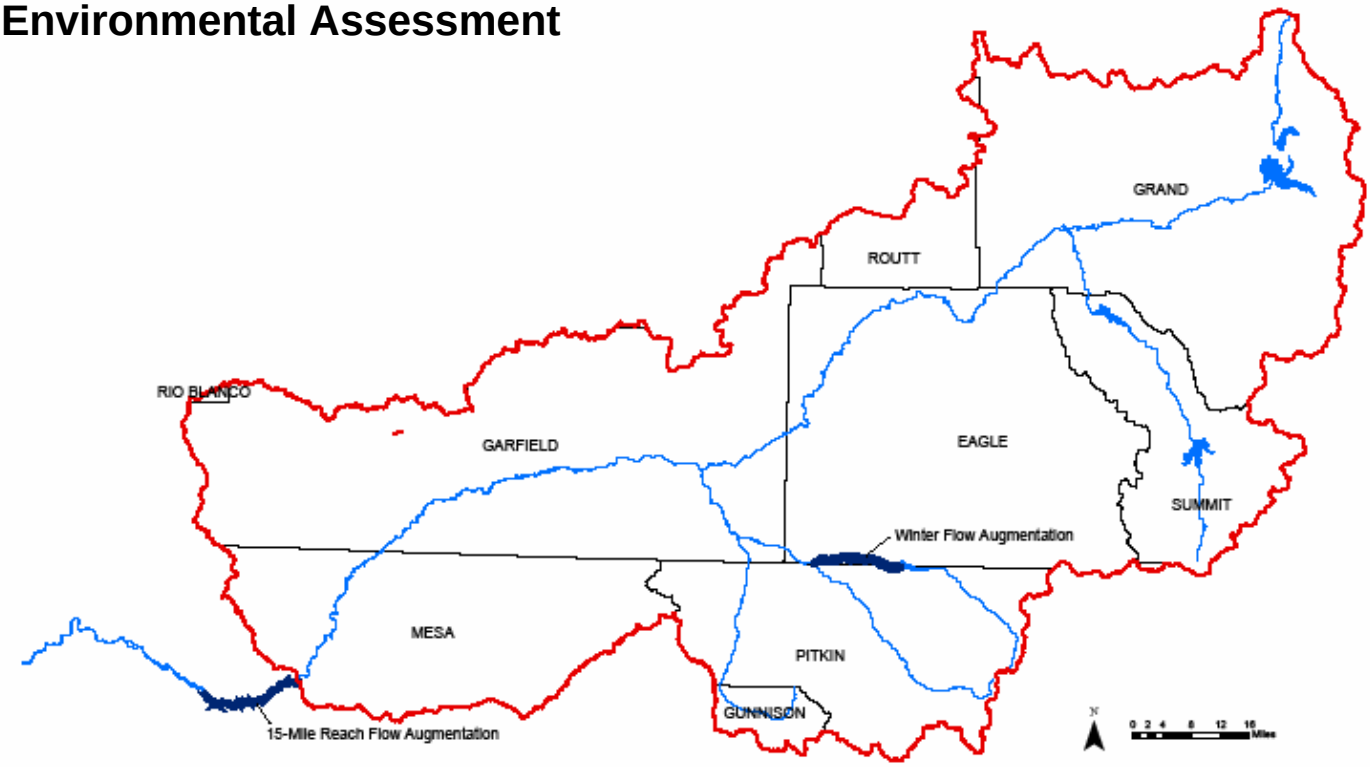
RECLAMATION

Managing Water in the West

EA No. EC-1300-07-01

Ruedi Reservoir Round II Water Marketing Program Repayment Contract – Colorado River Water Conservation District

Environmental Assessment



U.S. Department of the Interior
Bureau of Reclamation
Great Plains Region
Eastern Colorado Area Office

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ACRONYMS AND DEFINITIONS

15-Mile Reach	portion of the Colorado River that extends from the confluence of the Gunnison River upstream 15 miles to the Grand Valley Irrigation Company diversion dam near Palisade, Colorado
ac-ft	acre-feet
anchor ice	results when a river is allowed to freeze over entirely or in large part
cfs	cubic feet per second
contract	Ruedi Reservoir Round II Water Marketing Program Repayment Contract
CRO	Coordinated Reservoir Operations
CRWCD	Colorado River Water Conservation District
CWCB	Colorado Water Conservation Board
drought restriction	U. S. Fish and Wildlife Service waives Colorado River Water Conservation District's obligation to provide West Slope water users' commitment from Wolford Mountain Reservoir under the Programmatic Biological Opinion
EA	Environmental Assessment
Fry-Ark Project	Fryingpan-Arkansas Project
mi^2	square miles
NEPA	National Environmental Policy Act
Operating Principals	Operating Principals for the Fryingpan-Arkansas Project as described in House Document Number 130
PBO	Programmatic Biological Opinion regarding endangered fish species in the Upper Colorado River Basin issued by the Denver Office of the U.S. Fish and Wildlife Service in 1999
Reclamation	Bureau of Reclamation
Recovery Program	Recovery Implementation Program for Endangered Fishes in the Upper Colorado River
Ruedi	Ruedi Reservoir
third party	entity who subcontracts Ruedi Reservoir Round II Water Marketing Program Repayment Contract water from the Colorado River Water Conservation District
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
Wolford Mountain	Wolford Mountain Reservoir

Front cover graphics: Colorado River Water Conservancy District Service Area

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CHAPTER ONE – PURPOSE OF AND NEED FOR ACTION

INTRODUCTION

In response to a request for Ruedi Reservoir Round II Water Marketing Program water, the Bureau of Reclamation (Reclamation) proposes to enter into a 25-year repayment contract (contract) with the Colorado River Water Conservation District (CRWCD) acting by and through its Colorado River Water Projects Enterprise. This non-federal entity has requested a contract for 5,000 ac-ft to be used in its water marketing program for municipal, domestic, industrial, and agricultural water supplies. Until such demands develop CRWCD has also requested to use uncommitted water to augment summer flows in the 15-Mile Reach (portion of the Colorado River that extends from the confluence of the Gunnison River upstream 15 miles to the Grand Valley Irrigation Company Diversion Dam near Palisade, Colorado) and winter flows in the Fryingpan River under certain conditions.

This Environmental Assessment (EA) was prepared by Reclamation in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508), and Reclamation's NEPA Handbook (USDI 2000).

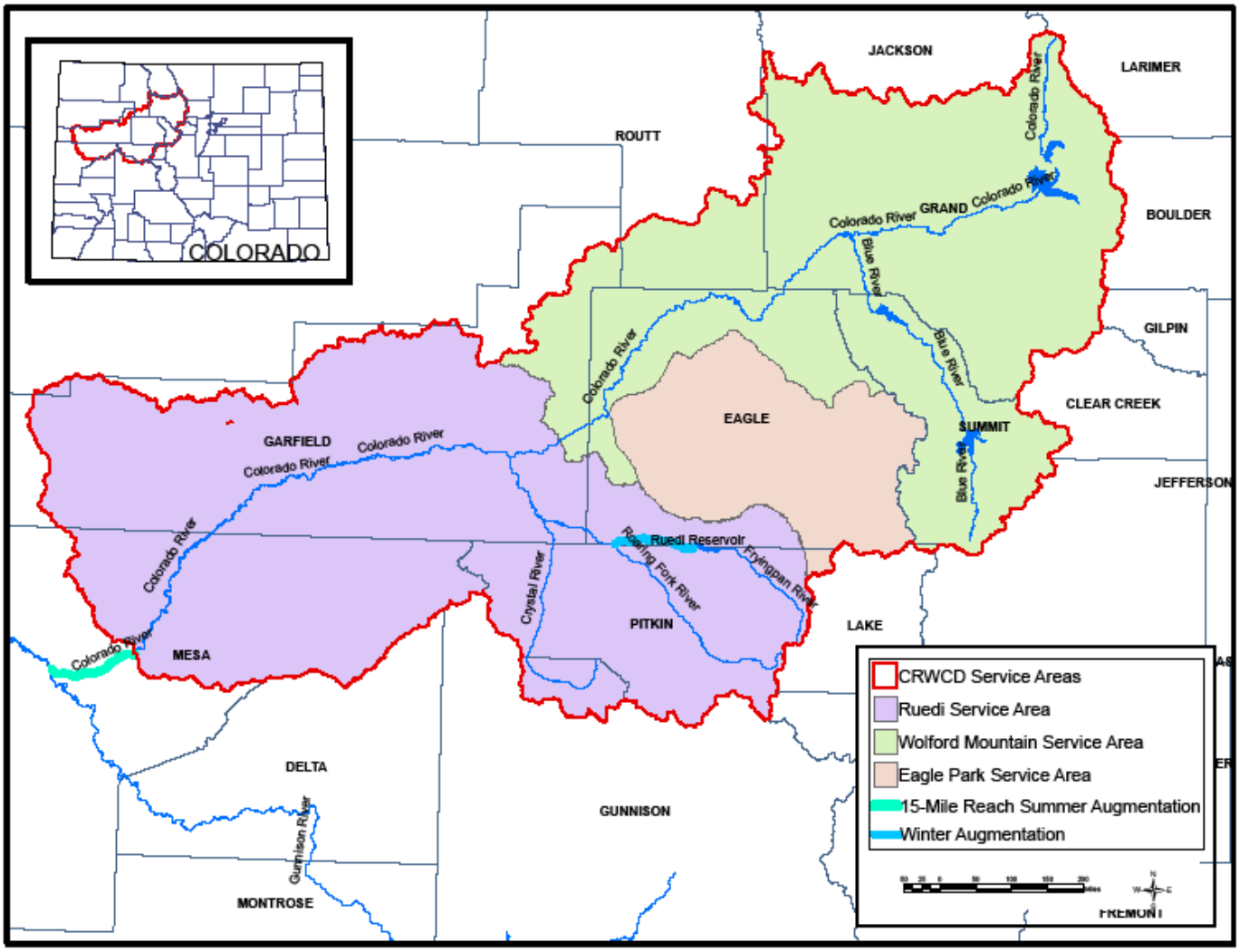
As required by the Final Record of Decision for Ruedi Reservoir Round II Water Marketing Program Final Supplement to the Environmental Statement (RRII FSES; USDI 1990), Reclamation has conducted site-specific NEPA compliance for the proposed contract request with this EA. This EA is not a decision document, but rather it is a disclosure of the environmental consequences of the No Action and Proposed Action Alternatives.

PURPOSE AND NEED

Issuance of the proposed contract would meet several objectives of the Operating Principals for the Fryingpan-Arkansas (Fry-Ark) Project as described in House Document Number 130 (Operating Principals; US Govt 1961). The primary purpose of Ruedi Reservoir (Ruedi) is to furnish water required for the protection of western Colorado water users, including present water rights and prospective uses of water. Receipts from the sale of water from Ruedi are applied to pay for operation and maintenance costs and to reimburse construction costs in excess of $7.6 million.

The proposed contract is needed by the CRWCD to assure it fulfills its statutory role of providing an adequate supply of water for western Colorado. Development on the West Slope of the Rocky Mountains is creating a demand for water that is growing at a rate of about 300 ac-ft per year. The 5,000 ac-ft addition to current water supplies would allow CRWCD to have supplies sufficient to fulfill current and future demands and facilitate better river management in the Colorado River Basin. The water would be subcontracted to third parties as a legal source for municipal, domestic, industrial, and agricultural uses within the boundaries of CRWCD's Service Area focused primarily on the Ruedi Service Area to replace stream depletions, preventing injury to downstream senior water right holders (Merritt 2006a, Merritt 2006b, Merritt 2006c). CRWCD believes that entering into a contract at this time is needed because the cost of the water is still economically viable. Figure 1.1 shows the area that CRWCD services.

FIGURE 1.1 - AREA MAP



Until marketing demands materialize, as a public entity, CRWCD is obligated to utilize as much of its water resources as possible (Merritt 2006c). Therefore, if there is uncommitted contract water available, CRWCD has proposed using the water to provide 1) a temporary partial replacement of water to the 15-Mile Reach when drought conditions exist at Wolford Mountain Reservoir (Wolford Mountain) up to 5 times in 25 years but not more than 3 years in a row and 2) a temporary enhancement to instream winter flows in the Fryingpan River when drought conditions do not exist at Wolford Mountain (Merritt 2006a). Notice the location of Ruedi in relation to the winter flow augmentation of the Fryingpan River and the summer flow augmentation of the 15-Mile Reach in Figure 1.1.

BACKGROUND

Reclamation and Ruedi Reservoir

Reclamation, an agency of the Department of the Interior, operates the Fry-Ark Project, which is a multipurpose transmountain diversion development in southeastern Colorado. It makes possible an average annual diversion not to exceed 120,000 ac-ft in any year or 2,352,800 ac-ft of water in any 34 consecutive years from the Roaring Fork basin on the West Slope to the Arkansas River on the East Slope of the Rocky Mountains. The average annual diversion to date has been approximately 52,400 ac-ft. In 1968, Ruedi Dam and Reservoir were constructed in order to capture the runoff from approximately a 226 mi^2 area, provide storage

for replacement of out-of-priority diversions to the East Slope, and to provide water for development of the West Slope. The primary source of runoff is the spring melt of accumulated winter snow pack, which is stored in Ruedi during the runoff period and then released later in the year.

Ruedi is an important source of municipal and industrial water for Colorado River Basin water users upstream of Grand Junction, Colorado. According to Colorado water law, water users with senior water rights are first in priority to divert water, whether from wells or surface water diversions. Water rights within the same drainage, which are junior to more senior water rights, are legally obligated to curtail their water use when their use of water would impede the senior water right holder from fully utilizing its water rights. To avoid having to curtail water use, junior water right holders may acquire augmentation water, which is released to insure senior water right holders are not "injured." Junior water right holders may enter into contracts with Reclamation to obtain direct delivery or augmentation water from Ruedi to provide the protection described above, and it is for this use that most contracts are established. Releases from Ruedi to meet contract demands may occur at any time of the year, but are primarily associated with dry seasons and seasons of peak water demand, mainly July through October.

In addition to water for replacement and contract for the West Slope, public recreation on Ruedi and the Fryingpan River are recognized under the Operating Principals. Protection of recreational values on the Fryingpan River is made through a provision of minimum flows below the junction of the Fryingpan River and Rocky Fork Creek. Ruedi and the Fryingpan River are well-established recreation destinations, supporting activities such as boating, picnicking, camping, and fishing.

Reclamation, the states of Colorado, Utah, and Wyoming, and water users are signatories to the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River (Recovery Program). The purpose of the Recovery Program is to recover the Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypa*), and bonytailed chub (*Gila elegans*) in the Colorado River and its tributaries above Lake Powell while allowing for existing and new water use in the basin. A Programmatic Biological Opinion (PBO; USDI 1999) was issued to Reclamation in 1999 identifying mitigation measures and elements to allow future development of water by users in the Colorado River Basin. Through Ruedi and other reservoirs, Reclamation and the CRWCD participate in some of these elements.

Coordinated Reservoir Operations (CRO) is an element of the Recovery Program, which aims to attain spring peak flow targets by augmenting peak flows through releases of inflow from participating reservoirs during a seven to ten day period around the peak. Participation in CRO is voluntary and is not meant to affect the timing or volume of fill of the participating reservoirs. Ruedi is one of the participating reservoirs in the CRO program.

Additionally, 5,000 ac-ft annually, 5,000 ac-ft 4 out of 5 years available through re-regulation, and 10,825 ac-ft by contract are made available to the Recovery Program under previous commitments. A team, including West and East slope water users, CWCB, State Division Engineer, U.S. Fish and Wildlife Service (USFWS), and Reclamation has frequent communications regarding coordination of releases to assist in attaining the 15-Mile Reach flow targets. Reclamation could release water from Ruedi and/or Green Mountain Reservoirs in any given year and is ultimately responsible for ordering releases from either reservoir for operational and contractual needs, including the CRO release.

Colorado River Water Conservation District

CRWCD is a quasi-municipal organization established by the State Legislature in 1937 to

protect, conserve and put to beneficial use the water resources of the Colorado River and its principal tributaries including the Yampa, White, and Gunnison Rivers. A water-marketing plan has been developed by CRWCD through its Colorado River Water Projects Enterprise, which allows third parties to contract for use of water directly, or by exchange or augmentation.

The area served by CRWCD overlaps numerous conservancy districts, including the Basalt Water Conservancy District, West Divide Conservancy District, Silt Water Conservancy District, Bluestone Water Conservancy District, and Ute Water Conservancy District. The CRWCD program is designed to complement the operating plans of these districts by making water available to third parties in situations where water would otherwise not be provided or when it would be more beneficial for a particular third party to obtain water through CRWCD.

CRWCD has an agreement with the USFWS, which expires in 2010 and constitutes the West Slope water users' commitment under the PBO, to provide 5,412.5 ac-ft per year from Wolford Mountain to the 15-Mile Reach. There is a drought clause in the existing agreement that allows CRWCD to waive its obligation to provide the water from Wolford Mountain if 1) the Weather Service's May 1st estimate of the April to July forecast for runoff in the Muddy Creek Basin upstream of Ritschard Dam is less than 28,000 ac-ft; and 2) the June 1st reservoir level is less than 56,000 ac-ft. Hereafter the aforementioned drought clause enactment shall be referred to as drought restriction. Wolford Mountain drought restriction is meant to include Wolford Mountain or any other water source used by CRWCD to meet its commitment made in the PBO or other agreements with USFWS.

CRWCD also participates in CRO at Wolford Mountain and, as with Reclamation, its participation is voluntary and does not affect the timing or ultimate attainment of fill. Currently CRWCD has three contracts for Ruedi water totaling 1,730 ac-ft annually, including the 700 ac-ft and 500 ac-ft contracts executed in 2000, and a 530 ac-ft contract executed in 2003.

ISSUES AND IMPACT TOPICS

During the consideration of the proposed contract, Reclamation conducted internal, public and agency scoping as discussed in Chapter Four – Consultation and Coordination to determine the issues relevant to the proposed contract (USDI 2006). Below is a summary of the issues Reclamation identified to be included for further evaluation in Chapter Three – Affected Environment and Environmental Consequences, and those considered but excluded from further evaluation along with a brief explanation.

Issues and Impact Topics Included for Further Evaluation

Ruedi Reservoir Operations

- Adherence to the Operating Principals and minimum streamflow requirements.
- Effects upon Ruedi, and the Fryingpan and Roaring Fork Rivers.

Threatened and Endangered Species

- Effects upon endangered fish in the 15-Mile Reach.
- Impacts to non-fish species.

Other Aquatic Resources

- Impacts to sport fish, their habitat, and their food sources in Ruedi, and the Fryingpan and Roaring Fork Rivers.

Farmland

- Impacts to prime, unique, statewide or locally important farmlands.

Recreation

- Changes in elevation of Ruedi.
- Impacts to fishery due to change in aquatic resources and wadability in the Fryingpan River.

Socioeconomics

- Effects upon tourism, local businesses, and employment.

Hydroelectric Production

- Impacts to Aspen's Hydroelectric Power Plant.

Issues and Impact Topics Considered but Excluded from Further Evaluation

Floodplains, Wetlands, Water Quality and River Physical Properties

Executive Order 11988 instructs federal agencies to avoid, to the extent possible, the long-and short-term adverse impacts associated with the occupancy and modification of floodplains and wetlands, and to avoid direct or indirect support of development in floodplains and wetlands wherever there is a practicable alternative. Executive Order 11990 Protection of Wetlands requires federal land management agencies to take action which will minimize destruction, loss, or degradation of wetlands. The contract would stipulate that CRWCD agrees to include the following language in contracts with third parties: "Section 404 of the Clean Water Act (33 U.S.C. 1344) regulates the discharge of dredged or fill material into waters of the United States. Contractor shall consult with the Army Corps of Engineers if construction of facilities necessary to use the Contracted Water requires Section 404 compliance, which may include obtaining a permit. Further consultation and approval by the United States Fish and Wildlife Service may be required to ensure compliance with the Endangered Species Act (16 U.S.C. §1531, et seq.) if Contractor proposes physical alterations to designated critical habitat of the Colorado River endangered fish species. As of February 2007, designated critical habitat exists from the Garfield County 320 Road Bridge Crossing of the Colorado River in Rifle downstream to the Colorado state line." Based upon this contract stipulation there are no impacts expected to these resources.

Cultural Resources

On August 7, 1998, Reclamation, the Colorado SHPO, and the Advisory Council on Historic Preservation signed a Programmatic Agreement on the Ruedi Reservoir Round II and Green Mountain Reservoir Water Marketing Programs (USBR 1998). When delivery of the contracted water is to water districts, such as CRWCD, this agreement defined the area of potential effect as "the area affected by the construction of new facilities from the point of diversion to the water treatment facility." Since there will be no such construction and the water released would still be within the boundaries of normal flows in the downstream rivers as a result of this contract, there would be no impact to cultural resources.

Indian Trust Resources

Indian trust assets are owned by American Indians but are held in trust by the United States. Requirements are included in the Secretary of the Interior's Secretarial Order 3206, American Indian Tribal Rites, Federal-Tribal Trust Responsibilities, the Endangered Species Act; and Secretarial Order 3175, Departmental Responsibilities for Indian Trust Resources. There are no known Indian trust assets within the CRWCD's Service Area, therefore there would be no effects on Indian trust resources.

Environmental Justice

As required by Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The issuance of the proposed contract would not adversely effect these populations as, according to the Fryingpan Valley Economic Study, the average household income of survey respondents visiting Ruedi was $93,600, and of the Fryingpan River was $128,500 (Crandall 2002). In addition, residents within and

surrounding the area of potential effect are not disproportionately minority or low-income.

AREA OF POTENTIAL EFFECT

The area of potential effect upon which the analysis has been completed encompasses the Ruedi Service Area as shown in Figure 1.1, and the Colorado River to the state line. Although in rare instances the water may be exchanged with Wolford Mountain or Green Mountain Reservoir water, CRWCD plans to primarily use the proposed contract water in the Ruedi Service Area (Merritt 2006c). Impacts in these areas were extrapolated from analyses completed in the RRII FSES, PBO, and/or the Ruedi Reservoir 2012 Agreement Final Environmental Assessment (2012 Agreement; USDI 2002), as well as site-specific analyses. Special attention was given to the amount of water involved with the proposed contracts (5,000 ac-ft in the proposed contracts versus up to the 51,500 ac-ft annually for water contracts and fish recovery releases analyzed in the RRII FSES) and knowledge that issuance of the proposed contract would not approach let alone exceed those impacts discussed in the aforementioned documents.

CHAPTER TWO – ALTERNATIVES

INTRODUCTION

This Chapter describes the No Action and Proposed Action Alternatives. The No Action Alternative essentially is the circumstance that exists currently. The Proposed Action Alternative was proposed by CRWCD and further clarified by Reclamation.

NO ACTION ALTERNATIVE

Under this alternative Reclamation would not issue the 5,000 ac-ft contract to CRWCD. In the absence of a contract with Reclamation, CRWCD would be unable to provide contracts to third parties, causing these entities to look for other ways to augment out-of-priority demands. Additionally, in some years CRWCD would be unable to deliver their water commitment to the 15-Mile Reach summer flows during years when Wolford Mountain is subject to drought restrictions or to the Fryingpan River winter flows during non-drought restriction years as described below (Merritt 2006c).

PROPOSED ACTION ALTERNATIVE

Under the Proposed Action Alternative, Reclamation would enter into a 5,000 ac-ft contract with CRWCD. The water would be subcontracted to third parties as a legal source for municipal, domestic, industrial, and agricultural uses to replace stream depletions, preventing injury to downstream senior water right holders. The third parties to be serviced would be within the River District's boundaries, primarily within the Ruedi Service Area from Glenwood Springs to Grand Junction. CRWCD would continue to primarily use its Wolford Mountain water to provide water sales contracts to third parties upstream of Glenwood Canyon or when the calling right is the Shoshone hydropower plant in Glenwood Canyon. However under certain hydrologic conditions CRWCD may find it desirable to use the proposed contract water in conjunction with Wolford Mountain and Green Mountain Reservoirs to help facilitate better river management (Merritt 2006a, Merritt 2006b, Merritt 2006c).

CRWCD anticipates needing to issue an additional 300 ac-ft of new subcontracts annually under its water-marketing program based upon the past decade of contracting; the total 5,000 ac-ft would not be needed for 16 years (Merritt 2006a, Merritt 2006b, Merritt 2006c). As shown in Table 2.1, the anticipated percentages of depletions or diversions per month are as follows: December thru March 1% each, April thru June and November 4% each, July 12%, August 20%, September and October 24% each (Merritt 2006a).

In addition, until marketing demands materialize in non-drought restriction years 75% of the uncommitted water would be used to augment winter flows in the Fryingpan River from January 1 to March 31 (Merritt 2006a). In December of each year CRWCD would project and submit to Reclamation a determination of the following year's municipal demands, and water availability in Wolford Mountain for delivery of the West Slope's 5,412.5 ac-ft commitment to the 15-Mile Reach. If it is projected that Wolford Mountain would not have a drought restriction during the upcoming summer, then CRWCD would request in December that a portion of their contracted water be released to augment winter flows in the Fryingpan River below Ruedi Dam. CRWCD would hold back 25% of the uncommitted water in order to allow for unexpected contract requests to be met. No winter flow releases would be made if CRWCD determines the drought restriction is expected to be triggered at Wolford Mountain. Although the December determination would be based on the best

TABLE 2.1 – PROJECTED MARKETING DEMANDS

Year	Projected Marketing Demands	January		February		March		April		May		June		July		August		September		October		November		December	
	ac-ft	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**	ac-ft	**cfs**
2007	300	3	0.0	3	0.1	3	0.0	12	0.2	12	0.2	12	0.2	36	0.6	39	0.6	72	1.2	78	1.3	12	0.2	9	0.1
2008	600	6	0.1	6	0.1	6	0.1	24	0.4	24	0.4	24	0.4	72	1.2	78	1.3	144	2.4	156	2.5	24	0.4	17	0.3
2009	900	9	0.1	9	0.2	9	0.1	36	0.6	36	0.6	36	0.6	108	1.8	117	1.9	216	3.6	234	3.8	36	0.6	26	0.4
2010	1200	12	0.2	12	0.2	12	0.2	48	0.8	48	0.8	48	0.8	144	2.3	156	2.5	288	4.8	312	5.1	48	0.8	35	0.6
2011	1500	15	0.2	15	0.3	15	0.2	60	1.0	60	1.0	60	1.0	180	2.9	195	3.2	360	6.1	390	6.3	60	1.0	44	0.7
2012	1800	18	0.3	18	0.3	18	0.3	72	1.2	72	1.2	72	1.2	216	3.5	234	3.8	432	7.3	468	7.6	72	1.2	52	0.8
2013	2100	21	0.3	21	0.4	21	0.3	84	1.4	84	1.4	84	1.4	252	4.1	273	4.4	504	8.5	546	8.9	84	1.4	61	1.0
2014	2400	24	0.4	24	0.4	24	0.4	96	1.6	96	1.6	96	1.6	288	4.7	312	5.1	576	9.7	624	10.1	96	1.6	70	1.1
2015	2700	27	0.4	27	0.5	27	0.4	108	1.8	108	1.8	108	1.8	324	5.3	351	5.7	648	10.9	702	11.4	108	1.8	78	1.3
2016	3000	30	0.5	30	0.5	30	0.5	120	2.0	120	2.0	120	2.0	360	5.9	390	6.3	720	12.1	780	12.7	120	2.0	87	1.4
2017	3300	33	0.5	33	0.6	33	0.5	132	2.2	132	2.1	132	2.2	396	6.4	429	7.0	792	13.3	858	14.0	132	2.2	96	1.6
2018	3600	36	0.6	36	0.6	36	0.6	144	2.4	144	2.3	144	2.4	432	7.0	468	7.6	864	14.5	936	15.2	144	2.4	104	1.7
2019	3900	39	0.6	39	0.7	39	0.6	156	2.6	156	2.5	156	2.6	468	7.6	507	8.2	936	15.7	1014	16.5	156	2.6	113	1.8
2020	4200	42	0.7	42	0.8	42	0.7	168	2.8	168	2.7	168	2.8	504	8.2	546	8.9	1008	16.9	1092	17.8	168	2.8	122	2.0
2021	4500	45	0.7	45	0.8	45	0.7	180	3.0	180	2.9	180	3.0	540	8.8	585	9.5	1080	18.2	1170	19.0	180	3.0	131	2.1
2022	4800	48	0.8	48	0.9	48	0.8	192	3.2	192	3.1	192	3.2	576	9.4	624	10.1	1152	19.4	1248	20.3	192	3.2	139	2.3
2023	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4
2024	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4
2025	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4
2026	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4
2027	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4
2028	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4
2029	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4
2030	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4
2031	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4
2032	5000	50	0.8	50	0.9	50	0.8	200	3.4	200	3.3	200	3.4	600	9.8	650	10.6	1200	20.2	1300	21.1	200	3.4	145	2.4

available information, if CRWCD makes an error and predicts a drought restriction, then CRWCD would use the water it would have put toward winter flow augmentation to the CRO in the spring and/or early summer (Merritt 2006c). The rate and timing of winter releases would be made adaptively depending upon current conditions in order to minimize negative impacts to fishery, and to maximize benefits to sport fish, their habitat and their food sources. Based upon recent historic flow patterns it is likely that a steady release over the entire January through March period would meet these criteria most often (Thompson 2006). Table 2.2 shows the possible additional daily volumes and rates of flow for winter releases from Ruedi above current conditions into the Fryingpan River by year with a variety of release schedules as a result of the implementation of this alternative.

TABLE 2.2 – PROJECTED RUEDI RESERVOIR WINTER RELEASES ABOVE CURRENT CONDITIONS

Year	Projected Surplus	75%	2 Week Release		4 Week Release		8 Week Release		12 Week Release	
	ac-ft	ac-ft	ac-ft/day	cfs	ac-ft/day	cfs	ac-ft/day	cfs	ac-ft/day	cfs
2007	4,700	3,525	252	127	126	63	63	32	42	21
2008	4,400	3,300	236	119	118	59	59	30	39	20
2009	4,100	3,075	220	111	110	55	55	28	37	18
2010	3,800	2,850	204	103	102	51	51	26	34	17
2011	3,500	2,625	188	95	94	47	47	24	31	16
2012	3,200	2,400	171	86	86	43	43	22	29	14
2013	2,900	2,175	155	78	78	39	39	20	26	13
2014	2,600	1,950	139	70	70	35	35	18	23	12
2015	2,300	1,725	123	62	62	31	31	16	21	10
2016	2,000	1,500	107	54	54	27	27	14	18	9
2017	1,700	1,275	91	46	46	23	23	11	15	8
2018	1,400	1,050	75	38	38	19	19	9	13	6
2019	1,100	825	59	30	29	15	15	7	10	5
2020	800	600	43	22	21	11	11	5	7	4
2021	500	375	27	14	13	7	7	3	4	2
2022	200	150	11	5	5	3	3	1	2	1
2023+	0	0	0	0	0	0	0	0	0	0

Finally, until marketing demands materialize, the contract with CRWCD would also be used to contribute uncommitted water to the 15-Mile Reach when the Wolford Mountain drought restriction is activated (Merritt 2006a). Again, although the December determination would be based on the best available information, if CRWCD makes an error and causes a winter flow release from Ruedi during a drought restriction year, CRWCD would waive its right to implement the drought restriction and would release its commitment of water from Wolford Mountain or any other water source used by CRWCD to meet its commitment made in the PBO or other agreements with USFWS (Merritt 2006c). Based on recent hydrologic estimates a drought restriction could have a recurrence interval of up to 20 percent, or up to 5 years over the proposed 25-year contract, and could occur up to 3 years in a row. Releases would be made adaptively from Ruedi to the 15-Mile Reach from August to October based upon need.

Refer to Table 2.3 for an example of the possible water allocation within the context

of this alternative. The estimated increase in water demand of 300 ac-ft per year was based on the past decade of contracting request levels experienced by CRWCD (Merritt 2006c). This estimate along with past hydrologic data yielded a possible allocation of summer flow augmentation for the 15-Mile Reach and winter flow augmentation for the Fryingpan River.

TABLE 2.3 – POTENTIAL ALLOCATION OF PROPOSED CONTRACT WATER

			5,000 ac-ft CRWCD Contract Water		
Historic Hydrologic Data Year	**Corresponding Contract Year**	**Wolford Mountain Allocation to 15-Mile Reach Flows (ac-ft)**	**Third Party Contract Demands (ac-ft)**	**Fryingpan River Winter Flow Allocation (ac-ft)**	**15-Mile Reach Summer Flow Allocation (ac-ft)**
1981	**2007**	0 - Drought Restriction	300	0	4700
1982	**2008**	5412	600	3300	0
1983	**2009**	5412	900	3075	0
1984	**2010**	5412	1200	2850	0
1985	**2011**	5412	1500	2625	0
1986	**2012**	5412	1800	2400	0
1987	**2013**	5412	2100	2175	0
1988	**2014**	5412	2400	1950	0
1989	**2015**	5412	2700	1725	0
1990	**2016**	5412	3000	1500	0
1991	**2017**	5412	3300	1275	0
1992	**2018**	0 - Drought Restriction	3600	0	1400
1993	**2019**	5412	3900	825	0
1994	**2020**	5412	4200	600	0
1995	**2021**	5412	4500	375	0
1996	**2022**	5412	4800	150	0
1997	**2023**	5412	5000	0	0
1998	**2024**	5412	5000	0	0
1999	**2025**	5412	5000	0	0
2000	**2026**	5412	5000	0	0
2001	**2027**	5412	5000	0	0
2002	**2028**	0 - Drought Restriction	5000	0	0
2003	**2029**	0 - Drought Restriction	5000	0	0
2004	**2030**	0 - Drought Restriction	5000	0	0
2005	**2031**	5412	5000	0	0

The contract would be subject to Reclamation law, as amended and supplemented, and the rules and regulations promulgated by the Secretary of the Interior under Reclamation law. Water released through the proposed contract would be delivered according to the Operating Principles established for Ruedi. Further, the contract would contain a shortage provision recognizing that the contract can be satisfied only when the water is available consistent with the Operating Principles.

The contract is subject to all requirements to maintain minimum instream flows detailed in the Operating Principals and by the CWCB. In order to reduce the potential that the proposed contract would cause a violation of the CWCB instream flows, Ruedi contracts and agreements issued after the establishment of an instream flow are subject to all requirements to maintain CWCB's minimum instream flows.

CHAPTER THREE – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION AND METHODOLOGY

This chapter describes the affected environment and discloses the environmental consequences associated with implementing the No Action and Proposed Action Alternatives as described in Chapter Two. Resources evaluated in this chapter include: Ruedi Reservoir operations, threatened and endangered species, other aquatic resources, farmland, recreation, socioeconomics, and hydroelectric production. As described in the Issues and Impact Topics section of Chapter One, there are no impacts expected to floodplains, wetlands, water quality, river physical properties, cultural resources, Indian trust assets, or environmental justice as a result of the issuance of the proposed contract, and therefore have been considered but eliminated from further evaluation.

The No Action Alternative represents current conditions and for the purposes of this analysis is compared to conditions that would exist if the contract were not awarded as described in Chapter Two. Furthermore, the No Action Alternative provided a baseline condition, which was used to evaluate the level of impact caused by the Proposed Action Alternative.

Impact Thresholds

Direct, indirect, and cumulative effects were analyzed for each impact topic and are described in terms of type, duration, and intensity with general definitions of each provided below.

Type - describes the classification of the impact as beneficial or adverse, and direct, indirect or cumulative.

Beneficial*:* positive change in the condition or appearance of the resource, or a change that moves the resource toward a desired condition.

Adverse*:* negative change that detracts from the resource's appearance or condition, or a change that moves the resource away from a desired condition.

Direct*:* effect caused by alternative and occurs in the same time and place.

Indirect*:* effect caused by alternative but is later in time or farther removed in distance, but is still reasonably foreseeable.

Cumulative*:* incremental effect caused by alternative when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

Duration - describes the length of time an effect would occur as short-, intermediate- or long-term.

Short-term: lasting for one to two years of the contract, or the resources resume pre-contract conditions quickly.

Intermediate-term: lasting between two and 16 years of the contract, or the resources resume pre-contract conditions in a longer period of time.

Long-term: lasting beyond 16 years of the contract, or the resources may not resume their pre-contract conditions in the foreseeable future.

Intensity - describes the degree, level, or strength of an impact as no impact, negligible, minor, moderate, or major. The following explain the thresholds used to determine the change in intensity.

No impact: no discernable effect.

Negligible: effect is at the lowest level of detection and causes very little or no disturbance.

Minor: effect that is slight, but detectable, with some perceptible effects of disturbance.

Moderate: effect is readily apparent and has measurable effects of disturbance.

Major: effect is readily apparent and has significant effects of disturbance.

RUEDI RESERVOIR OPERATIONS

The Ruedi Reservoir operation information presented here in summary can be found in detail in the Operating Principals, RRII FSES, and the 2012 Agreement. The analysis on the operations of Ruedi, and resultant impacts to Ruedi, and the Fryingpan and Roaring Fork Rivers in the two latter documents is included here by reference. The direct and indirect impact analysis was also based upon results from a hydrologic model, which focused upon Ruedi and the Fryingpan River. Throughout the analysis direct and indirect impacts to the Roaring Fork River were not explicitly discussed; however the reader should assume the impacts to be of the same nature but of lesser intensity than that of the Fryingpan River impacts.

A description of the hydrologic model used to simulate reservoir and streamflow conditions for the two alternatives is included in Appendix A. Note that the modeling period of record chosen was 1981 to 2005, as shown in Table 2.3, and did not include 1977 as has been done in past analyses. The reason for this omission is that 2002 was a more extreme drought year than 1977 and was the first of three years in a row of a drought period. In addition, to capture 5 drought years in a 25 year period of record, 1977 could not be included. Certain years were selected to represent types of years: 1981 dry year, 1988 moderate year, 1996 wet year, and 2002-2004 period of 3 dry years in a row. Even though 2003 could be considered a moderate year, it was on the border of being a dry year, and with it following the driest year on record, 2003 was operated as though it were a dry year.

Affected Environment

The Operating Principals describe the replacement capacity of Ruedi as that portion of the reservoir needed to replace water diverted out-of-priority to the Arkansas Basin via the Fry-Ark Project. The original replacement reservoir, which was not constructed, would have had a capacity of 28,000 ac-ft. Although not a legally binding maximum, 28,000 ac-ft is generally used as the Replacement Pool amount for analysis purposes. The Regulatory Capacity of Ruedi is that portion of the total reservoir capacity not needed for replacement purposes that would serve West Slope users. The Marketable Yield Pool represents the portion of the Regulatory Capacity of Ruedi which was dedicated to water marketing purposes. Table 3.1 summarizes the pools and the volumes associated with each.

The Operating Principals established the minimum releases as measured on the Fryingpan River immediately below the confluence with Rocky Fork as the lesser of inflow or 39 cfs during the period from November 1 to April 30, or 110 cfs during the period from May 1 to October 31. The CWCB has established minimum instream flows in the Fryingpan River below Ruedi based upon these flow rates; however the water rights are junior in priority to the minimum release requirements established for Ruedi.

The history of Ruedi water contracting is long and complicated; refer to Appendix B for a more detailed summary of Ruedi water marketing history than what will be described here. In 1982 Reclamation concluded Ruedi Reservoir Round I Water Sales, which totaled 7,850 ac-ft of water contracts annually. In response to additional demand, Reclamation initiated action to provide additional water sales through the Ruedi Reservoir Round II Water Marketing Program, which involved extensive U.S. Fish Wildlife Service (USFWS) consultation. In January 1990 Reclamation completed the RRII FSES, which recommended the preferred alternative with conservation

measures to offer for sale a total of 51,500 ac-ft of water annually from Ruedi; however, 5,000 ac-ft of this was to be withheld for conservation flows for identified endangered Colorado River fishes. In May 2002 Reclamation issued a Finding of No Significant Impact for the 2012 Agreement, which Reclamation agreed to contract 10,825 ac-ft annually through the year 2012 for the benefit of the endangered fish. Currently 6,114 ac-ft of Round II water is under contract with 19 contractors for 22 contracts, leaving 21,711 ac-ft available for water contracting.

TABLE 3.1 –RUEDI RESERVOIR POOL VOLUMES

Pool / Allocation	**Volumes** (ac-ft)	**Subtotals** (ac-ft)	**Totals** (ac-ft)
Replacement Capacity*			**Up to 28,000**
Regulatory Capacity			**73,278**
A. Marketable Yield		**51,500**	
1. Round I Contracts	7,850		
2. Endangered Fish Mitigation for Round II Marketing**	5,000		
2. Existing Round II Contracts (Non Endangered Fish)	6,114		
3. Contracted to Endangered Fish Use through 2012	10,825		
3. Available for Contract	21,711		
B. Withdrawn for Recreation		**20,000**	
C. Remaining Regulatory		**1,778**	
Inactive Storage			**1,032**
Dead Storage			**63**
Total Storage Capacity			**102,373**

* The Operating Principals state the replacement capacity is that portion of the reservoir needed to replace out-of-priority diversions to the Arkansas Basin by the Project. For the purpose of analyzing Marketable Yield, the replacement pool was assumed to be 28,000 ac-ft.

** An additional 5,000 ac-ft of water is available from Ruedi Reservoir to benefit endangered fish in 4 years out of 5 through re-regulation of the reservoir.

Environmental Consequences

No Action Alternative

This alternative would result in Ruedi, and the Fryingpan and Roaring Fork River flows continuing to fluctuate as they have historically as a result of yearly precipitation variations, releases for fish recovery and from previously established water contracts, and/or regulation according to the CWCB's minimum instream flows and the Operating Principles. Therefore, this alternative is expected to have no direct, indirect or cumulative impacts to Ruedi operations.

Proposed Alternative

Table 3.2 shows the simulated minimum, maximum, and average monthly flows in the Fryingpan River during all years of the period of record for the Proposed Alternative compared with the No Action Alternative. The model results indicate that the largest difference in flows throughout the year as a result of this alternative would be a reduction of 92 cfs and increase of 196 cfs for minimum flows, and a reduction of 96 cfs and increase of 196 cfs for maximum flows. Analysis related to the impacts of the changes in flows on sport fish, their habitat, or their food sources will be discussed in the Aquatic Resources section of this chapter; and impacts to fishery will be discussed in the Recreation section of this chapter.

TABLE 3.2 – SIMULATED FRYINGPAN RIVER FLOWS

Historic	Corres-ponding	November									December									January								
Hydrolic	Contract	No Action			Alternative			Difference			No Action			Alternative			Difference			No Action			Alternative			Difference		
Year	Year	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
*1981	*2007	60	60	60	60	61	60	0	0	0	59	59	59	60	60	60	0	0	0	59	59	59	59	60	59	0	0	0
1982	2008	42	43	43	42	43	43	0	0	0	42	43	42	42	43	42	0	0	0	42	43	42	42	45	42	0	2	0
*1983	*2009	157	165	158	157	165	158	0	0	0	165	172	168	165	172	168	0	0	0	162	172	167	169	186	182	7	13	15
**1984	**2010	204	208	205	203	207	204	-1	-1	-1	175	208	185	174	207	184	-1	-1	-1	175	175	175	174	190	188	-1	15	13
1985	2011	180	193	185	179	193	185	0	0	0	180	187	184	179	186	183	0	0	0	180	196	187	179	209	199	0	12	12
**1986	**2012	168	177	171	168	177	170	-1	-1	-1	168	186	175	168	186	175	-1	-1	-1	168	176	171	168	189	182	-1	12	11
1987	2013	169	185	176	169	185	177	0	0	0	169	207	180	170	208	181	0	0	0	169	179	173	170	191	184	0	12	11
1988	2014	125	154	129	122	151	127	-3	-3	-3	125	127	127	122	125	124	-3	-3	-3	121	127	125	122	134	131	1	8	6
*1989	*2015	65	68	66	61	65	63	-4	-4	-3	61	68	64	57	65	60	-4	-4	-3	63	65	64	59	70	68	-3	5	5
*1990	*2016	61	63	61	56	59	58	-4	-4	-4	61	63	61	56	58	57	-4	-4	-4	61	66	62	56	69	64	-4	3	2
1991	2017	68	92	78	66	91	75	-2	0	-2	74	85	79	70	81	75	-4	-4	-4	74	74	74	70	77	76	-4	3	2
*1992	*2018	101	109	102	97	105	98	-4	-4	-4	101	101	101	97	97	97	-4	-4	-4	101	101	101	96	97	96	-5	-4	-5
**1993	**2019	96	103	99	91	100	95	-4	-3	-4	97	103	99	91	97	93	-6	-6	-6	96	99	97	92	96	94	-3	-2	-3
1994	2020	141	149	142	138	145	138	-3	-3	-3	141	141	141	138	138	138	-4	-3	-4	141	152	149	138	151	148	-4	-1	-1
1995	2021	65	69	67	60	64	62	-5	-5	-5	65	68	66	60	64	62	-5	-5	-5	66	69	68	62	65	64	-4	-4	-4
**1996	**2022	208	308	212	206	306	211	-1	-1	-1	208	208	208	206	206	206	-1	-1	-1	208	208	208	206	206	206	-2	-1	-2
1997	2023	135	136	135	131	133	132	-3	-3	-3	135	135	135	131	131	131	-3	-3	-3	135	136	135	130	132	130	-4	-4	-4
**1998	**2024	188	190	188	190	192	190	2	2	2	188	188	188	190	190	190	2	2	2	188	189	188	189	190	189	1	1	1
**1999	**2025	144	244	155	143	243	153	-1	-1	-1	144	148	146	143	147	145	-1	-1	-1	144	152	147	142	150	144	-2	-2	-2
2000	2026	160	163	162	158	162	160	-1	-1	-1	159	162	161	157	160	159	-1	-1	-1	160	162	160	157	160	158	-3	-1	-3
*2001	*2027	79	92	82	72	95	76	-7	2	-6	78	81	80	71	73	72	-7	-7	-7	79	80	79	70	72	71	-8	-8	-8
*2002	*2028	72	90	74	68	86	71	-4	-4	-4	72	74	72	68	71	69	-4	-3	-4	72	72	72	67	68	67	-5	-4	-5
2003	2029	43	45	44	43	45	44	0	0	0	43	45	44	43	45	44	0	0	0	43	44	44	43	44	44	0	0	0
*2004	*2030	82	116	95	65	99	78	-17	-16	-17	81	82	82	64	65	64	-17	-17	-17	82	86	86	65	68	67	-17	-18	-18
**2005	**2031	73	75	74	68	69	68	-6	-6	-6	73	74	73	68	69	68	-6	-6	-6	74	74	74	67	69	67	-7	-6	-7
Average		115	132	118	113	130	116	-3	-2	-3	115	121	117	112	118	114	-3	-3	-3	114	118	118	112	120	116	-3	1	-3

Historic	Corres-ponding	February									March									April								
Hydrolic	Contract	No Action			Alternative			Difference			No Action			Alternative			Difference			No Action			Alternative			Difference		
Year	Year	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
*1981	*2007	59	66	65	59	66	65	0	0	0	66	67	66	66	66	66	0	0	0	49	80	64	49	81	64	0	0	0
1982	2008	42	43	42	42	45	42	0	2	0	42	43	42	42	43	42	0	0	0	43	79	59	43	71	55	0	-8	-4
*1983	*2009	143	162	147	152	179	157	9	17	10	143	152	150	152	161	160	9	9	9	140	150	144	106	153	129	-34	3	-15
**1984	**2010	143	175	145	151	190	154	8	15	9	143	143	143	151	151	151	8	8	8	143	242	187	85	239	165	-57	-2	-22
1985	2011	174	183	175	181	197	183	7	14	8	176	186	180	149	193	185	-27	7	6	118	187	158	61	229	131	-57	42	-27
**1986	**2012	173	195	189	185	201	195	12	6	7	186	212	197	191	213	200	5	2	3	186	263	211	94	254	181	-92	-9	-30
1987	2013	163	173	168	169	185	174	6	12	7	163	163	163	169	169	169	6	6	6	125	165	150	92	169	128	-33	4	-22
1988	2014	115	123	116	117	131	119	2	8	2	115	122	118	86	124	114	-29	2	-4	74	180	111	47	161	90	-27	-19	-21
*1989	*2015	65	86	78	41	80	66	-23	-6	-12	52	86	72	45	68	59	-7	-19	-13	50	114	79	49	115	79	-1	1	0
*1990	*2016	66	69	67	46	69	57	-20	0	-10	40	69	56	39	47	42	-1	-22	-14	45	97	63	39	95	62	-6	-2	-1
1991	2017	74	86	80	73	82	77	-1	-4	-3	52	79	75	41	75	51	-11	-4	-25	51	150	76	50	150	76	-1	-1	0
*1992	*2018	98	101	99	91	96	92	-7	-5	-7	98	106	103	84	99	96	-14	-7	-7	61	158	89	61	160	84	-1	1	-6
**1993	**2019	89	97	90	83	94	84	-6	-2	-6	90	110	104	53	104	95	-37	-6	-9	92	155	113	54	154	100	-38	-1	-13
1994	2020	142	152	148	137	151	144	-5	-1	-4	137	147	141	133	143	136	-5	-5	-5	60	148	112	58	142	100	-2	-6	-12
1995	2021	69	97	94	65	86	84	-4	-11	-11	72	99	94	40	85	67	-32	-14	-27	66	137	113	46	136	104	-20	-2	-9
**1996	**2022	208	214	213	206	210	209	-2	-4	-4	214	214	214	210	210	210	-4	-4	-4	152	235	188	151	215	178	-1	-21	-10
1997	2023	128	135	129	121	130	122	-7	-5	-6	128	138	130	85	131	122	-43	-7	-8	107	159	134	71	160	127	-36	1	-8
**1998	**2024	164	188	167	162	189	166	-2	1	-1	164	164	164	162	162	162	-2	-2	-2	84	171	134	82	172	131	-2	0	-3
**1999	**2025	144	149	148	142	143	143	-2	-6	-5	149	154	152	143	149	146	-6	-6	-6	89	154	127	87	151	123	-2	-4	-4
2000	2026	160	172	170	157	167	165	-3	-5	-5	170	172	171	165	167	166	-5	-5	-5	95	209	147	94	201	134	-1	-7	-13
*2001	*2027	79	82	81	69	71	70	-11	-11	-11	80	82	81	49	70	68	-31	-12	-13	59	107	81	46	107	70	-14	0	-11
*2002	*2028	72	94	91	67	83	81	-5	-10	-10	93	94	94	61	84	82	-32	-11	-11	56	210	110	56	213	105	0	3	-5
2003	2029	43	44	43	43	44	43	0	0	0	43	45	44	43	45	44	0	0	0	44	51	48	44	51	47	0	0	0
*2004	*2030	86	116	113	68	91	89	-18	-25	-25	52	121	102	42	98	59	-10	-23	-43	44	157	105	43	160	100	0	3	-5
**2005	**2031	74	85	84	67	71	71	-7	-14	-13	84	85	84	48	71	69	-36	-14	-15	65	91	74	44	106	67	-21	15	-7
Average		111	123	118	108	122	114	-3	-1	-4	110	122	118	98	117	110	-12	-5	-7	84	154	115	66	154	105	-18	0	-10

Historic	Corres-ponding	May									June									July								
Hydrolic	Contract	No Action			Alternative			Difference			No Action			Alternative			Difference			No Action			Alternative			Difference		
Year	Year	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
*1981	*2007	65	145	119	65	145	119	0	0	0	120	153	135	120	153	135	0	0	0	118	350	184	118	351	184	0	1	0
1982	2008	79	222	177	71	204	163	-8	-18	-15	222	318	280	204	279	249	-18	-38	-31	221	391	304	222	295	269	0	-96	-34
*1983	*2009	140	361	286	137	355	281	-3	-5	-4	355	670	539	350	658	530	-5	-12	-9	349	946	636	349	966	626	0	21	-10
**1984	**2010	242	559	444	239	555	441	-2	-4	-3	559	1308	957	555	1298	950	-4	-10	-7	263	1103	688	263	1103	688	0	0	0
1985	2011	130	326	265	130	324	264	0	-2	-2	309	996	660	307	985	654	-2	-12	-6	189	474	275	197	473	276	8	-1	1
**1986	**2012	193	444	368	192	444	367	0	-1	0	436	1032	663	436	1040	666	-1	7	3	277	997	574	277	1000	574	0	2	-1
1987	2013	129	300	250	127	297	248	-2	-3	-2	292	848	555	289	843	547	-3	-6	-8	137	431	266	137	431	266	0	0	0
1988	2014	88	229	189	87	229	189	-1	-1	-1	215	634	382	215	634	382	-1	0	0	190	366	272	185	366	272	-5	0	0
*1989	*2015	53	150	125	53	150	124	-1	-1	-1	120	148	134	119	147	134	-1	-1	-1	117	265	166	118	276	172	1	10	6
*1990	*2016	41	135	112	41	135	112	0	0	0	118	157	138	118	157	138	0	0	0	116	122	119	116	122	119	0	0	0
1991	2017	50	192	144	50	191	142	-1	-1	-1	181	216	198	180	215	197	-1	-1	-1	162	194	180	162	209	185	0	15	5
*1992	*2018	70	159	137	69	157	135	-1	-2	-1	142	154	147	140	152	145	-2	-2	-2	139	176	149	138	181	151	-2	4	2
**1993	**2019	149	409	340	148	407	339	-1	-2	-2	365	1027	630	363	1030	633	-2	3	3	216	735	407	216	735	405	0	0	-2
1994	2020	48	127	116	46	125	114	-2	-2	-2	135	181	161	132	179	158	-2	-3	-3	155	357	245	151	366	251	-3	9	6
1995	2021	135	406	306	134	404	305	-2	-2	-1	345	656	536	343	653	534	-2	-3	-3	563	881	796	563	920	801	0	39	5
**1996	**2022	153	451	309	152	511	312	-1	60	3	472	987	823	532	987	828	60	0	5	126	620	321	126	616	321	0	-4	0
1997	2023	129	388	283	128	386	281	-1	-2	-2	366	898	673	364	898	676	-2	0	3	188	639	340	188	639	341	0	0	1
**1998	**2024	88	272	197	86	269	194	-2	-3	-2	248	306	276	245	303	273	-3	-3	-3	127	544	307	127	543	307	0	-1	0
**1999	**2025	91	240	196	89	237	194	-2	-3	-2	229	374	302	226	370	299	-3	-4	-4	226	511	359	226	551	365	0	40	6
2000	2026	102	232	195	101	231	193	-1	-2	-1	214	584	358	212	589	366	-2	6	7	175	351	235	165	361	239	-10	11	4
*2001	*2027	79	183	149	78	180	147	-1	-2	-2	162	205	183	160	203	181	-2	-3	-3	141	214	182	145	237	188	4	23	6
*2002	*2028	123	242	152	123	244	153	0	3	1	115	185	132	115	185	132	0	0	0	109	351	231	120	362	241	11	11	10
2003	2029	47	133	117	47	132	117	0	-1	0	128	149	135	128	148	134	0	0	0	81	367	213	84	378	218	4	10	5
*2004	*2030	119	139	126	119	142	127	0	2	0	117	127	122	117	127	122	0	0	0	114	228	137	114	237	139	0	9	2
**2005	**2031	64	199	153	62	196	151	-1	-3	-2	183	214	200	180	211	197	-3	-3	-3	188	272	224	188	272	226	0	0	1
Average		104	266	210	103	266	208	-1	0	-2	246	501	373	246	498	370	0	-3	-2	187	475	118	188	480	116	0	4	-3

Historic	Corres-ponding	August									September									October									Average Annual		
Hydrolic	Contract	No Action			Alternative			Difference			No Action			Alternative			Difference			No Action			Alternative			Difference			Difference		
Year	Year	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
*1981	*2007	353	356	355	354	357	355	1	1	1	159	355	316	355	356	355	196	1	39	120	159	140	121	355	181	1	196	41	17	17	7
1982	2008	138	230	163	138	230	163	0	0	0	120	162	138	120	161	138	0	-1	0	110	139	122	112	141	124	3	2	2	-2	-13	-7
*1983	*2009	165	409	260	165	409	260	0	0	0	109	157	137	113	158	140	4	1	3	92	141	107	96	145	111	4	4	4	-1	4	0
**1984	**2010	173	248	216	173	248	216	0	0	0	103	173	130	108	173	132	5	0	1	89	192	127	94	197	131	5	5	5	-3	2	0
1985	2011	95	210	144	98	210	145	3	0	1	90	276	160	93	282	164	3	6	4	97	117	106	102	118	109	6	2	3	-5	6	0
**1986	**2012	132	245	169	132	245	169	0	0	0	115	187	148	112	187	148	-3	0	1	94	130	113	101	130	114	7	0	2	-6	2	-1
1987	2013	121	333	204	121	337	206	0	4	3	92	333	207	101	342	215	9	9	9	53	90	64	62	99	73	9	9	9	-1	4	1
1988	2014	353	365	358	358	370	363	5	5	5	65	360	123	76	365	132	10	5	10	50	78	66	60	88	76	10	10	10	-3	1	0
*1989	*2015	155	298	214	160	304	220	6	6	6	203	372	301	215	384	312	12	12	11	49	375	127	61	387	138	11	12	11	-1	1	0
*1990	*2016	279	357	341	284	364	347	5	6	6	98	359	226	111	371	238	13	12	12	88	115	103	101	128	116	13	13	13	-1	0	0
1991	2017	140	319	228	142	326	233	2	7	6	113	348	211	117	362	222	4	14	11	56	125	72	70	139	86	14	14	14	0	3	0
*1992	*2018	185	340	238	193	347	246	8	7	8	136	224	170	152	242	186	16	18	16	144	303	245	149	324	263	5	20	18	-1	2	1
**1993	**2019	127	209	165	131	209	167	4	0	2	119	214	149	120	230	160	1	16	10	153	345	252	169	362	269	16	16	16	-6	1	-1
1994	2020	350	387	365	359	396	374	9	9	9	81	382	125	100	391	142	18	9	17	50	81	66	68	99	84	18	18	18	1	2	1
1995	2021	166	478	260	166	478	260	0	0	0	109	167	131	110	167	131	1	0	0	99	138	122	114	156	139	15	18	17	-5	1	-4
**1996	**2022	152	350	287	156	360	296	4	10	8	114	350	286	115	371	302	1	21	16	92	114	103	109	115	110	16	1	8	6	5	1
1997	2023	137	213	176	137	213	177	0	0	0	118	156	131	118	156	131	0	0	0	99	144	120	109	144	121	10	0	1	-8	-2	-3
**1998	**2024	118	209	150	120	212	154	2	3	4	124	236	162	126	255	174	2	19	12	78	157	110	92	179	118	14	22	8	1	3	1
**1999	**2025	145	225	190	145	225	190	0	0	1	120	248	175	121	267	182	0	19	7	69	144	105	89	152	115	20	8	10	0	3	0
2000	2026	209	360	341	220	371	352	11	11	11	86	209	119	107	219	137	20	11	18	48	103	79	70	119	99	21	16	20	2	2	3
*2001	*2027	113	312	154	116	322	157	3	10	3	118	280	196	137	301	216	20	21	20	90	217	141	107	238	158	17	21	17	-3	3	-1
*2002	*2028	104	385	296	114	395	307	11	11	11	54	172	97	75	194	117	21	22	21	40	114	67	62	136	88	21	22	21	1	3	2
2003	2029	123	354	275	126	365	284	3	11	9	93	137	112	101	145	122	8	9	10	51	105	81	73	126	102	21	21	21	3	4	4
*2004	*2030	138	351	282	142	362	292	4	11	10	100	324	186	116	342	206	16	18	20	50	108	69	72	116	88	21	8	20	-3	-4	-6
**2005	**2031	154	310	210	162	320	216	8	11	6	91	353	239	109	375	258	18	22	20	102	114	109	112	114	113	10	0	5	-4	0	-2
Average		173	314	242	176	319	246	4	5	4	109	261	175	125	272	186	16	11	11	83	154	113	95	172	125	12	18	12	-1	-1	2

* Indicates dry years, ** indicates wet years, and no asterisks indicate moderate years.

Figure 3.1 shows the simulated relative effect of this alternative on Fryingpan River flows in representative dry, moderate, and wet years compared to what would be expected under current conditions. As shown in the model results for 1981, for a dry year early in the contract there would be an extension of higher flows for approximately 2 weeks in early fall. In other types of years there would be a small increase in flows starting in late summer and continuing through October as a result of the majority of the contract water being released during this time. Although contract water is being released at other times of the year (see Table 2.1 in Chapter Two), past operations at Ruedi show that a drawdown of the reservoir would be made in winter, and that flows would be bypassed in spring and early summer regardless of whether this alternative was implemented. However, there are occasions when flows in the Fryingpan River would be lower than current conditions as the reservoir is reaching the spring fill target date of April 15 as seen in the moderate, wet and two of the later dry year model runs below. Despite this, at no point would the flows violate minimum instream flow targets as described in the Operating Principals as a result of this alternative. Furthermore, the selection of this alternative is not expected to result in direct or indirect impacts to the flows greater than those presented in the RRII FSES.

Table 3.3 shows the simulated average monthly storage level in Ruedi for all years during the period of record for the Proposed Alternative compared with the No Action Alternative. The model results indicate that the average difference in storage levels over the 25 year life of the contract would be 1,153 ac-ft, which equates to a reduction of 1,032 ac-ft in dry years, 1,340 ac-ft in moderate years, and 638 ac-ft in wet years. However, the average annual reduction would vary between 326 ac-ft and 4,666 ac-ft, and throughout the year could be as low as 0 ac-ft and as high as 6,593 ac-ft. Under rare circumstances such as in 2003 the reduction as a result of this contract is greater than the contract amount due to inflow levels not high enough to compensate for the low reservoir level of the previous year, and operational constraints such as needing to release for minimum flow requirements in the Fryingpan River.

Figure 3.2 shows the simulated relative effect of this alternative on Ruedi storage levels when compared to current conditions in representative dry, moderate, and wet years. The differences between the alternatives relative to the boat ramps will be discussed in the Recreation section. For all year types the Proposed Alternative level of Ruedi would be lower during the late summer/early fall period. During all but dry years early in the contract term the reservoir would then stay lower until the spring fill, after which time the level would be the same as the No Action Alternative in all but the driest of years later in the contract term. However, at no point in the contract would the Replacement Capacity or Regulatory Pools other than the Marketable Yield Pool change as a result of this contract. The changes to the Marketable Yield Pool are within the limits as described and analyzed in the FSES.

The Proposed Alternative is expected to cause hydrologic changes as previously described; however, the changes are expected to be within the Operating Principals. Therefore, the implementation of this alternative would be expected to have no direct or indirect impacts to the operation of Ruedi.

Details of the expected cumulative impacts to hydrology as a result of issuance of these contracts along with all the existing and expected future releases from Ruedi can be found in the RRII FSES. Of particular note is that operations of Ruedi have an immediate impact to the Fryingpan River and a lesser impact to the Roaring Fork River. The selection of this alternative is not expected to result in cumulative impacts greater to those presented in the RRII FSES.

FIGURE 3.1 - SIMULATED FLOWS IN THE FRYINGPAN RIVER

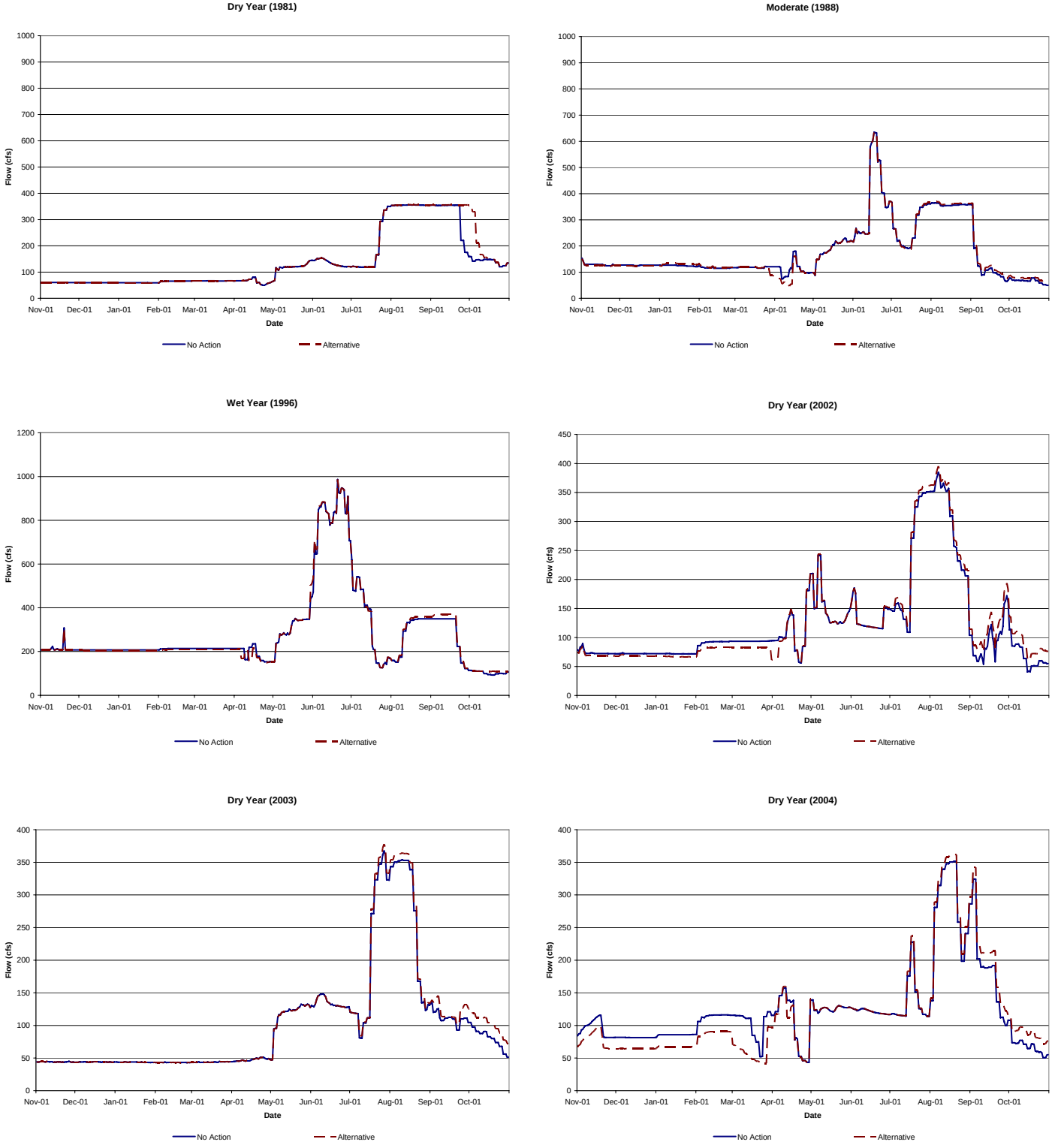


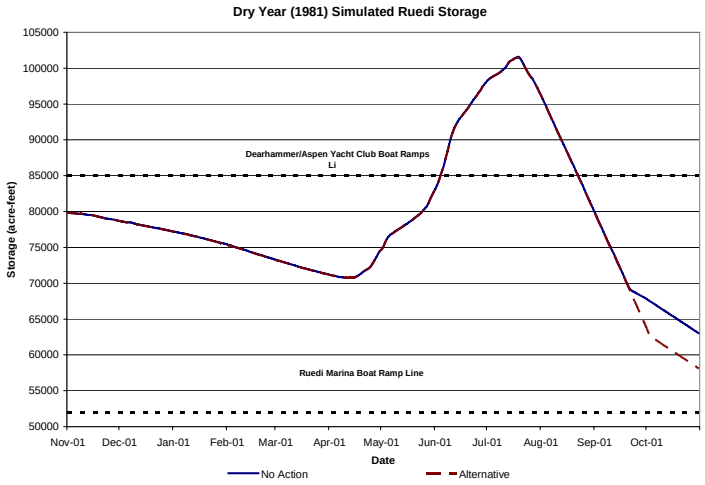
TABLE 3.3 – SIMULATED AVERAGE MONTHLY RUEDI RESERVOIR STORAGE LEVELS (AC-FT)

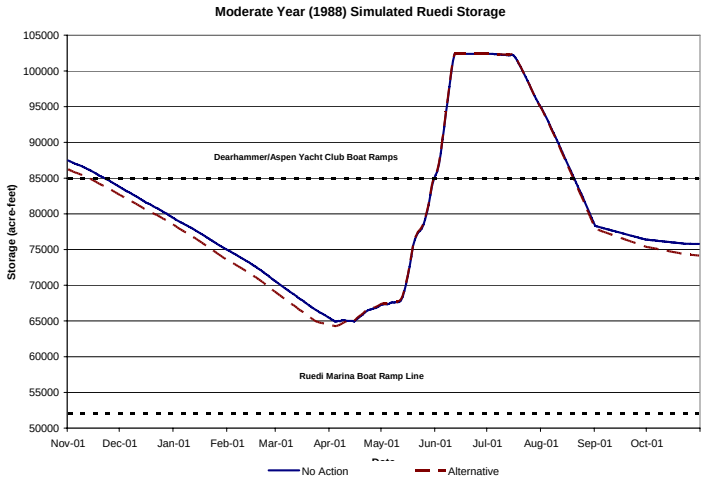
Historic Hydrologic	Corresponding Contract	November			December			January			February			March			April		
Year	Year	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference
*1981	*2007	79,374	79,366	-8	77,996	77,972	-24	76,381	76,344	-37	74,375	74,335	-40	72,223	72,190	-32	71,592	71,562	-30
1982	2008	63,098	58,168	-4,931	63,077	58,146	-4,931	63,237	58,305	-4,932	63,184	58,239	-4,945	63,452	58,506	-4,946	64,655	59,785	-4,870
*1983	*2009	99,197	99,042	-155	93,691	93,539	-152	87,225	86,536	-689	81,352	79,891	-1,461	75,812	73,807	-2,006	70,125	68,510	-1,615
**1984	**2010	97,374	96,981	-393	90,573	90,221	-352	84,339	83,532	-807	77,778	76,292	-1,486	71,197	69,236	-1,960	65,245	63,939	-1,306
1985	2011	97,981	97,603	-378	91,732	91,382	-349	84,925	84,150	-775	77,234	75,846	-1,388	69,780	67,995	-1,785	66,742	66,224	-518
**1986	**2012	96,782	96,330	-452	90,718	90,300	-418	83,864	83,069	-795	76,484	75,147	-1,336	69,256	67,609	-1,647	65,383	65,229	-155
1987	2013	99,368	99,160	-208	92,610	92,377	-233	85,333	84,705	-628	78,100	76,940	-1,159	71,348	69,840	-1,508	66,472	65,575	-898
1988	2014	85,787	84,611	-1,176	81,638	80,623	-1,015	77,267	76,090	-1,177	72,936	71,475	-1,461	67,925	66,428	-1,498	65,679	65,555	-125
*1989	*2015	75,349	73,811	-1,539	74,279	72,948	-1,330	73,188	71,782	-1,406	71,570	70,235	-1,335	70,112	69,995	-117	71,606	71,671	65
*1990	*2016	74,877	73,079	-1,798	73,995	72,442	-1,553	72,974	71,444	-1,531	71,468	70,069	-1,399	70,136	69,764	-372	70,810	70,815	5
1991	2017	73,959	72,027	-1,932	72,168	70,453	-1,715	70,194	68,506	-1,689	67,897	66,247	-1,650	65,630	64,901	-729	65,310	65,375	64
*1992	*2018	85,835	83,973	-1,862	82,988	81,388	-1,600	79,430	78,126	-1,304	75,749	74,800	-949	72,031	71,492	-539	70,811	70,783	-28
**1993	**2019	78,929	76,522	-2,407	76,278	74,213	-2,065	73,098	71,277	-1,821	70,162	68,590	-1,572	67,220	66,044	-1,175	64,797	64,667	-130
1994	2020	89,536	87,834	-1,701	85,157	83,666	-1,491	79,923	78,573	-1,349	74,010	72,826	-1,184	69,368	68,453	-915	66,749	66,377	-372
1995	2021	74,511	71,669	-2,842	73,170	70,632	-2,538	71,325	69,070	-2,256	68,665	66,859	-1,806	65,791	65,072	-719	64,816	64,789	-27
**1996	**2022	97,178	96,039	-1,139	90,419	89,357	-1,062	82,521	81,551	-971	74,062	73,262	-800	65,363	64,814	-549	60,346	60,465	119
1997	2023	81,406	79,691	-1,715	78,232	76,704	-1,527	74,578	73,282	-1,296	71,146	70,172	-974	67,074	66,506	-568	65,287	65,226	-61
**1998	**2024	99,878	99,665	-212	94,574	94,245	-330	86,014	85,606	-408	78,034	77,654	-380	70,880	70,600	-280	65,771	65,606	-165
**1999	**2025	97,495	96,237	-1,258	91,265	90,082	-1,184	84,007	82,939	-1,067	77,149	76,314	-835	70,302	69,793	-509	65,647	65,421	-227
2000	2026	97,878	96,663	-1,215	91,282	90,154	-1,128	84,325	83,325	-1,000	77,442	76,666	-776	70,064	69,585	-479	66,132	66,168	36
*2001	*2027	80,971	77,987	-2,984	78,870	76,313	-2,557	76,429	74,347	-2,082	73,916	72,405	-1,511	71,337	70,516	-821	70,711	70,679	-32
*2002	*2028	86,107	83,522	-2,585	83,979	81,615	-2,364	80,998	78,908	-2,089	77,188	75,546	-1,642	72,633	71,604	-1,029	70,977	70,632	-345
2003	2029	52,559	48,213	-4,347	52,809	48,463	-4,346	52,506	48,160	-4,346	51,945	47,599	-4,346	51,556	47,211	-4,345	53,156	48,817	-4,339
*2004	*2030	84,453	77,860	-6,593	82,607	77,043	-5,564	79,405	74,941	-4,464	74,542	71,366	-3,176	70,415	69,502	-912	70,847	70,836	-11
**2005	**2031	76,419	73,301	-3,118	74,291	71,510	-2,782	72,056	69,660	-2,396	69,523	67,725	-1,798	66,667	65,691	-975	66,112	66,046	-65

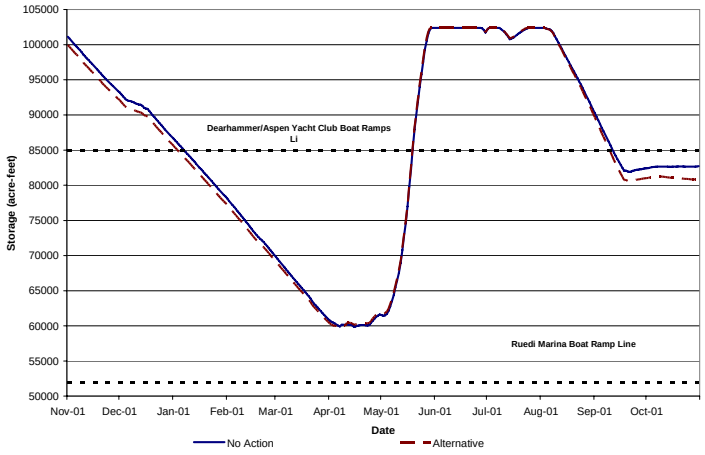
Historic Hydrologic	Corresponding Contract	May			June			July			August			September			October		
Year	Year	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference
*1981	*2007	78,509	78,478	-31	91,918	91,887	-31	99,601	99,557	-44	88,331	88,242	-89	72,748	72,028	-721	65,405	60,542	-4,863
1982	2008	71,592	67,369	-4,223	89,484	86,680	-2,804	102,250	101,985	-266	102,373	102,373	0	102,324	102,320	-5	101,947	101,866	-81
*1983	*2009	66,394	65,220	-1,174	84,499	83,745	-755	102,258	102,281	23	102,373	102,373	0	101,941	101,862	-80	100,866	100,562	-304
**1984	**2010	68,413	67,622	-791	100,989	100,757	-232	102,241	102,244	2	102,373	102,373	0	102,363	102,340	-23	101,208	100,957	-251
1985	2011	81,032	80,716	-315	100,504	100,436	-68	102,314	102,324	10	102,359	102,346	-13	100,110	99,913	-197	99,126	98,750	-376
**1986	**2012	73,119	73,217	98	96,306	96,393	86	102,180	102,187	7	102,373	102,373	0	102,353	102,347	-6	102,365	102,313	-52
1987	2013	82,460	82,047	-413	101,214	101,143	-71	101,710	101,742	32	98,710	98,636	-74	90,138	89,688	-449	87,665	86,671	-994
1988	2014	73,174	73,317	143	98,785	98,847	62	100,497	100,519	22	87,029	86,795	-234	77,361	76,654	-707	76,023	74,694	-1,330
*1989	*2015	81,383	81,517	134	94,544	94,725	181	101,037	101,096	58	96,439	96,111	-328	85,307	84,447	-860	75,497	73,937	-1,560
*1990	*2016	75,450	75,438	-12	90,547	90,535	-12	99,778	99,764	-14	91,303	91,059	-245	77,290	76,455	-836	74,850	73,236	-1,614
1991	2017	72,413	72,541	128	94,117	94,314	197	102,333	102,354	22	99,106	98,901	-205	90,074	89,277	-797	87,275	85,695	-1,580
*1992	*2018	81,429	81,466	37	94,972	95,118	147	101,941	102,038	98	97,439	97,146	-293	92,727	91,687	-1,040	84,138	82,013	-2,126
**1993	**2019	70,470	70,539	69	98,797	98,871	74	102,171	102,207	36	102,303	102,272	-31	102,014	101,522	-492	94,900	93,551	-1,349
1994	2020	77,321	77,266	-55	96,916	97,020	104	100,152	100,092	-61	86,138	85,584	-553	76,065	74,685	-1,381	75,073	72,603	-2,470
1995	2021	61,567	61,622	55	77,813	77,992	179	100,797	100,911	114	102,373	102,373	0	102,330	102,324	-6	101,856	101,244	-611
**1996	**2022	79,836	80,141	305	102,341	102,343	2	101,969	102,016	47	97,682	97,418	-265	84,470	83,341	-1,130	82,628	81,044	-1,584
1997	2023	74,228	74,255	26	99,423	99,466	43	102,278	102,298	21	102,373	102,373	0	102,373	102,372	-1	102,368	102,345	-23
**1998	**2024	74,552	74,545	-7	95,964	96,120	156	101,860	101,935	75	102,245	102,171	-74	101,452	100,943	-510	99,211	97,967	-1,244
**1999	**2025	68,351	68,284	-66	85,870	85,995	125	102,214	102,241	28	102,370	102,360	-10	101,517	101,192	-325	101,416	100,588	-828
2000	2026	84,379	84,627	248	102,194	102,224	30	101,606	101,626	20	89,730	89,187	-544	82,633	81,207	-1,426	81,894	79,320	-2,573
*2001	*2027	81,447	81,517	70	97,070	97,283	213	102,041	102,019	-22	100,033	99,756	-277	94,804	93,747	-1,058	88,794	86,557	-2,237
*2002	*2028	73,377	72,970	-407	80,039	79,623	-417	76,792	76,001	-791	60,234	58,794	-1,439	53,347	50,924	-2,423	52,183	48,463	-3,720
2003	2029	62,096	57,784	-4,312	92,215	87,929	-4,286	99,827	95,430	-4,398	88,938	83,990	-4,947	86,490	81,060	-5,430	85,842	79,354	-6,488
*2004	*2030	77,537	77,549	11	90,015	90,020	6	97,597	97,531	-66	90,803	90,345	-458	80,153	78,714	-1,439	77,510	74,854	-2,656
**2005	**2031	73,835	73,854	19	94,331	94,513	182	102,279	102,361	82	101,045	100,879	-165	90,850	89,747	-1,103	89,459	87,708	-1,751

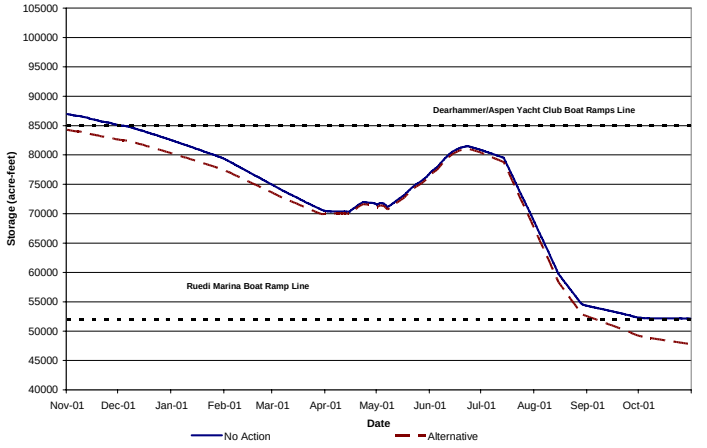
* Indicates dry years, ** indicates wet years, and no asterisks indicate moderate years.

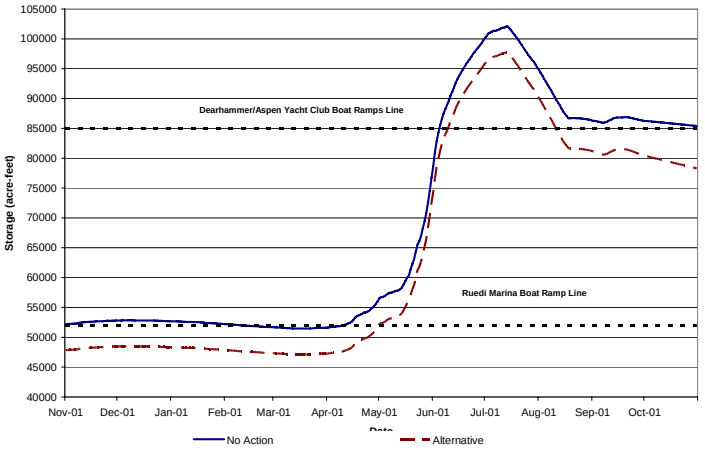
FIGURE 3.2 - SIMULATED RUEDI RESERVOIR STORAGE LEVELS

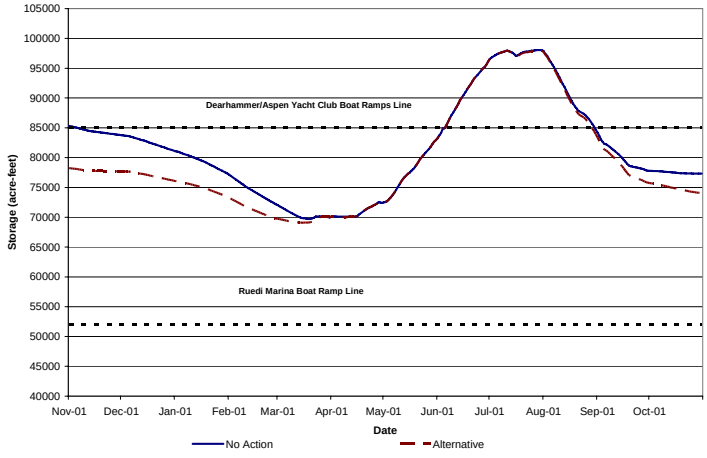












THREATENED AND ENDANGERED SPECIES

The endangered fish species information presented here in summary can be found in detail in the PBO and the 2012 Agreement. The endangered fish species cumulative analysis in these documents is included here by reference, whereas the direct and indirect impact analysis was based upon results from the hydrologic model.

Affected Environment

The Ruedi Service area spans Pitkin, Mesa, Garfield, and Eagle Counties of the broader CRWCD Service Area, which spans the additional counties of Grand, Summit, Routt, Gunnison, and Rio Blanco. Refer to Appendix C for a listing of Federally-listed threatened or endangered species. Ruedi and the Fryingpan River are within the Colorado River Basin, which is home to four endangered fish species: Colorado pikeminnow, razorback sucker, humpback chub, and bonytailed chub. Critical habitat for the Colorado pikeminnow and the razorback sucker occurs in the 15-Mile Reach. The fish use backwaters and side channels along this stretch of the Colorado River to reproduce, feed and grow.

Loss of stream flows in the 15-Mile Reach due to upstream depletions in the watershed is a major factor that has contributed to the decline of the endangered fish species in that area in recent times. This decline is primarily due to the loss of quantity and quality of habitat, which directly affect key reproductive life stages. The existing depletions in the Upper Colorado River Basin above the Gunnison River are estimated to be approximately one million ac-ft a year (USDI 1999).

Through the PBO and 2012 Agreement, Reclamation has made certain commitments to the Recovery Program. These commitments include providing 5,000 ac-ft per year continuous and 10,825 ac-ft per year through the year 2012 for Ruedi Round II water sales mitigation, and 5,000 ac-ft in 4 of 5 years through re-regulation of Ruedi releases.

Environmental Consequences

No Action Alternative

Under this alternative Reclamation would continue to provide water annually to the 15-Mile Reach as specified in the PBO and 2012 Agreement. Therefore, this alternative would be projected to have no impact to the endangered fish of the Colorado River Basin.

Proposed Action Alternative

Table 3.4 shows the potential allocation of contract water from Ruedi to the 15-Mile Reach for all years during the period of record as a result of the implementation of this alternative. Of particular note is that, according to the model, although 1,400 ac-ft is available to be released in 1992 as described in Chapter 2, only 335 ac-ft was simulated for release because the flows for that year were simulated to already be almost at the target flow.

TABLE 3.4 – SIMULATED RUEDI RESERVOIR RELEASES TO 15-MILE REACH FROM ALL COMMITMENTS (AC-FT)

Historic Hydrology	Corresponding Contract	July			August			September			October			Annual Total
Year	Year	No Act	Prop	Diff	No Act	Prop	Diff	No Act	Prop	Diff	No Act	Prop	Diff	Diff
***1981**	***2007**	2642	2670	**28**	10419	10419	**0**	7765	11297	**3532**	0	1140	**1140**	**4700**
1982	**2008**	0	0	**0**	0	0	**0**	1470	1470	**0**	0	0	**0**	**0**
***1983**	***2009**	0	0	**0**	0	0	**0**	472	472	**0**	0	0	**0**	**0**
****1984**	****2010**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**
1985	**2011**	0	0	**0**	15	15	**0**	4983	4983	**0**	3	3	**0**	**0**
****1986**	****2012**	0	0	**0**	283	283	**0**	1793	1793	**0**	0	0	**0**	**0**
1987	**2013**	3785	3785	**0**	9694	9694	**0**	7346	7346	**0**	0	0	**0**	**0**
1988	**2014**	6656	6656	**0**	13648	13648	**0**	521	521	**0**	0	0	**0**	**0**
***1989**	***2015**	1641	1641	**0**	4143	4143	**0**	13099	13099	**0**	1942	1942	**0**	**0**
***1990**	***2016**	1009	1009	**0**	14129	14129	**0**	5687	5687	**0**	0	0	**0**	**0**
1991	**2017**	101	101	**0**	13884	13884	**0**	6840	6840	**0**	0	0	**0**	**0**
***1992**	***2018**	595	605	**10**	3258	3287	**28**	2582	2642	**60**	10139	10375	**236**	**335**
****1993**	****2019**	0	0	**0**	2729	2729	**0**	8138	8138	**0**	9080	9080	**0**	**0**
1994	**2020**	6001	6001	**0**	14628	14628	**0**	197	197	**0**	0	0	**0**	**0**
1995	**2021**	0	0	**0**	0	0	**0**	1080	1080	**0**	76	76	**0**	**0**
****1996**	****2022**	157	157	**0**	12514	12514	**0**	8154	8154	**0**	0	0	**0**	**0**
1997	**2023**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**
****1998**	****2024**	0	0	**0**	3499	3499	**0**	8346	8346	**0**	3207	3207	**0**	**0**
****1999**	****2025**	0	0	**0**	2037	2037	**0**	6241	6241	**0**	1802	1802	**0**	**0**
2000	**2026**	6989	6989	**0**	12868	12868	**0**	968	968	**0**	0	0	**0**	**0**
***2001**	***2027**	4368	4368	**0**	2666	2666	**0**	5820	5820	**0**	4349	4349	**0**	**0**
***2002**	***2028**	8687	8687	**0**	12138	12138	**0**	0	0	**0**	0	0	**0**	**0**
2003	**2029**	11232	11232	**0**	9474	9474	**0**	120	120	**0**	0	0	**0**	**0**
***2004**	***2030**	860	860	**0**	10956	10956	**0**	5092	5092	**0**	87	87	**0**	**0**
****2005**	****2031**	0	0	**0**	10684	10684	**0**	10141	10141	**0**	0	0	**0**	**0**

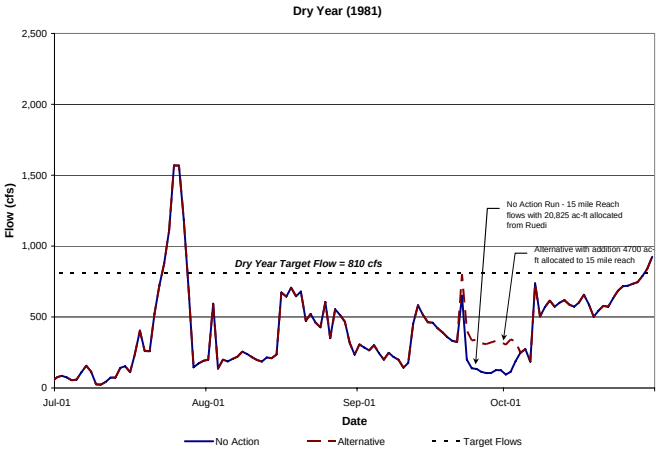
*Indicates dry years, ** indicates wet years, and no asterisks indicate moderate years.

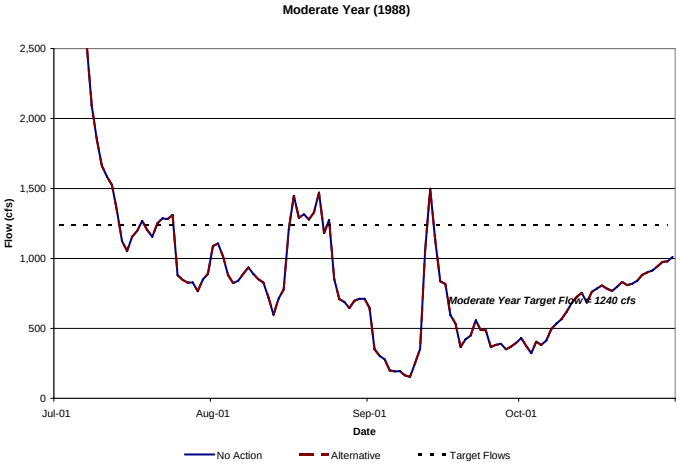
Figure 3.3 illustrates the simulated flows in the 15-Mile Reach as a result of this alternative when compared to current conditions in representative dry, moderate, and wet years. This figure along with Table 3.4 shows that, according to the model, benefits to the 15-Mile Reach would be achieved in two dry years over the course of the 25 year contract. As shown in the model results for 1981, the flow in the 15-Mile Reach would be enhanced, but would still remain below the target flow. Benefits are not expected from this alternative in other years because the water would be fully contracted, or it would not be a drought restriction year at Wolford Mountain Reservoir. Therefore, it is expected that this alternative would have a minor short-term beneficial impact on flows in the 15-Mile Reach.

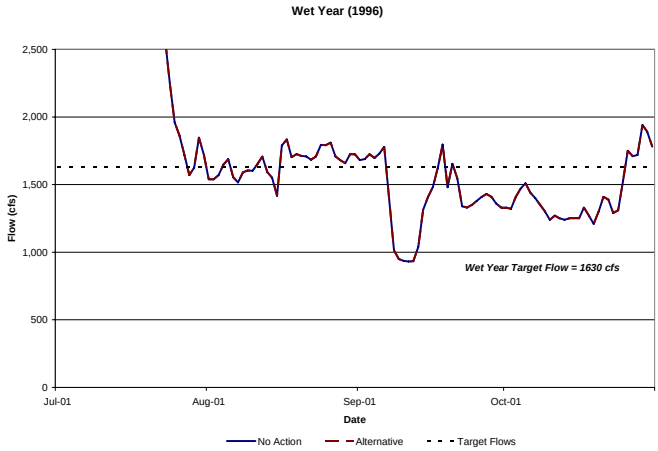
The impact level is not expected to change should weather conditions turn dry after a December determination that a drought restriction not be enacted at Wolford Mountain, because CRWCD has committed to release from Wolford Mountain in this case. In the case of an incorrect December determination that a drought restriction would not be enacted, the surplus water not utilized for winter flow augmentation would be used for CRO, thereby increasing the beneficial impacts to the 15-Mile Reach.

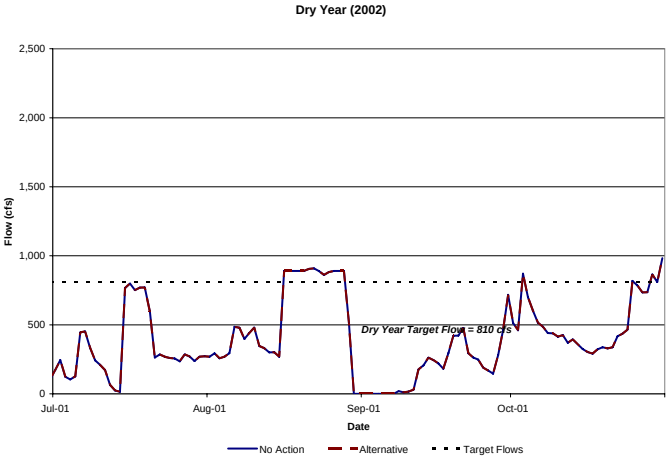
No further ESA consultation is required for the proposed contract because the PBO addressed the effects of all Federal and non-Federal depletions from the 15-Mile Reach, considered all existing and future operations and depletions from Ruedi, and provided mitigation for a portion of the adverse impacts. It determined the cumulative Federal and non-Federal depletions from the 15-Mile Reach "may affect"

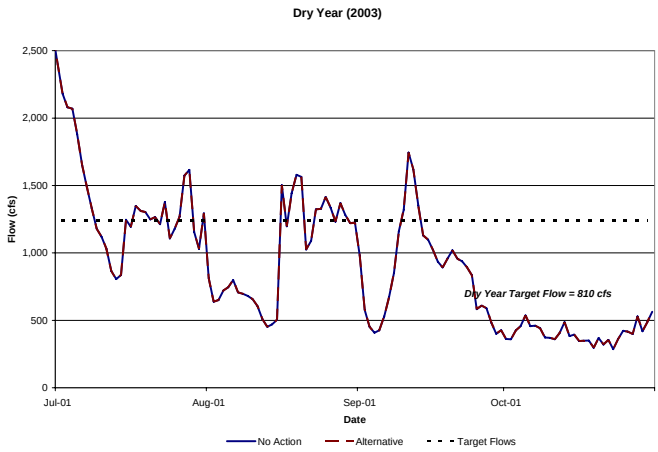
FIGURE 3.3 - SIMULATED 15-MILE REACH FLOWS

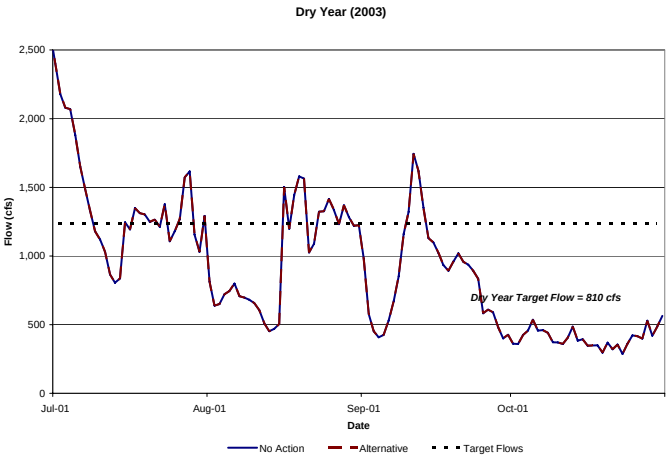












the endangered fishes and their critical habitats, but were not likely to jeopardize the continued existence, or destroy or adversely modify the designated critical habitat of these species. Additionally, the Service concluded that although the flow-related recovery actions would not be sufficient to fully offset all theadverse effects of historic and new water depletions, it was expected that a combination of flow and non-flow management activities in the Recovery Program for the Upper Colorado River Basin would provide suitable habitat for increasing the numbers of endangered fishes and likely restore critical habitat areas that have been substantially modified or completely lost (USDI 1999). Furthermore, as discussed in the Issues and Impact Topics Considered but Excluded from Further Evaluation in Chapter One, the stipulation that CRWCD would include language in contracts with third parties concerning Section 404 consultation with the Army Corps of Engineers would ensure that the USFWS would be consulted with when the construction of facilities necessary to use the contracted water proposes physical alterations to designated critical habitat of the Colorado River endangered fish species. Therefore this alternative would not be expected to result in cumulative impacts greater than those presented in the PBO.

OTHER AQUATIC RESOURCES

The information presented here in summary can be found in detail in the RRII FSES and 2012 Agreement. The analysis related to aquatic resource impacts in these documents is included here by reference. The direct and indirect impact analysis was also based upon results from the hydrologic model.

Affected Environment

Five game fish inhabit Ruedi including: rainbow trout (*Salmo gairdneri*), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), lake trout (*Salvelinus namaycush*), and kokanee salmon (*Oncorhynchus nerka*; Finnell 1977). Brown and rainbow trout are distributed throughout the Fryingpan River, along with smaller populations of brook and Colorado River cutthroat trout. Even without stocking, the Fryingpan River supports some of the highest fish populations and highest number of large fish per unit area in Colorado. Brown trout populations have been fairly constant at about 1,500 fish per hectare since 1992 and rainbow trout populations averaged about 300 fish per hectare from 1992 to 1996 (Strange, 1998).

Brown and rainbow trout use similar redds (gravel beds) for spawning. Brown trout spawn in the fall with fry emergence in late spring, and rainbow trout spawn in the spring with fry emergence occurring approximately one month after brown trout fry emergence. It is believed the minimum and optimum winter flows for various life stages of all species of trout ranges from 50 to 250 cfs (Nehring 1988).

The onset of a viable population of opossum shrimp (Mysis relicta) in Ruedi in the mid-1980's, which subsequently began flushing through the outlet works of Ruedi, has enhanced both the biomass and numbers of both brown and rainbow trout, especially for the first few miles just below Ruedi Dam (Nehring 1991, Nehring et al. 2000). The larger fish that result from this diet are probably particularly predatory on the young of other trout species, especially when flows decrease and less opossum shrimp are available (Nehring et al. 2000). The releases of opossum shrimp have clearly altered the diet of brown and rainbow trout in the reach immediately below the dam (Nehring 1991).

Macroinvertebrates represent a significant food source for trout species, and their presence is important to maintaining a productive fishery. Of the basic physical requirements necessary to sustain macroinvertebrate populations, river depth and flow velocity are the most critical (Nelson and Roline 1996). Significant fluctuations in flow velocity and depth can have negative effects on macroinvertebrates;

however, since this variation is typical for high mountain environments, where summer storm events are common, these species are adapted to fluctuations of this nature (Roline 2001). Of particular concern is the formation of anchor ice (river is allowed to freeze over entirely or in large part), which is influenced by both the flow of the river and air temperature. The longer the anchor ice event, the greater the negative effect on macroinvertebrate community structure and function. Maintaining winter flows greater than 70 cfs seems to result in less anchor ice than flows of 40 cfs in the upper half of the river, and after severe anchor ice formation macroinvertebrate community diversity and evenness appear to recover in one to two years if winter flows remain greater than 70 cfs (Roaring Fork Conservancy 2006).

Environmental Consequences

No Action Alternative

This alternative would result in Ruedi, and Fryingpan and Roaring Fork River flows continuing to fluctuate as they have historically as a result of yearly precipitation variations, releases for fish recovery and from previously established water contracts, and/or regulation according to the Ruedi Operating Principles. Therefore, this alternative is expected to have no direct or cumulative impact on sport fish, their habitat, or their food sources in these areas.

Proposed Action Alternative

As previously discussed, the model results in Table 3.1 and Figure 3.1 indicate that in the late summer there is potential for an elevation or extension in time of elevated flows as a result of the issuance of this contract. Brown trout often benefit from relaxed flows during late summer prior to the fall spawn, because instead of putting energy into fighting higher currents the fish can prepare physiologically for spawning (Ewert 2007). With an average increase in maximum flows of 5 cfs in August or up to 11 cfs , and 11 cfs in September or up to 22 cfs there is expected to be a minor long-term adverse impact on spawning success of brown trout as compared to current conditions.

In most years there is expected to be an elevation of flows in the fall where the flows are still lower than they would be later in winter, minimizing brown trout spawning in redds (gravel beds) that would later not be inundated. Therefore, there is expected to be a negligible intermediate-term direct beneficial impact to brown trout due to increased quantity of spawning habitat over current conditions.

In moderate years, when the model shows winter flows would be elevated above current conditions, there could be impacts in the rare situation it is determined that a quicker release schedule would be beneficial as described in Chapter Two. In those unusual instances there could be the potential for flushing of decomposed plant material, sediment, and other materials such as brown trout eggs out of redds. This could cause a minor beneficial direct impact to rainbow trout due to more favorable spawning conditions, but cause the opposite (adverse) to brown trout (Thompson 2007).

In those years when the flow is reduced in the Fryingpan River as a result of reduced reservoir releases in order to store to meet the spring fill target there would likely be a negligible to minor adverse direct impact to rainbow trout as this lower flow would limit the available amount of spawning habitat as compared to current conditions.

The model results indicate that as a result of this alternative there would be 9 months from November through April throughout the life of the contract that would be expected to have minimum flows reduced below 50 cfs. Therefore, with reductions of flows to below 50 cfs equating to roughly 6%, this alternative would likely have a negligible long-term adverse direct impact to trout when compared to current conditions.

Model results also indicate that as a result of this alternative there would be 20 months during the months of November through April throughout the life of the contract that would be

expected to have minimum flows reduced below 70 cfs. Therefore, with reductions of flows to below 70 cfs equating roughly these occasional reductions equating to roughly 13%, this alternative would likely have a minor long-term adverse direct impact to macroinvertebrates when compared to current conditions.

In summary, it is important to note that despite causing various beneficial and adverse impacts to aquatic resources as compared to current conditions, this alternative is not expected to result in direct or indirect impacts greater than those presented in the RRII FSES.

Details of the expected cumulative impacts to aquatic resources as a result of issuance of this contract along with all the existing and maximum future releases from Ruedi can be found in the RRII FSES and 2012 Agreement. Of particular note is that the existing and maximum future releases from Ruedi would likely result in less bottom area being underwater at the reservoir, which would decrease the rearing areas for juvenile trout, feeding areas for adult trout, and the production of fish food such as macroinvertebrates and macrophytes. These decreases would be especially noticed in the shallow bays along the north shore. In the Fryingpan River, and to a much lesser extent the Roaring Fork River, existing and expected releases from Ruedi would be expected to result in damage to incubating fish eggs, habitat loss, and reduced production of fish food such as macroinvertebrates. In conclusion, the selection of this alternative would not be anticipated to result in cumulative impacts greater than those already presented in the RRII FSES or 2012 Agreement.

FARMLAND

The information and analysis on the impacts to farmland are included here to satisfy the site-specific NEPA requirement as described in the RRII FSES.

Affected Environment

There are three different types of farmland that are within the Ruedi Service Area. Prime farmlands are those that have soil with the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops. Unique farmlands are lands other than prime farmland that produces specialty crops such as fruits, vegetables, and nuts. Statewide important farmlands are lands identified by states for agricultural use. There are no locally important farmlands within the service area. In total there is approximately 123,000 acres of these farmlands within the Ruedi Service Area; approximately 105,000 of which are on private lands to which the proposed contract water could hypothetically service.

Environmental Consequences

No Action

This alternative would result in Ruedi levels, Fryingpan and Roaring Fork River flows continuing to fluctuate as they have historically as a result of yearly precipitation variations, releases for fish recovery and from previously established water contracts, and/or regulation according to the CWCB's minimum instream flows and the Ruedi Operating Principles. As a result this alternative is expected to have no direct or cumulative impact on farmland.

Proposed Alternative

Delivery of water to CRWCD would require no new construction and the water released would still be within the boundaries of normal flows in the downstream rivers as a result of issuance of the proposed contract, causing no new land inundation. Therefore, there are expected to be no direct impacts to farmland as a result of this alternative.

Consideration also needs to be given to the indirect and cumulative impacts of this alternative. It is believed that with the implementation of this alternative, CRWCD

would subcontract with third parties who would irreversibly convert farmlands to non-agricultural use. However, since future third parties have not been identified it is not possible to quantify the indirect or cumulative impacts of this alternative on farmlands.

RECREATION

The information presented here related to Ruedi, and the Fryingpan and Roaring Fork Rivers in summary can be found in detail in the RRII FSES and 2012 Agreement. The analysis related to impacts to recreation in these documents is included here by reference.

Affected Environment

Ruedi Reservoir

Ruedi provides visitors with three boat ramps, four campgrounds with 81 developed sites, and 3 day-use picnic areas. One of the boat ramps is part of a privately owned facility called the Aspen Yacht Club, which currently has 75 members and 45 boat slips. Lands adjacent to Ruedi were transferred from Reclamation to the USFS in 1968. Facilities such as the boat ramps at Dearhamer Campground and Aspen Yacht Club are designed to be operable when the reservoir levels are at or above 85,000 ft. The Ruedi Marina Boat ramp is located on the western shoreline near the dam, and is designed to remain operable at reservoir volumes above 52,000 ac-ft. Refer to Table 3.3 for a listing of storage levels in Ruedi, and Table 3.6 for a listing of the resultant surface area in recent years.

Approximately 72% of visitors to the reservoir participate in some form of watercraft related activity, including motor boating (30%), sailing (20%), personal water craft use (10%), kayaking/canoeing (7%) and sailboarding (5%) (Crandall 2002). Camping (50%), fishing (53%) and sightseeing (35%) were also popular activities of visitors to Ruedi. Approximately 65% of Ruedi use is attributed to local users, many of whom make multiple trips during the season of use (Crandall, 2002). USFS records indicate that there were a total of 15,306 visitor days at Ruedi during the 2001 summer season, not including use at the Yacht Club (Keneally 2001).

The general season of use at Ruedi is Memorial Day through the weekend after Labor Day, with the heaviest use occurring from July 4th to Labor Day. Use of the area decreases after Labor Day, when campgrounds begin to close and other services end for the season, although use has been increasing during this shoulder season. Fall and winter recreation activities at the reservoir primarily include camping (associated with hunting), fishing and, when available, ice fishing (Keneally 2001).

Fryingpan and Roaring Fork Rivers

The Fryingpan River, which flows 14 miles from Ruedi Dam to Basalt, is also well known for its recreational opportunities. The river is managed by the Colorado Division of Wildlife as a "Gold Medal" trout fishery with catch-and-release requirements because of its ability to produce high numbers of trophy trout. This has made the Fryingpan River a nationally recognized fly-fishing destination.

Only about 7.5 miles of a total of 14 miles of the Fryingpan River from Ruedi to the confluence with the Roaring Fork River are available to the public for fishing and other recreation activities. Between November 2000 and October 2001 it was estimated that there was approximately 34,248 to 39,128 annual visitor days in this stretch of the river. The portion of public land just below the Ruedi Dam to just below Baetis Bridge accounts for approximately 72% of this use. Most of the use came from anglers (86%), during the on-season (71%), and from outside of the Roaring Fork Valley (84%) (Crandall 2002).

The USFS currently permits four outfitter-guides along the public land portions of the Fryingpan River below Ruedi Dam for a total of 1,521 visitor days and account for approximately 5.2 percent of the total annual

visitor days on the lower Fryingpan River (Crandall 2002). Outfitter-guide operations generally run from the beginning of May through the end of October, with 69 % or more of historic user trips occurring in July, August and September.

Access along the Fryingpan River below Ruedi Dam is a concern to many fisherman, because once flows exceed 250 cfs there is limited access to the opposing shoreline since access to about half of the 14 miles of riverbank in this reach is controlled by private land ownership. These factors lead to overcrowding along publicly-owned portions of streambanks and diminish user experience when flows limit wading. Table 3.3 shows the monthly number of days when flows have been equal to or greater than 250 cfs in the Fryingpan River in recent years.

The Roaring Fork River supports a commercial fishing industry based on float fishing from rafts and drift boats. Several segments of the Roaring Fork River also are Gold Medal Waters and have catch-and-release requirements. The USFS permits six outfitter/guides along the public land portions of the Roaring Fork.

Environmental Consequences

No Action Alternative

This alternative would result in Ruedi levels, Fryingpan and Roaring Fork River flows continuing to fluctuate as they have historically as a result of yearly precipitation variations, releases for fish recovery and from previously established water contracts, and/or regulation according to the CWCB's minimum instream flows and the Ruedi Operating Principles. As a result this alternative is expected to have no direct or cumulative impact on recreation in these areas.

Proposed Action Alternative

Table 3.5 shows the number of days greater than 250 cfs in the Fryingpan River during the period of record for the Proposed Alternative compared to current conditions. According to the model results over the entire life of the contract there would be 37 additional days with flows greater than 250 cfs and one day when flows are reduced below 250 cfs as a result of this alternative. This represents about an average increase of 1.4 days a year or roughly a 4% increase. By year type that equates to an average increase of 1.4 days in dry years, 1.5 days for moderate years, and 1.3 days for wet years. It should be noted that nearly a quarter of the days over 250 cfs occur in October. It is also interesting to note that according to the model of the days above 250 cfs, 33 of those days also reach above 300 cfs, but there are 17 days when flows are reduced below 300 cfs as a result of this alternative. These changes in flows are expected to result in negligible to minor long-term direct impacts on fishery recreation in the Fryingpan River.

Refer to the Other Aquatic Resources section for a discussion of the expected impacts to sport fish, their habitat, and their food sources as a result of the implementation of the Proposed Alternative. Using a conservative estimate, by extension it would be expected that similar levels of impact would result to fishery recreation in the Fryingpan River.

As seen in Figure 3.2 and Table 3.3, and discussed in the Ruedi Reservoir Operations section, this alternative is expected to cause a drop in the storage level of Ruedi. As shown in the model results for the 2003 run, as a result of this alternative the level would drop below that needed to keep Deerhammer Campground and Aspen Yacht Club Boat Ramps operable sooner and longer in a dry year late in the contract term. Assuming a September 7 Labor Day, the impact would be expected to last for nearly 3 months with approximately 4 weeks of that occurring during the general visitation season and 3 weeks during the heaviest visitation season. Visitors would need to use the Ruedi Marina Boat Ramp in order to gain access to the reservoir during these times. However, the model also showed in the 2002 run as a result of this alternative the Ruedi Marina Boat Ramp would become inoperable in a dry year late in

the contract. The impact would be expected to last for approximately 2 months with about 1 week of that occurring during the general visitation season. No boat access would be possible during this time. Therefore, a moderate direct short-term adverse impact would be expected to those whose recreation experience depends upon the boat ramps.

TABLE 3.5 – SIMULATED NUMBER OF DAYS FRYINGPAN RIVER FLOWS >250 CFS

Historic Hydrologic	Corresponding Contract	July			August			September			October			Annual Total
Year	Year	No Act	Prop	Diff	No Act	Prop	Diff	No Act	Prop	Diff	No Act	Prop	Diff	Diff
*1981	*2007	9	9	**0**	31	31	**0**	23	30	**7**	0	5	**5**	**12**
1982	2008	22	22	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**
*1983	*2009	31	31	**0**	12	12	**0**	0	0	**0**	0	0	**0**	**0**
**1984	**2010	31	31	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**
1985	2011	19	19	**0**	0	0	**0**	6	6	**0**	0	0	**0**	**0**
**1986	**2012	31	31	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**
1987	2013	19	19	**0**	9	9	**0**	9	12	**3**	0	0	**0**	**3**
1988	2014	16	16	**0**	31	31	**0**	2	2	**0**	0	0	**0**	**0**
*1989	*2015	6	6	**0**	6	6	**0**	25	25	**0**	5	5	**0**	**0**
*1990	*2016	0	0	**0**	31	31	**0**	14	14	**0**	0	0	**0**	**0**
1991	2017	0	0	**0**	13	14	**1**	11	11	**0**	0	0	**0**	**1**
*1992	*2018	0	0	**0**	9	9	**0**	0	0	**0**	18	21	**3**	**3**
**1993	**2019	17	16	**-1**	0	0	**0**	0	0	**0**	15	15	**0**	**-1**
1994	2020	15	15	**0**	31	31	**0**	2	2	**0**	0	0	**0**	**0**
1995	2021	31	31	**0**	15	15	**0**	0	0	**0**	0	0	**0**	**0**
**1996	**2022	16	16	**0**	22	22	**0**	20	20	**0**	0	0	**0**	**0**
1997	2023	16	16	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**
**1998	**2024	16	16	**0**	0	0	**0**	0	3	**3**	0	0	**0**	**3**
**1999	**2025	28	28	**0**	0	0	**0**	0	6	**6**	0	0	**0**	**6**
2000	2026	10	13	**3**	30	30	**0**	0	0	**0**	0	0	**0**	**3**
*2001	*2027	0	0	**0**	3	3	**0**	3	6	**3**	0	0	**0**	**3**
*2002	*2028	15	15	**0**	21	21	**0**	0	0	**0**	0	0	**0**	**0**
2003	2029	15	15	**0**	21	21	**0**	0	0	**0**	0	0	**0**	**0**
*2004	*2030	0	0	**0**	22	25	**3**	5	5	**0**	0	0	**0**	**3**
**2005	**2031	3	3	**0**	7	7	**0**	17	17	**0**	0	0	**0**	**0**

*Indicates dry years, ** indicates wet years, and no asterisks indicate moderate years.

Table 3.6 shows the simulated change in acres of surface area of the reservoir as a result of the implementation of this alternative compared to the No Action Alternative. The model results indicate that through the life of the contract there would be an annual average decrease of about 7 acres of surface area a year, which represents an approximate 0.84% decrease.

This equates to an annual average reduction in surface area of 7 acres in dry years, 9 acres in moderate years, and 5 acres in wet years due to the implementation of this alternative. However, within a year the surface area could decrease between 0 and 47 acres. Therefore, this alternative would likely have a direct adverse impact on those who recreate at Ruedi ranging between negligible in the intermediate-term to minor in the short-term.

In summary, it is important to note that despite causing various beneficial and adverse impacts to recreation as compared to current conditions, this alternative is not expected to result in direct or indirect impacts greater than those presented in the RRII FSES.

TABLE 3.6 – SIMULATED AVERAGE MONTHLY RUEDI RESERVOIR SURFACE AREA (AC)

Historic Hydrologic	Corresponding Contract	November			December			January			February			March			April		
Year	Year	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference
*1981	*2007	841	841	0	835	835	0	824	824	0	807	807	0	790	790	0	790	790	0
1982	2008	728	694	-34	728	694	-34	728	694	-34	728	694	-34	728	694	-34	739	704	-36
*1983	*2009	971	971	0	935	935	0	894	888	-6	859	847	-12	818	801	-17	779	768	-11
**1984	**2010	959	959	0	918	918	0	876	871	-6	835	824	-11	785	773	-11	745	734	-11
1985	2011	965	965	0	924	924	0	882	876	-6	830	818	-11	773	762	-11	751	751	0
**1986	**2012	959	953	-6	918	918	0	871	871	0	824	813	-11	773	762	-11	745	745	0
1987	2013	971	971	0	930	930	0	882	876	-6	835	824	-11	785	773	-11	751	745	-6
1988	2014	888	876	-12	859	853	-6	830	818	-11	796	790	-6	762	751	-11	745	745	0
*1989	*2015	813	801	-11	807	796	-11	801	790	-11	790	779	-11	779	779	0	790	790	0
*1990	*2016	813	801	-11	807	796	-11	796	785	-11	790	779	-11	779	773	-6	785	785	0
1991	2017	807	790	-17	790	779	-11	779	768	-11	762	751	-11	745	739	-6	745	745	0
*1992	*2018	888	876	-12	865	859	-6	847	835	-12	818	813	-6	790	790	0	785	785	0
**1993	**2019	841	824	-17	824	807	-17	801	785	-17	779	768	-11	756	751	-6	739	739	0
1994	2020	912	900	-12	882	871	-12	847	841	-6	807	796	-11	773	768	-6	751	751	0
1995	2021	807	790	-17	801	779	-23	785	768	-17	768	756	-11	745	739	-6	739	739	0
**1996	**2022	959	953	-6	918	912	-6	865	859	-6	807	801	-6	745	739	-6	709	709	0
1997	2023	859	847	-12	835	824	-11	807	801	-6	785	779	-6	756	751	-6	745	745	0
**1998	**2024	977	977	0	941	941	0	888	882	-6	835	830	-6	785	779	-6	745	745	0
**1999	**2025	965	953	-12	924	912	-12	876	865	-12	830	824	-6	779	773	-6	745	745	0
2000	2026	965	959	-6	924	912	-12	876	871	-6	830	824	-6	779	773	-6	751	751	0
*2001	*2027	853	835	-17	841	824	-17	824	807	-17	807	796	-11	785	779	-6	785	779	-6
*2002	*2028	888	871	-18	876	859	-18	853	841	-12	830	818	-11	796	790	-6	785	779	-6
2003	2029	650	622	-28	655	622	-33	650	622	-28	646	618	-28	646	613	-33	655	627	-29
*2004	*2030	876	835	-41	865	830	-35	841	813	-28	807	785	-23	779	773	-6	785	785	0
**2005	**2031	824	801	-23	807	790	-17	790	773	-17	773	762	-11	751	745	-6	751	751	0

Historic Hydrologic	Corresponding Contract	May			June			July			August			September			October			Average Annual
Year	Year	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	No Action	Proposed	Difference	Difference
*1981	*2007	835	835	0	924	924	0	977	977	0	900	900	0	796	790	-6	745	709	-36	-4
1982	2008	790	756	-34	912	894	-18	989	989	0	995	995	0	989	989	0	989	989	0	-21
*1983	*2009	751	745	-6	876	871	-6	989	989	0	995	995	0	989	989	0	983	983	0	-5
**1984	**2010	768	762	-6	983	983	0	989	989	0	995	995	0	989	989	0	983	983	0	-4
1985	2011	853	853	0	983	983	0	989	989	0	989	989	0	977	977	0	971	971	0	-2
**1986	**2012	801	801	0	953	953	0	989	989	0	989	989	0	989	989	0	989	989	0	-2
1987	2013	865	859	-6	983	983	0	989	989	0	971	971	0	912	912	0	900	894	-6	-4
1988	2014	801	801	0	971	971	0	983	983	0	894	894	0	830	824	-6	818	813	-6	-5
*1989	*2015	859	859	0	941	947	6	983	983	0	953	953	0	882	876	-6	818	807	-11	-5
*1990	*2016	818	818	0	918	918	0	977	977	0	924	918	-6	830	824	-6	813	801	-11	-6
1991	2017	796	796	0	941	941	0	989	989	0	971	971	0	912	906	-6	894	882	-12	-6
*1992	*2018	859	859	0	947	947	0	989	989	0	959	959	0	930	924	-6	876	859	-18	-5
**1993	**2019	779	779	0	971	971	0	989	989	0	989	989	0	989	989	0	947	935	-12	-7
1994	2020	830	830	0	959	959	0	977	977	0	888	882	-6	818	813	-6	813	796	-17	-6
1995	2021	718	718	0	835	835	0	983	983	0	995	995	0	989	989	0	989	983	-6	-7
**1996	**2022	847	847	0	989	989	0	989	989	0	965	959	-6	876	871	-6	865	853	-12	-4
1997	2023	807	807	0	971	977	6	989	989	0	995	995	0	989	989	0	989	989	0	-3
**1998	**2024	807	807	0	953	953	0	989	989	0	989	989	0	989	983	-6	971	965	-6	-2
**1999	**2025	768	762	-6	888	888	0	989	989	0	989	989	0	989	983	-6	989	983	-6	-5
2000	2026	876	876	0	989	989	0	989	989	0	912	906	-6	865	853	-12	859	841	-18	-6
*2001	*2027	859	859	0	959	959	0	989	989	0	977	977	0	947	935	-12	906	888	-18	-9
*2002	*2028	801	796	-6	847	847	0	824	818	-6	709	699	-10	660	641	-19	650	622	-28	-12
2003	2029	718	689	-29	930	900	-30	977	947	-30	906	876	-30	888	853	-35	888	841	-47	-32
*2004	*2030	830	830	0	912	912	0	965	965	0	918	918	0	847	841	-6	830	813	-17	-13
**2005	**2031	807	807	0	941	941	0	989	989	0	983	983	0	918	912	-6	912	900	-12	-8

* Indicates dry years, ** indicates wet years, and no asterisks indicate moderate years

Details of the expected cumulative impacts to recreation at Ruedi, and the Fryingpan and Roaring Fork Rivers as a result of issuance of these contracts along with all the existing and expected future releases from Ruedi can be found in the RRII FSES. Of particular note is that during the months of July through August, which is a critical period for retaining storage levels capable of operating boat ramps, the model indicated that if the entire 51,500 ac-ft is released for contracts and fish recover the probability of the reservoir levels dropping below 85,000 ac-ft in the months of July and August are 8 and 25% respectively. The probability of the reservoir levels falling below 52,000 ac-ft for the months of July and August are less than 1%. In addition, there was expected to be a reduction in wadeable area (flows not in excess of 250 cfs) of the Fryingpan River of 4-19% in a dry year, 9-23% in an average year, and 1-9% in a wet year. In summary, the selection of this alternative would not be projected to result in cumulative impacts greater than those presented in the RRII FSES.

SOCIOECONOMICS

The information presented here on socioeconomics related to Ruedi, and the Fryingpan and Roaring Fork Rivers in summary can be found in detail in the RRII FSES and 2012 Agreement. The analysis related to impacts to socioeconomics in these documents is included here by reference.

Affected Environment

Ruedi, and the Fryingpan and Roaring Fork Rivers are located in west central Colorado in Pitkin, Eagle and Garfield counties (refer to Figure 1.1). The Town of Basalt is the only major community located along the Fryingpan River and is situated at the confluence of the Fryingpan and the Roaring Fork Rivers. There are numerous private parcels upstream from Basalt along the Fryingpan River, most of which have been developed as single-family dwellings. There are several communities located along the Roaring Fork River downstream of its confluence with the Fryingpan River, the most prominent being Carbondale and Glenwood Springs.

Other than localized urban development around community centers, the Roaring Fork River Valley has significant rural development between the Roaring Fork River's confluence with the Fryingpan River and the Colorado River. Historically, ranching interests occupied a majority of the lands in the valley. However, within the last ten years this area has seen an increase in real estate development, generally for single-family dwellings, businesses, and resorts.

Recreation activity associated with Ruedi, the Fryingpan River and the Roaring Fork River benefits the valley economy and local communities where recreation visitors purchase goods and services. Of the total direct spending by Fryingpan River and Ruedi visitors within the Roaring Fork Valley, 49% is estimated to occur in the Basalt and El Jebel area. It is estimated that the total annual expenditures in the Basalt area from Ruedi and lower Fryingpan River visitors is $1,352,063 or 1.55% of Basalt's $87 million total sales for 2001. Total annual expenditures in the entire Roaring Fork Valley by these visitors are estimated to be $2,755,532 (Crandall 2002).

Fryingpan River recreation, especially fishing, generated nearly 50 percent of the direct recreation expenditures in the Fryingpan Valley. These recreation expenditures accounted for approximately 3% of the total estimated $87 million gross sales in Basalt in 2001 (Roaring Fork Conservancy, 2002). Annual direct spending on lodging related to Lower Fryingpan River recreation was about $292,000 or 31% of the 2001 gross lodging sales of $944,750 (Crandall 2002).

Within the Roaring Fork Valley, $1.52 million annually in total income (for businesses and employees) and an estimated 69 jobs are linked to the economic activity generated by lower

Fryingpan River visitors. Ruedi recreation activities are responsible for creation of $86,750 in total annual income and 4 jobs (Crandall 2002). River rafting on the Roaring Fork River was estimated to be responsible for $328,600 in direct spending in 2001 (Colorado River Outfitters Association 2001).

Environmental Consequences

No Action Alternative

This alternative would result in Ruedi, and Fryingpan and Roaring Fork River flows continuing to fluctuate as a result of yearly precipitation variations, releases for fish recovery and from previously established water contracts, and/or regulation according to the CWCB's minimum instream flows and the Ruedi Operating Principles. Therefore, this alternative is expected to have no direct, indirect, or cumulative impacts to socioeconomics.

Proposed Action Alternative

Refer to the Recreation section for a discussion of the expected impacts to fishery recreation on the Fryingpan River, and recreation at Ruedi as a result of the implementation of the Proposed Alternative. Using a conservative estimate, by extension it would be expected that similar levels of impact would result to the socioeconomics of the Roaring Fork Valley.

The availability of suitable augmentation water to supply demands in the growing Colorado River Basin area could also potentially play a role in local economies. If this contract were not issued, contractors would need to find other sources of water to meet their needs. This could be minimized somewhat by the availability of water from Wolford Mountain; however, Wolford Mountain cannot meet contracting demands on the Fryingpan and Roaring Fork Rivers unless the demands on these rivers are generated by calls on the Colorado River downstream of the Roaring Fork River, and in the short-term only about 1000 ac-ft is still available to contract from Wolford Mountain (Merritt 2006c). Any augmentation water that is necessary to meet calls on the Fryingpan and Roaring Fork Rivers can only be met by Ruedi or conversion of other rights to augmentation. However based on current requests and the availability of Wolford Mountain to meet at least some of the demand, it is not believed that the failure to implement this alternative would result in lost development opportunities on the west slope. Therefore, this alternative is expected to have no direct or indirect impacts to development in the Colorado River Basin.

In summary, it is important to note that despite causing various beneficial and adverse impacts to socioeconomics as compared to current conditions, this alternative is not expected to result in direct or indirect impacts greater than those presented in the RRII FSES.

Details of the expected cumulative impacts to socioeconomics at Ruedi, and the Fryingpan and Roaring Fork Rivers as a result of issuance of these contracts along with all the existing and expected future releases from Ruedi can be found in the RRII FSES and 2012 Agreement. Of particular note is the potential impact to recreation and in turn to socioeconomics due to Fryingpan River flows in excess of 250 cfs, limiting wadability and access of the river. Minimal effects to the socioeconomics of the area were expected as a result of impacts to recreation activities at Ruedi and on the Roaring Fork River, or as a result of impacts to the Fryingpan River sport-fish in the Fryingpan River. Furthermore it is not believed that there would be any lost development opportunities on the west slope as a result of limited augmentation water to supply demands in the growing Roaring Fork Valley.

HYRDROELECTRIC PRODUCTION

The information presented here in summary can be found in detail in the RRII FSES and 2012 Agreement. The analysis related to hydroelectric production impacts in these documents is included here by reference.

Affected Environment

The city of Aspen is licensed by the Federal Energy Regulatory Commission (FERC) to operate a hydropower facility at Ruedi Dam and Reservoir and to make use of operational releases from Ruedi to generate energy. According to Aspen's FERC license, Aspen's hydropower production objectives are subordinate to the operation of Reclamation's facilities; and according to a Memorandum of Agreement between Reclamation and Aspen, Reclamation has sole discretion concerning release rates from Ruedi.

The power plant can effectively use flows at or above 40 cfs and must cease operation below this level. In addition, the power plant can only use flows up to 250 cfs. The portion of the flow above that level will be bypassed around the power plant.

Environmental Consequences

No Action Alternative

This alternative would result in Ruedi, and Fryingpan and Roaring Fork River flows continuing to fluctuate as they have historically as a result of yearly precipitation variations, releases for fish recovery and from previously established water contracts, and/or regulation according to the CWCB's minimum instream flows and the Ruedi Operating Principles. Therefore, this alternative is expected to have no direct, indirect, or cumulative impacts to hydroelectric production for Aspen.

Proposed Action Alternative

Aspen's FERC license affords them the opportunity to use any releases made from Ruedi, consequently any releases within the capacity of the power plant are considered a benefit to Aspen. It would not be appropriate to consider releases in excess of the hydropower facility capacity as adverse impacts. Therefore, although as discussed in the Recreation section, the implementation of this alternative would be expected to increase the number of days above 250 cfs by an average of 4% through the life of the contract, no impact to hydroelectric production can be associated with this alternative relative to bypass flows. However, as shown in Table 3.1 the model indicated there would be an increase in the number of months that the average flows exceeded current conditions which would not need to be bypassed by nearly 90 occasions. Also, the number of months the average flows would be below 40 cfs did not change as a result of the issuance of this contract. Therefore, it is expected that the implementation of this alternative would cause a minor long-term direct beneficial impact to hydroelectric production.

Details of the expected cumulative impacts to hydroelectric production related to the changes in flow as a result of issuance of this contract along with all the existing and expected future releases from Ruedi can be found in the RRII FSES and 2012 Agreement. Of particular note in the RRII FSES is the projection of the number of months flows would be expected to drop below 40 cfs (4 in a dry year, and 1 each in an average and wet year) or rise above 250 cfs (1 in a dry year, and 2 each in an average and wet year) with the issuance of 46,500 ac-ft of water contracts and 5,000 ac-ft for fish releases. The 2012 Agreement found that increased flows due to releases for endangered fish up to 250 cfs are an opportunity for increased power production, but that it would result in bypass flows of approximately 48 days in a dry year, 55 days in an average year, and 61 days in a wet year. Mean monthly winter flows were not expected to drop below 40 cfs. In conclusion, the selection of this alternative would not be anticipated to result in cumulative impacts to hydroelectric production greater than those presented in the RRII FSES or 2012 Agreement.

CHAPTER FOUR – CONSULTATION AND COORDINATION

SCOPING PROCESS

On August 2, 2004 Reclamation sent a letter to 16 Federal and State agencies to help identify any significant concerns, issues, or site-specific environmental impacts as a result of the request from CRWCD. One letter from USFWS with 5 comments was received, including concerns on the impacts to the 15-Mile Reach and how the PBO commitment would be fulfilled, Fryingpan River flow concerns, and Ruedi level changes. The issues raised were resolved in a meeting on September 27, 2004 and December 14, 2005 between Reclamation, USFWS and CRWCD.

On May 3, 2006, Reclamation continued the scoping process by disseminating a scoping document to the Ruedi Round II Mailing List, which includes roughly 55 agencies, 55 organizations and businesses, and 35 private individuals; by notifying approximately 95 contacts on Eastern Colorado Area Office's Ruedi Reservoir Email List announcing the NEPA process concerning the request available on the website at http://www.usbr.gov/gp/nepa/quarterly.cfm#ecao; and by posting the scoping document on the Reclamation website. The scoping document described the proposed contract, announced the preparation of an Environmental Assessment (USDI 2006), and along with a news release that was issued on May 5, 2006 announced the public meeting that was to be held on May 11, 2006 at the Basalt Town Hall to solicit agency and public input on the proposal. 19 individuals signed in at the public meeting.

As a result of this scoping process, Reclamation received verbal feedback and 7 comment letters totaling approximately 50 comments. Comments focused on the Operating Principals being maintained; December determination dependability and ramifications; 300 ac-ft per year marketing estimate; hydrologic changes; uncommitted contract water utilization details; recreation and socioeconomic concerns; sport-fish and macroinvertebrate changes; and endangered fish and 15-Mile Reach flow augmentation concerns. A Reclamation planning team considered these comments in order to define the scope of issues and impacts topics to be analyzed, and the details of the Proposed Alternative to be included in this document.

COMMENTS ON DRAFT EA

On March 2, 2007 Reclamation sent a letter to the Ruedi Round II Mailing List and Ruedi Reservoir Email List announcing the availability of the Draft EA and request for comments. The Draft EA was posted on the previously mentioned website, and hardcopy and electronic copies of the document were available by request from Reclamation Eastern Colorado Area Office, 11056 W. County Road 18E, Loveland, CO 80537-9711, 970-962-4326.

The comment period closed March 26, 2007. Three letters were received from one federal and one state agency, and one non-profit organization with a total of 11 substantive comments. Appendix D includes a summary of the comments received along with Reclamation's responses.

PREPARERS

Table 4.1 is a list of preparers for this EA.

TABLE 4.1 – LIST OF RECLAMATION PREPARERS

Name	Title	Contribution
Burton, Robert	Archeologist	Cultural resources compliance.
Fenolio, Joel	Hydraulic Engineer	Water model configuration and analysis and document review.
Gomell, Terry	Repayment Specialist	Water contracting information and document review.
Lamb, Kara	Public Information Specialist	Public and agency involvement and notification.
Ronca, Carlie	Natural Resources Specialist	Project management for environmental compliance and document production.
Tully, Will	Environmental Specialist	Environmental compliance guidance and document review.
Wilson, Malcolm	Hydraulic Engineer	Water scheduling consideration and document review.

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APPENDIX A – MS Excel Ruedi Reservoir Operations Model

The following list provides a description of the model operations.

- Model simulates daily operations for up to 31 years using assumption that the 1975 - 2005 climatological conditions will repeat into future. A simulation year begins November 1 and ends October 31.

- Each simulation year is pre-classified on a scale of 1 to 4 based on historic runoff volumes (1 = high, 4 = low).

- Inflow bypass requirements to meet minimum streamflow are the lesser of 39 cfs or actual inflow for November 1 - April 30, and the lesser of 110 cfs or actual inflow for May 1 - October 31.

- Ruedi daily contract releases are sum of those releases that are required due to Cameo call, and those releases that are independent of any call. When Ruedi is in or out of priority is based on historic records. Contract releases for the current Round I and II contracts in the model are:

    1. Call dependent contracts - municipal monthly distribution = 7964 af.
    2. Call dependent contracts - industrial monthly distribution = 6000 af.
    3. Call independent contracts = 0 af.

- The Monthly Contract Distribution Percent is as follows:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Municipal	1	1	1	2	3	20	27	24	16	3	1	1
Industrial	7	7	7	7	9	10	12	10	9	8	7	7

- For the period November 1 - April 15 model simulates release of water to meet storage drawdown target, which is picked by the model based on each years runoff level (i.e. 1 = 60 Kaf, 2 = 65 Kaf, 3 = 65 Kaf, 4 = 70 Kaf). During this period model calculates the uniform daily release rate based on inflow and storage volume to be evacuated during this period. To provide a slightly more realistic simulation of actual operations, the drawdown period is broken into two forecasting periods:

    1. November 1 - January 31 and February 1 - April 15. This allows for some fluctuation of winter-time releases rather than one uniform value over the entire period.
    2. April 15 to July 15. Model calculates a release rate that targets filling the conservation pool around July 15. This is an attempt to mimic management decisions during the spring reservoir filling period to control releases based on available storage space, forecasted inflows and snowpack runoff, and anticipated release demands. The model computes a new release every half-month period during April 15 thru July 15. The release is calculated as:

        [(inflow - releases) - (maximum conservation storage - present storage)] / # days in period * factor

        Where :
        a. Inflow is total inflow from start of period to July 15.
        b. Releases are total Fry-Ark replacement releases, west slope contract, and estimated inflow bypass discharge from start of period to July 15

c. Factor is an adjustment factor for progressively increasing the influence of the forecasted inflows as follows:

April 15 - July 15, factor = 0.3	June 1 - July 15, factor = 0.6
May 1 - July 15, factor = 0.4	June 15 - July 15, factor = 0.8
May 15 - July 15, factor = 0.5	July 1 - July 15, factor = 1.0

- From July 15 - October 31 the model simulates releases for west slope contract demands, USFWS requested release for 15-Mile Reach, Fryingpan River winter flow release, bypass for river administration, bypass for minimum streamflow requirements, and spills if necessary.

- The USFWS daily recommended flows in 15-Mile Reach are based on each years level-of-runoff scale (1 - 4). The recommended flows for July in original model were replaced with August recommended values, since original values were felt to be excessive.

- Total releases from all sources to meet USFWS recommendations begin July 15. The required daily release is calculated as the deficit between the recommended daily flow rate and the average historic flow for the previous seven days. Historic flow for the 15-Mile Reach is determined as:

    1. Gauged flow on Colorado River near Palisade if simulation year is 1991 or later.
    2. Sum of gauged flow on Colorado River above Cameo and Plateau Creek and OMID return flows, minus Government Highline and GVIC canal diversions if simulation year is earlier than 1991.
    3. The total required release is increased by 10% for transit losses to 15-Mile Reach.

- The USFWS 15-Mile Reach demands are to be met by shared releases from Ruedi, Wolford Mountain, Williams Fork, and Green Mountain Reservoirs. Each reservoir is assigned an annual starting storage account for meeting the USFWS demands. Ruedi, Wolford Mountain, and Williams Fork Reservoir USFWS accounts become available on July15. The Green Mountain Reservoir account does not become available until August 15.

    1. Ruedi Reservoir's base annual account is a maximum of 20,825 ac-ft broken down as:

Designation	(af)
Mitigation	5,000
Fish 4 of 5 years	5,000
2012 Agreement	10,825

    2. Williams Fork Reservoir's account (East Slope Mitigation Pool) is set to 5,412 acre-feet each year.
    3. Green Mountain Reservoir's account is adjusted by a percentage according to the runoff volume level for the year (i.e. 1 to 4) being simulated:

Runoff Level	Green Mtn. Available
1	100% of 30,000 acre-feet
2	66% of 30,000 acre-feet
3	33% of 30,000 acre-feet
4	10 % of 30,000 acre-feet

    4. Wolford Mountain Reservoir's account is set each year based on the following table:

	5412 Pool	**6000 Pool**	**Total**		**5412 Pool**	**6000 Pool**	**Total**
	(acft)	(acft)	(acft)	1978	5412	6000	11412
1975	5412	6000	11412	1979	5412	6000	11412
1976	5412	3600	9012	1980	5412	6000	11412
1977	0	1200	1200	1981	0	1200	1200

	5412 Pool	6000 Pool	Total
1982	5412	6000	11412
1983	5412	6000	11412
1984	5412	6000	11412
1985	5412	6000	11412
1986	5412	6000	11412
1987	5412	3400	8812
1988	5412	5000	10412
1989	5412	3400	8812
1990	5412	1800	7212
	(acft)	(acft)	(acft)
1991	5412	4200	9612
1992	0	1800	1800
1993	5412	5000	10412
1994	5412	3100	8512
1995	5412	6000	11412
1996	5412	6000	11412
1997	5412	6000	11412
1998	5412	6000	11412
1999	5412	6000	11412
2000	5412	6000	11412
2001	5412	3078	8490
2002	0	300	300
2003	0	3000	3000
2004	0	4500	4500
2005	5412	6000	11412

- The amount released from each reservoir is based on the ratio of the previous days remaining available storage in account in each reservoir to the total available from all reservoirs. The ratio is then applied to the potential USFWS demand to get each reservoirs proportional release contribution.

- Once proportional release rates are calculated, any individual release limits are then applied. Williams Fork releases are limited to a maximum of 480 cfs per information from Denver Water Board. Wolford Mountain Reservoir fish releases are limited to 200 cfs. Since limits are applied after proportional release rates are calculated, the total release rate may not total up to the USFWS recommended flow rate, even though total available volume in all reservoirs is there.

APPENDIX B – Ruedi Reservoir Water Marketing History

Contracting	USFWS Consultation
Early 1980's: Reclamation began marketing water from Ruedi Reservoir.	
May 1982: Four 40-year Ruedi Round I Contracts executed for a total of 7,850 ac-ft.	
	Jun 1984: Reclamation requested consultation on Round II Water Marketing.
	Jun 1987: Reclamation received opinion from Service: 5,000 ac-ft annually and 5,000 ac-ft 4 out of 5 yrs from Ruedi Reservoir to enhance flows in the 15-Mile Reach and fund research.
Feb 1990: 40-year agreement to provide 5,000 ac-ft annually and 5,000 ac-ft 4 out of 5 years from Ruedi Reservoir for 15-Mile Reach.	**Jan 1990**: FSES and Record of Decision for Round II Water Marketing.
Sep 1991: Initial 1-yr contract for additional 10,000 ac-ft for 15-Mile Reach.	
Sep 1992: Reclamation began Round II Water Marketing Program.	
	Oct 1991: Razorback sucker listed as endangered.
	Apr 1994: Critical habitat for Colorado River endangered fish listed: main stem of Colorado River from Rifle downstream.
	Feb 1995: Reclamation requested re-initiation of consultation.
Aug 1996: Reclamation executed Round II Contract for 500 ac-ft and initial 1-yr contract for 21,650 ac-ft for 15-Mile Reach.	**May 1995** Reclamation received Biological Opinion (BO) with two Reasonable Prudent Alternatives (RPAs):
Oct 1996: Reclamation executed Round II Contract for 20 ac-ft.	1. Continue 5,000 and 5,000 ac-ft commitment.
Jul 1997: Reclamation suspended Round II Water Marketing.	2. Make remaining uncommitted yield of the regulatory pool (21,650 ac-ft) available for 15 years to enhance 15-Mile Reach flows.
	Jul 1997: Reclamation informed Service of inability to implement the 1995 BO; requests re-initiation to develop a new RPA.
	Summer 1997: Colorado Water Conservation Board (CWCB) informed Service and Reclamation that CWCB would not approve temporary one-year contract for water from Ruedi Reservoir to benefit endangered fish until Reclamation resumed Round II contracting.
	Fall 1997 thru Spring 1998: Development of new RPA was put "on hold" pending issuance of a final PBO.
	Spring 1998: Development of new RPA was put "back on the table" because a final PBO for 15-Mile Reach was not anticipated prior to August 1998, when water to benefit endangered fish in the 15-Mile Reach would be needed.
	Jan 1999: Reclamation received amendment to the 1995 BO for Round II w/ revised RPA's:
Summer-Winter 1999: Reclamation resumed Round II contracting; executed 4 Round II contracts for a total of 843 ac-ft.	1. Continue 5,000 ac-ft per year and 5,000 ac-ft 4 out of 5 years 2. Provide up to 21,650 ac-ft of Ruedi Reservoir water annually to Recovery Program through 2012 for 15-Mile Reach. 3. When the PBO is finalized and water users dedicate 10,825 ac-ft to the Recovery Program, reduce Reclamation's 21,650 ac-ft commitment from Ruedi Reservoir to 10,825 ac-ft. 4. Contract for 6,135 ac-ft of immediate need Round II water sales upon Reclamation's acceptance of the BO. 5. When the PBO is finalized and a long-term agreement signed, contract for balance of 17,000 ac-ft of Round II water.
	Dec 1999: PBO finalized and issued to Reclamation.
May 2000 to May 2003: Reclamation executed 13 Round II contracts for 3221 ac-ft.	**Jan 2000**: Reclamation accepts PBO: 1. PBO supersedes January 1999 BO. 2. Continue 5,000 ac-ft and 5,000 ac-ft commitment 3. Upon Reclamation's acceptance of the BO, Round II water may total up to 6,135 ac-ft. 4. Upon signature of an agreement to deliver 21,650 or 10,825 ac-ft to 15-Mile Reach; Reclamation may contract for remainder of 17,000 ac-ft.
June 2003: Reclamation executed contract with Colorado Water Conservation Board for 10,825 ac-ft.	
Summer 2003: Reclamation executed 3 Round II contracts for 1,530 ac-ft.	

APPENDIX C – FEDERALLY LISTED SPECIES AND HABITAT (COUNTY)

Species	Scientific Name	Status	Grand	Eagle	Summit	Routt	Pitkin	Gunnison	Mesa	Garfield	Rio Blanco
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Black-footed Ferret	*Mustela nigripes*	Endangered	No	Yes	No	Yes	No	No	No	Yes	Yes
Bonytail	*Gila elegans*	Endangered	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*	Yes**	Yes	No
Canada Lynx	*Lynx canadensis*	Threatened	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Colorado Pikeminnow	*Ptychocheilus lucius*	Endangered	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*	Yes**	Yes**	Yes*
DeBeque Phacelia	*Phacelia submutica*	Candidate	No	No	No	No	No	No	Yes	Yes	No
Humpback Chub	*Gila cypha*	Endangered	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*	Yes**	Yes	No
Mexican Spotted Owl	*Strix occidentalis*	Threatened	No	No	Yes	No	Yes	No	No	Yes	Yes
Osterhout Milk-vetch	*Astragalus osterhoutii*	Endangered	Yes	No	No	No	No	No	No	No	No
Parachute Beardtongue	*Penstemon debilis*	Candidate	No	No	No	No	No	No	No	Yes	No
Penland Alpine Fen Mustard	*Eutrema penlandii*	Threatened	No	No	Yes	No	No	No	No	No	No
Penland Beardtongue	*Penstemon penlandii*	Endangered	Yes	No	No	No	No	No	No	No	No
Razorback Sucker	*Xyracuchen texanus*	Endangered	Yes*	Yes*	Yes	Yes*	Yes*	Yes*	Yes**	Yes	Yes*
Slender Moonwort	*Botrychium lineare*	Candidate	Yes	No	Yes	No	No	No	No	No	No
Southwestern Willow Flycatcher	*Empidoxax traillii extimus*	Endangered	No	No	No	No	No	No	Yes	No	Yes
Uinta Basin Hookless Cactus	*Sclerocactus glaucuc*	Threatened	No	No	No	No	No	No	Yes	Yes	No
Uncompahgre Fritillary Butterfly	*Boloria acrocnema*	Endangered	No	Yes	Yes	No	Yes	Yes	No	No	Yes
Yellow-billed Cuckoo	*Coccyzus americanus*	Candidate	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Water depletions in the Upper Colorado River and San Juan River Basins may affect the species and/or critical habitat in downstream reaches in other states.
**There is designated critical habitat for the species within the county

(USFWS 2006)

APPENDIX D – COMMENT RESPONSES

Three letters were received on the Draft EA. The following provides a summary of the comments received along with Reclamation's responses.

U. S. FISH AND WILDLIFE SERVICE submitted by George Smith, Regional Hydrologist

Comment: The assessment adequately addressed the need for the contract and associated issues.

Response: Comment noted.

Comment: The completion of the contract is a high priority item in the Recovery Program's Recovery Action Plan and has been cited in the Service's "sufficient progress" memo for the past 2 years. We are looking for a quick approval of the River District's requested contract.

Response: Comment noted.

SOUTHEASTERN COLORADO WATER CONSERVANCY DISTRICT submitted by Scott A. Clark with Burns Figa & Will P.C.

Comment: During scoping we requested that the draft EA recognize the statutory priorities for use of water stored in Ruedi Reservoir. Reclamation should add clear language in both the environmental review documents and the contract itself identifying that the proposed contract is by its very nature constrained by the Fryingpan-Arkansas Project Legislation and Operating Principles incorporated therein. Reclamation should recognize that the Operating Principles require the waters available to the Project be used in a particular sequence.

Response: The Draft EA dealt with this issue on page 10 with the statement "Water released through the proposed contract would be delivered according to the Operating Principles established for Ruedi." It is not necessary to outline all of the Operating Principles or sequence of water use as the included statement is more comprehensive. Ruedi Round II contracts also specifically provide that the Project will be operated in accordance with the Operating Principles. Information has been added to the same paragraph on page 10 to indicate that the contracts are subject to law, rules, and regulations.

Definitions in the Ruedi Round II contracts clearly delineate the distinction between the "Replacement Capacity" and the "Regulatory Capacity" of Ruedi Reservoir. The water provided to Ruedi Round II contractors is from the "Marketable Yield" which is defined as "the 46,500 acre-feet of water estimated to be available from the regulatory capacity of Ruedi Reservoir…" Table 3.1 on page 13 shows that water contracts would come from the marketable yield of the regulatory capacity.

Comment: The contract should contain a shortage provision recognizing that the contract can be satisfied only when the water is available consistent with the Operating Principles.

Response: Information has been added to the same paragraph on page 10 to indicate that the contracts would contain a shortage provision. Also, as indicated previously, Ruedi Round II contract specifically provide the Project will be operated in accordance with the Operating Principles.

Comment: On page 2 the emphasizing phrase of "up to 5 times in 25 years but not more than 3 years in a row" applies to the expected frequency of drought conditions, not the expected frequency of releases to enhance instream winter flows in the Fryingpan River.

Response: Suggested language has been accepted; change has been made on page 2.

Comment: On page 9 state more clearly in the draft EA as well as the contract that after an erroneous winter flow release, CRWCD would not waive its obligation to provide water to the 15-Mile Reach from Wolford Mountain, as it could otherwise do under the drought restriction, but will in fact provide water to the 15-Mile Reach from Wolford Mountain.

Response: Clarification has been made on page 9. The contract will include details of the alternative.

Comment: Southeastern wants to ensure that nothing within Reclamation's proposed action will limit Reclamation's flexibility to allow use of Ruedi to satisfy Southeastern and Reclamation's part of the water users' 10,825 ac-ft per year obligation.

Response: Reclamation's actions relative to the proposed contract are not related to this issue and therefore have not been included in the EA.

TROUT UNLIMITED submitted by Drew Peternell, Director Colorado Water Project

Comment: Provide more reasoning for the impact determination of lower flows to trout (including rainbow trout spawning conditions) and macroinvertebrates. Describe more specifically with explanation the immediate impacts of lower winter flows and long-term impact of occasional reductions of lower winter flows.

Response: More elaboration has been included in the Other Aquatic Resources section of Chapter Three.

Comment: The EA does not address that brown trout often benefit from relaxed flows during late summer prior to the fall spawn.

Response: More elaboration has been included in the Other Aquatic Resources section of Chapter Three.

Comment: The EA does not discuss whether elevated winter flows in moderate years would have any adverse impacts on incubating brown trout eggs or other resources.

Response: More elaboration has been included in the Other Aquatic Resources section of Chapter Three.

Comment: The RRII FSES requires site-specific NEPA compliance and mitigation for individual water sales contracts. Reclamation must require CRWCD to mitigate any adverse environmental impacts identified in the Final EA.

Response: The RRII FSES is a programmatic environmental compliance document. It along with the PBO evaluated impacts of the release of 51,500 ac-ft annually for water contracts and fish recovery. There are no site-specific impacts that would result with the implementation of this contract; all the impacts were already addressed in the RRII FSES. This clarification has been added throughout Chapter Three.