

I. Project Title: Interagency Standardized Monitoring - Utah

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III. Project Summary:

This project monitors populations of endangered fishes in Utah. The following objectives have been outlined for post-larval, late juvenile/adult Colorado pikeminnow:

1. Develop annual indices of relative abundance.
2. Determine population trends.
3. Determine relationships between these trends and other environmental parameters.
4. Determine annual indices of relative abundance of sympatric species.

*Middle Green River*

Catch rates of Colorado pikeminnow in the middle Green River have been on a steady increase in recent years. However, during 2000 sampling activities, catch rates were dramatically higher than recent years. This catch rate (4.3 fish/hour) is by far the highest rate in this section of river since ISMP began in 1986. The next highest catch rate occurred in 1994 (2.2 fish/hour). In the middle Green River, nonnative game fish, particularly northern pike are becoming more abundant. There is also a noticeable increase in the abundance of black bullhead catfish and green sunfish in this section of the river over the past three years.

Fall seining for young-of-year produced 31 pikeminnow in 2000. This is much lower than catches observed in the early 1990's and slightly below the average for the past five years. Sampling results show a clustered distribution of young-of-year pikeminnow. Over half

of the fish were caught in one or two backwaters. In 2000, all pikeminnow were caught in the lower portion of the reach with 22 of the 31 being caught in the last backwater sampled.

#### *Lower Green River/Colorado River*

Monitoring for the last several years has shown an increase in the catch rates of adult, and particularly juvenile Colorado pikeminnow in the lower Green River and the Colorado River in Utah. Catch rates since 1991 have been elevated to those seen in the late 1980's. Catch rates for 2000 demonstrate a slight decline in the numbers of adult/juvenile Colorado pikeminnow caught. Overall catch rates continue to be low since 1991, after their apparent increase up to 1998 in the Colorado River. In the lower Green River, overall catch rates and recapture rates have also dropped slightly.

Catch rates for young-of-year (YOY) Colorado pikeminnow in Reach 3 are higher than the past three years and comparable to 1996. In Reach 1, YOY Colorado pikeminnow catch rates are slightly higher than 1999. These catch rates do not include approximately 200 YOY pikeminnow that were caught but not counted or measured to avoid mortality. In both reaches, YOY Colorado pikeminnow were well distributed throughout. Non-native cyprinids continued to dominate the catch in all reaches.

Annual monitoring of humpback chub populations in Desolation/Gray and Westwater canyons was continued in 2000. Monitoring for humpbacks was not conducted in Cataract Canyon this year. Monitoring in Desolation/Gray Canyon (June 28 - July 1) resulted in the capture of 15 humpback chub. Monitoring in Westwater Canyon (September 10-15) resulted in the capture of 77 humpback chub.

The three year effort to determine a humpback chub population estimate in Westwater Canyon was completed in the fall of 2000. A summary of those results are presented in this report; population estimates will require the assistance of a statistician and will be provided later.

#### IV. Study Schedule:

- a. Initial year: 1986
- b. Final year: 2000 for adult  
Ongoing for young-of-year

#### V. Relationship to RIPRAP:

General Recovery Program Support Action Plan  
V.A.1. Conduct standardized monitoring program.

VI. Accomplishments of FY 00 Tasks and Deliverables, Discussion of Initial Finding and Shortcomings:

Collection and database entry of adult/juvenile and YOY sampling as described in the ISMP handbook.

Task 1 - Baseline ISMP efforts (current sampling protocols).

*Middle Green River*

Adult/Subadult

The 2000 annual ISMP juvenile/adult Colorado pikeminnow electrofishing was conducted from 2 May through 10 May on the middle Green River. The elective reach for 2000 was RM 298.0 - 280. Flows during this sampling period were lower than that experienced in past years.

A total of 248 adult and juvenile Colorado pikeminnow (CS) were captured during monitoring activities (Table 1) for a catch rate of 4.3 fish/hour. This is the highest catch rate recorded for the middle Green River since ISMP began in 1986. Seventy-three of the 248 (29%) were recaptures. An additional 75 CS were observed, but were not netted. Captured CS ranged in size from 127 to 672 mm TL (mean = 512; Figure 1 and Figure 2) and 14 to 2546 g (mean = 1075).

Two razorback suckers were captured in reach 2 (Jensen). One was captured approximately two miles down river from Stewart Lake (RM 297.7) and the other approximately four miles down river from Stewart Lake (RM 295.8). These fish were 432 and 511 mm TL and weighed 610 and 961 g, respectively. The larger razorback sucker was a ripe male. Eleven roundtail chubs were netted, five in Reach 1 (Island Park), one in Reach 2 (Jensen) and five in the White River reach.

Channel catfish, bluehead sucker, flannelmouth sucker, and carp were captured throughout all reaches. Northern pike were encountered throughout all reaches of the middle Green River with the highest occurrence in the Jensen and elective reaches from Split Mountain to Horseshoe Bend (RM 316 - 280). Thirteen northern pike and twelve walleye were collected in the section of river from Stewart Lake to Sportsmans Drain (RM 299.8 - 295.0). Smallmouth bass (n = 13) were encountered in all reaches except the White River reach. Brown trout (n = 3) were caught in the Island Park and Jensen reaches. Rainbow trout were collected in the Island Park reach (n = 7).

Table 1. Numbers of Colorado pikeminnow captured (C), number of recaptures (R), observed (O) and catch per unit effort (#/hr) for ISMP post-juvenile/adult monitoring, middle Green and White rivers 2000.

Reach	RM	Dates	Colorado pikeminnow			
			#C	# R	#O	#/hr
1	334-326.7	5/02/00	14	7	9	2.6
2	316.0 -298.0	5/03/00	39	9	7	3.6
50 (elective)	298.0 - 280.0	5/04/00	82	14	19	6.6
3	262.0 - 245.0	5/09/00	63	29	30	4.9
13 (White R.)	21.3 - 0.0	5/10/00	50	14	8	4.0
Total			248	73	73	
Mean						4.3

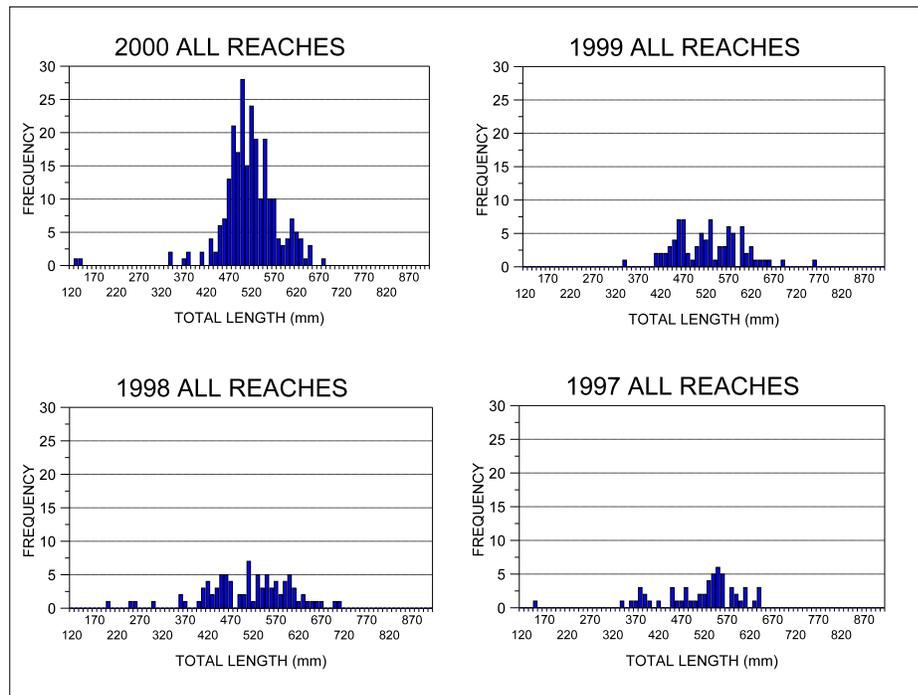


Figure 1. Length frequency of late juvenile/adult Colorado pikeminnow collected during ISMP electrofishing, middle Green and White rivers: 1997 - 2000.

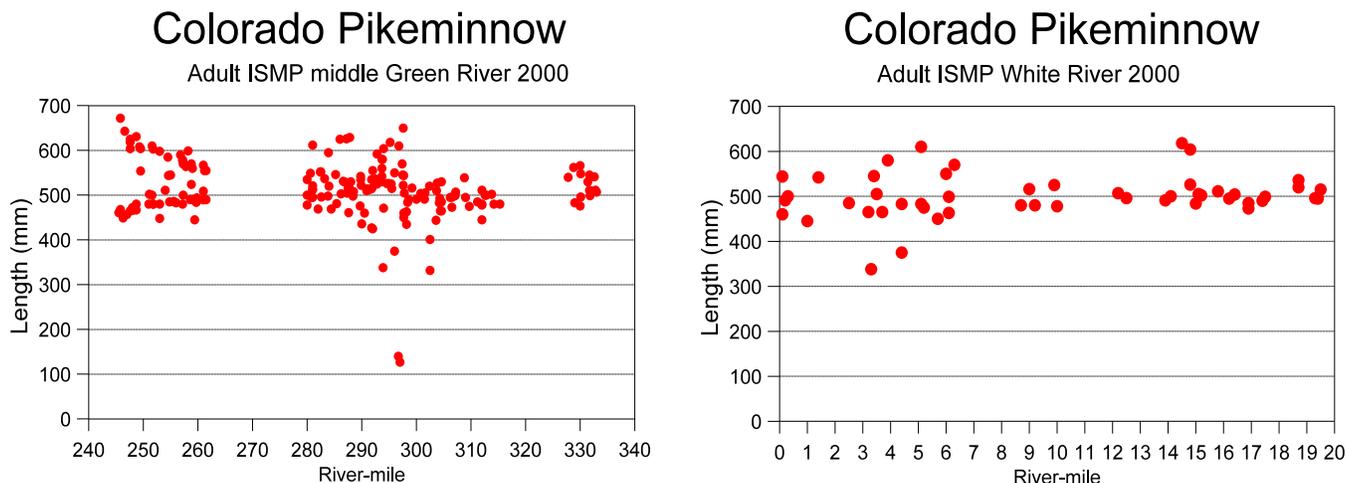


Figure 2. Lengths and distribution by river-mile of Colorado pikeminnow collected in the middle Green River and lower White River: May 2000.

Distance between captures of previously tagged Colorado pikeminnow ranged from 0 to 260 miles with a mean of 40 miles. Twenty-seven percent of the recaptured fish had moved less than one mile from the original capture location, 33 % were recaptured between 50 and 100 miles from their original tagging location and an additional 15% were recaptured more than 100 miles from the original location (Table 2).

Some interesting recaptures to note include a juvenile fish (195 mm), originally tagged at RM 106 below the town of Green River in 1995, was recaptured 208.2 miles upriver at RM 314.2 in Dinosaur National Monument in 2000 and measured 498 mm. Nine fish that were tagged in Desolation Canyon, three and four years previous, were recaptured near Ouray and up the White River. Five fish originally tagged in May in the lower Green River near RM 106 in the early to mid - 1990's were recaptured in the middle Green River near RM 300 in May 2000. Three of these fish, measuring 195 mm, 225 mm and 368 mm, were originally tagged in 1995 in the lower Green River and measured 498 mm, 480 mm, and 520 mm, respectively, when recaptured in the middle Green River. Another fish captured in the lower Green River in 1991 measuring 355 mm was recaptured nine years later in the middle Green River and measured 509 mm. A fifth fish caught in the lower Green River in 1992 measuring 430 mm was recaptured eight years later near Walker Hollow (RM 294) at a length of 610 mm.

This indicates movement of juvenile fish from the lower Green River to the middle Green River which may be a response to a shift in forage needs. This dispersal is also evident when comparing the length frequency distribution of pikeminnow caught in the lower Green River and the middle Green River sections. Colorado pikeminnow caught in the middle Green River are generally adults over 400 mm, while the lower Green River is occupied by several juvenile year-classes. Some movement within the sampling year was noted with fish moving from the Green River to the White River. Two fish (618 mm and 520 mm) originally tagged during sampling efforts of Colorado pikeminnow abundance estimates in the Green River at RM 246.8 (near the mouth of the White River) and RM 254.8 (pipeline on Ouray Wildlife Refuge) were recaptured in the White River two weeks

later at RM 14.5 and 18.7, respectively.

Table 2. Distance between original tagging location and recapture location for Colorado pikeminnow recaptured in the middle Green River during juvenile/adult Colorado pikeminnow ISMP monitoring: May 2000.

Distance between captures (miles)	Number	Percent
less than 1	19	27
1 - 5	12	17
5 - 10	5	7
10 - 50	14	20
50 - 100	9	13
100 - 200	8	11
200 +	3	4

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#### Young-of-year (YOY)

Annual ISMP fall 2000 sampling for YOY Colorado pikeminnow on the middle Green River was conducted from 26 - 29 September. Suitable backwaters were found in all subreaches for a total of 42 backwaters sampled. The weather was mostly clear and sunny over the three days. Main channel temperatures ranged from 9 - 17 °C and sampled backwater habitat temperatures ranged from 9 - 21 °C. A total of 13 species were collected during sampling and a summary of the catch follows.

Thirty-one Colorado pikeminnow were captured in eight backwaters. Slightly below average over the past few years for this section of river. The first pikeminnow was collected in a backwater visible upstream from the Bonanza bridge (RM 289.8) and 22 were collected in the last sampled backwater near Sand Wash (RM 217). This clumped distribution of young-of-year pikeminnow is consistent with past years (Figure 3). Pikeminnow lengths ranged from 37 to 76 mm with a mean length of 50.8 mm. This mean length is the highest observed since 1994 (Figure 4).

Young-of-year chubs (*Gila* spp.) were not encountered as often as in past years. Only three were collected in 2000 compared to 42 collected during 1999 fall seining.

Red shiners, fathead minnows, and sand shiners continue to dominate the catch. In addition to these, five other species of introduced fish were encountered: 12 carp, 15 green sunfish, three black crappie and two black bullhead catfish.

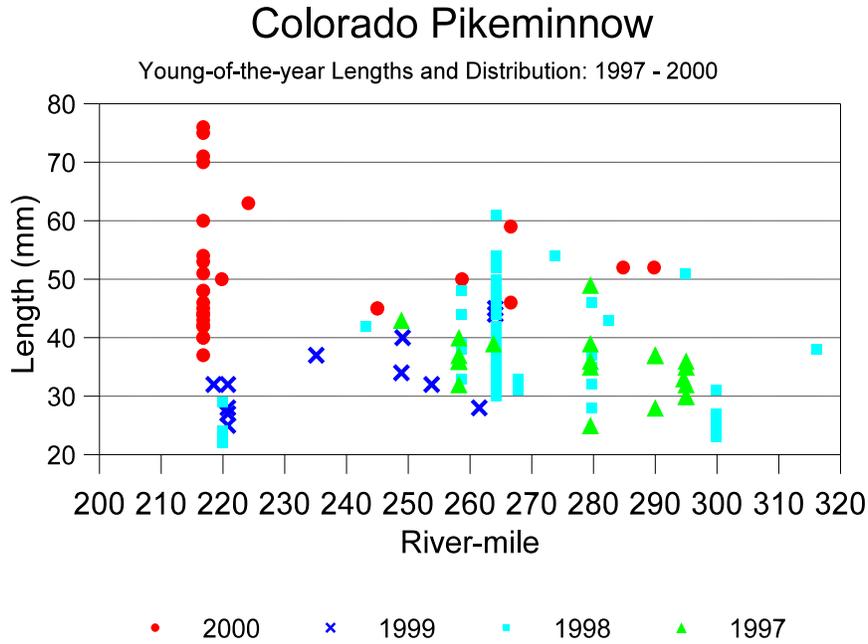


Figure 3. Lengths and distribution by year of young-of-the-year Colorado pikeminnow caught during fall ISMP seining activities: 1997 - 2000.

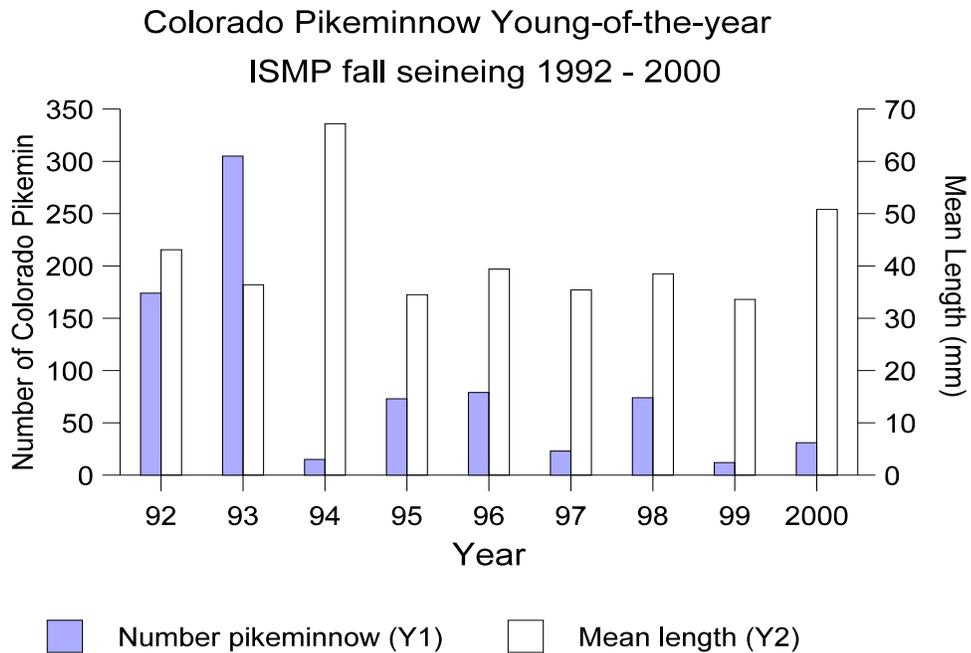


Figure 4. Number and average length of young-of-the-year Colorado pikeminnow collected during fall ISMP seining in the middle Green River: 1992 - 2000.

*Lower Green River/Colorado River*

Adult/Subadult

The 2000 annual ISMP Colorado pikeminnow monitoring was conducted from May 2 through May 13 on the lower Green River and the Colorado River. The elective, or wildcard reach (WC), in 2000 was designated RM 15 - 27 on the Green River.

Three elective reaches (one on the Colorado and two on the Green) have been standardized and were sampled every third year. Discharge in 2000 was slightly higher than in 1999, but much lower than 1998. In an average water year, sampling during the high flow allows us to effectively sample many of the flooded tributary mouths that pikeminnow inhabit at higher water level. However, low flows in 2000 prevented effective sampling of flooded tributary mouths.

A total of 33 adult/juvenile Colorado pikeminnow were captured in reaches 4 and 5, and a further 19 in the elective reach on the lower Green River. Six were captured on the Colorado River. An additional 12 Colorado pikeminnow were observed but not collected in the four official reaches, and seven additional Colorado pikeminnow were observed in the elective reach. Of the total captured, one was a juvenile (55 mm TL) that was too small to PIT tag. All other captures received PIT tags if one was not present. Captured Colorado pikeminnow ranged from 55 to 630 mm with average size increasing upstream (Table 3). For comparison, results are given from 1999 in Table 4.

Table 3. Summary of ISMP adult electrofishing, 2000

River Reach	Miles	Date	Flow (cfs)	# of CS		# Recaps	Mean TL (mm)
				Ad.	Juv.		
Colorado							
7	99 - 86	May 2-3	9635	5	1	1	487
8	68 - 49	May 4-5	11200	1	0	1	485
Green							
4	115 - 96	May 8-9	12650	19	7	4	428
5	56 - 40	May 10-11	13250	6	1	2	416
WC	15 - 27	May 12-13	11400	5	14	0	233

Table 4. Summary of ISMP adult electrofishing, 1999.

River Reach	Miles	Date	Flow (cfs)	# of CS		# Recaps	Mean TL (mm)
				Ad.	Juv.		
Colorado							
7	99-86	May 3-4	8200	1	0	0	467
8	68-49	May 5-6	8400	9	0	0	453
WC	27-15	May 19-20	9000	3	0	0	428
Green							
4	115-96	May 9-10	11500	42	1	8	409
5	56-40	May 11-12	9600	16	0	1	363

Fewer fish were collected in FY99 and FY2000 relative to previous years, making year classes difficult to distinguish (Figure 5). In the length-frequency graphs from the 1998 report, several year classes were apparent 1995-1998. In 1999, a decline was seen in the number of captures and recaptures and this year that trend has continued (Table 5). Of the eight recaptured fish, three have been located in the Utah database. One was found to have been captured in 1992 and 1995. This fish, captured in the lower Green River, was found in the same location with a movement of only one-tenth of a mile since 1995. Its growth since 1995 has increased from 486 mm to 605 mm TL and its weight has increased from 775 g to 1515 g. The other two fish were recaptured in 1999, and have displayed movement of less than a mile in the past year.

All fish were collected and counted in the first mile of each of 8 subreaches within each reach. In this subsample, nonnative fishes were more abundant than natives in both the lower Green and Colorado rivers (Figure 6). In addition to the one-mile subsample, one walleye, one largemouth bass, one cutthroat and eight brown trout were collected in the Colorado River. On the lower Green River, one walleye and two black bullhead catfish were collected. Three walleye stomachs were examined, two were empty and one had two small channel catfish. One bullhead stomach was examined but no fish were found.

Table 5. Numbers of Colorado pikeminnow, recaptured fish (in parentheses), and percent recaptured, during adult/juvenile ISMP sampling 1991-2000.

River	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
CO	9 (0)	27 (0)	20 (2)	28 (7)	30 (9)	33(13)	26(11)	24 (10)	10(1)	7(2)
(%)	<b>0</b>	<b>0</b>	<b>10.0</b>	<b>25.0</b>	<b>30.0</b>	<b>39.4</b>	<b>42.3</b>	<b>41.7</b>	<b>10.0</b>	<b>16.7</b>
GR	50 (3)	57 (5)	52 (2)	44 (7)	56 (7)	82 (5)	51 (6)	101 (15)	59(9)	33(6)
(%)	<b>6</b>	<b>8.8</b>	<b>3.8</b>	<b>15.9</b>	<b>12.5</b>	<b>6.1</b>	<b>11.8</b>	<b>14.8</b>	<b>15.3</b>	<b>18.2</b>
WC (%)	n/a	n/a	n/a	5 (0) GR	15 (0) GR	11 (0) CO	11 (0) GR	42 (2) <b>4.8</b> GR	3 (0) CO	19(0) GR

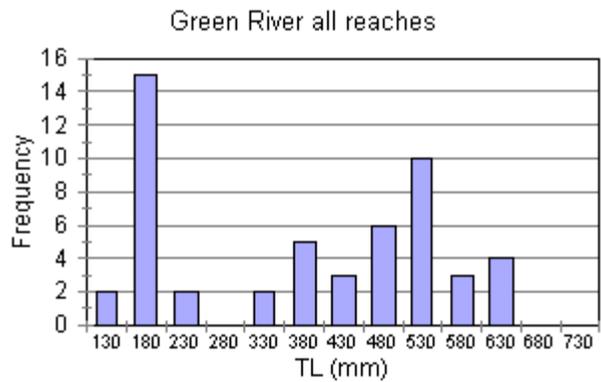
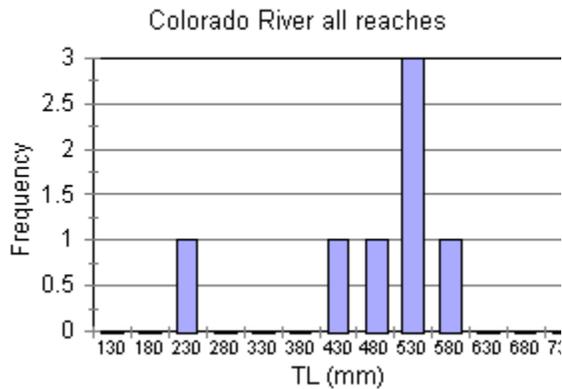


Figure 5. Length frequency of late juvenile/adult pikeminnow collected during ISMP spring electrofishing, 2000.

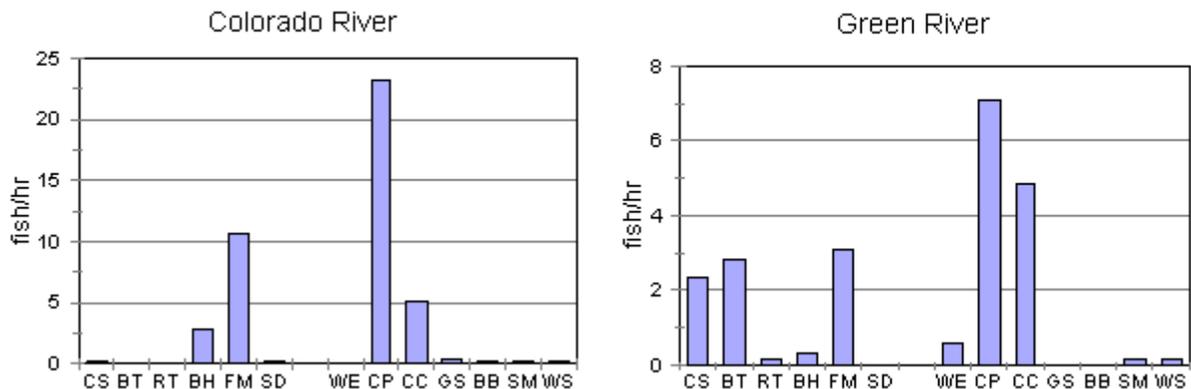


Figure 6. Species composition expressed in fish caught per hour in the one-mile subreaches of adult/juvenile ISMP sampling, 2000. CS-Colorado pikeminnow, BT-bonytail, RT-roundtail, BH-bluehead sucker, FM-flannelmouth sucker, SD-speckled dace, WE-walleye, CP-common carp, CC-channel catfish, GS-green sunfish, BB-black bullhead, SM-smallmouth bass, WS-white sucker.

#### Young-of-year (YOY)

The 2000 annual Interagency Standardized Monitoring Program (ISMP) for sampling young-of-year (YOY) Colorado pikeminnow in the fall was conducted the week of September 18-22, 2000 on the lower Green River and the Colorado River. Two teams of researchers sampled the Colorado River RM 110-0 (reach 1) and the Green River RM 120-0 (reach 3), meeting at the confluence of the two rivers.

In the Colorado River, 170 Colorado pikeminnow were captured, measured and released. An estimated 200 more YOY Colorado pikeminnow were captured at RM 30.8 and not counted or measured but released to avoid mortality. The fish not measured or counted are not included in the distribution chart. A further 15 were captured in habitats not within ISMP parameters and are not included. In the lower Green River, 619 YOY Colorado pikeminnow were captured and released in addition to 84 that were collected in habitats not within the ISMP parameters. Some samples were preserved in the field and may contain unidentified Colorado pikeminnow (7 samples from the lower Green River and 21 from the Colorado River). These collections were transferred to the Larval Fish Laboratory in November for identification.

The average length of Colorado pikeminnow in the lower Green River was 37.9 mm, and in the Colorado River it was 45.7 mm. These lengths represent a 10-20 mm increase in average length from that seen in 1999 (Table 6, Figure 7). In the lower Green River, YOY Colorado pikeminnow were distributed throughout the 120 miles with the highest concentrations between RM 20 and 70. In the Colorado River, pikeminnow were also found throughout the reach with the highest concentration at RM 30.8 (Figure 8).

Table 6. Total numbers, lengths and mean catch-per-unit-effort (CPUE; fish/100m<sup>2</sup>), by year, for Colorado pikeminnow caught during young-of-year monitoring on the Colorado and Green Rivers, 1991-2000.

Year	Colorado Pikeminnow Caught	Mean Length (mm)*	Length Range (mm)*	Total Area Sampled (m <sup>2</sup> )	CPUE (Fish/100m <sup>2</sup> )
1991					
Total	311	36.65	19-58	5278	5.89
Reach 3	190	36.71	22-58	3007	6.31
Reach 1	121	36.54	19-56	2271	5.32
1992					
Total	286	36.80	16-93	8948	3.19
Reach 3	134	40.61	16-93	5100	2.62
Reach 1	152	33.54	20-68	3848	3.95
1993					
Total	1355	36.83	14-74	7479	18.11
Reach 3	1211	37.36	14-74	4574	26.47
Reach 1	142	32.28	22-47	2905	4.88
1994					
Total	453	54.26	23-99	7030	6.44
Reach 3	315	49.98	23-99	3844	8.19
Reach 1	138	64.07	32-96	3186	4.33
1995					
Total	141	22.11	11-45	5612	2.51
Reach 3	57	24.94	13-45	2722	2.09
Reach 1	84	20.46	11-35	2890	2.90
1996					
Total	1276	42.7	19-75	7269	17.55
Reach 3	410	41.4	19-75	2981	13.75
Reach 1	866	39.6	20-81	4160	20.81
1997					
Total	52	29.8	13-40	5581	0.93
Reach 3	40	33.1	19-40	2821	0.10
Reach 1	12	18.3	13-34	2760	0.03
1998					
Total	340	32.4	18-68	7945	4.28
Reach 3	250	32.1	18-68	3235	7.79
Reach 1	88	34.5	20-60	4710	1.87
1999					
Total	312	26.7	15-43	8892	3.51
Reach 3	304	26.8	15-38	4102	7.41
Reach 1	8	25.0	19-43	4790	0.17
2000					
Total	789	39.7	21-88	10421	7.57
Reach 3	619	37.9	21-88	3704	16.71
Reach 1	170	45.7	25-82	6717	2.75

Reach 3: Green River, RM 120 to RM 0 (Confluence with the Colorado River)

Reach 1: Colorado River, RM 110 to RM 0 (Confluence with the Green River)

\*Does not include fish over 100 mm. (Or 1@92 mm in 1999)

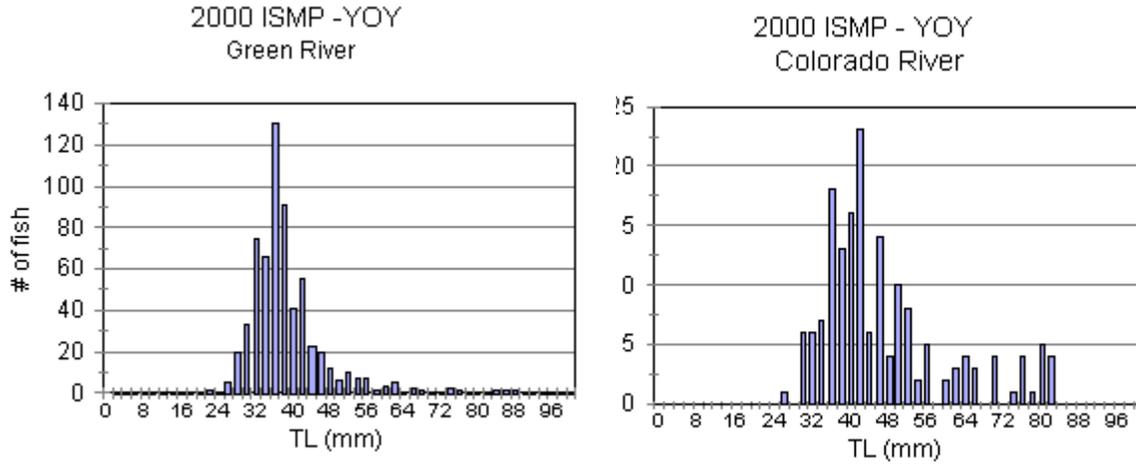


Figure 7. Length frequency distribution of YOY Colorado pikeminnow in the lower Green and Colorado rivers during ISMP, 2000.

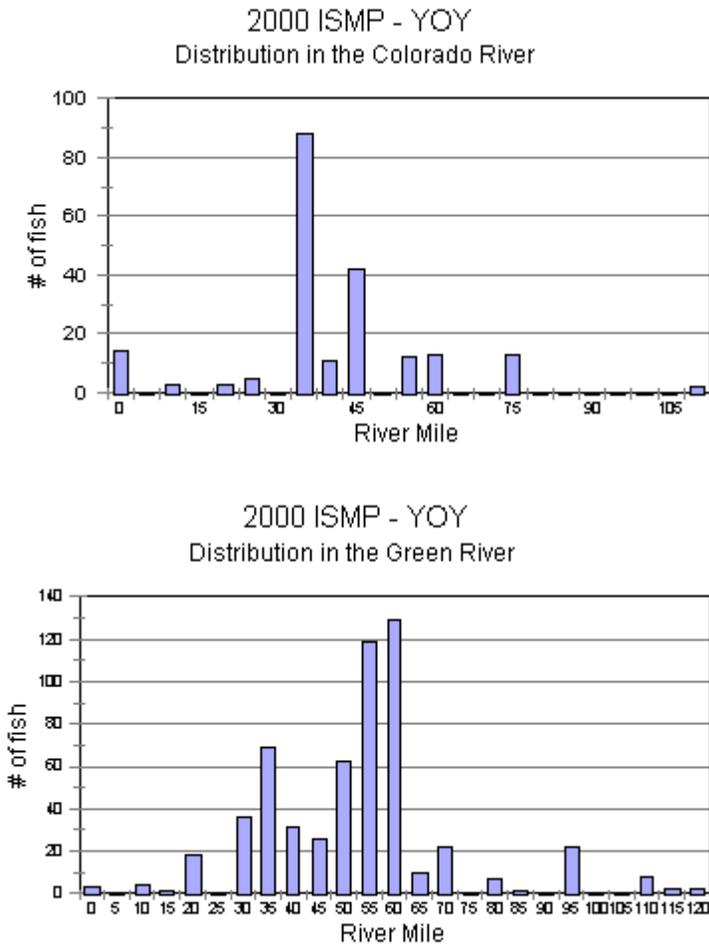


Figure 8. Longitudinal distribution of young-of-year Colorado pikeminnow in the lower Green and Colorado rivers, during ISMP sampling 2000.

Task 3 - Complete 3 sampling trips (one in Desolation/Gray, Westwater, and Cataract Canyons) in July/August for humpback chub monitoring.

Humpback chub populations were monitored in Desolation/Gray (Deso/Gray) and Westwater canyons. Cataract Canyon was not sampled this year. Sampling consisted of fishing six trammel nets (75' x 6'; 1" mesh), shoreline electrofishing, hoop netting, and seining to sample all life stages of fish present at each sampling location. Four trend sites were sampled in Deso/Gray June 28 - July 1, 2000. Three trend sites were sampled in Westwater Canyon September 10-15, 2000. Refer to the revised ISMP handbook for specific sampling methodologies.

*Desolation/Gray Canyon*

Desolation Canyon sampling occurred as Green River flows averaged 3570 cfs. This flow is less than optimal for sampling, determined in the past to be approximately 8000 cfs. Samples collected from seine hauls in low velocity habitat are not included in this report except for *Gila* spp. captures; 17 samples were preserved and not all have been processed. Of the samples that have been processed, two have been identified and were measured at 22 and 25 mm. An additional seven were identified in the field and ranged from 70-87 mm.

A total of 56 adult and juvenile *Gila* spp. were captured (including six recaptures): 15 humpbacks, 17 roundtails, one bonytail, and 23 chub not identified to species (either juveniles or adults of indeterminate morphology) (Table 7). All chubs were photographed and subjected to a series of morphometric measurements. Humpback and general *Gila* spp. trammel net catch rates are reported in Table 8. Chub densities found this year in Deso/Gray were comparable to 1999 catch rates, which were lower than 1997-1998, but similar to what had been found in the years previous.

A total of 27 late juvenile and adult Colorado pikeminnow were collected in 2000 with the majority collected at Coal Creek (RM 145.5). Four of these fish were recaptures (previous capture information to be analyzed at a later date). This years catch rates for Colorado pikeminnow were low relative to 1998 and 1999 (Table 9). Eleven of the eighteen captured fish were ripe males, indicating that again this year, as in the previous four years, our sampling coincided with Colorado pikeminnow spawning. The ripe males were found at the Cow Swim (RM 159.8) and Coal Creek (RM 145.5) sites. Sampling from previous years have demonstrated a concentration of spawning Colorado pikeminnow at the Joe Hutch (RM 160.0) site. A more complete analysis of this data will be provided in later reports.

Table 7. Summary of fishes collected in Deso/Gray Canyon, Green River; June 28 - July1, 2000. Table does not include collection of green sunfish. Results of seine hauls are not included and therefore the absence of non-native cyprinids.

Site / RM	Gear Type	HB	RT	CH	BT	CS	FM	BH	CP	CC
Cedar Ridge / 184.6	Trammel	4	4	11	-	2	15	22	11	23
	Electrofishing	-	-	-	-	1	9	8	7	17
Rock Ck / 174.0	Trammel	6	-	2	-	6	8	7	4	24
	Electrofishing	-	1	1	-	-	8	5	6	81
Cow Swim / 159.8	Trammel	3	7	7	-	8	3	8	2	24
	Electrofishing	-	-	-	-	-	-	1	2	9
Coal Ck / 145.5	Trammel	1	5	2	1	10	8	7	-	11
	Electrofishing	-	-	-	-	-	-	-	-	-
<b>Totals</b>	<b>Trammel</b>	<b>14</b>	<b>16</b>	<b>22</b>	<b>1</b>	<b>26</b>	<b>34</b>	<b>44</b>	<b>17</b>	<b>82</b>
	<b>Electrofishing</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>1</b>	<b>17</b>	<b>14</b>	<b>15</b>	<b>107</b>
	<b>Hoop nets</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>11</b>
<i>Grand Totals</i>		<i>15</i>	<i>17</i>	<i>23</i>	<i>1</i>	<i>27</i>	<i>51</i>	<i>58</i>	<i>32</i>	<i>200</i>

Table 8. Summary of long term trammel net catch rates (fish / net hour) for humpback chub / *Gila* spp. combined at four trend sampling sites in Deso/Gray Canyon, Green River; 1993-2000.

Site	1993	1994	1995	1996	1997	1998	1999	2000
RM 184.8	.03 / .03	.04 / .08	.09 / .09	.02 / .02	.06 / .31	.14 / .24	.03 / .07	.06 / .23
RM 174.0	- / .07	- / .02	- / .02	- / -	.04 / .12	.09 / .16	.07 / .10	.03 / .14
RM 160.0	- / .05	- / .07	.03 / .14	.04 / .04	.09 / .32	.17 / .17	.03 / .11	*.05 / .21
RM 145.5	- / .09	- / .12	.03 / .09	.02 / .02	.05 / .15	- / .06	.05 / .10	.03 / .15

\* For 2000, data for RM 160.0 is actually RM 159.8

Table 9. Summary of long term trammel net catch rates (fish / net hour) for Colorado pikeminnow at four trend sampling sites in Deso/Gray Canyon, Green River; 1993- 2000. \* For 2000, data for RM 160.0 is in actuality RM 159.8.

Site	1993	1994	1995	1996	1997	1998	1999	2000
RM 184.8	.02	-	.01	.02	.12	.08	.11	.03
RM 174.0	-	.07	.08	-	.20	.31	.07	.10
RM 160.0	.02	.02	-	.02	.73	1.35	.48	*.13
RM 145.5	-	.02	.02	-	.02	.06	.04	.16

### *Westwater Canyon*

Monitoring in Westwater Canyon occurred from September 10-15, 2000. The Colorado River flows fell from 4100 cfs to 3400 cfs over the sampling period. The monitoring data was lifted out of a larger data set compiled while trying to determine humpback and roundtail chub population sizes in Westwater Canyon. A summary of chubs recaptured during the monitoring effort is presented within Task 4.

A total of 312 *Gila* spp. were collected with trammel nets and electrofishing while conducting this year's monitoring effort (Table 10). Of that total, 77 were identified as humpback, 186 as roundtail and 49 were not identified to species (including 37 YOY chub with an average TL of 61 mm). Long term trammel net catch rates of humpback and roundtail chub at each of the three trend sites is presented in Table 11. One Colorado pikeminnow (56 mm) was collected through electrofishing efforts in 2000. Native catostomid total catch continued to increase in 2000 as it has the past few years. Speckled dace were also present in the catch (Table 10). Nonnative carp and channel catfish total catch continued to increase as well (Table 12). Largemouth bass and green sunfish were present in numbers similar to channel catfish and carp, respectively. The remaining nonnative fishes were present in the catch in relatively low numbers. A more complete analysis of species relative abundance and population structure will follow in later reports.

Table 10. Summary of native fishes collected in Westwater Canyon, Colorado River; September 10-15, 2000. Results of seine hauls are not included.

Site / RM	Gear Type	HB	RT	CH	CS	F M	BH	SD
Miner's / 124.1	Trammel	14	46	-	-	11	6	-
	Electrofishing	8	25	39	1	10	9	7
Cougar bar / 121.5	Trammel	37	44	-	-	5	3	-
	Electrofishing	12	52	10	-	8	4	-
Hades / 120.0	Trammel	6	19	-	-	3	5	-
<b>Totals</b>	<b>Trammel</b>	<b>57</b>	<b>109</b>	<b>-</b>	<b>-</b>	<b>19</b>	<b>14</b>	<b>-</b>
	<b>Electrofishing</b>	<b>20</b>	<b>77</b>	<b>49</b>	<b>1</b>	<b>18</b>	<b>13</b>	<b>7</b>
<i>Grand Totals</i>		<i>77</i>	<i>186</i>	<i>49</i>	<i>1</i>	<i>37</i>	<i>27</i>	<i>7</i>

Table 11. Summary of long term trammel net catch rates (fish / net hour) for humpback chub / roundtail chub at three trend sampling sites in Westwater Canyon, Colorado River; 1993-2000.

Site	1993	1994	1995	1996	1997	1998	1999	2000
Rm 124.1	.53 / .61	.35 / .31	.42 / .46	.51 / .59	.25 / .92	.53 / .72	.16 / .98	.06 / .20
Rm 121.5	.40 / .44	.27 / .26	.64 / .44	.39 / .16	.31 / .25	.63 / .25	.58 / .22	.17 / .20
Rm 120.0	.45 / .92	.10 / .22	.30 / .30	.21 / .40	.25 / .16	.12 / .26	.14 / .09	.08 / .26

Table 12. Summary of nonnative fishes collected in Westwater Canyon, Colorado River, September 10-15, 2000. Results of seine hauls not included.

Site / RM	Gear Type	C P	CC	WS	BB	LMB	GS	FH	RS	SS	BNT
Miner's / 124.1	Trammel	6	7	-	-	1	0	-	-	-	-
	Electrofishing	12	28	-	-	5	-	7	3	2	-
Cougar bar / 121.5	Trammel	2	1	-	8	1	1	-	-	-	-
	Electrofishing	9	27	5	7	68	27	6	4	2	1
Hades / 120.0	Trammel	-	-	-	-	1	-	-	-	-	-
<b>Totals</b>	<b>Trammel</b>	<b>8</b>	<b>8</b>	<b>-</b>	<b>8</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
	<b>Electrofishing</b>	<b>21</b>	<b>55</b>	<b>5</b>	<b>7</b>	<b>73</b>	<b>27</b>	<b>13</b>	<b>7</b>	<b>4</b>	<b>1</b>
<i>Grand Totals</i>		<i>29</i>	<i>63</i>	<i>5</i>	<i>15</i>	<i>76</i>	<i>28</i>	<i>13</i>	<i>7</i>	<i>4</i>	<i>1</i>

Catch rates for humpback chub and roundtail chub were relatively low in 2000 (Table 6). Low CPUE (fish/net hour) may be indicative of a continued declining trend of both species in Westwater Canyon. However, a low water year and a relatively early sampling period may have also had an effect on the observed CPUE. In addition, overall trammel net CPUE for the three passes conducted under Task 4 was increased over 1999.

### *Cataract Canyon*

Sampling in Cataract Canyon has been conducted on a very infrequent basis by the UDWR from 1990-1997. Annual monitoring the fish community in Cataract Canyon was included in the ISMP beginning in 1998. However, the density of chubs in Cataract Canyon is very low; less than we see in Deso/Gray and far less than that seen in Westwater Canyon. Thus, with the approval of the Biology Committee, monitoring of Cataract Canyon was canceled this year and will not occur again until the Cataract Canyon humpback chub population estimates beginning in Fall 2002. The funds provided for this portion of the task are being transferred to the humpback chub population estimate occurring in Desolation/Gray Canyon in 2001.

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### Task 4 - Humpback chub population estimates in Westwater Canyon.

A three year effort (FY98-FY2000) to determine a humpback chub population estimate in Westwater Canyon culminated in FY2000. Three sampling passes were conducted over six weeks each of the three years to estimate the size of the humpback chub and roundtail chub population in Westwater Canyon. All *Gila* spp. larger than 150 mm were PIT tagged. A similar approach was taken by USFWS personnel working in Black Rocks Canyon.

Sampling sites coincided with the annual monitoring sites in Westwater Canyon (RM 124.1, RM 121.5, RM 120.0). Sampling occurred exclusively with trammel nets to target the adult component of the Westwater chub populations. Past research indicates that trammel nets provide the greatest numbers of adult sized chubs and electrofishing is a better technique to collect juveniles. Electrofishing was employed on the first pass and served as the annual ISMP monitoring trip (see table 10 and Table 12 in Task 3). Chubs of appropriate size caught from electrofishing efforts were PIT tagged. However, to remain consistent between population estimate sampling passes, the electrofishing captures will not be included in the final analysis. Approximately seven to fourteen trammel nets were fished at each site beginning in the late afternoon, through the first few hours of darkness, and again during the pre-dawn and early morning hours. Each net was checked at 2-hour intervals and all chubs removed to a holding pen. During each trip we sampled for two days at the Miner's Cabin site (RM 124.3 - 123.7), for two days at the Cougar Bar site (RM 122.1 - 121) and one day at the Hades Bar site (RM 120.0 - 119.8).

The catch and recapture of humpback and roundtail chubs collected at each of these sites on each of these three trips is presented in Table 13 and Table 14. Same trip recaptures were not considered. Recaptures are presented as long term (1992-1999) and annual

(2000) for each pass. These results are a summary of the raw data and preliminary at this time. Following further verification of this data set we will pursue generating a population estimate. Further analyses of growth and movement will be discussed in future reports.

Table 13. Summary of humpback chub captures and recaptures during three sampling passes in Westwater Canyon, Colorado River; Fall, 1999. All fish were collected with trammel nets. Long term recaptures refer to fish originally tagged between 1992 and 1999.

<i>Pass</i>	<i>Sampling Dates</i>	<i>Location</i>	<i>Total HBC</i>	<i>Long Term</i>	<i>Annual (1<sup>st</sup> Pass)<sup>1</sup></i>	<i>Annual (2<sup>nd</sup> Pass)<sup>2</sup></i>
1	000911-12	RM 124.3 - 123.7	14	4	N/A	N/A
	000913-14	RM 122.1 - 121.0	37	11	N/A	N/A
	000915	RM 120.0 - 119.8	6	0	N/A	N/A
2	000925-26	RM 124.3 - 123.7	19	4	0	N/A
	000927-28	RM 122.1 - 121.0	35	8	2	N/A
	000929	RM 120.0 - 119.8	6	1	0	N/A
3	001009-10	RM 124.3 - 123.7	36	11	0	0
	001011-12	RM 122.1 - 121.0	102	25	2	2
	001013	RM 120.0 - 119.8	0	0	0	0

1 Represents fish tagged during first pass

2 Represents fish tagged during second pass

Table 14. Summary of roundtail chub captures and recaptures during three sampling passes in Westwater Canyon, Colorado River; Fall, 1999. All fish were collected with trammel nets. Long term recaptures refer to fish originally tagged between 1992 and 1999.

<i>Pass</i>	<i>Sampling Dates</i>	<i>Location</i>	<i>Total RTC</i>	<i>Long Term</i>	<i>Annual (1<sup>st</sup> Pass)<sup>1</sup></i>	<i>Annual (2<sup>nd</sup> Pass)<sup>2</sup></i>
1	000911-12	RM 124.3 - 123.7	46	6	N/A	N/A
	000913-14	RM 122.1 - 121.0	44	3	N/A	N/A
	000915	RM 120.0 - 119.8	19	4	N/A	N/A
2	000925-26	RM 124.3 - 123.7	48	3	3	N/A
	000927-28	RM 122.1 - 121.0	35	4	1	N/A
	000929	RM 120.0 - 119.8	26	3	0	N/A
3	001009-10	RM 124.3 - 123.7	126	20	0	5
	001011-12	RM 122.1 - 121.0	85	10	1	3
	001013	RM 120.0 - 119.8	27	4	0	0

1 Represents fish tagged during first pass

2 Represents fish tagged during second pass

Long term recaptures continue to be greater than annual recaptures. It may be necessary for future humpback chub population estimate efforts to collect the necessary information to allow the use an open estimate model. Final analysis of FY98-FY2000 data will determine the accuracy of this approach.

Humpback chub populations estimate activities in Westwater Canyon during FY98 and FY99 yielded a moderate degree of PIT tag loss. Few individuals were documented for PIT tag loss during FY2000.

## VII. Recommendations:

- 1) Results of fall seining indicate a clustered distribution of YOY pikeminnow in many reaches. In many cases, better than half of the YOY pikeminnow collected for the year are found in one or two backwaters. This makes observation or detection of trends and year class strength questionable. An increase in effort by sampling more habitats would help reduce this affect.

Currently, the back and mouth of backwaters along with backwaters of maximum depth

of less than .3 meters are not sampled. In many instances, it has been observed that these habitats contain many pikeminnow. Including these areas and shallow habitats would increase the detection of pikeminnow.

With the adult portion of ISMP being eliminated, there is a need for improved monitoring of YOY Colorado pikeminnow. An increase in effort involving a more thorough sampling of available backwaters will improve the validity of the data collected.

- 2) Develop an approach/model that facilitates the use of multi-year recapture data in humpback chub population estimates (i.e. open population estimate).

#### VIII. Project Status:

Adult portion moving to population estimate sampling  
Young of the year portion ongoing with possible changes.

#### IX. FY 99 Budget:

- A. Funds budgeted: \$169,325
- B. Funds expended/obligated: \$169,325
- C. Difference: \$ 0
- D. Percent FY2000 work completed: 100%
- E. Recovery Program funds spent for publication charges: \$0.00

#### X. Status of data submission:

*Middle Green River:* Data submitted to database manager on December 1, 2000

*Lower Green River/*

*Colorado River:* All data has been entered into electronic database. It will be submitted to the USFWS by Jan 15, 2001.

XI. Signed: Kevin Christopherson

December 6, 2000