

**AUGMENTATION OF  
COLORADO PIKEMINNOW  
(*Ptychocheilus lucius*)  
IN THE SAN JUAN RIVER: 2011**

**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

To:

The San Juan River Basin Recovery Implementation Program

June 30, 2012

## EXECUTIVE SUMMARY

- Phase II (2010-2020) Colorado pikeminnow augmentation plan implemented
  - Fish health issues at Dexter National Fish Hatchery prevented Fall 2010 stockings
    - 218,463 2009 & 2010 Year Class Colorado pikeminnow stocked in May 2011
    - Last scheduled stocking of multiple Year Classes
  
- A total of 645,051 Colorado pikeminnow were stocked into the San Juan River in 2011
  - May 17- PNM sluiceway (River Mile 166.6)
    - 182,412 fish acclimatized for 42 hours
    - Average 85 mm Total Length (TL), 2010 YC
  - May 18- Boyd Park (Animas River Mile 1.0)
    - 36,051 fish hard released
      - 32,308 fish, avg. 121 mm TL, 2010 YC
      - 3,743 fish, avg. 247 mm TL (range= 160-363 mm), 2009 YC
        - Passive Integrated Transponder (PIT) tagged fish
  - November 2- PNM sluiceway
    - 268,350 fish acclimatized for 22 hours
      - Avg. 70 mm TL, 2011 YC
  - November 2- Boyd Park
    - 158,238 fish acclimatized for 20 hours
      - Avg. 60 mm TL, 2011 YC
  
- 2012 Dexter NFH&TC following Phase II production
  - ≥400,000 age-0 Colorado pikeminnow reared annually
    - Soft releases to occur in Fall 2012-2020

## **Table of Contents**

EXECUTIVE SUMMARY .....	i
INTRODUCTION .....	1
Relationship to the Recovery Program .....	3
Objectives for Augmentation Fiscal Year 2011 .....	4
STOCKINGS .....	5
SUMMARY .....	7
Literature Cited .....	9
Appendix 1- Colorado pikeminnow stocked into the San Juan River under the Phase I augmentation plan (2002-summer 2010). .....	11
Appendix 2- Colorado pikeminnow stocked into the San Juan River under the Phase II augmentation plan. ....	12
Appendix 3- Summary of Colorado pikeminnow stocked into the San Juan River, 1996-2010. ....	13
Appendix 4- Summary of Colorado pikeminnow stocked into the San Juan River, 2011-2020. ....	14

## **List of Tables**

Table 1- May 17, 2012 pre-stocking enclosure sampling results for PNM Sluiceway. ....	5
Table 2- Colorado pikeminnow stockings in the San Juan River 2011.....	6
Table 3- Pre-release sampling at PNM Sluiceway and Boyd Park Nov. 2, 2011.....	7

## **INTRODUCTION**

Colorado pikeminnow, *Ptychocheilus lucius*, is a federally-listed endangered fish native to the San Juan River. Colorado pikeminnow were first considered 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 juvenile age-0 Colorado pikeminnow were stocked into the San Juan River by UDWR (Ryden 2003). In addition, 197 adult Colorado pikeminnow ( $\geq 450$ mm TL) 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 (SJRIP) endangered fish database indicated that, as of 2011, 26 individual recaptured Colorado pikeminnow have recruited from the sub-adult to the adult size class within the San Juan River. This is an increase of seven individuals, up from 19 in the 2010 recapture analysis. Captures of larval Colorado pikeminnow in 2004, 2007, and 2009-2011 confirms that limited reproduction is occurring in the San Juan River (Brandenburg et al 2012). Analysis of recapture data suggests that hatchery-reared Colorado pikeminnow can survive in the San Juan River and that stocking will likely 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 an additional 3,000 age-1+ PIT tagged 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. Although not specified in the Phase I augmentation plan, the stocking of these fish was approved on a case-by-case basis 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 accounted 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 survival and retention were 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), in 2007 all stocked Colorado pikeminnow were acclimatized for up to 24 hours prior to release into the river, when possible. A *Stocking Plan and Protocol for the Augmentation of Colorado pikeminnow (Ptychocheilus lucius) in the San Juan River* (Furr and Davis, 2009) was created to provide a justification and framework for how *in situ* acclimatization would occur. Since 2007, a total of 1,164,588 age-0 and 194,931 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**

Propagation and augmentation are part of the plan to recover Colorado pikeminnow in the San Juan River. While augmentation increases overall population numbers, it also provides opportunities for research (i.e., movement studies, habitat and spawning site selection), can add 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 (FWCO) 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.

### **Objective for Augmentation Fiscal Year 2011**

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 first Spring release of 182,412 age-1 Colorado pikeminnow occurred on May 17, 2011 at the PNM Pumping Plant Sluiceway (PNM Sluiceway) located at RM 166.6 (Table 2). These fish had originally been slated for stocking in Fall of 2010 but were held-over at Dexter NFH&TC due to fish health concerns. Once these concerns were allayed, fish were cleared for shipment and rescheduled for delivery at the first available date. The PNM Sluiceway site was selected due to previous successful use for acclimatizing large numbers of Colorado pikeminnow, presence of low velocity habitats, and easy accessibility by the hatchery truck. Block nets were positioned at the mouth of the sluiceway's confluence with the San Juan River mainstem forming an enclosure approximately 50 x 6 meters (300 m<sup>2</sup>). The enclosure was sampled by seine (3 x 1.5 m, 3 mm mesh) to document fishes present within the release enclosure and remove predatory threats. Fishes collected are summarized in Table 1. In accordance with 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).

**Table 1-** May 17, 2012 pre-stocking enclosure sampling results for PNM Sluiceway.

Species	Number (n)	TL (mm;range)	WT (g;range)	Comments
Catlat	14	(47-74)	(1-3)	>100 other juveniles (<80 mm) and 9 sub-adults (300-420 mm) collected but not measured
Catdis	1	94	7	
Catlat x Catdis	1	61	1	
Gamaff	1	25	<1	
Pimpro	6	(31-72)	(≤1)	±50 fish were collected and identified but not measured
Micdol	1	75	5	

Catlat = *Catostomus latipinnis*, flannelmouth sucker; Catdis = *Catostomus discobolus*, bluehead sucker; Gamaff = *Gambusia affinis*, western mosquitofish; Pimpro = *Pimephales promelas*, fathead minnow; Micdol = *Micropterus dolomieu*, smallmouth bass



Colorado pikeminnow were tempered on site in the hauling tank for at least one hour and to within 1°C of the measured river temperature, after which, 182,412 fish (avg. 85 mm TL) were transferred into the enclosure. The block nets were removed after about 42 hours of acclimatization and fish were allowed to disperse.

The second Spring stocking occurred on May 18, 2011 at Boyd Park located at Animas River mile (A-RM) 1.0. This stocking consisted of two separate year classes of Colorado pikeminnow: age-1 (2010 YC) and age-2 (2009 YC) PIT tagged fish (Table 2). Elevated flows in the Animas River prior to the stocking prevented a soft release of these fish. Without an alternative site available it was decided to hard release these fish. Fish were tempered on site in the hauling tank for at least one hour and to within 1°C of the measured river temperature and released.

**Table 2-** Colorado pikeminnow stockings in the San Juan River 2011.

Date	Age/Year Class	# of Fish	Avg. TL in mm	Release Site River Mile	Release Type (soft vs. hard)
May 17	1/ 2010	182,412	85	166.6	Soft
May 18	1/2010	32,308	121	A-RM 1.0	Hard
May 18	2/2009	3,743	247	A-RM 1.0	Hard
November 2	0/2011	268,350	70	166.6	Soft
November 2	0/2011	158,238	60	A-RM 1.0	Soft
<b>Total Stocked</b>		<b>645,051</b>			

The annual Fall release of  $\geq 400,000$  age-0 (2011 YC) Colorado pikeminnow occurred on November 2, 2011. In total, 426,588 age-0 Colorado pikeminnow were soft released at two locations (Table 2). Pre-release sampling was conducted using a Smith-Root model LR 20 backpack electro-fishing unit (Table 3). At both sites fish were acclimated in the hatchery trucks for at least one hour and to within 1°C, released into the enclosures, and held for 20-22 hours. The release site at PNM Sluiceway was used on November 3 for a soft release of  $\geq 300$  mm razorback sucker from Uvalde National Fish Hatchery. The 3/16" mesh block net used to hold the Colorado pikeminnow was replaced with a 1" mesh block net allowing for emigration of the Colorado pikeminnow while still entraining the larger razorback sucker for acclimatization.

All Colorado pikeminnow stocked into the San Juan River in 2011 were produced, reared, and PIT tagged at Dexter NFH&TC under a separate workplan.

**Table 3-** Pre-release sampling at PNM Sluiceway and Boyd Park Nov. 2, 2011.

Release Site RM	Species	Number	TL (range)	WT (range)	Comments
PNM Sluiceway RM 166.6	Ptyluc	5	(108-265)	(7-120)	The 265 mm fish was a recapture, a 144 mm fish implanted with a 134.2kHz PIT tag
	Catlat	2	(162-205)	(38-94)	
	Lepcyca	1	93	13	
	Micsal	1	211	142	
Boyd Park A-RM 1.0	Xyrtex	8	(320-385)	(290-490)	Another 6-10 fish observed but not captured, all fish collected stocked at Boyd Park on 25OCT2011
	Catlat	1	78	NA	
	Lepcyca	2	(79-88)	(8-11)	
	Micsal	3	(97-130)	(11-29)	

Ptyluc= *Ptychocheilus lucius*, Colorado pikeminnow; Catlat= *Catostomus latipinnis*, flannelmouth sucker; Lepcyca= *Lepomis cyanellus*, green sunfish; Micsal= *Micropterus salmoides*, largemouth bass; Xyrtex= *Xyrauchen texanus*, razorback sucker

## SUMMARY

Augmentation efforts for 2011 satisfied SJRIP-LRP **Task 1.1.2.2** - *Annually stock >400,000 age-0 CPM into the San Juan River* and **Task 1.1.2.3** - *Opportunistically stock available CPM in excess of those described above.* **Task 1.2.2.1**- *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*, is ongoing. Data collected during 2012 sampling efforts will be considered when developing the Fall 2012 stocking schedule and will address **Task 1.2.2.1**.

Due to fish health concerns, the Colorado pikeminnow originally scheduled for stocking in Fall of 2010 were stocked in Spring of 2011 by Dexter NFH&TC and NMFWCO. On May 17, 182,412 Colorado pikeminnow (2010 YC) were soft released at PNM Sluiceway (RM 166.6) and held for approximately 42 hours. On May 18, 32,308 Colorado pikeminnow (2010 YC) and 3,743 PIT tagged Colorado pikeminnow (2009 YC) were hard released at Boyd Park (A-RM 1.0). A soft release was not possible at this site due to sudden increases in flows in the Animas River. This release concludes the planned stocking of multiple year-classes and PIT tagged Colorado pikeminnow in the San Juan River.

On November 2, 2011, Dexter NFH&TC and NMFWCO soft released 426,588 age-0 (2011 YC) Colorado pikeminnow. Two sites were utilized; 268,350 fish released at the PNM Sluiceway (RM 166.6) and 158,238 fish released at Boyd Park (A-RM 1.0). Fish were acclimatized in enclosures for approximately 20 hours prior to final release. This Fall stocking was representative of future annual stocking efforts as outlined under the Phase II augmentation plan (Furr 2010).

Phase II augmentation efforts will be subject to annual review and revision under an 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 (Furr 2010).

## Literature Cited

- Brandenburg, W. H., M. A. Farrington, and E. Gilbert. 2012. Colorado pikeminnow and razorback sucker larval fish survey in the San Juan River during 2011, Draft. Prepared by American Southwest Ichthyological Researchers L.L.C. for the San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque. 57 pp.
- Brown, C., and R. L. Day. 2002. The future of stock enhancements: lessons for hatchery practice from conservation biology. *Fish and Fisheries* 3 (2): 79-94.
- Cresswell, R. C., and R. Williams. 1983. Post-stocking movements and recapture of hatchery-reared trout released into flowing water – effect of prior acclimation to flow. *Journal of Fish Biology* 23: 265-276.
- Davis, J. E., and D. W. Furr. 2008. Non-native species monitoring and control in the upper San Juan River, New Mexico: 2007. U.S. Fish and Wildlife Service, Albuquerque, NM. 38 pp.
- Furr, D. W. 2010. Augmentation of Colorado pikeminnow (*Ptychocheilus lucius*) in the San Juan River Phase II, 2010-2020 (Draft Augmentation Plan). U.S. Fish and Wildlife Service, Albuquerque, NM. 20 pp.
- Furr, D. W and J.E. Davis. 2009. Stocking plan and protocol for the augmentation of Colorado pikeminnow (*Ptychocheilus lucius*) in the San Juan River. Draft for the U.S. Fish and Wildlife Service, Albuquerque, NM. 9 pp.
- Golden, M. E., P. B. Holden, and B. Albrecht. 2006. Retention, growth, and habitat use of stocked Colorado Pikeminnow stocked as Age-0 Fish in the San Juan River from 2002-2005: Final Summary Report. San Juan River Basin Recovery Implementation Program, United States Fish and Wildlife Service, Albuquerque, NM. 129 pp. + appendices
- Kaya, C. M., and E. D. Jeanes. 1995. Retention of adaptive rheotactic behavior by F1 fluvial Arctic grayling. *Transactions of the American Fisheries Society* 124: 453-457.
- Olla, B. L., M. W. Davis, and C.B. Schreck. 1992. Comparison of predator avoidance capabilities with corticosteroid levels induced by stress in juvenile coho salmon. *Transactions of the American Fisheries Society* 121: 544-547.
- Ryden, D. W. 2003. An augmentation plan for Colorado pikeminnow in the San Juan River. U. S. Fish and Wildlife Service, Grand Junction, CO. 63 pp. + appendices.
- Ryden, D. W. 2004. Augmentation of Colorado pikeminnow in the San Juan River: 2002-2003. Interim Progress Report. U. S. Fish and Wildlife Service, Grand Junction, CO. 13 pp.

- Ryden, D. W. 2005. An augmentation plan for Colorado pikeminnow in the San Juan River. Addendum # 1: Stocking age-1 fish to supplement ongoing augmentation efforts. U. S. Fish and Wildlife Service, Grand Junction, CO. 3 pp.
- Ryden, D.W. 2008a. Augmentation of Colorado pikeminnow in the San Juan River: 2007. Interim Progress Report. U.S. Fish and Wildlife Service, Grand Junction, CO. 6 pp + Appendix
- Ryden, D.W. 2008b. Long term monitoring of sub-adult and adult large-bodied fishes in the San Juan River: 2007. Final report for the SJRIP, U.S. Fish and Wildlife Service, Albuquerque, NM. 55 pp.
- San Juan River Basin Recovery Implementation Program. 2011. Long-range plan. San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- Schlechte, J. W., and D. L. Buckmeier. 2006. A Pond Evaluation of Habituation as a Means to Reduce Initial Mortality Associated with Poststocking Predation of Hatchery-Reared Largemouth Bass. *North American Journal of Fisheries Management* 26: 119-123.

Appendix 1- Colorado pikeminnow stocked into the San Juan River under the Phase I augmentation plan (2002-summer 2010).

Dates	Number Stocked & (Age-Class)	Stocked at River Mile(s)	Mean Total Length (mm)	Range of Total Lengths (mm)	Responsible Agency
<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	CDO-Mumma
<b>2004: 281,219 total fish stocked</b>					
06/09/2004	1,219 (2)	180.2	218	144-278	CDO-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	CDO-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	CDO-Mumma
<b>2006: 326,547 total fish stocked</b>					
07/13/2006	3,247 (2)	180.2	200	119-278	CDO-Mumma
07/13/2006	279 (3)	180.2	216	155-276	CDO-Mumma
07/20/2006	3,986 (2)	180.2	211	117-297	CDO-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; CDO-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, NM. ~ indicates estimates

Appendix 2- Colorado pikeminnow stocked into the San Juan River under the Phase II augmentation plan.

Dates	Number Stocked & (Age-Class)	Stocked at River Mile(s)	Mean Total Length (mm)	Range of Total Lengths (mm)	Responsible Agency
<b>2010: Stocking Postponed until Spring 2011</b>					
<b>2011: 645,051 total fish stocked</b>					
May 17	182,412 (1)	166.6	85	Unknown	Dexter & NMFWCO
May 18	32,308 (1)	A-RM 1.0	121	Unknown	Dexter & NMFWCO
May 18	3,743 (2)	A-RM 1.0	247	160-363	Dexter & NMFWCO
Nov 2	268,350 (0)	166.6	70	Unknown	Dexter & NMFWCO
Nov 2	158,238 (0)	A-RM 1.0	60	Unknown	Dexter & NMFWCO
<b>Total number of fish stocked from Fall 2010-2020 = 645,051</b>					

Dexter = Dexter National Fish Hatchery and Technology Center, Dexter , NM; NMFWCO= New Mexico Fish & Wildlife Conservation Office, Albuquerque, NM. A-RM= Animas River Mile;

Appendix 3- Summary of Colorado pikeminnow stocked into the San Juan River, 1996-2010.

Year Stocked	Number Stocked	Stocked at River Mile(s)	Mean Total Length (mm)	Range of Total Lengths (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



Appendix 4- Summary of Colorado pikeminnow stocked into the San Juan River, 2011-2020.

Year Stocked	Number Stocked	Stocked at River Mile(s)	Mean Total Length (mm)	Range of Total Lengths (mm)	Age-Class & (Year-Class) of Fish Being Stocked	Type of Stocking	Entity/Agency Responsible for Stocking
2011	214,720	166.6/A-RM 1.0	85/121	Unspecified	Age-1 (2010)	Rescheduled 2010 Augmentation	USFWS
2011	3,743	A-RM 1.0	247	160-363	Age-2 (2009)	Rescheduled 2010 Augmentation	USFWS
2011	426,588	166.6/A-RM 1.0	70/60	Unspecified	Age-0 (2011)	Augmentation	USFWS