

**AUGMENTATION OF  
COLORADO PIKEMINNOW  
(*Ptychocheilus lucius*)  
IN THE SAN JUAN RIVER: 2010**

**Annual Report**



Photo by USFWS

Submitted By:

D. Weston Furr, Fish Biologist  
U. S. Fish and Wildlife Service  
New Mexico Fish and Wildlife Conservation Office  
3800 Commons Ave NE  
Albuquerque, NM 87109

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To:

The San Juan River Basin Recovery Implementation Program

## EXECUTIVE SUMMARY

- Phase II Colorado pikeminnow augmentation plan drafted
  - 2010 was the last year for scheduled stockings of multiple year-classes
  - As guided by the SJRIP, Dexter NFH&TC prepares for production of age-0 fish only
  
- A total of 353 Colorado pikeminnow stocked into the San Juan River in 2010
  - Stocked July 28, 2010 in the Animas River immediately upstream of its confluence with the San Juan River
  - 2008 Year Class (age-2)
  - Average 306 mm Total Length; Range 240-356 mm
  - Opportunistically stocked fish
  
- Annual Fall stockings postponed due to the detection of Largemouth Bass virus in September 2010 at Dexter NFH&TC
  - Dexter NFH&TC holding fish that had been scheduled for stocking in Fall 2010
  - Accelerated fish health testing schedule agreed upon with State partners
  - Final fish health sampling results available early May 2011
  - Fall 2010 held over fish to be stocked in May 2011
  
- 2011 Dexter NFH&TC shifts to Phase II production
  - $\geq 400,000$  age-0 reared annually
    - Annual soft releases to occur in Fall 2011-2020

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## **INTRODUCTION**

Colorado pikeminnow, *Ptychocheilus lucius*, is a federally-listed endangered fish native to the San Juan River. Colorado pikeminnow were first listed as endangered in 1967 by the United States Fish and Wildlife Service (USFWS) and then given full protection under the Endangered Species Act of 1973. In 1996, experimental stocking of Colorado pikeminnow into the San Juan River was undertaken by the Utah Division of Wildlife Resources (UDWR) Moab field station. The purposes of this effort were to evaluate dispersal and retention of stocked juvenile Colorado pikeminnow, and to determine the availability, use, and selection of habitats by early life stages. Between 1996 and 2000, 832,449 larval and age-0 Colorado pikeminnow were stocked into the San Juan River by UDWR (Ryden 2003). In addition, 197 adult Colorado pikeminnow were stocked into the San Juan River, 49 in 1997 and 148 in 2001 (Ryden 2003). In subsequent years, several hundred of those experimentally released Colorado pikeminnow were recaptured during either seining or electrofishing efforts (Ryden 2008a). An analysis of the San Juan River Basin Recovery Implementation Program's (SJ RIP) endangered fish database indicates that since 2004 nineteen individual recaptured Colorado pikeminnow have recruited from the sub-adult to the adult size class within the San Juan River. Captures of larval Colorado pikeminnow in 2004, 2007, 2009, and 2010 confirms that reproduction, to some degree, is occurring in the San Juan River (Brandenburg and Farrington 2011). Data suggest that stocked hatchery-reared Colorado pikeminnow can survive in the San Juan River and that stocking will assist in the re-establishment of the San Juan River Colorado pikeminnow population (Ryden 2008b, Davis and Furr 2008).

An *Augmentation plan for Colorado pikeminnow in the San Juan River* (Ryden 2003) provided the guidance for an eight-year augmentation effort. This plan called for the annual stocking of age-0 Colorado pikeminnow in the fall of each year, 2002-2009 ( $\geq 250,000$  in fall 2002 and  $\geq 300,000$  2003-2009). An addendum to this augmentation plan called for 3,000 age-1+ Colorado pikeminnow to be stocked annually, beginning in 2006 (Ryden 2005). This plan, referred to as Phase I, expired at the end of 2009. A new augmentation plan was drafted in 2010 and calls for the continuation of stocking through 2020 (Furr 2010).

In addition to fish stocked as part of the annual requests under the Phase I augmentation plan, Colorado pikeminnow were opportunistically obtained from various sources between 2003 and 2006 and stocked into the San Juan River. These became available to the SJRIP because they were excess to augmentation efforts occurring elsewhere in the Colorado River Basin. While not specified in the Phase I augmentation plan, the stocking of these fish was approved by the SJRIP Biology Committee (SJRIP-BC). Ages ranged from 1-5 and fish were reared at three different hatcheries: the Colorado Division of Wildlife's Mumma Native Species Hatchery, Dexter National Fish Hatchery and Technology Center (Dexter NFH&TC), and the Arizona Game and Fish Department's Bubbling Ponds Hatchery. A total of 16,258 fish were opportunistically acquired and account for 44.5% of all age-1 or older (age-1+) fish stocked from 2002-2009.

Experimental soft releases by Golden et al. (2006) indicated that short term survivability and retention was improved by acclimatizing Colorado pikeminnow to riverine conditions for up to 7 days prior to release into the mainstem. Based on this study and others (Cresswell and Williams 1983, Olla 1992, Kaya and Jeanes 1995, Brown 2002, Schlechte 2006), it was determined in 2007 to acclimatize all stocked Colorado pikeminnow for up to 24 hours prior to release into the river. Since 2007, a total of 738,000 age-0 and 12,519 age-1+ Colorado pikeminnow have been acclimatized and released at multiple locations upstream of RM 133.3 in the San Juan River.

### **Relationship to the Recovery Program**

The need for artificial propagation and augmentation of this species in the San Juan River is necessary for several reasons, most important of which is to expand the size of the existing Colorado pikeminnow population (Ryden 2003). While augmentation increases overall population numbers, it also provides opportunities for research (i.e., movement studies, habitat and spawning site selection), adds genetic diversity to the existing gene pool, and fulfills specific recovery actions (SJRIP 2011). Subsequent data collection may identify factors limiting successful recruitment of this species in the San Juan River.

**Goals, Actions, and Tasks relating to augmentation of Colorado pikeminnow defined in the SJRIP Long Range Plan (2011):**

- **Goal 1.1 - Establish Genetically and Demographically Viable, Self-Sustaining Colorado Pikeminnow Population**
  - **Action 1.1.1- Develop plans for rearing and stocking CPM.**
    - **Task 1.1.1.3-** Evaluate and adjust stocking goals of augmentation plan.
    - **Task 1.1.1.4** Review and update CPM augmentation plan as needed.
  - **Action 1.1.2- Produce, rear, and stock sufficient numbers of CPM to meet stocking goals of augmentation plan.**
    - **Task 1.1.2.1-** Annually produce and rear at least 300,000 age-0 (50-55 mm TL) and 3,000 age-1 CPM at Dexter NFH&TC.
    - **Task 1.1.2.2-** Annually stock >300,000 age-0 CPM.
    - **Task 1.1.2.3-** Annually stock 3,000 age-1 CPM.
    - **Task 1.1.2.4-** Opportunistically stock available CPM in excess of those described above.
- **Goal 1.3 - Monitor and Evaluate RBS and CPM Augmentation Program and Genetic Integrity.**
  - **Action 1.3.1- Monitor status and success of stocked RBS and CPM.**
    - **Task 1.3.1.1-** Determine survival and recruitment of stocked RBS and CPM to assess stocking success and to determine when to implement mark-recapture population estimates.
  - **Action 1.3.2- Evaluate factors limiting RBS and CPM population recovery.**
    - **Task 1.3.2.1-** Identify, describe, and implement strategies for improving survival and retention of stocked razorback sucker and Colorado pikeminnow, including acclimation prior to stocking, size of fish stocked, time and location of stocking, physiological conditioning, and predator avoidance.

Stocking of fish reared at USFWS hatcheries in the Southwest Region are subject to Regional Policy No. 03-06, “Stocking of fish and other aquatic species”. This policy applies to production, transport, and stocking for USFWS hatchery production and incorporates guidance and requirements from USFWS Fish Health Policy (713 FWM 1-5), Policy for Controlled Propagation of Species Listed under the Endangered Species Act (Federal Register 65:183), and goals and objectives of the USFWS’s Strategic Plan for the Fisheries Program. The USFWS’s Fish and Wildlife Conservation Offices are the primary conduit for satisfaction of policy requirements and ensure compliance with needs relative to fish health, stocking requests and priorities, deviation from approved stocking requests, pre-stocking treatments (e.g. nonnative fish removal from stocking sites), and applicable environmental regulation. New Mexico FWCO is the pertinent field office for processing of SJRIP stocking requests.

### **Objectives for Augmentation Fiscal Year 2010**

1.) Coordinate with Dexter National Fish Hatchery to procure and stock fish according to guidelines set forth in *Augmentation of Colorado pikeminnow (Ptychocheilus lucius) in the San Juan River Phase II, 2010-2020 (Draft Augmentation Plan)* (Furr 2010) and *Stocking plan and protocol for the augmentation of Colorado pikeminnow (Ptychocheilus lucius) in the San Juan River* (Furr and Davis 2009).

## **STOCKINGS**

The summer release of age-2 Colorado pikeminnow occurred on July 28, 2010 in the Animas River approximately 200 meters upstream of its confluence with the San Juan River, near RM 181 (Table 1). This site had been previously used for releases due to the presence of low velocity habitats and easy accessibility by the hatchery truck. Block nets were positioned along a section of an embayed shoreline forming an enclosure approximately 9 x 2 meters. The enclosure was sampled by 4’ x 12’ x 1/8” mesh seine to remove predatory fish. Fishes collected included young-of-year flannelmouth sucker (*Catostomus latipinnis*) (n=7, total length ranged 38-50 mm), juvenile speckled dace (*Rhinichthys osculus*) (n=5, total length ranged 23-29 mm), and one juvenile fathead minnow

(*Pimephales promelas*) (20 mm total length). In addition, two crayfish were collected within the enclosure. In accordance to stocking and non-native fish control protocols, non-native fishes were removed and sacrificed, but remaining native fish were returned to the habitats from which they were collected (Furr and Davis 2009).

Colorado pikeminnow were tempered on site in the hauling tank for at least one hour and to within 1° Celsius (°C) of the measured river temperature of 23.2 °C. A total of 353 Colorado pikeminnow (avg. TL = 306 mm) were transferred into the enclosure. Due to summer rainstorms in the area and the potential of increased Animas River flows and subsequent breach of the enclosure and loss of equipment, it was decided the block nets should not be left overnight. The block nets were removed after approximately 5 hours of acclimatization and fish allowed to disperse.

**Table 1** Colorado pikeminnow stockings in the San Juan River 2010

Date	Age/Year Class	# of Fish	Release Site River Mile	Release Type (soft vs. hard)
July 28	2/ 2008	353	181	Soft
Total Stocked		353		

The Fall releases of  $\geq 3,000$  age-1+ (2009 Year Class) and  $\geq 300,000$  age-0 (2010 Year Class) Colorado pikeminnow were to occur in November 2010. However, with the detection of Largemouth Bass virus (LMBv) in groups of bonytail (*Gila elegans*) and Gila topminnow (*Poeciliopsis occidentalis*) at Dexter NFH&TC in September 2010, all subsequent stockings were postponed until fish health issues were addressed. Colorado pikeminnow scheduled for release in 2010 were held over with the intent that fish would be stocked in Spring 2011 once Dexter NFH&TC is cleared to resume fish deliveries.

All Colorado pikeminnow stocked into the San Juan River in 2010 were produced, reared, and PIT tagged at Dexter NFH&TC under a separate workplan.

## SUMMARY

Augmentation efforts for 2010 failed to satisfy SJRIP-LRP **Task 1.1.2.2** - *Annually stock >300,000 age-0 CPM* and **Task 1.1.2.3** - *Annually stock >3,000 age-1 CPM*, but did fulfill **Task 1.1.2.3** - *Opportunistically stock available CPM in excess of those described above*. The failure to meet Tasks 1.1.2.2 and 1.1.2.3 was wholly due to the unexpected postponement of the Fall stockings because of LMBv issues at Dexter NFH&TC. Therefore, only 353 opportunistically acquired Colorado pikeminnow were able to be stocked prior to the detection of LMBv in 2010.

The Colorado pikeminnow originally scheduled for stocking in Fall of 2010 have been held by Dexter NFH&TC for stocking in Spring of 2011. When this stocking occurs it will be the last scheduled stocking of multiple year-classes (age-1 and age-2+ fish) as Dexter NFH&TC will begin increased production of age-0 fish only. Beginning in 2011, and as outlined under the Phase II augmentation, the annual request will be for  $\geq 400,000$  age-0 Colorado pikeminnow to be reared by Dexter NFH&TC and soft released in the Fall of each year (Furr 2010). This will be the stocking target for 2011 and subsequent years unless augmentation numbers and age classes are modified by the SJRIP. Phase II augmentation efforts will be subject to annual review and revision under the adaptive management approach. Information and reports from ongoing management activities will be analyzed by the SJRIP-BC to guide augmentation strategies regarding appropriate numbers, age-classes, and stocking locations of Colorado pikeminnow to be stocked.

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Appendix 1- Colorado pikeminnow stocked into the San Juan River under the Phase I & Phase II augmentation plans.

Dates	Number Stocked & (Age-Class)	River Miles Stocked At	Mean Total Length (in mm)	Range Of Total Lengths (in mm)	Responsible Agency <sup>a</sup>
<b>2002: 210,418 total fish stocked</b>					
10/24/2002	105,209 (0)	180.2	51	32-127	USFWS-CRFP
10/24/2002	105,209 (0)	158.6	51	32-127	USFWS-CRFP
<b>2003: 176,933 total fish stocked</b>					
11/06/2003	155,764 (0)	180.2-170.5 & 158.6-148.5	58	38-100	USFWS-CRFP
11/06/2003	20,164 (0)	188.4-180.7 & 163.7-159.2	58	Unknown	BIO-WEST
11/06/2003	1,005 (1)	180.2	180	125-280	COW-Mumma
<b>2004: 281,219 total fish stocked</b>					
06/09/2004	1,219 (2)	180.2	218	144-278	COW-Mumma
10/21/2004	30,000 (0)	178.6-169.5 & 163.7-159.2	50	Unknown	BIO-WEST
10/21/2004 & 10/28/2004	250,000 (0)	180.2-170.5 & 158.6-148.5	50	35-116	USFWS-CRFP & BIO-WEST
<b>2005: 306,811 total fish stocked</b>					
07/07/2005	500 (1)	180.2	201	114-256	USFWS-Dexter
07/07/2005	1,491 (2)	180.2	204	121-281	COW-Mumma
10/20/2005	20,000 (0)	175.8, 167.5 & 167.4	55	32-151	BIO-WEST
10/20/2005 & 11/03/2005	282,270 (0)	180.2-170.5 & 158.6-148.5	55	32-151	USFWS-CRFP
11/10/2005	2,550 (2)	180.2	167	115-252	COW-Mumma
<b>2006: 326,547 total fish stocked</b>					
07/13/2006	3,247 (2)	180.2	200	119-278	COW-Mumma
07/13/2006	279 (3)	180.2	216	155-276	COW-Mumma
07/20/2006	3,986 (2)	180.2	211	117-297	COW-Mumma
08/03/2006	1,722 (5)	147.9	410	333-518	USFWS/AZG&F
09/06/2006	259 (5)	147.9	428	389-461	USFWS/AZG&F
10/03/2006	3,200 (1)	158.6	163	119-199	USFWS-Dexter
10/19/2006 & 11/02/2006	313,854 (0)	180.2-170.5 & 158.6-148.5	57	36-111	USFWS-CRFP
<b>2007: 479,226 total fish stocked</b>					
04/18/2007	1,590 (1)	134.5	176	137-228	Dexter & NMFWCO
10/03/2007	81,974 (0)	134.5	~55	Unknown	Dexter & NMFWCO
10/03/2007	1,666 (1)	134.5	~178	147-208	Dexter & NMFWCO
11/07/2007	199,717 (0)	180.2-170.5	58	38-146	USFWS-CRFP
11/14/2007	194,279 (0)	166.6	55	41-157	USFWS-CRFP
<b>2008: 275,091 total fish stocked</b>					
4/15/2008	2,057 (2)	134.9	209	Unknown	Dexter & NMFWCO
10/21/2008	2,800 (2)	134.3	299	Unknown	Dexter & NMFWCO
11/06/2008	270,234 (0)	166.6	55	Unknown	Dexter & NMFWCO
<b>2009: 476,942 total fish stocked</b>					
3/17/2009	1,442 (3)	133.5	240	Unknown	Dexter & NMFWCO
3/17/2009	1,500 (3)	133.5	240	Unknown	Dexter & NMFWCO
10/26/2009	4,000 (2+)	133.5	325	Unknown	Dexter & NMFWCO
10/26/2009	1,000 (2+)	133.3	325	Unknown	Dexter & NMFWCO
11/09/2009	468,000 (0)	166.6	55	~50-60	Dexter & NMFWCO
11/09/2009	1,000 (2+)	180.2	325	Unknown	Dexter & NMFWCO
<b>2010: 353 total fish stocked</b>					
7/28/2010	353 (2)	181	306	240-356	Dexter & NMFWCO
<b>Total number of fish stocked from 2002-2010 = 2,532,306</b>					

USFWS= U.S. Fish & Wildlife Service; CRFP = Colorado River Fishery Project, Grand Junction, Colorado; BIO-WEST = BIO-WEST, Inc., Logan, Utah; COW-Mumma = Colorado Division of Wildlife, J.W. Mumma Native Species Hatchery, Alamosa, Colorado; Dexter = Dexter National Fish Hatchery and Technology Center, Dexter, NM; AZG&F = Arizona Game and Fish Department, Bubbling Ponds Hatchery, Sedona, AZ; NMFWCO= New Mexico Fish & Wildlife Conservation Office, Albuquerque. ~ indicates estimates

Appendix 2- Summary of Colorado pikeminnow stocked into the San Juan River, 1996-2010.

Year Stocked	Number Stocked	River Mile(s) Stocked At	Mean Total Length (in mm)	Range Of Total Lengths (in mm)	Age-Class & (Year-Class) Of Fish Being Stocked	Type Of Stocking	Entity/Agency Responsible For Stocking
1996	100,000	148.0 & 52.0	55	25-85	Age-0 (1996)	Experimental	UDWR
1997	116,878	148.0 & 52.0	45	35-55	Age-0 (1997)	Experimental	UDWR
1997	49	180.2	644	550-753	Age-16 (1981)	Opportunistic	USFWS
1998	10,571	148.0	24	18-28	Age-0 (1998)	Experimental	UDWR
1999	500,000	158.6	"Larvae"	Unspecified	Age-0 (1999)	Experimental	UDWR
2000	105,000	141.9	"Larvae"	Unspecified	Age-0 (2000)	Experimental	UDWR
2001	148	180.2	540	442-641	Age-10 (1991)	Opportunistic	USFWS
2002	210,418	180.2 & 158.6	51	32-127	Age-0 (2002)	Augmentation	USFWS
2003	175,928	180.2-170.5 & 158.6-148.5 (a) 188.4-180.7 & 163.7-159.2 (b)	58	38-100	Age-0 (2003)	Augmentation	USFWS (a) & BIO-WEST (b)
2003	1,005	180.2	180	125-280	Age-1 (2002)	Opportunistic	CDOW
2004	280,000	180.2-170.5 & 158.6-148.5	50	35-116	Age-0 (2004)	Augmentation	USFWS & BIO-WEST
2004	1,219	180.2	218	144-278	Age-2 (2002)	Opportunistic	CDOW
2005	302,270	180.2-170.5 & 158.6-148.5	55	32-151	Age-0 (2005)	Augmentation	USFWS & BIO-WEST
2005	500	180.2	201	114-256	Age-1 (2004)	Opportunistic	USFWS
2005	4,041	180.2	181	115-281	Age-2 (2003)	Opportunistic	CDOW
2006	313,854	180.2-170.5 & 158.6-148.5	57	36-111	Age-0 (2006)	Augmentation	USFWS
2006	3,200	158.6	163	119-199	Age-1 (2005)	Augmentation	USFWS
2006	7,233	180.2	207	117-297	Age-2 (2004)	Opportunistic	CDOW
2006	279	180.2	216	155-276	Age-3 (2003)	Opportunistic	CDOW
2006	1,981	147.9	411	333-518	Age-5 (2001)	Opportunistic	AZG&FD, USFWS & BIA
2007	475,970	180.2-170.5, 166.6 & 134.5	58	37-157	Age-0 (2007)	Augmentation	USFWS
2007	3,256	134.5	176	137-228	Age-1 (2006)	Augmentation	USFWS
2008	2,057	134.9	209	Unspecified	Age-2 (2006)	Augmentation	USFWS
2008	2,800	134.3/133.5	299	Unspecified	Age-2+ (2006)	Augmentation	USFWS
2008	270,234	166.6	55	Unspecified	Age-0 (2008)	Augmentation	USFWS
2009	2,942	133.5	240	Unspecified	Age-3 (2006)	Augmentation	USFWS
2009	5,000	133.5/133.3	325	Unspecified	Age-2+ (2007)	Augmentation	USFWS
2009	468,000	166.6	55	~50-60	Age-0 (2009)	Augmentation	USFWS
2009	1,000	180.2	325	Unspecified	Age-2+(2007)	Augmentation	USFWS
2010	353	181	306	240-356	Age-2 (2008)	Opportunistic	USFWS