personal communication).

The biggest threat to the entire bull trout population in the Lake Pend Oreille Core Area is believed to be from lake trout that occur in the lake (LPOBTWAG 1999). Findings from Donald and Alger (1993) suggest that over time bull trout will not persist in the presence of lake trout. Priest Lake and Flathead Lake, Montana have experience dramatic declines in bull trout numbers as lake trout numbers increased (Mauser 1986; Deleray et al. 1999). Work on Lake Pend Oreille indicates the lake trout population is also expanding rapidly (DuPont et al. In Prep). The kokanee population (major prey item for lake trout and bull trout) is a fraction of what it once was and is at risk of collapsing if changes do not occur soon. If kokanee collapse, we would likely see bull trout declines shortly after as occurred in both Priest Lake and Flathead Lake. Plans are currently in progress to reduce lake trout numbers in Lake Pend Oreille through angler incentive programs, trap netting, and gillnetting in areas where lake trout congregate especially during the spawning season.

The Lake Pend Oreille basin is the only core area in the Panhandle Region that is currently near its federal recovery goals. Currently two of the recovery goals are being met—the overall population is stable or increasing and efforts are being made to correct all known man-caused barriers. The two recovery goals that are not being met are having six local populations with over 100 adults and having an overall population size of 2,500 adults. Currently, the population estimate for adult bull trout is 2,305 and five local populations had over 100 adult spawners (three others had between 90 and 99). These estimates are conservative as it assumes all bull trout in Lake Pend Oreille spawn every year. If the bull trout population continues to increase at the rate it has over the past 11 years, all recovery goals in the Lake Pend Oreille Core Area will be met in the near future.

The State of Idaho developed a recovery plan for bull trout in the Lake Pend Oreille Core Area (LPOBTWAG 1999). The recovery goals (restoration targets) of this plan are that six tributaries must support healthy spawning populations. A healthy spawning population is defined as one that shows a stable or increasing trend and has a 95% probably of persistence over the next 100 years (LPOBTWAG 1999). There is no minimum number of adults that must be

associated with each of these tributaries or a total number of adults that must be associated with the entire core area in the state recovery plan. Analysis of redd counts in the Lake Pend Oreille basin by Downs and Jakubowski, (2005 b) found that four bull trout spawning populations (Trestle Creek, Granite Creek, Gold Creek, and Sullivan Springs) appear to be stable or increasing. However based on the BAVAM model (Lee and Rieman 1994), none of them had over a 95% probability of persistence for the next 100 years. These findings suggest that recovery of bull trout (according to the state criteria) in the Lake Pend Oreille Core Area may be quite a ways off. Downs and Jakubowski (2005 a) argue that the techniques used to calculate probability of persistence are being refined and current models may not be appropriate for this analysis. They recommend that probability of persistence modeling not be used to evaluate recovery, and instead they suggest that recovery in the Pend Oreille basin be evaluated through a combination of goals recommended in both the State and Federal plans. The recovery goals they suggest for the Lake Pend Oreille Core Area are, a minimum of 2,500 adults must occur in the core area, there must be at least six local populations with over 100 adults, and these six local populations must have a stable or increasing trend in their abundance of adults. The only difference between this suggestion and the federal recovery goals is, instead of requiring a stable or increasing trend for the entire bull trout population, a stable or increasing trend must occur for six different spawning tributaries. Four of the five spawning tributaries that had a spawning escapement of over 100 adults during 2004 showed increasing trends in abundance since 1994 and none of these trends were significant at the $P < 0.05$ level (Downs and Jakubowski, 2005 b). Three other streams had spawning escapements between 90 and 99 adults with all showing increasing trends (only significant for one) in abundance since 1994 (Downs and Jakubowski, 2005 b). Regardless of which recovery goals we use, it appears that if increases in redd counts continue to occur, bull trout numbers should reach both recommended recovery goals in the near future.

Once recovery goals are met in the Lake Pend Oreille Core Area, we believe the Idaho Fish and Game and U.S. Fish and Wildlife Service should investigate allowing limited harvest of bull trout on Lake Pend Oreille. We believe that allowing limited harvest of bull trout will keep anglers interested and concerned about the species, which inevitably will lead to more support for continued efforts to improve this fishery. Any harvest allowed on this fishery should not exploit weak local populations, or result in not meeting any of the stated recovery goals.

Kootenai River Core Area

North and South Callahan creeks are the only two streams that appear to be important for spawning bull trout in the Idaho portion of the Kootenai River Core Area. Twenty-five redds were counted in both of these tributaries, which suggests the spawning escapement was 73 adults. Many other streams have been surveyed in Idaho over the years, but bull trout redds were not found in any of them except for a few in Boulder Creek (Walters, IDFG, personal communication). The majority of the bull trout population in the Kootenai River Core Area occurs in Montana. During 2004, 84% of the redds were counted in Montana, and in 2003, 76% of the redds were found to occur there.

The total estimate of adult bull trout that occurred in the entire Kootenai River Core Area was 464 fish during 2004. This estimate is believed to be very conservative, as during 2004, it was believed that low flows may have blocked or prevented bull trout from entering many of the spawning streams (Mike Hensler, MFWP, personal communication). In fact the drop in bull trout numbers that were observed from 2002 to 2004 in the Kootenai River watershed may be in

response to the drought that occurred over this period (Mike Hensler, MFWP, personal communication).

Entrainment of bull trout from Lake Koocanusa through Libby Dam may be helping to bolster the population of bull trout in the Kootenai River Core Area. Redd counts downstream of Libby Dam more than doubled after the floods of 1996 and 1997. Lake Koocanusa has a thriving bull trout population, and entrainment of these fish through Libby Dam could be high on flood years. To test whether bull trout being entrained over Libby Dam were contributing to the spawning escapement in Montana tributaries, Montana Fish, Wildlife and Parks put radio transmitters in many of the bull trout located just downstream of Libby Dam. During this study, none of the radio tagged bull trout made migrations into known spawning tributaries in Montana (Mike Hensler, MFWP, personal communication). Most of these fish remained near Libby Dam, although some made migrations downstream into Idaho. It is still not clear what role entrainment plays in the population status of bull trout in the Kootenai River Core Area.

Based on our results, it appears that two of the four recovery goals are currently being met in the Kootenai River Core Area (Table 3). Despite this report, we think we are close to meeting all the bull trout recovery goals for this core area. During 1999, we believe five bull trout populations had a spawning escapement over 100 adults, which meets the recovery goal, and the spawning escapement for the entire core area was probably over 800 fish (the goal is 1,000 adults). Based on radio telemetry studies, many bull trout located downstream of Libby Dam do not spawn every year, and consequently, many more adults were in the core area than redd counts indicate. Possibly over 1,000 adult bull trout occurred in the core area during 1999 and as the drought cycle ends, it is very likely we will see bull trout numbers bounce back to what we saw in 1999.

Coeur d'Alene Lake Core Area

Redd counts in the Coeur d'Alene Lake Core Area indicate that only the three index streams (Medicine Creek, Wisdom Creek, and the upper St. Joe River) located in the upper St. Joe River basin are responsible for producing all or the vast majority of the bull trout in the entire core area. In the past six years, only during 2004 were more than two redds counted outside the three index streams. In the 1930s, most of the major tributaries in the St. Joe River and some in the St. Maries Rivers were documented to have bull trout in them (IDFG 1933). This apparent loss of bull trout populations in so many tributaries makes it critical that we learn more about what the major sources of mortality are and what may be limiting their numbers. Answers to these types of questions may be necessary before proper actions can be taken to restore this bull trout population.

All bull trout redds counted in the three index streams during 2004 were within 5.5 km of each other. This puts almost the entire bull trout population in the Coeur d'Alene Lake Core Area at risk from one catastrophic event. Currently, a dense stand of lodgepole pine and large amounts of dead and dying trees occur in this area, which makes it a prime spot for an intense fire. Despite these alarming facts, when we evaluated the trend in abundance of redds in the three index streams an increasing trend was evident. This trend was not significant, but couple this with a record high redd count in 2004 and gives us some confidence that the bull trout populations in the index streams are not in jeopardy of collapsing in the near future.

Redd surveys in Medicine Creek have consistently produced the highest counts in the Coeur d'Alene Lake Core Area, and the 52 redds counted in 2004 was a record high and

represented about 66% (52 out of 79) of all the redds counted. It is believed that Medicine Creek is critical to the persistence of bull trout in the Coeur d'Alene Lake Core Area. Ironically, the habitat in Medicine Creek is not unaltered. Several stream segments remain channelized from mining activities that occurred in the early 1900s. These channelized stream reaches provide poor spawning and rearing habitat. The U.S. Forest Service should investigate the potential for habitat restoration in Medicine Creek.

Currently, none of the bull trout recovery goals is being met in the Coeur d'Alene Lake Core Area. The adult bull trout population does not appear stable as it has fluctuated greatly over the past 12 years, manmade barriers still exist that block bull trout migrations, and the adult population size is estimated to be 229 fish. The current recovery plan asks for a stable or increasing population, with full access to potential spawning streams, and at least 1,100 adult spawners, 300 of which must occur in the Coeur d'Alene River watershed. Obviously, considerable efforts must occur before this bull trout population will ever approach the current recovery goal. As efforts to improve this bull trout population occur, the recovery goals should be re-evaluated to determine how realistic they are.

No attempts were made to survey tributaries of the Coeur d'Alene River for bull trout redds, as we are not aware of any data that suggests spawning and rearing populations occur there. Anglers have reported catching bull trout in recent years from the Coeur d'Alene River, although biologists have verified none. Two different anglers indicated they caught bull trout from the South Fork Coeur d'Alene River at the mouth of Bear Creek. Bear Creek is known to have a strong brook trout population and brook trout are often misidentified as bull trout, even by experienced individuals. Fish surveys (electrofishing or snorkeling) should occur in areas where bull trout reports commonly occur to help substantiate their validity.

North Fork Clearwater River Core Area

The estimated spawning escapement for bull trout (142) for the Little North Fork Clearwater drainage during 2004 was the highest estimate we have had. Redd counts have been conducted in a fairly consistent manner in four Little North Fork Clearwater River streams over the last eight years (1996-2003). A linear regression of redd counts in these four streams shows a significantly increasing trend. This increasing trend, coupled with the record high spawning escapement, gives strong reason to believe that the bull trout population in the Little North Fork Clearwater River is increasing.

Redd counts in the North Fork Clearwater River and Breakfast Creek were down in 2004 (54) and were the lowest recorded since 2000. The number of stream reaches surveyed for bull trout redds has changed over the years and only since 2001 has the number of stream reaches surveyed occurred in a somewhat consistent manner. From 2001 to 2004, a flat trend has been observed in the number of redds counted in the North Fork Clearwater River and Breakfast Creek drainages. If we combine these with the Little North Fork Clearwater the trend is only slightly increasing (2.2 redds/year over about 28 streams). Based on the few years that we have collected consistent data and the relatively flat trend in redd counts we cannot say that the bull trout population in the North Fork Clearwater River Core Area is stable or increasing.

Increasing numbers of redds in tributaries of the Little North Fork Clearwater River do not appear to be related to improving habitat conditions, as most of these stream are fairly remote and little human activity occurs in them. The improvements in bull trout numbers can probably be attributed to when fishing regulations changed in 1994 from an allowable two fish

harvest to no harvest on bull trout. A long-lived species such as bull trout can easily be exploited especially seeing how large congregations of bull trout can occur in a few pools (DuPont et al. In Press f).

Currently, one or two of the four recovery goals are being met in the North Fork Clearwater River Core Area (Table 3). There are at least 13 local populations in the recovery area, and the goal is 11. In the Little North Fork Clearwater River, we were not aware of any manmade fish barriers that would block bull trout migration. We did not do any redd surveys in the North Fork Clearwater watershed, and consequently, we are unsure whether any barriers exist in this area. The two goals not being met are the stability of the bull trout population and its population size. We cannot say for certain that the population is stable or increasing largely because of the number of years (four) streams have been consistently surveyed for redds. It is very likely the bull trout population is increasing based on data from the Little North Fork Clearwater River and future surveys will give more validity to this belief. The other goal not being met is that at least 5,000 adults must occur in the entire core area. The adult population estimate during 2004 was 436 fish. We recognize that the remote nature of this core area makes it difficult to survey many of the streams; however, we believe we are now counting most of the important spawning streams in the core area. It is also believed that resident bull trout occur in many tributaries in the Core Area, which may be being overlooked. Nonetheless, it appears the number of adults in this Core Area is far from the recovery goal.

The recovery goal for the entire North Fork Clearwater Core Area (5,000 adults) is twice that of the Lake Pend Oreille Core Area (2,500 adults). The Lake Pend Oreille Core area is believed to support the strongest bull trout population in Idaho. The sterile nature of the streams in the North Fork Clearwater Core Area is believed to limit primary production and in turn fish biomass in many of these tributaries. As a result, we should not expect to see the same number of bull trout as occurs in the Lake Pend Oreille Core Area where many of the spawning tributaries are low elevation spring fed streams, and a large stable lake provides high survival for maturing juveniles and overwintering adults. We do not believe the recovery goal of 5,000 adults in the North Fork Clearwater River Core Area is realistic. We suggest that this portion of the recovery plan be re-evaluated and a more realistic goal be developed.

RECOMMENDATIONS

1. Continue to monitor bull trout spawning escapement through redd counts in the Priest Lake, Lake Pend Oreille, Kootenai River, St. Joe River and Little North Fork Clearwater River watersheds.

2. Using redd counts, continue to evaluate that status of bull trout in each of the core areas that occur in the Idaho Panhandle Region.

3. Investigate new streams/stream reaches where bull trout spawning may be occurring.

4. Continue to provide annual training to all people who will be conducting redd counts in the Panhandle Region.

5. Discuss with the U.S. Forest Service the feasibility of habitat restoration in Medicine Creek and/or Wisdom Creek.

6. Conduct a survival study on bull trout in the St. Joe River basin to evaluate what the major limiting factors are.

7. Re-evaluate the recovery goals for the North Fork Clearwater River Core Area.

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