

GREEN RIVER ACTION PLAN: MAINSTEM

	ACTIVITY	WHO	STATUS	FY 07 10/06 9/07	FY 08 10/07 9/08	FY 09 10/08 9/09	FY 10 10/09 9/10	FY 11 10/10 9/11	FY 12 10/11 9/12	OUT- YEARS
I.	PROVIDE AND PROTECT INSTREAM FLOWS (HABITAT MANAGEMENT)									
I.A.	Green River above Duchesne River (Utah only; flows not threatened in Colorado because river is entirely within a National Wildlife Refuge and National Monument.)									
I.A.1.	Initially identify year-round flows needed for recovery while providing experimental flows.									
I.A.1.a.	Summer/fall.	FWS-ES	Complete	USFWS 1992.						
I.A.1.b.	Winter/spring.	FWS-ES	Complete	Muth, et al. 2000.						
I.A.1.c.	Review summer/fall flow recommendation.	FWS-ES	Complete							
I.A.2.	State acceptance of initial flow recommendations.									
I.A.2.a.	Summer/Fall.	UT	Complete	USFWS 1992 and revised in Muth et al. 2000.						
I.A.2.b.	Winter/Spring.									
I.A.2.b.(1)	Review scientific basis.	UT	Complete	Muth et al. 2000.						
I.A.2.b.(2)	Assess legal and physical availability of water.	UT	Complete							
I.A.3.	Deliver identified flows.									
>*	I.A.3.a. Operate Flaming Gorge pursuant to the 1992 Biological Opinion to provide summer and fall flows.	BR	Complete							
>*	I.A.3.b. Operate Flaming Gorge to supply winter and spring test flows for research.	BR	Complete	Muth et al. 2000.						
	I.A.3.c. Complete NEPA on reoperation of Flaming Gorge pursuant to Biological Opinion and Record of Decision.	BR	Complete	ROD issued February 16, 2006: U.S. Bureau of Reclamation 2006.						
>*	I.A.3.d. Operate Flaming Gorge Dam to provide winter and spring flows and revised summer/fall flows, pursuant to the new Biological Opinion and Record of Decision.	BR	Ongoing	X	X	X	X	X	X	X
	I.A.3.d.1. Conduct real-time larval razorback and Colorado pikeminnow sampling to guide Flaming Gorge operations.	LFL/FWS	Ongoing	X	X	X	X	X	X	X
I.A.4.	Legally protect identified flows.									
I.A.4.a.	Protect Summer/Fall flows.									
	I.A.4.a.(1) Hold public meeting to establish future appropriation policy.	UT	Complete 10/94	Utah Division of Water Rights. 1994 (public meetings October 1994; policy November 1994).						
	I.A.4.a.(2) Adopt and implement new policy (new appropriations subject to flow criteria).	UT	Complete 11/94							
>*	I.A.4.a.(3) Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.	UT	Ongoing	X	X	X	X	X	X	X
	I.A.4.a.(4) Evaluate effectiveness of policy.	UT	Ongoing	X	X	X	X	X	X	X
I.A.4.b.	Protect Winter/Spring flows.									
I.A.4.b.(1)	Hold public meeting to establish future appropriation policy.	UT	Pending	X						
	I.A.4.b.(2) Review policy, and, if needed adopt and implement new policy (new appropriations subject to flow criteria).	UT	Pending	X	X					
>*	I.A.4.b.(3) Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.	UT	Pending	X	X	X	X	X	X	X
I.B.	Green River below the Duchesne River									
I.B.1.	Initially identify year-round flows needed for recovery while providing experimental flows.	FWS-ES	Complete	Muth et al. 2000.						
I.B.2.	State acceptance of initial flow recommendations (dependent on development of initial flow recommendations).									
I.B.2.a.	Review scientific basis.	UT	Complete	Muth et al. 2000.						
I.B.2.b.	Assess legal and physical availability of water from Green River and tributaries.	UT	Complete	X						
I.B.3.	Legally protect identified flows (dependent on development of initial flow recommendations).									
I.B.3.a.	Hold public meeting to establish future appropriation policy.	UT	Pending	X						
I.B.3.b.	Review policy, and, if needed adopt and implement new policy (new appropriations subject to flow criteria).	UT	Pending	X						
>*	I.B.3.c. Prepare and execute contracts with water users as required to subordinate diversions associated with approved and/or perfected rights.	UT	Pending	X	X	X	X	X	X	X
I.C.	Price River									
I.C.1.	Determine endangered fish spring through autumn use of the Price River.	UT	Complete	Cavalli 1999.						
I.C.2.	Determine winter use and seasonal flow needs for Colorado pikeminnow in the Price River.	UT/FWS	Pending	X						
I.D.	Evaluate and revise as needed, flow regimes to benefit endangered fish populations. See Kitcheyan and Montagne 2005, Bestgen et al. 2006.	FWS/Program	Ongoing	X	X	X	X	X	X	X
I.D.1.	Develop study plan to evaluate flow recommendations.	FWS/BOR/WAPA	Complete	X						

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I.D.1.a.	Evaluate survival of young and movement of subadult razorback suckers from floodplains into the mainstem in response to flows.	TBD	New Start		X	X	X	X	X	
I.D.1.b.	Evaluate recent peak flow studies related to floodplain inundation and entrainment of larval razorback suckers.									
I.D.1.b.(1)	Complete final report on entrainment of larval razorback suckers in floodplains.	UDWR/LFL	Ongoing		X					
I.D.1.b.(2)	Monitor changes in the magnitude, timing, and size distribution of sediment	USGS	Ongoing	X	X	X				
I.D.1.b.(3)	Synthesize physical and biological data from recent peak flow studies related to floodplain inundation and entrainment of larval razorback suckers.	TBD	New Start		X	X				
I.D.1.c.	Monitor larval razorback suckers in mainstem, and synthesize information on drift as related to flows and other conditions.									
I.D.1.c.(1)	Conduct annual monitoring of larval razorback suckers and analyze historic monitoring data.	FWS/LFL	Ongoing	X	X	X	X	X	X	X
I.D.1.d.	Determine relationship of backwater development to sediment availability and peak flows in Reach 2.	TBD	New Start		X	X				
I.D.1.e.	Evaluate effect of base flow variability on backwater maintenance and quality.									
I.D.1.e.(1)	Conduct annual monitoring of larval Colorado pikeminnow.	LFL	Ongoing	X	X	X	X	X	X	X
I.D.1.e.(2)	Monitor age-0 Colorado pikeminnow in backwaters.	UDWR	Ongoing	X	X	X	X	X	X	X
I.D.1.e.(3)	Evaluate response of native fish to nonnative predator removal	UDWR	Ongoing	X	X	X	X	X	X	X
I.D.1.e.(4)	Integrate biological and physical data on backwaters.	TBD	New Start		X	X				
I.D.1.f.	Determine influence of flow and temperature recommendations on entire fish community with emphasis on nonnative fish life history in lower Reach 1 and upper Reach 2.	LFL/FWS	Ongoing	X	X	X				
I.D.1.g.	Determine spillway entrainment of nonnative fish at Flaming Gorge Dam.	CDOW/UDWR	Ongoing	X	X	X				
I.D.2.	Integrate and synthesize reports for evaluation and recommended revision of flow and temperature recommendations.	Program	New Start			X	X			X
I.E.1.	Estimate future water demands on San Rafael River.	PD/Utah	Pending	X						
I.E.2.	Develop tributary management plan for San Rafael River.	PD	TBD							
I.E.3.	Conduct appropriate Section 7 and NEPA compliance to implement tributary management plan.	PD/FWS	TBD							
II.	RESTORE HABITAT (HABITAT DEVELOPMENT AND MAINTENANCE)									
II.A.	Restore and manage flooded bottomland habitat.									
II.A.1.	Conduct site restoration.									
II.A.1.a.	Old Charlie Wash.									
>*	II.A.1.a.(1) Construct water control structure and fish kettle.	BR	Complete	Inlet and outlet water control structures repaired and a fish-harvest kettle installed in spring 1995. Inlet structure replaced March 1996. Leaks to outlet structure repaired in 1999.						
	II.A.1.a.(2) Update management plan.	PD	TBD							
	II.A.1.a.(3) Monitor and evaluate success.	FWS-FR/BR	TBD	Need for operational plan TBD pending determination of role of OCW in recovery.						
II.A.2.	Acquire interest in high-priority flooded bottomland habitats between Ouray NWR and Jensen to benefit endangered fish.									
II.A.2.a.	Identify and evaluate sites.	FWS-FR	Complete							
II.A.2.b.	Pre-acquisition planning and identification of acquisition options.	PD	Complete	Six sites acquired (1008.1 acres total). Floodplain acquisition completed and operation, maintenance and evaluation of sites incorporated into Green River Subbasin Floodplain Management Plan (Valdez and Nelson 2004a) (IIA4).						
II.A.2.c.	Conduct appraisal/NEPA compliance.	PD	Complete							
>*	II.A.2.d. Negotiate acquisition and acquire.	PD	Complete							
	II.A.2.e. Evaluate effectiveness of land acquisition activities and provide recommendations.	PD	Complete							
II.A.3.	Implement levee removal strategy at high-priority sites.									
II.A.3.a.	Preconstruction (contaminants screening, floodability assessments, environmental compliance, design, and engineering).	PD/BR	Complete	Levees breached at 8 sites (accessing 274 acres). Levee removal completed and operation, maintenance and evaluation of sites incorporated into Green River Subbasin Floodplain Management Plan (Valdez and Nelson 2004a) (IIA4). See also Birchell et al. 2002.						
>*	II.A.3.b. Construction (levee breaching). [NOTE: Subject to review and approval for depression wetlands.]	BR	Complete							
>*	II.A.3.c. Operate and maintain.	BR/FWS	Complete							
	II.A.3.d. Evaluation.	FWS	Complete							
>*	II.A.4. Develop and implement Green River Subbasin Floodplain Management Plan (Valdez and Nelson 2004a). See also Tetra Tech 2005, Christopherson et al. 2005, Brunson and Christopherson 2005, and Modde and Haines 2005.	Program	Ongoing	X	X	X	X	X	X	X
II.A.4.a.	Validate and refine Green River Subbasin Floodplain Management Plan	Program	Ongoing	X	X	X	X	X	X	X
II.B.	Restore native fish passage at instream barriers.									
II.B.1.	Assess and make recommendations for fish passage at low flows at Tusher Wash.	FWS-FR/ - WR/BR	Complete	Cavalli 2000.						
II.B.2.	Screen Tusher Wash diversion to prevent endangered fish entrainment, if warranted.									
II.B.2.a.	Assess need.	UDWR	Complete	Cavalli 2000, Kitcheyan et al. 2001.						

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	II.B.2.b. Design.	BR	Pending	X	X	X				
>*	II.B.2.c. Construct.	BR	Pending		X	X	X			
	II.C. Enhance water temperatures to benefit endangered fishes.									
	II.C.1. Identify options to release warmer water from Flaming Gorge Reservoir to restore native fish habitat in the Green River.	BR	Complete	USBR 2005.						
	II.D. Support actions to reduce or eliminate selenium impacts at Ashley Creek and Stewart Drain. [NOTE: selenium remediation (in all reaches) will be conducted independently of and funded outside of the Recovery Program.]	FWS-ES	Ongoing	X	X	X	X	X	X	X
	III. REDUCE IMPACTS OF NONNATIVE FISHES AND SPORTFISH MANAGEMENT ACTIVITIES (NONNATIVE AND SPORTFISH MANAGEMENT)									
	III.A. Reduce negative impacts to endangered fishes from sportfish management activities.									
	III.A.1. Determine relationship between Flaming Gorge test flows and the fish community in Lodore Canyon..	UDWR	Complete	Bestgen 1997, Bestgen and Crist 2000, F60						
>*	III.A.2. Control escapement of nonnative fishes from Ouray National Wildlife Refuge originating from Pelican Lake.	FWS-RW	Complete	Construction completed prior to spring 1997 runoff.						
>*	III.A.3. Identify and control sources of catfish and centrarchids in the middle Green River.	UDWR	Complete	Jackson and Badame 2002.						
	III.A.4. Develop and implement control programs for nonnative fishes in river reaches occupied by the endangered fishes to identify required levels of control. Each control activity will be evaluated for effectiveness, and then continued as needed. See III.A.2.c.1.& 2. under General Recovery Program Support Action Plan.									
>*	III.A.4.a. Northern pike in the middle Green River.	UDWR/FWS	Ongoing	X	X	X	X	X	X	X
	III.A.4.b. Nonnative cyprinids and centrarchids in nursery habitats.									
>*	III.A.4.b.(1) Small nonnative cyprinids from backwaters and other low-velocity habitats in the lower Green River.	UDWR	On hold	Trammell et al. 2005 report complete; development and implementation of control program on hold.						
>*	III.A.4.b.(2) Smallmouth bass in middle and lower Green River.	UDWR/FWS	Ongoing	X	X	X	X	X	X	X
>*	III.A.4.c. Channel catfish (e.g. Deso./Gray Canyons) to protect humpback chub populations, and in the middle Green River to protect razorback sucker and Colorado pikeminnow. On hold pending development of more efficient techniques.	FWS/UDWR	On hold							
	IV. MANAGE GENETIC INTEGRITY AND AUGMENT OR RESTORE POPULATIONS (STOCKING ENDANGERED FISHES)									
	IV.A. Augment or restore populations as needed, and as guided by the Genetics Management Plan.									
	IV.A.1. Develop integrated stocking plan for the four endangered fishes in the Green River.									
	IV.A.1.a. Prepare plan.	UDWR	Complete	Nesler et al. 2003.						
	IV.A.1.b. Program acceptance.	UDWR	Complete	Nesler et al. 2003.						
>	IV.A.1.c. Implement plan.	UDWR	Ongoing	X	X	X	X	X	X	X
	IV.A.1.c.(1) Conduct high-priority lab/field studies identified in bonytail reintroduction plan.	UDWR	Draft not accepted; dropped.	Crowl and Rivera 2000.						
	IV.A.1.d. Evaluate stocking success as identified in monitoring plan for stocked fish.	LFL/FWS/ STATES/PD	Ongoing	X	X	X	X	X	X	X
	V. MONITOR POPULATIONS AND HABITAT AND CONDUCT RESEARCH TO SUPPORT RECOVERY ACTIONS (RESEARCH, MONITORING, AND DATA MANAGEMENT)									
	V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.									
	V.A.1. Verify additional Colorado pikeminnow spawning areas in lower Green.	UT	Complete	Chart et al. 1999.						
	V.A.2. Identify additional razorback sucker spawning areas in lower Green.	UT	Complete	Chart et al. 1999, Muth et al. 1998.						
	V.B. Conduct population estimate for humpback chub.									
	V.B.1. Desolation/Gray. (Sampling occurs in September and October, overlapping fiscal years. Sampling is conducted for 2 years, followed by no sampling for 2 years, with report write-up in the first year following sampling, then sampling resumes in September of the second year). See Jackson and Hudson 2005.	UDWR	Ongoing	X			X	X	X	X
	V.C. Conduct population estimate for Colorado pikeminnow. Sampling is conducted for 3 years, followed by no sampling for 2 years.									
	V.C.1. Middle Green River (including Yampa and White rivers). See Bestgen et al. 2005.	LFL/UDWR/ FWS	Ongoing	X	X			X	X	X
	V.C.2. Lower Green River. See Bestgen et al. 2005.	LFL/UDWR/ FWS	Ongoing	X	X			X	X	X

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V.D.	Conduct population estimate for razorback sucker.	TBD	Pending		X	X	X	X	X	X