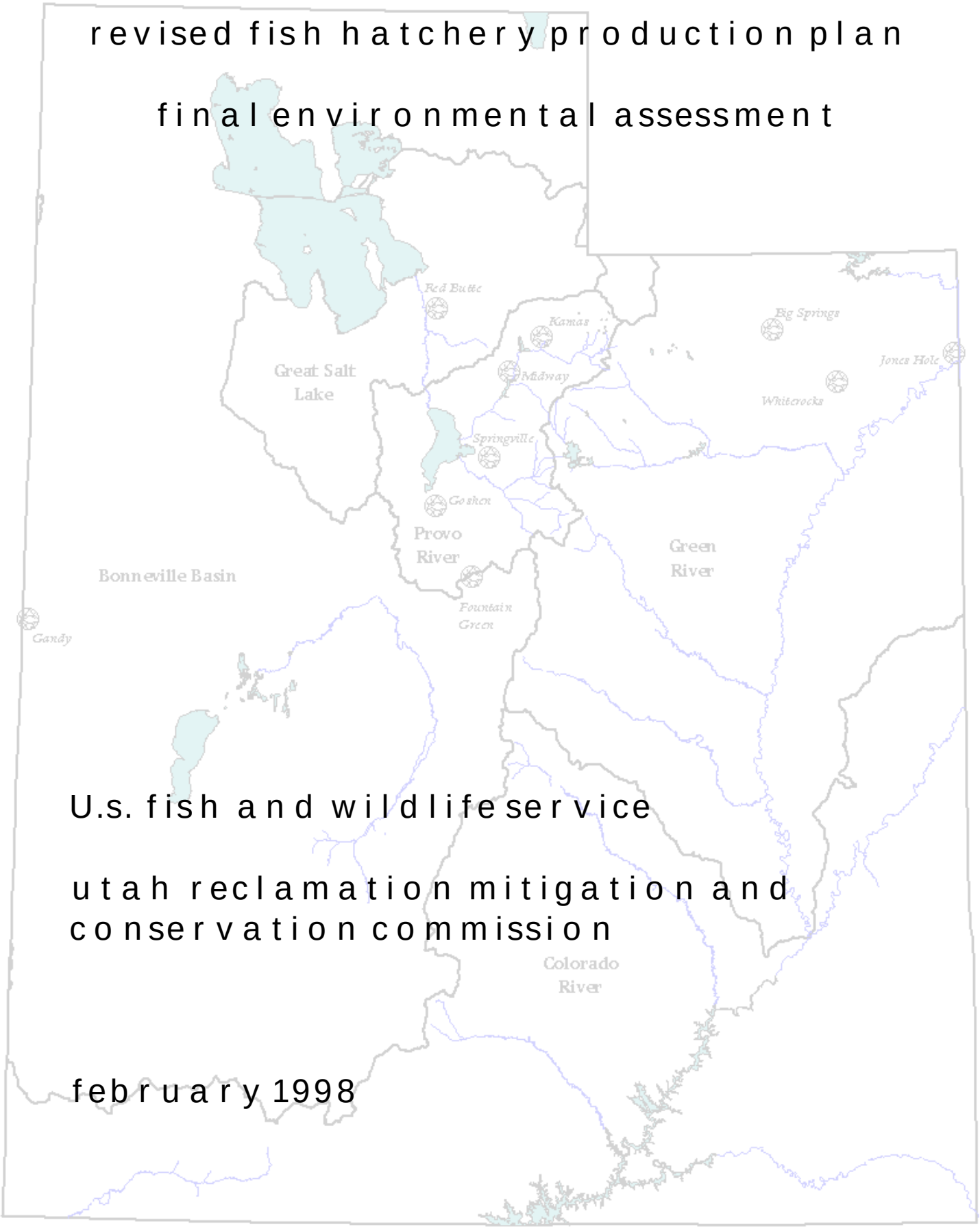
revised fish hatchery production plan

final environmental assessment



U.S. fish and wildlife service

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chapter 1
PURPOSE, NEED and issues

INTRODUCTION

The purpose of this Environmental Assessment (EA) is to evaluate the Revised Fish Hatchery Production Plan (Plan) submitted by the Hatchery Workgroup (see Appendix A for a list of Workgroup membership and history of the original plan). The Plan consists of recommendations to meet a portion of the fish-stocking needs in the Colorado River Storage Project (CRSP)-affected area waters. The Plan is presented as the Proposed Action Alternative in the EA. It has not been prepared as a separate document.

The CRSP-affected area entails waters affected by CRSP storage unit facilities—Flaming Gorge and Lake Powell—and facilities constructed under a CRSP-participating project, which are the Emery County Project—Joe's Valley Reservoir and Huntington North Reservoir—and the Central Utah Project (CUP)—several units—in Utah. A list of these projects and the related impacted waters is included as Appendix B.

BACKGROUND

The Central Utah Project Completion Act (CUPCA) established the Utah Reclamation Mitigation and Conservation Commission (Commission) to coordinate fish, wildlife and recreation conservation projects as mitigation for Federal reclamation projects in Utah, particularly, CUP's Bonneville Unit. CUPCA directed the Commission to develop a Mitigation and Conservation Plan that identifies projects the Commission will implement[1]. The CUPCA (Section 313(c), Fish and Wildlife Features in the Colorado River Storage Project) identified $22.8 million for hatchery rehabilitation and construction to meet warm- and cold-water fish-stocking needs in CRSP-affected area waters. The 1997 Mitigation and Conservation Plan includes a Statewide Program Element for fish hatchery restoration and construction. CUPCA requires the Plan as a condition to complete this program element. Fish hatchery restoration and construction has not been proposed or committed as a federal mitigation measure for CRSP impacts in Utah in lieu of measures to avoid or reduce or compensate for adverse impacts on fish populations or habitats. Rather, these measures are proposed to improve and increase the culture and production of native and non-native species for stocking of recreational fisheries and for conservation and recovery needs. This program will help support recreational opportunities and other mitigation and conservation measures previously implemented or currently planned.

[1]Under CUPCA, the hatchery element must be achieved within the ecosystem restoration requirement of §301. The Commission published its first 5-year Mitigation and Conservation Plan in May, 1996, with specific direction from Congress that the Commission's program employ an ecosystem approach, public involvement, measures based on best available scientific knowledge and partnerships. Project evaluation was based on five decision factors: benefits to fish, wildlife and recreation resources; fiscal responsibility; agency and public involvement and commitment; consistency with laws and programs and other contributions.

The Commission has determined that, based on updated information, a Plan revision is necessary. This revision incorporates the Mitigation and Conservation Plan (Commission 1997) priorities, hatchery feasibility study results (HRS 1996, JDK 1990a, 1990b, FishPro 1996a, 1996b, 1997), the stocking assessment report (BIO/WEST, Inc. 1997) results, and the Utah Division of Wildlife Resources (Division) Fish Stocking and Transfer Procedures (Division 1997c).

106 STAT. 4640 Public Law 102-575--Oct. 30, 1992

SEC. 313. FISH AND WILDLIFE FEATURES IN THE COLORADO RIVER STORAGE PROJECT.

(c) FISH HATCHERY PRODUCTION.--$22,800,000 shall be available only for the planning and implementation of improvements to existing hatchery facilities or the construction and development of new fish hatcheries to increase production of warmwater and coldwater fishes for the areas affected by the Colorado River Storage Project in Utah. Such improvements and construction shall be implemented in accordance with a plan identifying the long-term needs and management objectives for hatchery production prepared by the United States Fish and Wildlife Service, in consultation with the Utah Division of Wildlife Resources, and adopted by the Commission. The cost of operating and maintaining such new or improved facilities shall be borne by the Secretary.

PURPOSE AND NEED

Existing Condition The CRSP facilities contributed to the demand for hatchery-reared products by creating large reservoirs in Utah that provide millions of angling hours, but require stocking to sustain them. Sport fish stocking demands have been met in the past by State fish hatcheries and a Federal fish hatchery. But, those demands can no longer be met as the fish hatcheries are deteriorating and losing fish production capacity.

The CRSP facilities and their operation impacted many aquatic habitats for wild fish and native species. Recovery or conservation of native species may require reintroduction or supplementation to achieve the desired population levels or protection of genetic diversity. The native species would come from a designated facility (hatchery or stream side hatching unit). The appropriate role for hatchery production in species conservation and restoration is identified through recovery and conservation strategies.

Desired Condition The overall need for the Commission adopting and implementing the revised Plan is to increase production of warm- and cold-water fishes from hatcheries to meet Federal, State and Tribal fishery resources' long-term needs and management objectives in the CRSP-affected area waters. These management objectives vary with program, water and season. Objectives for waters that are stocked consider species, strain, stock, health or fitness (ability to survive and reproduce in a given environment). This need is captured in the 1997 Mitigation Plan's Desired Future Condition statement:

Warm water and cold water fish production and reservoir stocking needs in the State are met, providing a variety of sport fish opportunities to the public. Through the hatchery program, native fish populations are augmented to meet conservation and recovery needs.

In addition to meeting warm- and cold-water fish production and native fish populations needs, projects included in the Plan should also meet the following purposes:

- # Be cost-effective (both capital and operations and maintenance) and/or provide the versatility to respond to future management objectives and species and/or size in the hatchery product
- # Optimize capital costs and minimize long-term O&M costs
- # Perpetuate or increase existing hatchery production capabilities where possible in meeting increased production demands
- # Complement other Federal, State or Tribal programs, such as species conservation strategies
- # Implement projects with substantial matching fund contributions
- # Avoid or minimize stocking impacts on wild or native aquatic species
- # Consider alternative technologies, such as stream-side hatching units
- # Provide educational opportunities
- # Provide hatchery-site environmental enhancement
- # Evaluate project implementation and effectiveness

Developing a Proposed Action To develop a proposed action that would bridge the gap between the existing and desired condition, i.e., assist in meeting warm- and cold-water fish production needs and augment native fish populations, it was necessary to:

- # Identify current and future warm water and cold water fish propagation needs for the CRSP-affected area waters
- # Evaluate existing capability and proposed rehabilitation and construction projects that respond to that need
- # Develop a proposed action made up of those projects

The CRSP-affected area waters that are managed with stocking, species stocked and management objectives are listed in Appendix C (Table C-1).

Seventy-six waters were identified. Of the these, 18, or 24% are streams and 58, or 76% are lakes or reservoirs. For conservation needs, (e.g., least chub) specific waters may not have been named. Strategies for these species that will identify specific waters are currently being developed.

Fish-stocking needs for these waters were projected for the 1996-2035 period, based on the life of the hatcheries (40-year life span of concrete raceways). The Division and Tribe managers identified fish-stocking needs that are based on size, numbers and pounds[2] of fish. These indicate an increased need over the 40-year period. More detail for cold water, warm water and native species is in the following section.

Stocking Needs Stocking practices in Utah changed approximately ten years ago. The Division has reduced their stream-stocking program, recognizing that streams do not provide the same return as reservoirs; and in response to an increasing demand for native

[2]The determination of needs is based on sizes, numbers and pounds; however, pounds are used as a single indicator of hatchery capacity or ability to meet the need to simplify the analysis and the development of alternatives.

and wild fisheries. This demand is mainly for streams and small reservoirs. Most fish are now stocked in reservoirs that do not provide sufficient habitat to establish self-sustaining populations (BIO/WEST 1997, see Appendix A for more information).

Cold-Water Species Needs for cold-water fishes in the CRSP-affected area waters were identified for kokanee salmon, brook, brown, rainbow, cutthroat, lake trout, grayling and splake. Annual totals for the cold-water sport fish (by weight) are given in Table 1. Needs by size, weight and number are given in Appendix C (Table C-2).

Table 1. Annual totals for the cold water fish needs for CRSP-affected area waters, in pounds.

Year	1996	2000	2005	2010	2015	2025	2035
Brook trout	372	629	629	629	629	629	629
Brown trout	640	781	871	1,075	1,153	1,165	1,178
Cutthroat trout, all subspecies	41,226	49,144	52,767	46,029	43,207	44,608	44,651
Grayling	1	1	1	1	1	1	1
Kokanee	10,395	9,450	0	0	0	0	0
Lake trout	0	32	32	32	32	32	32
Rainbow trout, all strains	291,232	469,553	525,030	579,406	580,009	683,459	792,620
Splake	1,750	1,750	2,250	2,250	2,250	2,250	2,250
TOTALS	345,616	531,340	581,579	629,422	627,280	732,144	841,361

The maximum total annual cold-water sport fish-stocking needs for CRSP-affected area waters for the 1996-2035 period is 841,361 pounds, (occurring in the year 2035) made up of 629 pounds brook trout; 1,178 pounds brown trout; 44,651 pounds cutthroat trout; 1 pound grayling; 32 pounds lake trout; 792,620 pounds rainbow trout and 2,250 pounds splake. By weight, 93% of these fish are stocked in reservoirs, 5% are stocked in streams, and 1% are stocked in high mountain lakes.

Rainbow trout The bulk of the increased need for cold-water fish is made up of rainbow trout (94% in 2035). A review of rainbow trout stocking needs by size (see Table C-2, Appendix C) indicates that the increase is due to stocking needs for 10 inch or catchable sized fish that support intensive yield fisheries (see Table C-1, Appendix C for these waters).

The catchable-sized fish are better able to compete with non-sport fishes for food, avoid predation and better insure a return to the creel. For example, in Flaming Gorge Reservoir, the fishery is made up of stocked rainbow trout, and wild fisheries for lake trout, kokanee salmon and smallmouth bass. In order to provide the stocked rainbow trout component, stocking at least catchable-sized rainbow trout is necessary to avoid predation by large lake trout.

Flaming Gorge, Strawberry and Jordanelle Reservoirs are waters with the three highest stocking needs. Management objectives for these are described in Appendix C. Flaming Gorge Reservoir stocking dominates the CRSP-affected area waters needs. The Flaming Gorge stocking need is large because it is a large water (over 42,000 surface acres) that can handle much more angler use than it currently has, and because

it requires stocking of larger sized fish (10 inch rainbow trout) to provide a successful fishery, given the other primary species: lake trout and kokanee.

To maintain the 840,000 angler hours estimated for Flaming Gorge Reservoir in 1995, allowing for kokanee and lake trout harvest; stocking 750,000 catchable (i.e., 8 inch fish) rainbow trout is required. With an improved return to the creel for larger stocks (i.e., 10 inch fish), 600,000 rainbow trout would be required. It is anticipated that it would the year 2000 before any increases in stocking from improved hatcheries are possible. This is the basis of the increase in stocking between the period of 1996-1999 and 2000-2004. Increases beyond the year 2004 reflect anticipated increases in fishing pressure.

Cutthroat trout The cutthroat trout (the next largest need) sportfish needs for the year 2005 (the year of highest need, total 52,767 pounds) are made up of 44,220 pounds Bear Lake; 1,201 pounds Bonneville; 6,384 pounds Colorado River; 960 pounds Snake River; and 1 pound Yellowstone[3].

The Bonneville and Colorado River cutthroat trout conservation strategies'[4] goal is to reestablish populations in their Geographic Management Units (GMU)—a specific area with defined management for a species such as Bonneville cutthroat trout. These populations would be in addition to the sport fishing populations. For the Bonneville cutthroat trout (Division 1997a), the Jordan River drainage (Great Salt Lake watershed) and Utah Lake/Provo River drainage subunits of the Northern Bonneville GMU are within the CRSP-affected area. The conservation population goals for this GMU are to:

- Maintain 3 populations and 16.4 occupied stream miles and 350 occupied surface acres of lentic (still water, such as lakes or ponds) water in the Jordan River drainage;
- Maintain 6 populations and 88 occupied stream miles and 350 occupied surface acres of lentic water in the Utah Lake/Provo River drainage.

Actions identified for all subunits of the Northern Bonneville GMU include reintroduction through development of brood stock (sexually mature fish kept in a hatchery for breeding) Bonneville cutthroat trout populations to provide for future reintroduction efforts and refuge sources.

[3]The 1 pound of Yellowstone cutthroat trout is 4,000, 1 inch fry stocked in Pete's Hole, Colorado River watershed. This water is located on the Manti LaSal National Forest above Joe's Valley Reservoir and is a popular sport fishing water. It also receives stocked rainbow trout. Colorado River cutthroat trout may be used, given a brood stock source.

[4]The conservation strategies are documents describing procedures and strategies required to provide for the long-term conservation of the cutthroat trout in Utah to eliminate threats that warrant listing of the cutthroat trout as a sensitive species by State and Federal agencies, and as threatened or endangered under the Endangered Species Act (ESA) of 1973, as amended.

For Colorado River cutthroat trout (Division 1997b), the Northeastern GMU (including the North Slope Uintas, South Slope Uintas and North Tavaputs Plateau) includes waters within the CRSP-affected area. The conservation population goals for this GMU are to maintain 33 populations within 432 stream miles of occupied Colorado River cutthroat trout habitat. Reintroduction has not yet been identified as an action in this species' conservation strategy, but it is anticipated in the future.

Warm-water species identified include smallmouth bass, wiper (a hybrid produced by crossing striped bass and white bass), channel catfish, June sucker, least chub, roundtail chub, leatherside chub, flannelmouth sucker, bluehead sucker, bonytail, Colorado squawfish, humpback chub and razorback sucker. The CRSP has impacted the threatened and endangered fish species (bonytail, Colorado squawfish, humpback chub and razorback sucker) in the Colorado River. Federal laws have established funding sources other than CUPCA for the recovery of these species. Hatchery needs for them are not included in this EA. A summary of species stocking needs for this EA is given in Table 2[5].

Sizes and numbers of the warm-water and native species, as defined in the proposed facility feasibility report (FishPro 1996b), are detailed in Appendix C (Table C-2).

[5] The numbers needed to conserve and/or recover these species have been converted to pounds to determine needed hatchery capacity.

Table 2. Annual total for warm-water fish needs, in pounds.

Year	1996	2000	2005	2010	2015	2025	2035
Channel catfish	8,232	16,464	16,464	16,464	16,464	16,464	16,464
Smallmouth bass	343	0	0	0	0	0	0
Wiper	216	0	0	0	0	0	0
Least chub	0	171	171	171	0	0	0
June sucker	0	84,582	84,582	84,582	362	362	0
Leatherside chub	0	0	6,298	6,298	6,298	0	0
Roundtail chub	0	0	45,046	45,046	45,046	0	0
Bluehead sucker	0	0	0	0	56,086	56,086	56,087
Flannelmouth sucker	0	0	0	0	56,086	56,086	56,087
Total	8,791	101,217	152,561	152,561	180,340	129,000	128,637

The maximum total annual need for warm-water fish in CRSP-affected area waters is 180,340 pounds (year 2015, see Table C-2 for numbers and sizes). The warm-water species annual total stocking and conservation needs increase with time.

Native fish conservation needs identified June sucker and least chub production as immediate needs and roundtail chub, leatherside chub, bluehead sucker and flannelmouth sucker production as additional needs. The distribution of other native species (e.g., mountain sucker and redside shiner in the Bonneville Basin) are being reviewed in comparison to their historical range. Culture of these may be a future conservation strategy. Warm-water sportfish needs decline for Mona Reservoir (currently managed for wiper) after 1997, as it is being considered for June sucker recovery (see Table C-1). If Mona Reservoir is not used for June sucker recovery, stocking of wiper will continue. Stocking of smallmouth bass in Jordanelle will be discontinued after 1998, upon establishment of that fishery.

Amphibian conservation needs identified boreal toad and spotted frog as immediate. While not specifically identified in CUPCA [§313 (c), see page 1-2], amphibians are included in the action alternatives evaluated in the EA. Culture of these species has been identified as a need, and an issue. It is further discussed under the Issue

Identification section. Conservation strategy plans for these are being developed under the Bonneville Basin Conservation and Recovery Team direction.

The maximum annual amphibian conservation need is 400,000 individuals. The level of production was developed by Division biologists, based on their monitoring of existing populations and is supported by the Draft Spotted Frog Conservation Agreement and Strategy (1997). There is a decline in numbers after the year 2010, when the planned amphibian conservation is accomplished.

Table 3. Annual totals for amphibian needs, in numbers of individuals.

Year	1996	2000	2005	2010	2015	2025	2035
Boreal toad	0	200,000	200,000	200,000	0	0	0
Spotted frog	0	200,000	200,000	200,000	0	0	0
Total	0	400,000	400,000	400,000	0	0	0

proposed action

The Proposed Action is for the Commission to adopt and implement the revised Plan. This entails:

- Funding reconstruction or rehabilitation of four existing cold-water fish hatchery facilities managed by the Division and by U.S. Fish and Wildlife Service (Service)
- Funding construction of new hatcheries: a warm-water fish hatchery and a smaller, interim hatchery to be managed by the Division and a cold-water fish hatchery to be managed by the Ute Tribe (Tribe)
- Requiring the implementation of a State and Tribal fish-stocking policy[6]
- Including a public education component at each site
- Considering stream-side hatching units
- Including a monitoring program

Table 4 identifies how each element of the proposed action addresses the purpose and need, or how the proposed action will bridge the gap between the existing and desired condition. Note that three elements of the proposed action— stocking policy, public education and stream side hatching units—originated in issues raised by the public. The “need” for these is identified in the next section: Issue Identification.

[6]A stocking assessment report was completed which recommended the development of a stocking policy by the State and the Tribe. For more details, see the Plan history in Appendix A. The Division Fish Stocking and Transfer Procedures is in Appendix D.

Table 4. Purpose and need underlying the proposed action

Purpose and Need	Proposed Action
The purpose of rebuilding or rehabilitating existing State and Federally-managed cold-water hatcheries and building a new State-managed cold water hatchery is to maintain and increase production of kokanee salmon, brook, brown, rainbow, cutthroat, lake trout, splake and grayling to meet the increased sport fish need. This should be cost-effective, provide the versatility to respond to changing management objectives, use matching fund contributions and perpetuate and increase existing hatchery capabilities.	The Commission will fund 75%[7] of the cost of reconstruction of Kamas and Whiterocks State fish hatcheries, a new Fountain Green State fish hatchery, and rehabilitation of the Jones Hole National Fish Hatchery. These are existing hatchery sites with known capabilities of rearing the desired species. These improvements will provide 422,589 lbs. capacity, or 50% of the need.
The purpose of building a new warm-water fish hatchery, and an interim native fish hatchery is to meet the identified sport fishery need in the CRSP-affected area waters and the recovery and conservation reintroduction or supplementation needs of native species. This should complement the recovery and conservation programs.	The Commission will fund 75% of the construction costs of a warm-water hatchery at the Goshen or Gandy for the production of channel catfish, recovery of June sucker and conservation of least chub, leatherside chub, flannelmouth sucker, roundtail chub, bluehead sucker, boreal toad, spotted frog and other species currently under study (for example, mountain sucker); and a smaller, interim facility at Red Butte [8] or another mutually agreed upon location for June sucker recovery. The capacity of these will provide approximately 54% of the identified need (97,383 lbs).

[7]The 25% matching funds is anticipated to come from the cooperating agency or Tribe. The State of Utah has secured funding match for Kamas and Fountain Green Fish Hatcheries and is pursuing funding for the other hatcheries. The Ute Tribe has resolved to provide matching funding (April 1997). The Service may provide matching funding through NEPA and engineering support.

[8]The interim facility at Red Butte for June sucker culture is supported by the draft June Sucker Recovery Plan under the action of enhancing populations in Utah Lake and its tributaries.

Purpose and Need	Proposed Action
The purpose of building a new cold-water hatchery is to provide for Tribal sport fish and Colorado River cutthroat trout conservation needs.	The Commission will fund 75% of the construction costs of a cold-water facility at Big Springs for the production of Colorado River Cutthroat Trout to meet sport fish and conservation needs. This facility will provide 30,000 lbs. capacity, approximately 4% of the need.
There is a need to avoid impacts of stocked fish on wild or native aquatic species.	The revised Plan includes the Division Fish Stocking and Transfer Procedures and a recommendation for a Tribal stocking policy. The Division Procedures are for transportation, conservation and recovery stocking of native species, native and nonnative sportfish and recreation stocking. They also include fish health requirements, fish from hatcheries and fish transfers. The Procedures are included in Appendix D. They consider wild fisheries management and comply with native fish recovery and conservation.
There is a need to educate the public on the use of hatcheries as a tool to meet a management need, and on the importance of habitat to sustain both wild and stocked fish populations.	Public information and education will be provided at each hatchery site and through existing Federal, State and Tribal programs.
There is a need to supplement cold water stream fish populations with a technology that may be used with or in lieu of traditional hatcheries to culture a more "wild" product.	Stream-side hatching units may be provided.
There is a need to evaluate project implementation and effectiveness.	Implementation and effectiveness monitoring of Commission cooperative agreements will be conducted. The use of validation monitoring is being evaluated by the Commission.

The Commission is establishing an evaluation process to measure performance and accomplishments of its programs. The Commission's monitoring program will include: implementation monitoring to evaluate if the project was completed, and effectiveness monitoring to determine if the project helped achieve the desired future condition. Validation monitoring evaluates if a better way to achieve the desired future

condition exists. The use of validation monitoring for this project is being evaluated by the Commission.

Implementation monitoring will be accomplished through fiscal oversight of cooperators, field reviews and other informal and formal methods. Effectiveness monitoring may be conducted through creel census for the sport fish objectives, and field monitoring under the recovery and/or conservation strategies. The Commission will rely heavily on information collected by cooperators. Activities in addition to those carried out by the Division, for example, are not anticipated.

The plan is intended to be adaptable and amended on an as-needed basis as changes in objectives occur or as new information becomes available. These changes are not considered to be significant, and new environmental analyses are not anticipated. Affected agencies and interests will be consulted as to these changes.

The action to be taken by the Commission is to adopt or deny, in whole or in part, the revised Plan. If adopted, funding can be made available as it is appropriated by Congress for site-specific NEPA review, design and construction. To date, the annual budget for the Plan has not been adequate to fund a complete construction project. Each hatchery construction site may take 2 years or more, depending on the site-specific needs. If the construction of any facility costs less than the feasibility report estimate, this funding may be available for another facility.

As identified in CUPCA 313 (c), the Secretary of the Interior (Interior) shall fund operation and maintenance (O&M) of the new or improved hatcheries (see text box, page 1-2). Interior staff have met with the Division to develop a Cooperative Agreement (CA) for the funding of the O&M of the Kamas hatchery.

The funding for the Kamas Hatchery O&M by Interior is based on costs attributed to the increased production over an identified level, on a per pound cost basis. This approach may or may not be taken for other facilities funded under this Plan.

ISSUE IDENTIFICATION

Scoping to identify issues has been ongoing from the adoption of the original plan in 1994 and through the Kamas Hatchery scoping[9]. Plan revision was coordinated through the Hatchery Workgroup as discussed above (see Appendix A). Issues identified through the stocking assessment report (BIO/WEST 1996) development, stocking policy, and the Proposed Action are listed below. These issues relate to the Plan only. Site-specific construction issues will be handled under site-specific National Environmental Policy Act (NEPA) analysis that will be tiered off this analysis.

1. Stocking Impacts Commenters were concerned that stocking hatchery-reared fish could affect the genetic integrity or health of wild trout, as well as the health of other animals that inhabit stocked waters. It is believed that what is stocked makes a difference in the conservation of wild trout

[9]The Kamas State fish hatchery was identified as a high priority under the original Plan. The site-specific NEPA analysis was completed in December 1997. Some issues raised during scoping for the Kamas project were of a programmatic nature and are considered in this EA.

gene pools. They also wanted assessed the impacts to riparian areas caused by anglers attracted to them because the adjacent water was stocked.

The Proposed Action incorporates stocking assessment report (BIO/WEST 1997, see Appendix A) recommendations through the inclusion of a stocking policy. The Division has adopted a stocking policy, effective September, 1997. The implementation of a Tribal stocking policy is also required.

Of the CRSP-affected area waters, the issue of angler impacts on riparian areas adjacent to stocked waters is probably of highest concern in the Uinta Mountains.

2. Economics Economics of the state hatchery system were questioned. What was specifically requested was information on the updated cost of state hatchery system renovation, providing the economic basis for the Proposed Action, and the capital and operation and maintenance costs on a per pound basis.

Economics of the entire State, Federal or Tribal hatchery programs are beyond the scope of the revised Plan, as it deals only with hatcheries that stock CRSP-affected area waters in Utah. The updated costs of rehabilitating or constructing the hatcheries which stock these waters are provided in Appendix C (Table C-3). An economic summary of the alternatives is provided in Chapter 3. This includes construction or rehabilitation capital costs, O&M cost estimates, and total production costs on a per pound basis.

3. Education Commenters requested that public education on the use of hatcheries in fisheries management and the importance of habitat be included in the Plan.

4. Stream-side Incubation Units The comment was made that hatchery size and distribution for native cutthroat trout restoration efforts should be balanced. Specifically, the request was made that the use of stream-side hatching units be considered.

The stream-side hatching units may be used to restore native cutthroat trout in Utah, or to temporarily supplement self-sustaining fisheries. The Division has used these units for Bonneville cutthroat trout production at remote sites.

ISSUES CONSIDERED, BUT ELIMINATED FROM FURTHER ANALYSIS

Issue: Fisheries Management The comment was made that the Plan should include an evaluation of fishing regulations (seasons, species, size, gear and limits) to reflect (they believe) the public's changing attitude toward catch-and-release, trophy-waters and quality experience versus put-and-take fisheries (fisheries based on stocking catchable-sized fish that are harvested that year).

Response: The Plan is driven by the management objectives and resulting stocking needs of the Division and the Tribe. The use of fishing regulations, responding to the public's changing attitude toward catch-and-release, trophy waters and put-and-take fisheries are considerations of the management objectives. The Division is currently developing Hydrologic Unit Management Plans. These plans identify the

management objectives. The Tribe is revising their fish management plan as well.

Issue: Hatcheries vs Habitat The funding base for the action alternatives and opportunity costs (i.e., the diversion of funds) from habitat restoration and conservation programs was questioned. It was felt that hatchery programs can draw agency funds away from stream habitat conservation and restoration. Some feel that agencies should focus heavily on habitat restoration instead of using hatchery-produced fish to meet management objectives.

Response: The use of the $22.8 million for hatchery construction or rehabilitation is in CUPCA 313(c). Commission funds are provided through Congressional appropriations. Funds were authorized for ecosystem restoration to mitigate for the impacts of the Federal reclamation program in Utah. The CUPCA also authorized funding for recreation-related projects not specifically related to ecosystem restoration, such as campgrounds and the $22.8 million for hatchery construction and rehabilitation. The Proposed Action will help satisfy the demand for fishing recreation created by the CRSP facilities in a manner that is compatible with and supports the CUPCA ecosystem restoration objectives. It was also determined that the funding is in fair proportion to that authorized for habitat restoration. The habitat restoration and enhancement provision in CUPCA are not diminished in lieu of the hatchery program.

Habitat restoration is included in the Division's program, as well. The bulk of the fish-stocking needs in the CRSP-affected area waters are for reservoirs that are not able to sustain fisheries without stocking. See discussion under the Cold-Water Species section, pages 1-4 and 1-5.

Issue: Science vs Politics Some respondents felt that scientific management, not political agendas, should direct hatchery programs. It is presumed that these respondents felt that the best science was not always the directing influence.

Response: This EA presents a scientifically-based analysis of the management objectives and how they are best met. It relies on the identification of stocking needs by fisheries managers and biologists who are familiar with sport fish recreation needs, water carrying capacities and conservation and recovery needs. The State stocking needs are in accordance with the Division Fish Stocking and Transfer Procedures (Appendix D). These procedures state that stocking will comply with Hydrologic Unit Plans and other plans; and with input from the angling public, private landowners and other resource agencies (see p. 10, Appendix D).

Issue: Regulations Some people want increased consideration of enhancing naturally-reproducing or wild fish in fisheries management, rather than depending so heavily on put-and-take fishery management. The management of fishing demand through regulations should be considered.

Response: The Division's Fish Stocking and Transfer Procedures state that wild fisheries should be considered where appropriate (see Appendix D). The use of wild fish and regulations for management will be considered under the Division Hydrologic Unit Management Plans. The

Tribe is updating the management plan for their waters.

Issue: Basin Management Plans The comment was made that the Plan should incorporate Division Basin Management Plans (Hydrologic Unit Management Plans).

Response: Because management goals of the Division's Basin or Hydrologic Unit Management Plans drive the Division's stocking needs, the Hydrologic Unit Management Plans are incorporated in the EA.

Issue: Amphibians Amphibians are identified in the fish-stocking needs. The appropriateness of using the CUPCA funds to culture amphibians for conservation purposes was questioned.

Response: The CUPCA 313(c) specifically identifies funding for fish hatcheries. The culture of amphibians was included in the State's stocking needs as an element of the conservation strategies for the boreal toad and spotted frog. Amphibians have been impacted by the CRSP. The Division has included these as an aquatic wildlife species and supports their inclusion in the action alternatives evaluated in the EA. As CUPCA and the Mitigation and Conservation Plan direction includes applying an ecosystem approach and enhancing biological diversity, these needs are included.

Issue: **Private sector** A comment was made that the private sector should be considered as a valuable and available resource and included in the alternatives described by the EA.

Response: The EA provides an analysis of the environmental impacts of a range of reasonable alternatives that meet the identified purpose and need. The purchase of fish from private sources is not a reasonable alternative because it does not meet the Desired Future Condition of meeting Federal, State and Tribal fishery resources' long-term needs and management objectives in the CRSP-affected area waters that are stocked. These management objectives require various species, strains, or stocks, with good health or fitness (the ability to survive and reproduce in a given environment). Private hatcheries typically raise a commodity based on a highly domesticated fish. The State and Federal hatcheries need to raise and provide a wide variety of fish for reintroduction or supplementation of native or wild populations of fish that are able to survive the rigors of the environment and grow to reproductive or harvestable sizes. Genetic fitness and health of hatchery fish are just two factors that determine their survival in the wild.

The agency management objectives are under regular evaluation and revision (Michigan 1994). Genetic composition, (e.g., species, subspecies, strain or stock) sizes, timing of stocking, and rearing process requirements are adjusted to improve the stocked fishery. Hatcheries must be able to respond to these changes through their production processes.

There is also a concern about potential quality-assurance problems with the use of private sector products. The fish-production process is as important as the end product (Michigan 1994). Quality assurance in the hatchery-produced fish is accomplished through process-based requirements and

practices. These are evaluated through production histories. Differences in practices may not be seen in the hatchery-produced fish at stocking, but can improve the ability of the fish to survive in the wild and improve the value of the fishery. State, Federal and Tribal hatcheries have developed and continue to refine production techniques aimed at performance in the natural environment, rather than only reducing cost/pound for a profit factor.

For these reasons, the use of the private sector to meet the identified purpose and need is not considered a reasonable alternative in the EA.

chapter 2
PROPOSED ACTION AND ALTERNATIVES

INTRODUCTION

This section explores reasonable alternatives that meet the purpose and need and respond to the issues identified in Chapter 1, and includes a no action alternative. The No Action alternative is primarily used as a baseline to define the affected environment. From this baseline, changes to the environment are evaluated that may occur under each alternative. These environmental consequences are captured in Chapter 3.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the Commission would not adopt and implement the Plan. The seven hatchery sites would not be funded for construction or rehabilitation. This alternative is described below.

Rehabilitation or reconstruction of existing State and Federally-managed cold-water hatcheries.
Cold-water hatchery rehabilitation or reconstruction would not occur. The existing State and Federal facilities would continue to be used to stock CRSP-affected area waters. These facilities are: Kamas, Fountain Green, Mantua, Midway, Loa, Springville, White Rocks, managed by the Division; Jones Hole, managed by the Service, and Youth Camp, a facility managed by the Tribe for rearing and holding fish to be stocked.

The Jones Hole National Fish hatchery provides a portion of the stocking requirement for CRSP-affected area waters (Flaming Gorge Reservoir, Jordanelle Reservoir, Steinaker Reservoir, Red Fleet Reservoir), while the Division provides the remainder. The Jones Hole facility also provides stocks for other Tribal waters. The Division facilities also provide stock for other waters in the State.

Construction of a warm-water fish hatchery and interim facility.
No warm-water fish hatchery or interim facility would be constructed.

Construction of a new cold-water fish hatchery.
The Big Springs Tribal Hatchery would not be constructed. The Tribe would continue to receive stocked fish from the Jones Hole National Fish Hatchery.

Fish stocking policy.
The Division's Fish Stocking and Transfer Procedures have been implemented. There would be no requirement for a Tribal stocking policy, as their waters would be stocked by the Jones Hole National Fish Hatchery.

Public education.
Public displays at the existing hatcheries in the Plan would not be updated to incorporate the use of hatcheries and the importance of habitat.

Stream-side hatching units.
No consideration of stream-side hatching units for native trout would occur.

PROPOSED ACTION ALTERNATIVE

The proposed action alternative consists of: Commission adoption of the revised Plan, with incorporation of State and Tribal stocking policies, a public education component and consideration of stream-side units for native trout production. The components of the Plan are described below. The revised Plan recommends that a total of seven sites be funded for construction or rehabilitation to best meet the needs and purposes. The Commission would fund 75% of the sites identified in the Plan. Construction or rehabilitation would follow a site-specific NEPA analysis and facility design.

Rehabilitation or reconstruction of existing State and Federally-managed cold-water hatcheries.
This component consists of reconstruction of Kamas and Whiterocks State Fish Hatcheries, constructing a new facility at the Fountain Green State Fish Hatchery site and rehabilitating the Jones Hole National Fish Hatchery. Feasibility reports for these facilities contain more detail on site specific recommendations and are available for review (FishPro, Inc. 1996a). A summary of the site specific information has been included in Appendix E. The Division has secured funding for 25% of the costs for Kamas and Fountain Green Fish Hatcheries. Sources of matching funds for Jones Hole are currently unidentified. This may be provided through NEPA and engineering by the Service.

These facilities would provide an increased production of 422,589 pounds of fish or 50% of the cold-water fish need in 2035 (Table 1).

Construction of a warm-water and native fish hatchery and interim facility.
This would involve building a hatchery at either the Goshen Warm Springs or Gandy sites and a smaller, interim facility at Red Butte or an acceptable alternate site. Further evaluation is needed to choose the preferred warm-water hatchery site to best meet the need and identify the construction costs. Capacity to meet approximately 54% of the identified need will be constructed under the Plan, given the level of funding. The existing feasibility report evaluated the use of both sites at a cost of approximately $16 million. It is anticipated that a single permanent hatchery and an interim facility to meet 54% of the need will cost less than $10 million, but more information is needed to identify costs. The interim facility, if located at Red Butte dam, could be used to culture cutthroat trout, but its primary purpose would be to culture June sucker. The ownership and management of Red Butte dam and Reservoir have not been decided. An acceptable alternate site for the interim facility may be needed.

Construction of a new cold-water fish hatchery.
The construction of a new 30,000 pound facility at the Big Springs site on Tribal lands is to meet Colorado River cutthroat trout production needs and Tribal sportfish stocking needs. A feasibility report is available which describes the site-specific proposal for this facility (FishPro Inc. 1997). The Ute Tribal Counsel passed a resolution to provide 25% matching funds for hatchery construction on April 10, 1997.

Fish-stocking policy.
To avoid stocking impacts to wild and native species, an indirect impact of hatchery construction and rehabilitation, the Division's Fish Stocking and Transfer Procedures are incorporated in the Proposed Action Alternative. The Procedures include requirements for fish health, fish from hatcheries, fish transfers, transportation, conservation and recovery, and recreation. The recreation stocking procedures include new introductions, stocking of nonnative salmonids, other nonnative fish, and special event stocking. This stocking is coordinated with all recovery and conservation programs. The Procedures are included in Appendix D. A Tribal stocking policy is to be developed as well.

Public education.
To educate the public on the use of hatcheries and the importance of habitat to both stocked and wild fish, the public information provided at the sites through kiosks, walkways, viewing windows, or similar tools will incorporate this information. Components from the Division's existing aquatic education program will be used to support the purpose and need. The Division's statewide aquatic education program components are:

- Environmental conservation activities, such as Adopt-A-Water
- Aquatic habitat clinics, explaining the characteristics of habitat and the importance to wildlife
- Angling ethics and safety, including catch and release fishing techniques, fishing locations and access near urban areas
- School programs on aquatic ecology and
- Information on fisheries management activities.

Stream-side hatching units.
To produce a cold-water fish which has more "wild" characteristics, consideration of the use of stream-side hatching units used in conjunction with (i.e., using "eyed" eggs-a developmental stage before hatching in which the eye is visible. This stage is less susceptible to handling stress) or instead of a traditional hatchery is included in the Proposed Action alternative. Stream-side units are now being used in Utah; and will likely continue to be for maintaining certain conservation populations. The intended use of these units is to increase the rate of egg hatching over that observed in the stream. Estimated hatching rates as high as 90-98% with the use of these units have been observed on the Salmon-Challis National Forest. Wyoming Game and Fish Department and the Shoshone-Bannock tribe in Idaho have also had successful hatching with these units. Once the hatched fry enter the stream, they are subject to all of the stresses (e.g., predation) that are present on the wild population. It is believed that these hatched fry have characteristics that are more like a naturally-reproducing population than those produced in a hatchery.

The use of these units has typically been for reintroducing native species, by enhancing the egg hatching rate. Further evaluation is needed as to the number and location of these units for native cutthroat trout conservation needs in Utah. The Commission is looking into potential evaluation studies for the stream-side incubation units.

Maximum capacity alternative

Rehabilitation or reconstruction of existing State and Federally-managed cold-water hatcheries.
This alternative consists of reconstruction or rehabilitation of those existing sites which would produce a greater number of pounds of fish for the same funding. It was developed to evaluate the ability to optimize capital costs. This alternative also recommends that a total of seven sites be funded. Matching funding from the hatchery owners and managers would be the same as the Proposed Action Alternative.

Reconstruction and rehabilitation of the existing State cold-water facilities would include Kamas, Midway and Springville State Fish Hatcheries. Rehabilitation of the Jones Hole National Fish Hatchery is included in this alternative. These would provide an increased capacity of 466,130 pounds or 55% of the need.

Construction of a warm-water and navit fish hatchery and interim facility. Same as the Proposed Action Alternative.

Construction of a new cold-water fish hatchery. Same as the Proposed Action Alternative.

Fish stocking policy. Same as the Proposed Action Alternative**.**

Public education. Same as the Proposed Action Alternative.

Streamside hatching units. Same as the Proposed Action Alternative.

ALTERNATIVES CONSIDERED BUT ELIMINATED

New CRSP Hatcheries Building a new warm-water hatchery and a new cold-water hatchery for stocking CRSP-affected area waters only was an alternative considered but eliminated. Such facilities would meet the need but would not be most cost-effective. Land and water rights purchases for both warm- and cold-water facilities could add significant costs. This alternative would also not meet the purpose of perpetuating or increasing existing hatchery production capabilities, or likely have substantial matching fund contributions.

Implement 1994 Plan Moving forward with the 1994 Plan would not meet the need to increase production of warm- and cold-water fishes to meet long term needs. Construction of the identified priority hatcheries would increase production of the cold-water fishes, but the CUPCA 313(c) funding would be expended before a warm-water facility could be built.

Hatchery sites eliminated from criteria ranking:

Glenwood State Fish Hatchery A new concrete raceway and oxygen injection system was constructed at Glenwood in 1992. The feasibility study for Glenwood was postponed.

Wahweap State Fish Hatchery Wahweap is a warm-water fish culture station with 7.8 acres of water in 11 ponds. It is near Lake Powell where most of its production is used. It does have good potential as a native fish facility and an excellent well water supply. There are currently 600 razorback suckers

on hand. The feasibility study was postponed.

Ouray National Fish Hatchery Ouray is being used as a genetic refuge for endangered Colorado River fishes to develop brood stocks through pedigreed mating of wild fish. It is located on the Ouray National Wildlife Refuge adjacent to the Green River.

Horsethief Ponds This facility was constructed in 1992 for the sole purpose of providing refugia for Colorado squawfish, humpback chub, bonytail chub and the razorback sucker. All are endangered fishes of the Upper Colorado River Basin**.**

Federal laws have provided funding sources other than CUPCA for the above three projects. Hatchery needs for those species are not included in the action alternatives.

Hotchkiss National Fish Hatchery
Hotchkiss stocks CRSP waters in Colorado and New Mexico and was built for this purpose in the early 1970's. As very little, if any, stocking of CRSP-affected area waters in Utah is done from the Hotchkiss Hatchery, it is not anticipated that CUPCA funding will be available for renovations there.

Ft. Roubidoux Tribal Site This is a tribal property of historical significance. No facility currently exists here. The feasibility study (FishPro 1997) recommended that this site not be developed at this time. Additionally, the area may be considered for wetland mitigation under the CUP.

Table 5. Summary of Alternatives

Alternative	1. No Action	2. Proposed Action	3. Maximum Capacity
Estimated Total Cost	0	$28.6 million	$28.2 million
Rehabilitation or reconstruction of existing cold-water hatcheries	No increased capacity	2 reconstructed State hatcheries; 1 rehabilitated Federal hatchery, 1 new state hatchery Increased capacity: 422,589 lbs[1]	3 reconstructed State hatcheries; 1 rehabilitated Federal hatchery, Increased capacity: 466,130 lbs
Construction of a warm-water and native fish hatchery and interim facility	No new hatchery	One new hatchery at either Goshen or Gandy site, an interim hatchery at Red Butte or acceptable alternate location	same as Proposed Action Alternative
Construction of a new cold-water fish hatchery	No new hatchery	One new hatchery at the Big Springs site Capacity: 30,000 lbs	same as Proposed Action Alternative
Fish stocking policy	State stocking policy developed, no Tribal policy	State and Tribal stocking policy developed	same as Proposed Action Alternative
Public education	No additional effort	Incorporated in site specific plans	same as Proposed Action Alternative
Stream-side hatching units	No consideration for use	Consideration of units to supplement native fish production	same as Proposed Action Alternative

[1]Total increased capacity reflects only the change in capacity at reconstructed or new State facilities and the total capacity at the Federal and Tribal Facilities. The Tribal and Federal facilities stock predominantly CRSP-affected area waters.

analysis

Using the No Action alternative baseline, a description of environmental effects of the action alternatives, related to identified issues (stocking impacts, economics, education and streamside incubation) is presented. As discussed before, the site-specific construction effects of the individual hatcheries will be evaluated under the site-specific NEPA review. The effects of the alternatives are summarized in Table 7 at the end of this section.

1. Stocking Impacts

The Division has approved the Fish Stocking and Transfer Procedures, which is a part of the two action alternatives. These procedures include requirements for fish health, fish from hatcheries, fish transfers, transportation, conservation and recovery, and recreation. The recreation stocking procedures include new introductions, stocking of nonnative salmonids, other nonnative fish, and special event stocking.

The Tribe is currently revising their fish management plan to place emphasis on the reestablishment of Colorado River cutthroat trout in streams. A Tribal stocking policy will be required prior to expenditure of federal funds via CUPCA.

The issue of angler impacts to riparian areas, as indicated before, is probably of highest concern in the Uinta Mountains. The 1995 Utah Angler Survey (Lilieholm and Krannich 1996) indicated that angler use in the Uinta Mountains as a whole was exceeded only on Strawberry Reservoir, Lake Powell and the Provo River.

The highest fishing pressure in the Uinta Mountains is probably on those lakes with close access to Highway 150 (e.g., Lost Lake, Trial Lake, Mirror Lake and others), and nearby campgrounds. Many of the lakes of the Uintas are on lands managed as the High Uintas Wilderness and roadless areas by the U.S. Forest Service (Forest).

For those waters within the High Uintas Wilderness, the Forest is evaluating a Forest Plan amendment in which they propose to define desired condition classes and limits of acceptable change (U.S. Department of Agriculture 1996). During the public review an issue was raised that fish stocking can cause excessive human use in some areas. The Forest is proposing the use of a Memorandum of Understanding (MOU) with the State of Utah to implement possible changes in current fish-stocking practices.

In their stocking procedures, the Division has stated that they will continue to manage fisheries in wilderness areas.

For those lakes along Highway 150 and all waters in the state, the Division has initiated a planning process for the hydrologic units or watersheds of Utah. There are 66 hydrologic units in Utah. Plans for these are to be developed over a 3-year period. They are to be dynamic planning documents and will be updated on a regular basis. The plans will identify the resources, key issues and management goals of sport fish and other aquatic species of interest in the hydrologic units. The plans will also

identify the actions needed to address key issues and to accomplish management goals.

The Division's hydrologic unit management plans are for broader planning to establish management consistency among waters within a hydrologic unit and to coordinate with other agencies and private landowners where appropriate. These plans are the appropriate avenue to work with the Forest to determine the appropriate level of fish stocking in areas such as the Uinta Mountains.

No Action Alternative The implementation of the Division's Fish Stocking and Transfer Procedures will result in reduced impacts to native and wild aquatic species. There would be no requirement for the Tribe to develop a fish-stocking policy as their waters would continue to be stocked in accordance with Service-approved fishery plans.

It is anticipated with implementation of the MOU under the Forest's planning process and coordination under the Division's hydrologic unit management plans, that angler impacts to riparian areas adjacent to waters that are stocked will be reduced.

Proposed Action Alternative Same as the No Action Alternative for the Division's Fish Stocking and Transfer Procedures. A Tribal stocking policy would be required prior to receiving funding. The Commission and Service would work with the Tribe to develop this policy. While the details of this policy are not yet developed, it is anticipated that implementation would also result in lessened impacts to native and wild aquatic species.

Maximum Capacity Alternative Same as the Proposed Action Alternative

2. Economics

While the estimated cost of achieving the needs and purposes of the original plan have increased to approximately $64 million, (Division handout 1/30/97, see Table C-3, Appendix C) the funding authorized by CUPCA §313(c) has not increased[1].

No Action Alternative No additional funds would be provided through the Commission. The hatchery requirements and costs for each site have already been identified with the feasibility studies. No site-specific NEPA analysis would be funded beyond the Kamas State Fish Hatchery site. Funding identified for §313(c) may be available to be used for other Commission programs, if the Commission determines through public involvement in accordance with §301 (g) that fish and wildlife interests would be better served by doing so.

Proposed Action Alternative This alternative outlines recommended actions to meet a *portion* of the fish-stocking needs in the CRSP-affected area waters, given the level of funding. This alternative would have a total cost of $28.6 million, with the Commission funding 75% of reconstruction, new construction and rehabilitation. Production costs of the new or rehabilitated facilities range from $2.15 to $8.19 on a per pound basis (see Table 6) for the total production. Production costs of increased production only would be less.

[1]CUPCA §313 (c) authorized $22.8 million in funding in January 1991 dollars. These are indexed annually by the applicable engineering cost indexes (see CUPCA §201).

Maximum Capacity Alternative Capitol costs are estimated to be $28.2 million, with the Commission funding 75% of reconstruction, new construction and rehabilitation. The range in production costs of the new or rehabilitated facilities under this alternative is the same as the Proposed Action Alternative.

Table 6. Economic summary of alternatives

Facility	Capacity (lbs)			Capital Cost Estimate[2]	O&M Costs [3] ($/lb)			Production Costs Post Project $/lb[4]
	Current	Post	Increase		Current	Post	Increase	
Proposed Action Alternative								
Kamas	80,000	140,000	60,000	$5,651,900	1.96	1.65	1.24	4.51
White Rocks	35,511	87,700	52,189	$2,430,000	3.97	2.13	0.88	4.09
Jones Hole	175,000	263,000	88,000	$1,674,000	1.91	1.70	1.27	2.15
Fountain Green	59,250	106,650	47,400	$5,836,000	3.05	2.34	1.44	6.21
Big Springs		30,000	30,000	$2,983,000		1.16	1.16	8.19
Warm-water		97,384[5]	97,384	$10,000,000[6]		Not available	Not available	7.26 + land + O&M
Total cold-water			277,589	$28,574,900				
Maximum Capacity Alternative								
Kamas	80,000	140,000	60,000	$5,651,900	1.96	1.65	1.24	4.51
Midway	161,264	233,800	72,536	$4,930,500	1.97	1.67	1.00	3.16
Springville	172,106	242,700	70,594	$2,927,000	1.76	1.54	1.00	2.39
Jones Hole	175,000	263,000	88,000	$1,674,000	1.91	1.70	1.27	2.15
Big Springs		30,000	30,000	$2,983,000		1.16	1.16	8.19
Warm-water		97,384	97,384	$10,000,000		Not available	Not available	7.26 + land +O&M
Total cold-water			321,130	$28,166,400				

[2]Based on feasibility studies (FishPro, 1996a, 1996b and 1997, JDK 1990a and 1990b).

[3]O&M costs of the increase in production are calculated by dividing the difference in post and current total O&M costs by the increased pounds (e.g., for Kamas: [(231,500-157,000)/60,000]=1.24).

[4]Production costs on a per pound basis include capital costs and are based on a 40 year facility life and a 6.5% interest rate. Amortized capital costs cannot be separated for current and increased production. Reconstruction and/or improvements extend the useful life of existing facilities by the same length of time as the increased production.

[5]The 97,189 pound value represents 54% of the identified warm-water stocking needs (see Table 2, P. 1-7) based on pounds.

[6]Does not include cost of land acquisition.

3. Education

Under the action alternatives, aquatic education opportunities would be updated at the hatcheries.

No Action Alternative Site-specific updated information would not be available. Awareness by the public of the importance of habitat to both wild and stocked fish would not be increased.

Proposed Action Alternative Public education opportunities at the funded facilities would incorporate design features described in Chapter 2 to display messages on the use of hatcheries and the relationship and importance of habitat protection. Awareness by the public would be increased through these opportunities.

Maximum Capacity Alternative Same as for the Proposed Action Alternative

4. Stream-side Incubation Units

The Oregon Department of Fish and Wildlife (undated handout), the State of Wyoming and others have successfully used stream-side hatching units (up to 90% hatched eggs) for trout and salmon. Stream-side units are being used in Utah; and will likely continue to be for maintaining certain conservation populations. The intended use of these units is to increase the rate of egg hatching over that observed in the stream. Estimated hatching rates as high as 90-98% with the use of these units have been observed on the Salmon-Challis National Forest. Once the hatched fry enter the stream, they are subject to all of the stresses (e.g., predation) on that wild population. It is believed that these hatched fry have characteristics that are more like a naturally-reproducing population than those produced in a hatchery.

No Action Alternative The consideration of stream-side hatching units would probably not occur beyond the present level used by the Division. Additional culture of native species through this practice would not be realized.

Proposed Action Alternative This alternative considers the stream-side hatching units to supplement or replace the use of traditional hatchery production. Evaluation is needed on these units for success in the native cutthroat trout conservation efforts. Production of native and/or wild fisheries may be increased.

Maximum Capacity Alternative Same as the Proposed Action Alternative.

Table 7. Summary of environmental effects of the alternatives.

Issue	No Action Alternative	Proposed Action Alternative	Maximum Capacity Alternative
1. Economics	Funds may be moved to other programs.	Same as No Action, Funds may be moved to other programs.	Same as Proposed Action
2. Stocking impacts	Impacts of stocking reduced with Division policy implementation	Same as No Action, impacts also reduced with Tribal policy implementation.	Same as Proposed Action
3. Education	Public awareness of hatcheries and habitat relationship unchanged	Public awareness of hatcheries and habitat relationship increased.	Same as Proposed Action
4. Stream-side incubation	No realization of increased production through this practice	Production of stream native fisheries may be increased.	Same as Proposed Action Alternative

Purpose and need

Since each alternative should meet the purpose and need (See pages 1-2 and 1-3) as well as address the issues, the degree to which each alternative meets the purpose and need was also evaluated.

A summary of the evaluation is in Table 8 at the end of this chapter. Existing and proposed facilities were evaluated according to the following criteria to measure how well these facilities could meet the purpose and need.

1. **Facilities should contribute towards meeting the need for increased production of warm- and cold-water fishes from hatcheries to meet Federal, State and Tribal fishery resources' long-term needs and management objectives in the CRSP-affected area waters. They should also be versatile to respond to future management objectives. Site and water supply must meet biological, physical and technical needs of the program**.

2. **Facilities should be cost-effective. Facility site and design should optimize capital costs and minimize O&M costs.**

3. **Projects should perpetuate or increase existing hatchery capabilities.**

4. **Project should complement efforts of other Federal, State and Tribal programs, such as conservation strategies.**

5. **Projects should have matching fund contributions, or partnerships.**

6. **Projects should provide educational opportunities.**

7. **Projects should provide site-specific environmental enhancement.**

1. Meet the increased production need. Site and water supply.

Fish management objectives for CRSP-affected area waters in Utah include propagation and stocking of both warm- and cold-water fishes. Both are included in the management objectives and propagation requirements for these differ (i.e. different facilities are needed for propagation). Management objectives for the use of hatchery raised fish may vary with program, water and time and consider species, strain, stock, health and quality of fish, or fitness as well as number, size and time and place of stocking.

Characteristics evaluated to meet the biological, physical and technical needs of the program are: water quality, water temperature, water supply security (to preclude disease, other fish species and human interference), cost efficiency, water

quantity (amount and dependability) and physical site layout.

No Action Alternative The State facilities which stock CRSP-affected area waters would remain at the present production capacity or lose capacity with time as they age. The ability to respond to changing management objectives would also decline with time. For example, as concrete raceways deteriorate, fish may move among them, reducing the ability to keep lots separate, a requirement in preventing hybridization between rainbow trout and cutthroat trout. The best use of such a facility would be production of rainbow trout only.

Replacement or improvements to some components of the facilities could occur on a much smaller scale, if funding were made available from the management agencies. It is likely that these improvements would only maintain current production levels and not increase them.

The Tribe would continue to receive stocked fish from the Jones Hole National Fish Hatchery.

Warm-water sport fish and conservation culture needs would not be met. Fish culture for recovery and conservation of some warm-water native species may continue at a very reduced level, on a space available basis. For example, the State Fisheries Experiment Station has been used to provide a refugium for June sucker. However, the identified needs for recovery efforts cannot be met with this facility, as it is a research facility and is not able to produce the numbers and pounds needed. Recovery and conservation would continue through translocation alone, where it is appropriate. Warm-water sport fish stocking needs may be met by purchasing fish from out-of-state sources. Funding is rarely available, and fish may not be available from outside sources when desired.

Overall, the purpose and needs would not be met. No stocking or reduced stocking for recreational sport fishing may shift pressure to other waters, impacting wild fishery resources and impacting the quality of the experience. No or reduced stocking for conservation purposes may ultimately result in more listings of aquatic species under the ESA.

The water supply and site layout of the existing hatcheries is inadequate to meet the purpose and need.

Proposed Action Alternative A portion of the identified needs (approximately 54 %), based on increased and/or improved capacity, would be met for both warm- and cold-water species. Constructed or rehabilitated hatcheries would be used to produce fish to meet sport fish recreation and native fish conservation and recovery needs, providing fish of a required species, size, stock, quality or fitness (ability to survive and reproduce in the wild). An evaluation of the potential hatchery sites were made according to the criteria given in Appendix F.

The Plan incorporates the use of the existing State hatchery system, as well as building new facilities to meet the need. As the state hatchery system must meet needs outside the CRSP-affected area waters, it is the *increased capacity* that was evaluated in meeting the needs at these facilities.

The Tribe would be able to produce fish to meet their management goals, including the restoration of Colorado River cutthroat trout in tribal streams.

A portion of the warm-water sport and native fish stocking needs would be met through a hatchery dedicated to this purpose.

Evaluations of all considered facilities indicate that water supply and site layout of hatcheries in the Proposed Action Alternative is best suited to meet the purpose and need. Water quality data, information on water supply, land security and gradient for gravity flow is given in Appendices E and F. More information is available in the feasibility reports (FishPro 1996a, 1996b and 1997).

Maximum Capacity Alternative While this alternative would provide more pounds than the proposed alternative, it would not best meet the need at the level of funding. Based on water temperature and past experience, the Midway and Springville sites are not as well suited to produce species other than rainbow trout as those State hatcheries in the Proposed Action Alternative (Fountain Green and Whiterocks). Providing the versatility to respond to future management objectives and changes in species and/or size of the hatchery project, such as stocking Colorado River cutthroat trout to meet recreation sport fish needs, would not be met. Meeting the other needs (e.g., warm-water stocking needs) would be the same as the Proposed Action Alternative.

While water supply and site layout of the sites in this alternative are adequate, they are not best suited to respond to changes in fish management objectives.

2. Be cost-effective

Proposals will provide maximum holding capacity and economy of construction, maintenance and operation without sacrificing quality, function or service.

No Action Alternative Repair of existing facilities at State hatcheries as funding becomes available is not the most cost-effective way of maintaining or increasing production. With the use of aging hatcheries, O&M costs are anticipated to increase.

The use of relocation for native fish recovery and conservation may have lower capital costs than building a new facility; however, management objectives and other criteria would not be met. For several of these species there are not adequate numbers and/or sources for relocation.

Three private sources were contacted for purchasing channel catfish (14 inch). One replied, indicating that channel catfish could be provided for stocking (to Salt Lake City) at a cost of approximately $1.78/lb. This is considerably less than the production cost reported in Table 6 for the warm-water and native species hatchery ($7.26/lb + land + O&M). However, this production cost reflects the cost of propagating a variety of endangered and sensitive species at a facility designed and built for that purpose. The requirements for rearing channel catfish are much more modest and production costs should be less. The cost of State-produced sensitive and endangered species are not comparable with the cost of privately grown channel catfish.

There are also fish health concerns associated with hauling fish over long distances. Also, a Utah Department of Agriculture-approved source was not

available when the Division attempted to purchase channel catfish last year. With these considerations, the purchase of warm-water sportfish may not be as cost effective as producing these fish within the State fish hatchery system.

Proposed Action Alternative The use of existing sites, with known capabilities, is a cost effective alternative. Land and water right purchases to meet the cold-water fish production needs are not necessary with this alternative.

As discussed under the No Action Alternative, the construction of a warm-water hatchery to meet warm-water sportfish and native fish needs would have higher capital costs than relocation from existing populations. However, recovery and conservation needs of some species (e.g., June sucker) would not be met. As stated above, local production of warm-water sport fish could be more cost effective than purchasing from outside sources.

Maximum Capacity Alternative Same as the Proposed Action Alternative

3. Perpetuate or increase existing production capabilities.

No Action Alternative Existing hatchery capabilities would not be perpetuated as discussed under Meeting the Need above. Aging facilities would continue to lose capacity without rehabilitation or reconstruction.

Proposed Action Alternative The use of existing hatchery sites with known capabilities will perpetuate existing production capabilities where possible in meeting increased production demands. Reconstruction of existing facilities will optimize the site layout and add longevity to otherwise aging hatcheries.

Maximum Capacity Alternative Same as the Proposed Action Alternative.

4. Complement other programs

No Action Alternative No other program, including conservation efforts would be complemented under this alternative.

Proposed Action Alternative Native aquatic conservation programs for both warm- and cold-water species would be complemented. Recreational sport fish programs would be complemented as well.

Maximum Capacity Alternative Programs discussed in the Proposed Action Alternative would be complemented except the Bonneville cutthroat trout sport fish goals as described under the conservation strategy.

5. Partnerships

No Action Alternative No partnerships would be made to meet the purpose and need.

Proposed Action Alternative Partnerships with the State and Tribe would be developed to meet the purpose and need. The State has acquired matching funds for two cold-water hatcheries and the interim native fish hatchery. The Tribe has resolved to provide matching funds for the Big Springs hatchery. Inkind services such as engineering and NEPA analysis may be available from the Service.

Maximum Capacity Alternative Same as the Proposed Action Alternative.

6. Provide educational opportunities

No Action Alternative

Additional educational opportunities would not be available.

Proposed Action Alternative

Educational opportunities would be provided at reconstructed or new hatcheries. These opportunities will include information on the role of habitat in sport fish recreation and native species recovery and conservation.

Maximum Capacity Alternative Same as Proposed Action.

7. Environmental resource enhancement

No Action Alternative No environmental resources would be enhanced at the hatchery sites.

Proposed Action Alternative The opportunity to enhance environmental resources, particularly wetlands with the reconstruction of hatcheries exists under this alternative. Relocation of facilities such as hatchery buildings and raceways to avoid sensitive areas will be considered in the design. For example, at the Kamas Hatchery site 1.19 acres of wetlands may be enhanced or converted, while construction impacts on 0.73 jurisdictional and 2.29 nonjurisdictional wetlands have been identified. Improved treatment of effluent will also likely occur.

Maximum Capacity Alternative Same as Proposed Action.

Table 8. Summary of purpose and need analysis.

Criteria	1. No Action	2. Proposed Action	3. Maximum Capacity
Meet need and site and water supply	Recreation, recovery and conservation needs through hatchery production not met Existing hatchery site layout and water supply is inadequate in meeting purpose and need	Approximately 54% of both warm- and cold-water recreation, recovery and conservation needs met through increased production at the funding level. Hatchery sites and water supplies best suited to meet purpose and need	Higher production of rainbow trout provided to meet the coldwater recreation need, however increased production of other cold-water species would not be realized. Warm-water production same as Proposed Action. Hatchery sites and water supplies adequate, but not best suited to meet purpose and need.
Optimize cost	Alternative not most cost effective. O&M costs anticipated to increase	Use of existing sites and local production of warm-water species most cost effective in meeting purpose and need	Same as Proposed Action
Perpetuate production	Existing capabilities would decrease	Existing capabilities would be maintained and increased.	Same as Proposed Action
Complements programs	Recreation and conservation programs not complemented	Recreation and conservation programs complemented	Same as Proposed Action
Partnerships	No partnerships made	Partnerships with State and Tribe to meet needs	Same as Proposed Action
Educational opportunities	No additional educational opportunities	Educational opportunities increased at facilities	Same as Proposed Action
Environmental enhancement	Hatchery environmental resources would not be enhanced	Hatchery environmental resources would be enhanced with site design	Same as Proposed Action

CHAPTER 4
REFERENCES, ACRONYMS and definitions

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ACRONYMS

CA--Cooperative Agreement
cfs--cubic feet per second; One cfs is equivalent to 450 gallons per minute
Commission--Utah Reclamation Mitigation and Conservation Commission
CRSP--Colorado River Storage Project
CUP--Central Utah Project
CUPCA--Central Utah Project Completion Act
Division--Utah Division of Wildlife Resources
EA--Environmental Assessment
ESA--Endangered Species Act

FONSI--Finding of No Significant Impact
Forest--U. S. Department of Agriculture, Forest Service
gpm--gallons per minute
GMU--Geographic Management Unit
Interior-- Department of the Interior's Office of the Secretary
MOU--Memorandum of Understanding
NEPA--National Environmental Policy Act
O&M--Operations and Maintenance
T&E---Threatened and Endangered
Tribe--Ute Indian Tribe
TU--Trout Unlimited
UBRP--Uintah Basin Replacement Project
Service--United States Fish and Wildlife Service

definitions[1]

Conservation management to preserve the genetic integrity of geographic genotypes and to maintain rare alleles within specific populations. Conservation also includes preserving ecosystem processes that existed historically. Conservation methods include research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping and transplantation.

Ecosystem a community of animals and plants and their interrelated environment. It is a three-dimensional landscape segment in which organisms interact with each other and with their physical environment.

Ecosystem restoration actions taken to return an ecosystem to a close approximation of its condition prior to disturbance. This typically includes measures to address the chemical, physical, and biological components and functions of the natural ecosystem in question.

Enhancement the improvement of a resource over existing conditions.

Hydrologic Unit Management Plan a plan written for a hydrologic unit (drainage, sub-drainage) to describe management for aquatic species and their habitats.

Introduced species a species which has been released or stocked into historically unoccupied waters for promoting conservation or sportfishing purposes.

Mitigate, mitigation cause to become less severe or harmful; reduce impacts; actions to avoid, minimize, reduce, eliminate, compensate, or rectify impacts to resources.

[1]Taken from the State of Utah Fish Stocking and Transfer Procedures,(Division 1997c, see Appendix D), the 1997 Mitigation and Conservation Plan (Commission 1997), the Draft June Sucker Recovery Plan (Service 1995) and the native cutthroat trout conservation agreements and strategies (Division 1997a and b).

Native species a species that historically (since the time of modern exploration and settlement of Utah) occurred in a specific area or habitat.

Put and take a fisheries management in which fish are stocked to provide immediate fishing opportunities. The stocked fish are not intended to stay in the receiving waters and grow to a larger size. This type of management is used in Intensive Yield Waters (See Appendix D definitions).

Recovery applied to species listed as "endangered" under the Endangered Species Act (ESA). It is the establishment of self-sustaining populations and protection of the habitat on which they depend.

Reintroduction release of a species into historically occupied sites for the purpose of reestablishing populations.

Restoration the return of a resource (e.g., population, habitat) to a close approximation of its condition before disturbance.

Supplementation add to existing populations to meet sport fish recreation or native fish recovery and/or conservation management objectives

Translocation, transplantation the removal of individuals from a naturally occurring population and subsequent release of these individuals to other habitats.

Wild fish free-ranging fish that are the result of natural reproduction.

CHAPTER 5
comments and responses

Eleven comment letters were received on the Draft Environmental Assessment for the Revised Fish Hatchery Production Plan. The letters were received from:

1 Peter Hovingh

2 Marilyn Dinger

3 Trophy Fish Ranch

4 Utah Outdoor Interest Coordinating Council

5 United States Fish and Wildlife Service, Utah Field Office

6 United States Department of Interior

7 Utah Council, Trout Unlimited

8 United States Forest Service, Intermountain Region

9 State of Utah

10 United States Fish and Wildlife Service, Management Assistance Office

11 National Trout Unlimited

Copies of the comment letters are included in the bound copy of this document, available through the Mitigation Commission. Comments requiring a specific response are presented here in a comment and response format. In some instances one or more commentor made the same inquiry or statement. When the comments were similar or the same, they were combined into one comment (see for example, Comment 62).

Chapter 1 Purpose, Need and Issues

Comment 1 It is not clear that this one document is both the Environmental Assessment and the Revised Fish Hatchery Production Plan. (U. S. Department of the Interior)

Response 1 The Revised Fish Hatchery Production Plan is presented as the Proposed Action Alternative in the Draft Environmental Assessment (EA). It was not prepared as a separate document. The text in the EA Introduction has been changed to reflect this. The preferred alternative, to be described in a Finding of no Significant Impact (FONSI), will constitute the Fish Hatchery Production Plan.

Comment 2 Include a section on the affected environment that describes or lists the CRSP projects that have resulted in the increased need for hatchery produced aquatic resources (U. S. Fish & Wildlife Service, Utah Field Office)

Response 2 A list of the CRSP projects and the related waters is included in the new Appendix B.

Comment 3 How do fish stocking needs for the CRSP-affected area waters relate to a statewide program element for fish hatchery restoration and construction? Activities and facilities outside the affected hydrologic units would not be mitigation or ecosystem management. (U. S. Forest Service, Intermountain Region)

Response 3 The fish hatchery restoration and construction is considered "statewide" as it crosses several watersheds. It was included in the Central Utah Project Completion Act (CUPCA) to meet the sportfish recreation and native fish conservation and recovery needs for the CRSP-affected area waters. The sportfish recreation needs are for CRSP-affected area waters only. These are within the Colorado River, Green River, Jordan River and Utah Lake hydrologic units.

The alternative to construct new hatcheries only was considered but eliminated as it would not make the best use of the funding levels and the existing developed sites and water sources. The hatcheries considered may or may not be located in the affected hydrologic unit, depending on the species to be cultured. The use of hatchery production is not identified as mitigation, but as an activity to meet the recreation need — that of providing sportfishing recreation.

For some species (e.g., least chub, leatherside chub, boreal toad and spotted frog), conservation and recovery needs will be met both within and outside these watershed units because of the conservation need to implement the best opportunities regardless of where they occur.

To better meet the ecosystem restoration requirement of CUPCA §301, construction of a warm-water and native species hatchery was included in CUPCA §313 (c), and a stocking policy requirement and native fish conservation and recovery needs were incorporated in the EA.

Comment 4 We are concerned with the way the term "mitigation" is being used for this plan. We recognize that the hatchery provision was a separate item in the CUPCA authority. However a section with operational definitions would be helpful for this and many other terms (including "conservation", "native species", etc. that have differing denotations and connotations). We also recognize that this hatchery plan is not intended to serve a true ecosystem mitigation goal. We are concerned that the illusion of mitigation will be used here and in the future for support of ecosystem degrading activities. This should be explicitly spelled out for an educated, but nontechnical audience. An example of this kind of concern is where catchable-size rainbow trout are cultured and stocked outside of their native range as "mitigation/restoration" for the impacts of Federal projects. From a biological perspective, the continual "supplementation" or "put and take" stocking of a catchable-sized "introduced" species might be more accurately viewed as an additional biological perturbation to the loss of flows and habitat by construction of Federal water projects. (National Trout Unlimited)

Response 4 As explained in the response to comment 3, and as you have alluded, the Hatchery element of the Statewide Program does not mitigate for habitat impacts attributed to the Federal Reclamation water development projects in Utah, nor was it intended to. Construction or reconstruction of existing hatchery facilities has not been proposed or committed as a Federal

mitigation measure for CRSP impacts in Utah in lieu of measures to avoid or reduce or compensate for adverse impacts on fish populations or habitats. Rather, these measures are proposed to improve and increase the culture and production of native and non-native species for supplemental stocking of recreational fisheries and for conservation and recovery needs. This program will help support and supplement recreational opportunities and other mitigation and conservation measures previously implemented or currently planned. The other mitigation and conservation elements planned by the Commission are described in the Mitigation and Conservation Plan (1997). Definitions have been added to the section with the acronyms (Chapter 4), and text has been added to the background section to avoid the impression of the hatchery element providing mitigation.

Comment 5 Given the requirement that the hatchery element of CUPCA must be achieved within the ecosystem restoration requirement of §301, propagation and stocking should strive to complement the basic goal for mitigation and restoration. We support the ecosystem restoration requirement for any form of propagation and stocking. We also support the Management Recommendations of the recently adopted American Fisheries Society Position on Biodiversity which clearly takes an ecosystem approach to conserving living resources. Further, we view the continued or novel transfer of non-native, hybridized, or homogenized gene pools; the potential spread of exogenous diseases among watersheds; and the alteration of trophic relationships to be inconsistent with the basic precepts of scientifically-based concepts of ecosystem management or biodiversity conservation. (National Trout Unlimited).

Response 5 A major purpose of the hatchery element of the Commission's Mitigation and Conservation Plan is to provide sport fishing opportunities and the recreation-based purposes of CRSP projects in Utah. While the Commission is aware of and committed to the ecosystem restoration requirement of CUPCA §301, we must implement this project through the Division and the Tribe who have direct authority over fish and other aquatic wildlife within their jurisdictions. The Division has adopted fish stocking and transfer procedures and the Tribe is revising its management plan and will develop a stocking policy. The bulk of the pounds of fish stocked for sportfishing is to reservoirs (85-93% over the 1996-2035 period), followed by stocking to streams (11-5%) and to high mountain lakes (1-4%). This information has been added to Chapter 1, Purpose and Need.

Recovery and conservation, through stocking endangered and sensitive species, will be according to their respective restoration and/or conservation plan goals. The State has stringent standards for disease control. We believe that these policies and plans help meet the ecosystem standard.

Comment 6 Include a section describing what portion of each State hatchery receiving Federal funding supports CRSP waters. It would be informative to know the present and future percentages of fish from each hatchery that are used in stocking CRSP waters. (U. S. Fish & Wildlife Service, Utah Field Office)

Response 6 The cold-water fish stocking needs presented in Chapter 1, Purpose and Need, indicate that about 30% of present Division statewide production of 1 million pounds will go into CRSP-affected area waters. The individual hatcheries are not dedicated to particular waters,

but are managed as a system. A section describing what portion of each State hatchery in the action alternatives that support CRSP-affected area waters is not feasible.

Hatcheries produce fish to be stocked not just in their region, but all over the state, although the Division makes stocking trips as short as possible to save money and to avoid putting more hauling-associated stress on the fish than is necessary. State hatcheries adjust stocking schedules annually and even during the year as conditions change due to droughts, floods or reservoirs being drained. Those State hatcheries included in the action alternatives are not the only State hatcheries which stock CRSP affected area waters. The increased capacity of the reconstructed State hatcheries will be used for production in CRSP affected area waters. Because the action alternatives would rehabilitate existing facilities rather than develop new sites to meet the coldwater sport fish needs, and because of the degraded existing condition of those State hatcheries, reconstruction is required to maintain the existing capacity as well as increasing it.

Comment 7 The EA does not mention Fountain Green, Mantua, Midway, Loa, Springville or Whiterocks hatcheries O&M funding. Are there current MOUs for these hatcheries and will the Secretary pay O&M costs for these State hatcheries? (U. S. Fish & Wildlife Service, Utah Field Office)

Response 7 Currently an agreement for O&M funding has been finalized between DOI and the Division for the Kamas State Fish Hatchery only. Agreements for the other hatcheries included in the EA will be developed on a case-by-case basis.

Comment 8 Reference the increasing demand for native and wild fisheries. (Utah Council, Trout Unlimited)

Response 8 There is an increasing demand for native and wild fisheries. This demand is mainly being met by streams and smaller reservoirs. Under the native and wild fisheries management for those waters, the Division is reducing stocking levels for catchable-sized fish in some waters. For example, Duck Fork Creek and Duck Fork Reservoir were put under special regulations in 1995. The stocking of catchable-sized fish in Duck Fork Reservoir (4,000/year) is being reduced. These stocking reductions are small compared to stocking levels for the larger reservoirs. This information has been added to the text in Chapter 1.

Comment 9 We are concerned about how stocking needs are being determined, the goals these needs are serving, and the financial and personnel resources they usurp (in lieu of alternate activities). Are these needs determined on the basis of true conservation or mitigation requirements (i.e., long-term persistence) and the limits/potentials of the watersheds, on the basis of a portion of recreational angling public's desires, or on available production capacity? In reviewing the FishPro documents, there seems little to suggest the former. Furthermore, in Table 1, the total overall cold water fish "need" is for the various strains of rainbow trout (which already accounted for >93% of the 1996 production). Please note that we are not suggesting a greater management effort on native cutthroat *via stocking*. Rather, we are merely noting that the increased production and stocking is for non-restorative and non-mitigative purposes. (National Trout Unlimited)

Response 9 The purpose in the EA is to meet the sportfish recreation and native fish conservation and recovery needs for hatchery production. The stocking needs were developed by the Division managers to meet these needs in State-managed waters and by Tribal fisheries biologists for waters managed by the Tribe. The sportfish recreation needs were developed based on each waterbody's carrying capacity, the Divisions's Fish Stocking and Transfer Procedures (see page 15, Appendix D), consideration for changing anglers' needs and preferences and conservation and recovery requirements. The feasibility reports completed by FishPro were not the basis for the development of the stocking needs, but were studies on the feasibility of a particular site for hatchery development or rehabilitation. Most of the identified stocking needs are for non-restorative and non-mitigative purposes. The EA does include the identified stocking needs for conservation and recovery of native species as directed by their respective recovery or conservation plans.

Comment 10 Change text to read: "Reintroduced native species may have to come from a designated hatchery facility and/or stream-side hatching units." There seems to be an advocacy for business as usual, not adequately considering other proven technologies. (Utah Council, Trout Unlimited)

Response 10 The text has been changed as requested. Stream-side hatching units are included in the action alternatives. The number, location and operation and management of these need to be determined.

Comment 11 How does building put-and-take hatchery capacity to stock reservoirs that do not provide sufficient habitat to establish self-sustaining populations mitigate for loss/degradation habitat from CRSP? Wouldn't habitat restoration/enhancement be cheaper and more ecologically appropriate than hatchery operations? (U. S. Forest Service, Intermountain Region)

Response 11 The purpose of the alternatives evaluated in the EA was not intended to provide mitigation for loss and/or degradation of habitat from CRSP, but to meet the sportfish recreation and native fish conservation and recovery needs. Mitigation of habitat loss has been and is being conducted, as described in the Commission's Mitigation & Conservation Plan (1997).

Comment 12 How does stocking 11 times as many rainbow trout as native cutthroat trout accomplish "recovery or conservation" of declining cutthroat trout? (U. S. Forest Service, Intermountain Region)

Response 12 As mentioned above, the stocking needs were developed to meet recreation and conservation or recovery needs. Draft conservation strategies for both Bonneville and Colorado River cutthroat trout identify reintroduction as an action to eliminate or reduce threats to the cutthroat's persistence, including developing rearing facilities. Those hatcheries that are capable of responding to rearing cutthroat were selected over others to develop the Proposed Action. The Proposed Action responds proportionately to all identified needs, e.g., about 54% of cold-water needs and 54% warm-water needs would be met. Cold-water native fish restoration needs, such as cutthroat trout, may be accommodated 100%, as management desires indicate. Stocking by the Division will be done according to their Fish Stocking and Transfer Procedures, which states that it will comply with the conservation strategies for the cutthroat trout.

Comment 13 Taken at face value, the purpose of the new hatcheries would be to serve primarily a truly conservation or restoration use. In the Utah case this would imply native cutthroat trout and several warm water species that are of concern or are federally listed under ESA. Yet, of the 100 + entries of expected needs, less than 1/3 are for species native to Utah (although not necessarily to watersheds). Furthermore, two of the four Federal hatcheries listed in Table B-3 produce species or stocks that are not native to Utah's watersheds. Clearly, based on recent history, conservation and restoration are expected to receive minor management attention. We support inclusion of native warm water species and amphibians. However, we support restoration and recovery of these in an ecosystem context and support integrated management approaches aimed at preventing or removing root causes for their decline. Any propagation of these should complement this larger goal. (National Trout Unlimited)

Response 13 The purpose and need of the EA is to meet the recreation, conservation and recovery needs for hatchery capability and production. Most of the conservation and recovery strategies for Utah's native species include a reintroduction action to eliminate or reduce threats to the species' persistence. This reintroduction action often includes the development of rearing facilities. However, it is only one action of many that typically include: determination of population status, determination of genetic integrity, maintenance or enhancement of habitat, selective control of nonnative species, monitoring of populations and habitat and development of a mitigation protocol for future development and habitat alteration. The conservation and recovery stocking needs listed in the EA are consistent with the conservation strategies for those species. These needs do make up less than 1/3 of the total, the majority being to meet the sportfish recreation needs. According to the Division's Fish Stocking and Transfer Procedures, stocking will be coordinated with conservation teams and consistent with conservation and recovery strategies.

Of the Federal hatcheries listed in Table B-3, only improvements at Jones Hole National Fish Hatchery are under consideration in the EA. It is a cold-water hatchery, which is capable of culturing Colorado River cutthroat trout in addition to rainbow trout and other species.

Comment 14 The annual total splake and kokanee needs appear inadequate for the needs of Strawberry and Deer Creek reservoirs. (Utah Outdoor Interest Coordinating Council)

Response 14 Splake were not included in the Strawberry Reservoir management plan since the main objective was to manage with species which would reproduce — with Bear Lake cutthroat trout as a predator, and kokanee a competitor with Utah chub. Adding them would require approval by the team that approved the original plan — an interagency/citizen advisory team made up of representatives of the Division, the Forest Service, Bureau of Reclamation, Fish and Wildlife Service, Utah Wildlife Federation, Strawberry Bay Marina and Utah Division of Water Quality. Kokanee salmon are still an important aspect of Strawberry Reservoir management, but at this time is does not appear that there is successful tributary spawning.

Splake are a deeper water species for part of the year and need good water quality. If the water quality is such that they are forced above the thermocline (i.e., due to low oxygen conditions in deeper water) they will not do well. The Division is not sure that Deer Creek Reservoir would be suitable based on this reason. Kokanee have been suggested by the Division's Central Region

staff for Deer Creek but until the needs of Strawberry Reservoir can be met, the Division has not wanted to stock these fish in other waters. Also, with the warm water predators in Deer Creek, it is questionable if fry and fingerling kokanee would survive.

Comment 15 According to Table B-2, the trend toward stocking fewer but larger fish in reservoirs is not the case. Many stocking levels increase in numbers. (U. S. Fish & Wildlife Service, Utah Field Office)

Response 15 This statement was meant to reflect the historical trend from stocking large numbers of fry or fingerling (2-4" in length) fish to fewer numbers of catchable or subcatchable (7-8" and larger in length) sized fish to better ensure return to the creel. You are correct in your interpretation of Table B-2; for the 40-year planning period, stocking of catchable sized fish does increase to meet the anticipated increase in demand. The text has been edited to avoid this confusion.

Comment 16 Why stock nonnative Snake River cutthroat or Yellowstone cutthroat trout in Utah, particularly with rainbow trout? The inevitable genetic homogenization is not "ecosystem restoration". (U. S. Forest Service, Intermountain Region)

Response 16 Snake River and Yellowstone cutthroat trout are being stocked into waters where the Division is not managing for native salmonids. For example, Snake River cutthroat trout are stocked in the Green River tailwater fishery and in some reaches of the Weber River. Both waters have limited spawning habitat. These waters provide a unique fishery that has been accepted by anglers. The Division is stocking fingerlings in both locations and they appear to survive and grow well, but are not reproducing. The rainbow trout stocked in the same waters are not reproducing well, either. These waters are both heavily impacted resources that are not consistent with historic habitats in Utah.

Comment 17 Is the revised Plan premature or is it simply oriented to put-and-take fishing since 17% of the cutthroat trout stocking is Colorado River cutthroat, but reintroduction has not yet been identified as part of the conservation strategy for that species. (U. S. Forest Service, Intermountain Region)

Response 17 The cutthroat trout culture identified in the EA will primarily be for sportfish populations (as defined in the conservation strategy), but these populations will not necessarily be put-and-take fisheries. The best possible brood source will be used for hatchery production, so that any stockings will be with pure cutthroat trout. Hatchery cutthroat trout will be stocked into lakes and rivers/streams for sportfishing, but not into or near streams/lakes that contain pure conservation populations (as defined in the conservation strategy).

Although not yet identified, culture for conservation populations will be used if needed. Conservation populations will be managed primarily by translocation of the nearest pure conservation population neighbor or by culture (probably stream-side incubation) of the nearest pure conservation population neighbor. An example of the use of hatchery cutthroat trout production, as identified in the EA, would be to replace the stocking of a non-native cutthroat trout (e.g., Yellowstone cutthroat trout) in high-elevation lakes that were in the historical range

of a native cutthroat trout (e.g., Colorado River and Bonneville cutthroat trout). Facilities would be adapted to provide conservation through fish culture.

Comment 18 Stream-side hatching units can supplement the base hatchery system. We feel that the cutthroat populations are too few and the goals should be considered to be flexible and updated annually. (Utah Council, Trout Unlimited)

Response 18 We agree that stream-side hatching units may provide a good supplement to the base hatchery system. The effectiveness of these units, however, still needs to be evaluated in Utah for native cutthroat trout. Information is needed as to where the use of these stream-side units will be appropriate, etc. As the activities identified in the conservation strategies are completed (i.e., surveys and genetic analyses), the cutthroat population stocking needs will be updated.

Comment 19 Placing amphibian culture in this proposal is jumping the gun until the Conservation Strategy plans are developed. What is the basis for an annual amphibian conservation production need of 400,000 individuals? Why are these cold-water amphibians being raised in warm-water hatcheries associated with greater salinity than that found in snow-melt rivers systems? (Peter Hovingh)

Response 19 We do not feel that it is premature to culture boreal toad or spotted frog for the needs of Utah. The draft conservation strategy for the spotted frog was noticed in the Federal Register for public review on November 28, 1997. A boreal toad conservation strategy and agreement or a conservation management plan will be drafted for Utah in the near future. Research needs have been identified in the conservation strategy for spotted frog to determine the optimum life stage (e.g., eggs, tadpoles, juveniles, or adults) for successful introductions to occur. Similar research is being conducted for boreal toad by the State of Colorado and may be repeated in Utah. Identifying culture space for 400,000 individuals up-front will provide the flexibility that may be necessary to reach recovery goals. Native species managers estimated the production needs on currently available knowledge.

Both hatchery locations (Goshen and Gandy Springs) are within the historic range of spotted frog, therefore, culture of this species should not be a problem. The State of Colorado has successfully cultured boreal toad outside of this species' native range (K.L. Scherff-Norris 1997). The culture template established by the State of Colorado will be reviewed for suitability of use for boreal toad culture.

Comment 20 Provide additional justification for the 400,000 individuals for amphibian stocking needs. Cite appropriate conservation plans. (U. S. Department of the Interior)

Response 20 See the above response (Response 19). The Draft Spotted Frog Conservation Strategy has been cited as suggested.

Comment 21 Amphibians may be better conserved by NOT stocking fish in their lakes than by attempting artificial culture of these species. Culture of amphibians is likely to be unsuccessful as described given: the sites are outside of the native range, the different thermal requirements of

boreal toad and spotted frog, the use of a warm water facility, predation by introduced fish and infection by *Saprolegnia* fungus from hatchery-stocked fish. Are the alternate sites native habitat for these species? (U. S. Forest Service, Intermountain Region)

Response 21 With the approval of the Division Fish Stocking and Transfer Procedures, non-native fish will not being stocked in locations known to contain sensitive amphibians in Utah. Selective control of nonnative species is an action identified in the draft spotted frog conservation strategy. Many of the locations for spotted frog management do not presently support fish. Many factors have been identified in the conservation strategy for the decline of spotted frog along the Wasatch Front. All of these factors must be considered for spotted frog management actions. Culture of spotted frog will be one useful management tool for this species.

We feel that the culture of amphibians will be successful in Utah. Culture of boreal toad has been demonstrated to be successful in the State of Colorado (K.L. Scherff-Norris 1997). The alternative sites currently being evaluated (Gandy and Goshen) are within the native habitat for spotted frog and several of the native fish species (e.g., least chub). Suitable culture sites are generally limited by adequate water supply more than any other factor.

Comment 22 Are Goshen and Gandy "Springs surrounded by desert" or "mountaintop refuges"? Those are native habitat for Columbia spotted frog. Any other types of sites are unlikely to succeed as frog "culture" sites. Boreal toad and spotted frog have different thermal requirements, and probably cannot be raised in the same (especially warmwater facility). (U. S. Forest Service, Intermountain Region)

Response 22 Culture of any species does not have to occur within its native range to be successful. Water temperature, salinity, etc., can be regulated to suit individual species needs in a hatchery environment. Spotted frog and boreal toad will not be raised in the same tank or pond because of their different requirements. See the responses provided above.

Comment 23 The Division stocking policy has been approved, this should be reflected in the EA. (Utah Council, Trout Unlimited)

Response 23 We have the final Division Fish Stocking and Transfer Procedures, effective September 24, 1997. References in the EA will be revised to reflect the final.

Comment 24 There was a recommendation to change the reference to the interim hatchery at Red Butte to "The Commission will fund 75% of the construction costs of a hatchery interim facility at Red Butte or another mutually agreed upon location." (U. S. Fish & Wildlife Service, Utah Field Office and State of Utah)

Response 24 The ownership, operation and maintenance of the Red Butte Dam is under discussion and has not yet been resolved. The text has been changed as recommended.

Comment 25 Describe where the additional funding (the 25%) will come from before spending the 22.8 million. (U. S. Fish & Wildlife Service, Utah Field Office)

Response 25 The 25% matching funds is anticipated to come from the cooperating agency or Tribe. The State of Utah has secured the funding for Kamas hatchery and is pursuing funding for the other hatcheries. The Ute Tribe resolved to provide matching funding (April 1997). Fish and Wildlife Service may provide matching funding through NEPA and engineering support. This information has been added to the action alternatives in Chapter 2.

Comment 26 State whether the interim facility at Red Butte comports with the June Sucker draft Recovery Plan. (U. S. Department of the Interior)

Response 26 The interim facility at Red Butte for the culture of June sucker is supported by the draft June Sucker Recovery Plan, under the action of enhancing populations in Utah Lake and its tributaries. The text has been changed to reflect this.

Comment 27 The best way to avoid impacts on native fish and amphibians is NOT to stock alpine lakes and other historically fishless water bodies and to use ONLY native strains and species of local genotypes where stocking. (U. S. Forest Service, Intermountain Region)

Response 27 Thank you for your comment. The Division's Fish Stocking and Transfer Procedures includes a section on stocking in alpine lakes, which was developed in conjunction with the U.S. Forest Service (Forest). The implementation of these procedures will avoid and lessen impacts to native fish and amphibians.

Comment 28 Hatcheries are only tools used to achieve some goals, protection enhancement and restoration of habitat are more ecological, efficient and appropriate. They should be mentioned before artificial hatcheries, as first option. (U. S. Forest Service, Intermountain Region)

Response 28 The EA deals only with the hatchery tool to achieve the goals of sportfish recreation and native fish conservation and recovery. The Commission is participating in numerous habitat protection, enhancement and restoration program elements in addition to the hatchery program element. These are described in the Commission's 1997 Mitigation and Conservation Plan.

Comment 29 Cultured, stocked fish are not "wild". Stream-side units have deleterious effects on coldwater streams, introducing nutrients from excess food, excreta and possibly diseases. (U. S. Forest Service, Intermountain Region)

Response 29 We are unable to locate documented studies describing the potentially adverse effects you mention. Please provide us additional information if you have it. We are very interested in collecting further information to aid in evaluating this technique. As we understand them, stream-side units are simply hatching units used to increase the hatching success rate over that in the stream. Typically, eggs are taken from the stream or from a hatchery source if appropriate and placed in the hatching units. These eggs must be from a certified disease-free source. When the eggs hatch and fry swim up, they move into the stream. No additional feeding takes place with the use of stream-side hatching units.

Comment 30 The Division can make the provision of sport fishing opportunities reliant on wild, self-sustaining populations, as stated in their stocking policy, possible by restraining over-fishing. (Peter Hovingh)

Response 30 Many waters in Utah that are managed for sport fishing are altered environments where suitable habitat is not available for natural reproduction and wild populations. The Division is managing more waters all the time with "Special Regulations" and for wild fish, but there is an increasing angling public, and most of the larger waters cannot be managed as wild fisheries. Utah has an angling public that has not completely accepted wild fish management and "Special Regulations." In a 1996 survey, the reduction of the Statewide limit on trout from eight fish to four fish was opposed by two out of three of the anglers. This reduction would not reduce stocking levels. Reducing the current limit would lower the harvest during heavy harvest months but the fish saved would still be harvested at other times. The limit would have to be reduced to one or two fish in order to lower the stocking levels. The concept of managing for wild fish on all waters is not possible given Utah's natural resources, currently altered resources and public demand.

Fishing levels are to be evaluated in the hydrologic unit management plans, as described in the EA. These management plans will evaluate the appropriateness of special regulations and limits on a case by case basis.

Comment 31 The third type of monitoring that requires examination of the assumptions underlying this project is equally important. (U. S. Forest Service, Intermountain Region)

Response 31 Validation monitoring is included in the Commission's Mitigation and Conservation Plan as a third type of monitoring. This monitoring evaluates if there is a better way to achieve the desired future condition. This type of monitoring asks the question: if the project was implemented and we did not reach the desired future condition, what was wrong with our approach, our assumption, and our design? Monitoring at this level is usually appropriate for large scale projects. The Commission is evaluating this type of monitoring for the hatchery project.

Comment 32 If the Commission's monitoring program contemplates activities in addition to those carried out by the Division as an integral part of its fisheries management program, an understanding of what agencies will be conducting monitoring and what level of funding will be provided for monitoring efforts will be beneficial. These types of activities have historically been carried out by the Division, as they will be in the future. Additional funding may be needed, depending on the level of monitoring determined to be necessary. (State of Utah)

Response 32 The monitoring described in the EA is consistent with that in the Commission's Mitigation and Conservation Plan, where it is stated that the Commission will rely heavily on information collected by cooperators. This monitoring will include implementation monitoring to determine if the project was completed. This may be accomplished through fiscal oversight of cooperators, quarterly progress reports, field reviews and inspections and other methods as appropriate. It will include effectiveness monitoring to determine if the project helped achieve the desired future condition. This may be accomplished through the conservation strategy

monitoring, and through Division creel census programs. For the effectiveness and implementation monitoring, we do not anticipate activities in addition to those carried out by the Division. As stated in the response to comment 31, the Mitigation Commission is evaluating validation monitoring for the hatchery project.

Comment 33 The cost efficiency of the proposal was questioned. The cost of construction and/or reconstruction was not factored in. (Trophy Fish Ranch and Utah Council, Trout Unlimited)

Response 33 The economic information presented in Chapter 3, Table 6 has been redone to factor in the capital costs of construction.

Comment 34 How will lack of information on the return of hatched fry to the population be addressed in monitoring plans? Increased electrofishing surveys only increase stress, physical damage and mortality in fish that this project is supposed to recover if used. (U. S. Forest Service, Intermountain Region)

Response 34 It is not anticipated that the monitoring of these populations will require an increase in electrofishing surveys. The monitoring will consist of that described in the conservation strategies for the cutthroat trout: monitor population and habitat, which requires monitoring protocols be developed and implemented to determine program effectiveness. The Commission is looking into potential evaluation studies for the stream-side incubation units.

Comment 35 The use of stream-side hatching units to supplement both the native and anadromous fish in Wyoming, Idaho, Washington and Texas has proven successful. Initial use of these units on streams in 1997 has shown its merits for native cutthroat recovery. (Utah Council, Trout Unlimited)

Response 35 Utah has been using stream-side hatching units for cutthroat trout as well. Different states have different meanings of success, however. Stream-side units are being used in Utah; and will likely continue to be used for maintaining certain conservation populations. The intended use of these units is to increase the rate of egg hatching over that observed in the stream. Estimated hatching rates as high as 90-98% with the use of these units have been observed on the Salmon-Challis National Forest. Once the hatched fry enter the stream, they are subject to all of the stresses (e.g., predation) on that wild population. It is believed that these hatched fry have characteristics that are more like a naturally-reproducing population than those produced in a hatchery.

Comment 36 Why is the Division stocking to replace an excessive and unnecessary daily kill limit of eight trout in most waters? (U. S. Forest Service, Intermountain Region)

Response 36 There is a difference of opinion as to whether an eight fish limit is excessive and unnecessary. As stated above in Response 30, Utah has an angling public that has not completely accepted wild fish management and “Special Regulations.” A survey was conducted in 1996 to evaluate the reduction of the Statewide trout limit from eight to four fish and about two out of three anglers were opposed. Reducing the limit from eight fish to four fish would not

reduce the stocking levels. Cutting the current limit in half only reduces the harvest during heavy harvest months but those fish saved are still harvested at other times. The limit would have to be reduced to one or two fish in order to reduce stocking needs.

Comment 37 The commitment required to restore native fish populations needs standards, not guides. (U. S. Forest Service, Intermountain Region)

Response 37 The conservation strategies that have been developed for sensitive native species have identified standards for conservation. The Division's stocking policy states that it will be consistent with the conservation strategies for native fish.

Comment 38 One should question fish stocking in general on the basis of ecosystem management and biological diversity, as mollusks and amphibians are impacted by stocking. Will hatcheries be used to culture rare mollusks and insects? (Peter Hovingh)

Response 38 The State of Utah has accounted for the effects of fish stocking on other aquatic wildlife in the recent Fish Stocking and Transfer Procedures, effective date of September 24, 1997. Fish stocking by the Division will be conducted according to these procedures. They state: "Under the authority of the Wildlife Board, the Utah Division of Wildlife Resources shall protect, propagate, manage, conserve, and distribute protected wildlife throughout the State".

The culture of mollusks and insects is not considered an immediate need in the State of Utah, as the highest culture priorities for rare species have been identified for: June sucker, least chub, spotted frog and boreal toad. The design of the Proposed Action hatchery will not preclude culture of mollusks and insects. These may be cultured in the future.

Comment 39 We suggest that the Hatcheries vs. Habitat issues needs re-examination. The argument used to wave off this issue is one of legislative and funding authority. Further, if the Politics vs. Science conclusion is correct (an expansion of this conclusion is also warranted. As presented, it is a "just so" argument.) then the habitat issue needs to be examined on the grounds that its elimination was not based on science. We recognize that CUPCA contains provisions for habitat mitigation and substantial authorized budgets. We emphasize that these should not be diminished in lieu of the hatchery provisions. (National Trout Unlimited)

Response 39 As you have stated, the CUPCA includes provisions for habitat mitigation with substantial authorized budgets. The Commission's Mitigation and Conservation Plan identifies project priorities according to mitigation priorities, that is, "in place-in kind" as the highest priority, as supported by Trout Unlimited. However, as stated in the EA, CUPCA also authorized funding for recreation-related projects not specifically related to ecosystem restoration, such as the hatchery project. The habitat projects identified were not diminished in lieu of the hatchery provision.

The Politics vs Science conclusion is made based on the identification of the stocking needs. These were developed by managers and biologists who are familiar with sport fish recreation needs, water carrying capacities and the needs for species conservation. The stocking needs were not based on politics, as suggested by the issue identified in Chapter 1.

Comment 40 Culture and transplantation of amphibians is untested, probably impractical, expensive and risky (because of the likelihood of stress, disease etc.) compared to protection of native biodiversity. (U. S. Forest Service, Intermountain Region).

Response 40 We agree that the protection of native biodiversity is preferable to the culture and transplantation of amphibians. The conservation strategies developed for spotted frog identify actions to conserve this species, including habitat protection and habitat development, among others. However, the augmentation and expansion of populations through culture has also been identified. The State of Colorado has successfully cultured boreal toad and preliminary data indicates high survival rates of released individuals (Muths et al. 1997).

Chapter 2 Proposed Action and Alternatives

Comment 41 The private sector should be considered as a valuable and available resource and included somewhere in the options offered in the assessment. Perhaps the possibility should be explored for the purchase of at least the 30,000 pounds that the proposed new hatchery at Big Springs plans. Could not the Colorado River cutthroat be produced at another location such as Jones Hole? The rainbow trout could be supplied on a bid basis from the private sector. The objections of unreliability, poor quality, etc. are totally invalid if the proper procedures are outlined in any bid invitation. (Trophy Fish Ranch)

Response 41 Private hatcheries typically raise a commodity based on a highly domesticated fish. The State and Federal hatcheries raise a variety of fish for supplemental stocking, for reintroduction or supplementation of native or wild populations of fishes that must survive the rigors of the environment and grow to be caught and harvested. Genetic fitness and health of hatchery fish are the factors that determine their survival in the wild.

The purchase of fish from private sources is not a reasonable alternative because it does not meet the Desired Condition of meeting Federal, State and Tribal fishery resources' long-term needs and management objectives in the CRSP-affected area waters. These management objectives for waters that are stocked consider species, strain, stock, health or fitness which is defined as the ability to survive and reproduce in a given environment.

Comment 42 Previous drafts included an analysis of the needs of each hatchery under consideration. Included was detail on water supply, construction requirements, and other site specific data. This information, for those sites in the Preferred Alternative should be included in the Appendix of the Final Environmental Assessment (Utah Council, Trout Unlimited)

Response 42 As recommended, this information has been added.

Comment 43 Could Wahweap Hatchery be expanded to produce the additional warm-water fish more economically than the $10 million proposed for a new warm-water hatchery? (Trophy Fish Ranch)

Response 43 Wahweap presently produces threatened and endangered Colorado River fishes and some sport fishes. The water supply at Wahweap is limited to 1 to 2 cfs, which prevents the program from expanding.

Comment 44 Under the Proposed Action, identify why an alternate site for the Red Butte interim hatchery may be needed. An interim site for June sucker culture will continue to be a high priority and other arrangements will be made if it is determined that Red Butte cannot provide the needed facility. (U. S. Fish & Wildlife Service, Utah Field Office)

Response 44 As mentioned previously in Response 24, the ownership and operation and maintenance of the Red Butte Dam is under discussion. We agree that the interim hatchery for June sucker culture is a high priority. The text has been amended to identify the need for a possible alternate site.

Comment 45 The Plan should include a commitment and an abbreviated outline of the Divisions' education program that supports a balanced approach to sport fishing, and species and habitat restoration. (Utah Council, Trout Unlimited)

Response 45 This information has been added to the Proposed Action Alternative in Chapter 2, as recommended.

Comment 46 The use of stream-side hatching units may be effective in some areas, but they also have serious drawbacks through disease transmission; and flooding and silting, which results in gill problems and high mortality. (Trophy Fish Ranch)

Response 46 The stream-side hatching units are intended to be used to supplement native trout populations. These units will be used with certified disease-free eggs, in appropriate locations with the necessary level of operation. This will prevent problems such as disease, flooding and silting.

Comment 47 Describe how the needs beyond the sixty per cent funded under this EA will be met. (U. S. Fish & Wildlife Service, Utah Field Office)

Response 47 It is anticipated that either the State will meet the needs beyond the capability of this project with its own funding or that all of the needs may not be met. The State, Tribe and Federal agencies may have other resources that can be drawn upon. This information has been added to the text in Chapter 2, in the description of the action alternatives.

Comment 48 Update the Division's stocking policy information to reflect the final policy wording. (Utah Council, Trout Unlimited)

Response 48 As stated above in Response 23, references to the Division's Fish Stocking and Transfer Procedures have been updated to reflect the final policy wording.

Comment 49 If guidelines are advisory, rather than performance standards, this policy is unlikely to protect or enhance native species, strains or local genotypes or amphibians. (U. S. Forest Service, Intermountain Region)

Response 49 It is mandatory for all Division personnel to follow the stocking policy. The policy states that stocking of nonnative fish and sportfish will be consistent with the Colorado River cutthroat, Bonneville cutthroat trout, least chub conservation agreements and strategies, and the June sucker Recovery Plan and conservation strategies, and plans for native species in the Colorado River and Virgin River drainages. Stocking will also be consistent with strategies for amphibians. These strategies and plans do include performance standards.

Comment 50 The EA should explain what further evaluation of the stream-side hatching units is needed. Include a brief outline of the necessary evaluations and how those will be completed. For example, what is the comparative costs of fish produced in stream-side units versus a traditional hatchery? (U. S. Department of the Interior)

Response 50 Future evaluation will include: the identification of species to be reared, sites where units are proposed to be used, the number and who will operate and maintain the units, etc.

Information on specific comparative costs is lacking. These units have lower capital costs than a traditional hatchery, however, they are not capable of producing the number and pounds of fish that a traditional hatchery can. Their use in the Intermountain West has typically been for reintroducing native species, enhancing the egg hatching rate over what is observed in the stream. This information has been added to the text in Chapter 2

Comment 51 A careful review of the proposed action and the maximum capacity alternative is needed. The future need is predominantly for rainbow trout (94%). From the data in the EA, there is no apparent need to emphasize other cold water species in the plan. There seems to be ample justification to adopt the Maximum Capacity Alternative as the Proposed Action. (U. S. Department of the Interior)

Response 51 The identified need for stocking is predominantly for rainbow trout as you have stated. However, in order to meet the purpose of providing the versatility to respond to future management objectives and species and/or size in the hatchery product, such as stocking native Colorado River and/or Bonneville cutthroat trout, rather than nonnative Yellowstone or Snake River cutthroat, the hatcheries listed in Chapter 2 were selected for the Proposed Action. Those hatcheries that make up the Maximum Capacity Alternative will provide only an additional 5% in capacity by weight. This additional 5% is not worth the loss of versatility provided by those facilities in the Proposed Action.

Comment 52 Not only is the stream-side hatching unit methodology proven, its intended use is to supplement traditional methodologies as well as “produce a cold-water fish which has more ‘wild’ characteristics.” (Utah Council, Trout Unlimited)

Response 52 The stream-side hatching units are known to be able in most instances to achieve a high success rate of egg hatching over that observed in the stream. Once the fry swim up and move to the stream, they are subject to all of the stresses of the stream, such as predation, that wild fish fry are. The use of stream-side hatching units is included in the action alternatives. The identification of number and location of sites where these units will be used, and who will operate and maintain them is needed.

Comment 53 More than evaluation of appropriateness is needed for the stream-side hatching units. Effects of stream enrichment from excess food and animal waste, and risks of disease, must be assessed and disclosed. Utah already has whirling disease in several streams, and pollution degradation in many more. (U. S. Forest Service, Intermountain Region)

Response 53 As stated above in Responses 29 and 52, the stream-side hatching units are used through the swim up fry life stages only. No supplemental feeding is conducted. Some maintenance is necessary to ensure that the inflow is adequate and that fine sediments are not posing a problem.

Comment 54 "Maximum Capacity" and "Proposed" Alternatives differ very little. This hardly constitutes a "reasonable range of alternatives." Such a range should include: (1) mitigation of CUPCA/CRSP impacts to cold-water habitats and species; (2) mitigation of CUPCA/CRSP impacts to warm-water habitats and species; and (3) restoration plans for native species and habitats. (U. S. Forest Service, Intermountain Region)

Response 54 The State Hatchery Program element of the Commission's Mitigation and Conservation Plan is not intended to provide mitigation of CRSP impacts to cold-water habitats and species, warm-water habitats and species or stand-alone restoration for native species and habitats. These activities are funded under other projects and/or programs in the Mitigation and Conservation Plan (1997). Rather, a reasonable range of alternatives was evaluated to meet the identified purpose and need: that is, to provide production of both the warm- and cold-water fishes from hatcheries to meet Federal, State and Tribal fishery resources' long-term needs and management objectives in the CRSP-affected area waters. These management objectives include meeting sport fish recreation, native fish conservation and recovery through culturing.

Comment 55 This current "analysis" appears to be little more than a justification for a pre-conceived desire to perpetuate and expand hatchery operations, using newly available money, with scant regard for professed "ecosystem restoration." (U. S. Forest Service, Intermountain Region)

Response 55 The proposed action evaluated in the EA incorporates the Division's stocking policy, and requires a Tribal stocking policy to reduce the impacts of past practices. It also includes an education component to educate the public on the use of hatcheries as a tool to meet a management need, and on the importance of habitat to sustain both wild and stocked fish populations. Almost half of the $22.8 million identified in CUPCA 313(c) will be used to fund a new warm-water hatchery, and an interim facility, with the main objective of native fish and amphibian restoration. The purpose and need of the proposed action is not for ecosystem restoration, but for the provision of sport fishing opportunities and native species restoration.

This purpose and need must meet the ecosystem restoration requirement and we believe that with the components mentioned above, it does.

Comment 56 The wording here suggests the real goal of this Plan is to take advantage of CUPCA 313(c) funding, rather than "ecosystem restoration." The "economics" summary of Table 7 confirms this impression. (U. S. Forest Service, Intermountain Region)

Response 56 The goal of the Proposed Action Alternative is to meet the purpose and need as defined and discussed in the above responses. It must be done in a way to meet the ecosystem restoration requirement. It is not an ecosystem restoration project per se, although the culture and transplantation to meet native species conservation and recovery is incorporated. We believe that with the inclusion of the Division stocking policy and the requirement for a Tribal stocking policy, that requirement has been met. The economics summary of Table 6 is in response to a specific request for that information during the scoping of Kamas Hatchery.

Comment 57 There is a discrepancy in the number of hatcheries under Alternative 2. The Alternative mentions only <u>six</u>, yet descriptions of the Alternative refer to "<u>seven</u> sites." (U. S. Forest Service, Intermountain Region)

Response 57 There are seven sites in the Alternatives; the text has been corrected.

Comment 58 The Division's Fish Stocking and Transfer Procedures will be executed without implementation of the Plan. (State of Utah)

Response 58 The Wildlife Board approved the Fish Stocking and Transfer Procedures and it was signed by the Division Director on September 24, 1997. The text has been edited to reflect this approval.

Chapter 3 Environmental Analysis

Comment 59 Who determines whether or not natural recruitment is insufficient when this can be manipulated by catch quotas and types of bait? The statement that the Division will continue to manage fisheries in wilderness areas does not mean the management of habitat, but means only the fish limits, baits and type of hooks. (Peter Hovingh)

Response 59 The Division has the authority and responsibility to manage the fishes of the State and determines whether or not natural recruitment is insufficient to support a sport fishery or to meet species conservation goals. Two conditions have to be present for the management of a naturally self-sustaining fishery. One, the availability of sufficient spawning and nursery habitat; and two, a high productivity or availability of fish food to allow for good growth of the naturally produced fish. Without adequate growth, wild fish will not reach a size acceptable to anglers. If these two conditions exist, the Division has been willing to investigate wild fish management. Special regulations, or catch quotas and types of bait will not result in a good fishery without adequate natural habitat and good growth. The State has a number of waters where fish are wild, but they are all small or stunted. For example, the Blacksmith Fork and Ogden Rivers have good spawning and nursery habitat but the resulting brown trout population is stunted or very slow

growing. On the Blacksmith Fork, the Division tried special regulations and after 25 years, took them off. Managing with special regulations does not always provide an adequate fishery resource.

Comment 60 It is very important to have a peer review of the MOU on stocking in wilderness areas by the public and by a scientific review group including out-of-State public. (Peter Hovingh)

Response 60 The use of MOUs between the Forest and the Division is to implement changes in current fish-stocking programs within the High Uintas Wilderness. There is currently no public review process of these MOUs. However, any Division stocking will be conducted according to their stocking policy, which states that it will comply with native species recovery and conservation programs. The Division Fish Stocking and Transfer Procedures was reviewed through their Regional Advisory Councils and Wildlife Board, and made available to the public through news releases on these meeting agendas.

Comment 61 Angler impacts may be insignificant, compared to ecological impacts of stocking exotic, non-native fish in high mountain lakes, especially if no native fish were present before stocking. How will these impacts be "reduced" or avoided? (U. S. Forest Service, Intermountain Region)

Response 61 The State of Utah's Fish Stocking Policy and Transfer Procedures, adopted by the Wildlife Board in September, 1997, state that the Division will continue to manage fisheries in wilderness areas consistent with the MOU between the Division and the Forest. In general, lakes that now support a fisheries resource will continue to be managed as such. A proposal and review of potential impacts will be required before any new lakes can be stocked. If feasible, the fisheries would be managed with the appropriate native cutthroat trout subspecies and rainbow trout would not be stocked within currently designated wilderness areas. Therefore, these impacts may be avoided or reduced with the adoption of the State of Utah's Fish Stocking Policy and Transfer Procedures. These Procedures must be in accordance with the Division's Hatchery Production Plan, Annual Fish Stocking Schedule, Annual Fish Transfer Schedule, Hydrologic Unit Plans and individual Water Management Plans. These Plans are defined in the Procedures included in Appendix D.

Comment 62 The document states that "...the Commission funding of $22.8 million has not increased." While we recognize the broad discretionary authority of the Mitigation Commission to reallocate funds, the sentence seems in context to reference the specific authorization of Section 313(c) of CUPCA. Unless the Commission has decided to reallocate funding, we suggest qualifying the authorization in terms of 1990 dollars, then explaining by footnote that CUPCA authorizations are adjusted by the applicable engineering or consumers' price indices.

Response 62 The text has been edited to reference the CUPCA 313(c) authorization. The amount has been identified as January 1991 dollars that are indexed annually with the appropriate indices.

Comment 63 The project capital costs should be amortized and included in the per pound price of the fish to be produced. If capital investment costs are amortized over the next 40 years by production weight the per pound production costs generally go up. The following table summarizes these amortized costs.

Facility	Capital x $M	Amortized Cost per unit LB in $	Current cost per LB (O&M)	Post Project O&M	Total Cost
Proposed					
Kamas	5.6	+2.35	1.96	1.65	4.00
White rocks	2.4	+1.16	3.97	2.13	3.29
Jones Hole	1.6	+0.48	1.91	1.70	2.18
Fountain Gr.	5.8	+3.08	3.05	2.34	5.42
Big Springs	2.9	+2.49	0	1.16	3.65
Warm-water	10	+2.02	0	NA	O&M + 2.02
Total	28.5	+1.78	???	???	O&M + 1.78
Maximum					
Kamas	5.6	+2.35	1.96	1.65	4.00
Midway	4.9	+1.70	1.97	1.67	3.37
Springville	2.9	+1.03	1.76	1.54	2.57
Jones Hole	1.6	+0.48	1.91	1.70	2.18
Big Springs	2.9	+2.49	0	1.16	3.65
Warm-water	10	+2.02	0	NA	O&M + 2.02
Total	28.1	+1.58	???	???	O&M + 1.58

In total production costs these projects end up increasing the total long-run costs. Perhaps what makes this attractive at the local level is that the capital investment comes from the Federal budget and the O&M and economic benefits are realized at the State level. (Trophy Fish Ranch, Utah Council, Trout Unlimited and National Trout Unlimited)

Response 63 The amortized capital costs have been incorporated in the total production costs in the economic summary of the document (Table 6). The cost on a per pound basis for existing production does not include the capital costs of the existing facilities, so comparisons in cost between existing and future hatcheries cannot be made. References to comparisons will be deleted and costs of production will be presented for information.

Comment 64 How much habitat restoration/enhancement could be funded and implemented, to really mitigate CUPCA/CRSP impacts, for the imputed $2.30/lb of increased productivity of native fish? (U. S. Forest Service, Intermountain Region)

Response 64 If the funding identified for hatcheries could be made available for habitat restoration or enhancement, approximately $22 million would be added to the amount already provided by the Commission for this area. Based on work that has been done in Utah, and depending on the project design, the hatchery project funding could provide 15 or more stream miles of habitat improvement or stream restoration. Acquisition of property or easements would increase costs and reduce the amount of stream miles. We have no cost estimates for a complete watershed approach, as this is so variable.

Comment 65 The information as presented in Table 6 could confuse the casual reader on the comparative cost of the increase in production obtained by implementation of the various alternatives. The table lists the cost of proposed improvements and the increase in production that results from implementation of the improvements. It should also list the operation and maintenance (O&M) costs of the increase in production. Please add two more columns of data under O&M Costs as follows:

Proposed Action	**Increase**	**$/lb**
Kamas	$74,400	1.24
White Rocks	$46,176	0.88
Jones Hole	$112,000	1.27
Fountain Green	$68,300	1.44
Big Springs	$34,828	1.16
Warm Water	Not available	Not available
Maximum Capacity		
Kamas	$74,400	1.24
Midway	$72,536	1.00
Springville	$70,594	1.00
Jones Hole	$112,000	1.27
Big Springs	$34,828	1.16
Warm water	Not available	Not available

If Table 6 is provided only to facilitate an economic analysis of alternatives, current and post project capacity and O&M costs columns could be deleted; the information is relevant only because it permits calculation of the increase of production, and the O&M costs for that increase

in production. As it is stated, and emphasized by italics, on P. 3-7, Proposed Action Alternative, paragraph 2, 2nd sentence: "...it is the increased capacity which will be evaluated in meeting the needs at these facilities." (State of Utah)

Response 65 The economic summary information provided in Table 6 was provided in response to a specific request for that information during the scoping process for the Kamas Hatchery reconstruction project. A hatchery's ability to meet the identified need and to provide the versatility to respond to future management objectives and species and/or size in the hatchery product was used to select facilities for the Proposed Action Alternative.

The increased production was evaluated to determine how well the State program need would be met, rather than evaluating the entire capacity of the reconstructed hatchery. The Division must use these hatcheries to meet stocking needs on waters other than those in the CRSP-affected area. The capital costs are not available for the existing hatcheries, so production cost comparisons (pre- and post-project) cannot be made. In response to comments made on the economic review information, capacity, capital cost, O&M costs and production costs will be provided in Table 6 for information. Where applicable, values for current, post and increased production are identified.

Comment 66 The stream-side hatching units have been used successfully in native salmonid conservation efforts and should be considered under this policy. The State of Wyoming has successfully used these (stream-side incubation units) with native cutthroat trout. (Utah Council, Trout Unlimited and State of Utah)

Response 66 The stream-side hatching units are included in the Proposed Action. Utah has been using stream-side hatching units on a limited basis for cutthroat trout as well. Different states have different meanings of success, however. Stream-side units are being evaluated in Utah and for purposes provided above (see Responses 35 and 52) will likely remain in use for maintaining certain conservation populations. See Response 35 for information on hatching rates.

Comment 67 Use of hatchery brood with stream-side incubation units is directly contrary to the goal of "wilder" trout. Genetics plays as much or more of a role in adaptiveness of propagated fish as does cultural setting. "Hatchery brood", by definition, are individual fish adapted to living in confinement facilities near humans, NOT wild streams. (U. S. Forest Service, Intermountain Region)

Response 67 The importance of genetics in conserving or reintroducing native species is well recognized. However, it is believed that the use of stream-side hatching units, may help provide a fish which has characteristics more like a wild fish than those produced in a traditional hatchery. Stream gravels may be used with stream-side hatching units, exposing hatched fry to velocities more like the stream than found in a hatchery raceway. The stream is the water source for the hatching boxes with diurnal temperature fluctuations, which again is more like a stream environment than a spring water source with stable temperatures. The intent of the stream-side hatching units is to boost the hatching rate over that of the stream. Hatchery brood stock may have to be used if eggs are not available from a wild source.

Comment 68 How can the O&M costs be decreased in the Proposed Action when "$1.16 to 2.30/lb" is higher than "$1.16 to 1.70/lb" for the Maximum Capacity Alternative? Would less cost-effective hatcheries (e.g., White Rocks, Fountain Green) be retired under this proposal? (U. S. Forest Service, Intermountain Region)

Response 68 The decrease of the O&M costs occur with reconstruction at a specific hatchery when compared to its present O&M costs. Comparisons between alternatives were not intended. The hatcheries that you have identified would not be retired, but are incorporated in the Proposed Action Alternative, as defined in Chapters 1 and 2 of the EA. They are not included in the Maximum Capacity Alternative, but would continue to be operated by the State of Utah.

Comment 69 It is mentioned that impacts from the enhancements are expected to be positive, yet new facilities will be constructed at the Fountain Green State Hatchery site and the Big Springs site. No plans or environmental impacts were included in the EA. There was no discussion on what will be built at the Big Springs site. A new hatchery at Big Springs could have significant cultural, aquatic and wildlife impacts. In various public hearings on the Uintah Basin Replacement Project, several Tribal members expressed concern over the Big Springs site since they consider it to be sacred. More site specific description should be included in this EA which is supposed to cover the entire revised fish hatchery production plan. (United States Fish and Wildlife Service, Management Assistance Office)

Response 69 The impacts mentioned in the EA that are anticipated to be positive are the result of stocking policy implementation, culture and transplantation of native species for recovery and conservation purposes, and provision of sport fish recreation opportunities. The information available from the feasibility studies do not allow for any site-specific evaluation of environmental impacts at this time, particularly for the new hatcheries. It is not yet known what will be built at the Big Springs site. A site-specific NEPA analysis will be conducted for all sites including the Big Springs site if they are selected for implementation to evaluate those concerns and issues you have identified. Measures would be developed to avoid or reduce potential impacts, where possible. The site-specific information from the feasibility studies and the original Hatchery Production Plan have been included in Appendix E.

Comment 70 All hatchery water sources should have a thorough biological inventory. (Peter Hovingh)

Response 70 The Division's Aquatic Section biologists are surveying the waters of the State.

Comment 71 Site and water supply must also lie within the native and adapted Hydrologic Unit (basin or watershed) range of the species, strain or local genotype of "Native" fish cultured there. Trans-basin stocking is not ecosystem restoration, nor does it conserve biological diversity. (U. S. Forest Service, Intermountain Region)

Response 71 The alternate sites for meeting native fish recovery and conservation needs are within the native hydrologic unit of some of the species identified, but not all. Adequate water supply location, economic limitations and management considerations make it less practical to locate a number of smaller hatcheries within the native and adapted hydrologic unit of each

species rather than a single, larger location. Stream-side hatching units within the native hydrologic unit may be appropriate for this use. They are low-cost, temporary, low-impact and can be sited within the native basins.

Comment 72 If the goal is "preventing hybridization between rainbow trout and cutthroat trout", then stocking into native cutthroat waters should also be prevented. (U. S. Forest Service, Intermountain Region)

Response 72 The Division's Fish Stocking and Transfer Procedures states that stocking of nonnative species will be consistent with conservation and interagency agreements. These include the conservation agreements for Colorado River and Bonneville cutthroat trout. The Division will not stock nonnative species in waters that have been identified for cutthroat trout conservation.

Comment 73 What analysis is presented of the relative effectiveness and cost of habitat restoration (with more enlightened catch/kill regulations), compared to "stocking for conservation purposes", to prevent a trend toward listing of these species? On what is the assumption of the necessity/effectiveness of conservation stocking based? (U. S. Forest Service, Intermountain Region)

Response 73 No analysis of the relative effectiveness and cost of habitat restoration compared to stocking for conservation purposes has been completed. Conservation strategies for these species include a suite of activities identified to conserve them. These activities include identifying and reducing threats to a species through surveys, genetic analysis, introduction or reintroduction, habitat maintenance or enhancement, nonnative species control among others. Conservation stocking will play one role, with varying importance depending on the species. The Commission is also participating in many of the other conservation activities with numerous agencies.

Comment 74 For the No Action Alternative, please substitute the singular refugium for the plural refugia. (State of Utah)

Response 74 The wording change has been made as recommended.

Comment 75 Proposed Action, substitute "providing fish of a required species" for "providing species of a required species." (State of Utah)

Response 75 The wording change has been made as recommended.

Comment 76 The cost of transport and/or purchase of warm-water fish from out-of-State was mentioned as prohibitive, but no figures were cited. Shouldn't these be included for comparison? (Trophy Fish Ranch)

Response 76 No licensed commercial facility currently raises warm-water sport or native non-sport fish in Utah. The Division attempted to buy catchable channel catfish from out-of-State in 1997, but could not locate a source approved by the Utah Department of Agriculture and Food

(Agriculture). Cost estimates for the purchase and transport of 14-inch channel catfish have been obtained and are included in the EA for information. However, in order for the Division to take possession of these fish, they must come from an Agriculture-approved source. These cost estimates also do not include an evaluation of the resulting fishery. See Comment and Response 76.

Comment 77 The statement that purchasing warm-water sport fish "....is not as cost effective as rearing them locally" is not necessarily true, and would be difficult to support without actually going through the entire process, including an evaluation of results. We suggest you change the sentences to read: "If space is available at an existing hatchery, purchase of warm-water sportfish may not be as cost effective..." (State of Utah)

Response 77 Wording has been changed as recommended.

Comment 78 If "State hatcheries are not the best for raising species other than rainbow trout", and 91% of the production envisioned by this Plan is that of exotic species, why pretend this Plan really proposes significant "ecosystem restoration" or "conservation stocking" of species that may be listed? (U. S. Forest Service, Intermountain Region)

Response 78 The purpose of the EA is to identify the alternative that best meets the identified need. The statement above refers to those State hatcheries selected under the Maximum Capacity Alternative for cold water sport fish production. They were not included in the Proposed Action because they are not as capable for cutthroat trout production. The bulk of the identified stocking for recovery and conservation is for warm-water species which will be handled through the proposed warm-water hatchery, and interim hatchery at Red Butte or an acceptable alternate location.

Comment 79 If "construction of a warm-water hatchery to meet native fish needs would have higher capital costs than relocation from existing populations," why not relocate feasible species, freeing existing hatchery facilities for June sucker, etc. (U. S. Forest Service, Intermountain Region)

Response 79 Under the draft recovery and conservation agreements for several native species, population augmentation of species either transplanted or raised in a designated hatchery has been identified as an action necessary to eliminate or reduce threats to the species and to restore populations to a minimum viable size in appropriate areas. Most of these are warm-water species, which would be best cultured in a warm-water facility. There is currently no warm-water facility available for their culture. Relocation has also been identified as a conservation activity, given the appropriate genetic analysis, where appropriate.

Comment 80 Maximum Capacity Alternative, Delete the word "increased in "provide more increased pounds." (State of Utah)

Response 80 The wording change has been made as recommended.

Comment 81 Under the Maximum Capacity Alternative, the statement is made that the Bonneville cutthroat trout sportfish goals would not be met. This issue is not addressed earlier in the document and no explanation is made.(U. S. Fish & Wildlife Service, Utah Field Office)

Response 81 Under the Maximum Capacity Alternative, the State hatcheries that would be reconstructed are more suited to producing rainbow trout. Those facilities that are known to be capable of producing cutthroat trout would not be reconstructed. So, it is anticipated that under the Maximum Capacity Alternative, the need for Bonneville cutthroat trout sportfish would not be met. The text has been edited to better explain this issue.

Comment 82 We suggest you insert "of hatcheries in the Proposed Action Alternative" after the words "site layout" in the text for Site and Water Supply, Proposed Action.

Response 82 The wording change has been made as recommended.

Comment 83 The statement is made that the State of Utah has acquired matching funds for the Red Butte native fish hatchery. Is this true? It is the Service's understanding that the use of Red Butte is still in question because of the problems with safety and long-term ownership of the Dam.(U. S. Fish & Wildlife Service, Utah Office)

Response 83 The State of Utah has acquired June sucker mitigation funds (for the Provo City Airport) to develop an interim facility for culture of June sucker. The management of the Red Butte Dam and the related safety requirements is still under discussion and, depending on the outcome, may not be available for June sucker culture. An alternate interim site may still be required. The text has been altered to reflect this. A long-term facility for the culture of June sucker as a recovery measure is still the highest priority regardless of the outcome of the Red Butte site.

Comment 84 Under the discussion of environmental resource enhancement, there is no mention of enhancement opportunities, or restoring native species, especially endangered, threatened, candidate and sensitive species. This should be identified as a positive result of both the action alternatives as it restores ecosystem integrity and function.(U. S. Fish & Wildlife Service, Utah Office)

Response 84 The discussion of environmental resource enhancement refers to site-specific enhancement that may be accomplished in conjunction with the reconstruction or construction of the hatcheries under the action alternatives. Wetland enhancement at the Kamas Hatchery site is one example. The restoration or conservation of endangered, threatened, candidate and sensitive species is an identified program need to which the Proposed Action responds.

Comment 85 Describe in greater detail the opportunities mentioned here for wetland enhancement through reconstruction of State hatcheries. Which hatcheries might be modified to enhance wetlands? What approximate acreage of wetlands would benefit from such actions? (U. S. Department of the Interior)

Response 85 Of the two State hatcheries that are proposed for reconstruction under the Proposed Action, Kamas and Whiterocks, only the Kamas Hatchery site is known to have wetland enhancement opportunities. The Environmental Assessment for that project identifies that 1.19 acres of wetlands may be enhanced or converted under the Proposed Action. It also identifies impacts to 0.73 jurisdictional and 2.29 nonjurisdictional acres of wetlands. This information has been added to Chapter 3. Until more site-specific evaluation is conducted for the Whiterocks site, the wetland opportunities there are unknown.

Comment 86 The Red Butte native fish hatchery is not a hatchery in the context of Kamas or Fountain Green. Please clarify this language and list the use of facilities such as Red Butte elsewhere as appropriate. (Utah Council, Trout Unlimited)

Response 86 The facility discussed would be a hatchery structure as opposed to a stream-side incubation unit. The feasibility investigations have identified a structure that could be constructed to meet the immediate culture needs of the June sucker. The facility could be used to culture cutthroat trout as well, but the primary purpose of this facility would be to culture June sucker. The Red Butte facility or alternate site is defined as an interim facility.

Comment 87 Is "improved treatment of effluent" only "likely?" That should be a central design standard, to address a known negative effect on receiving water quality. At a minimum, designed/constructed wetlands could be used for secondary/tertiary filtering and treatment of effluent. (U. S. Forest Service, Intermountain Region)

Response 87 All hatcheries (both reconstructed and new sites) under the Proposed Action will be required to meet State water quality discharge permits, as are existing facilities. Opportunities for the use of wetlands for effluent treatment will be explored, and incorporated into the hatchery design where possible, given site or space limitations. Presently, it is not known if improved effluent treatment (i.e., better than minimum permit limits) at a particular hatchery site is possible.

Appendix B Management Objectives and Fish needs

Comment 88 The consideration which assumes the construction of the Uinta and Upalco Units of the CUP, used in the development of fish stocking numbers, is a poor one. (Utah Outdoor Interest Coordinating Council)

Response 88 To best meet sportfish recreation needs, these proposed waters were included. As more is known about the Uinta and Upalco Units of the CUP, the design for the hatchery providing stocks for the related waters may be adjusted.

Comment 89 Table B-1. CRSP-affected area waters with species stocked and management objectives, listed by watershed. There are omissions of management objectives for numerous water bodies. Specific water body comments: (Utah Outdoor Interest Coordinating Council)

Cedarview and Midview Reservoirs: Unless there are plans to eradicate smallmouth bass from the entire Uinta basin, it is ludicrous not to

manage smallmouths in both Cedarview and Midview Reservoirs.

Moon Lake: Unless kokanee are to be eradicated then they are to be managed.

Red Fleet Reservoir: Unless largemouth bass and bluegill are to be eradicated then they are to be managed.

Strawberry Reservoir: What about future rainbow trout and splake?

Deer Creek Reservoir: What about future splake?

Response 89 Thank you for your comments regarding management objectives for specific waters. The table lists CRSP waters with management objectives that are met through stocking. The waters and species that you mentioned with the exception of Strawberry and Deer Creek Reservoirs are managed as wild fisheries and were not included in the table.

Strawberry Reservoir: The Division has purchased sterile rainbow trout eggs. At the time the stocking needs were developed, sterile rainbow trout eggs were not considered an option, as a source was not available. It may not be an option yet if the percent sterility of these commercial eggs is not adequate. Splake were not included in the original management plan for Strawberry Reservoir.

Deer Creek Reservoir: As mentioned above in Response 14, the Division does not believe that splake will do well in Deer Creek Reservoir. Kokanee have been suggested by the Division's Central Region staff for Deer Creek but until the needs of Strawberry Reservoir can be met, the Division has not wanted to stock these fish in other waters. Also, with the number of predators in Deer Creek, it is questionable if fry and fingerling kokanee would survive.

Comment 90 Roundtail chub, flannelmouth sucker, and bluehead sucker are included in the Colorado River. These species should be included under the Green River as well. Boreal Toad is a species listed under the Green River Watershed, Green River. It would be more accurate to list the boreal toad under the Green River Watershed; otherwise it reads as though the boreal toad occurs only along the Green River corridor, not the entire Green River watershed. (State of Utah)

Response 90 The changes have been made as recommended.

Comment 91 Does the summary include all the waters (especially streams) where native fish restoration is in progress or being planned? (Utah Council, Trout Unlimited)

Response 91 The summary identifies waters where known native fish restoration through augmentation is being planned. Waters where augmentation is not planned but other conservation activities are, such as habitat improvement or nonnative species control, are not included in this list, as those activities are considered beyond the scope of the EA. Conservation plans for the cutthroat trout (both Colorado River and Bonneville) have not yet identified all of the waters where native fish restoration is in progress or being planned. This holds true for all native species. Many sites are still being surveyed.

Comment 92 There should be 171 lbs. of least chub listed in the weight column under year 2000, and 100,000 roundtail chub listed in the numbers column, under the year 2015 (State of Utah).

Response 92 This correction has been made to Table C-2, as recommended.

Comment 93 Stocking for Flaming Gorge overshadows all other waters in the state. By the year 2035, that reservoir alone accounts for 77% of the annual stocking need. It appears that Flaming Gorge is driving the entire State hatchery program and that stocking needs in all other waters are negligible by comparison. The EA text should be supplemented with an explanation of the dominant role of Flaming Gorge Reservoir in establishing the State stocking needs. (U. S. Department of the Interior)

Response 93 Flaming Gorge Reservoir stocking dominates the CRSP-affected area waters needs. The Flaming Gorge stocking need is large because it is a large water (over 42,000 surface acres) that can provide much more angler use than it currently receives, and because it requires stocking of larger sized fish (10-inch rainbow trout) to provide a successful fishery, given the other primary species (lake trout and kokanee).

Angler numbers statewide have grown about 2% per year since the 1950's. If that rate of growth continues in the future, it is anticipated that angler pressure will move from Strawberry and Jordanelle Reservoirs to Flaming Gorge Reservoir. This information and additional information from the management plan in the Appendix C has been added to the text in Chapter 1.

Comment 94 The Flaming Gorge Reservoir management plans for both Wyoming and Utah need to be merged before finalizing specific hatchery production needs for Utah. This is particularly important as 60% of the total fish hatchery production specified for year 2000 is for Flaming Gorge Reservoir. Several questions need to be answered: how does the Utah Flaming Gorge management plan match with the Wyoming Game and Fish plans and objectives? What percentage of the anglers at Flaming Gorge is based on the rainbow trout fishery? What actions, decisions, problems led the Division to propose such a dramatic increase in rainbow trout stocking needs between years 1996 and 2000? These concerns should be resolved before a final decision on the Production Plan is reached. (Utah Council, Trout Unlimited)

Response 94 Flaming Gorge Reservoir is managed jointly by the Division and the Wyoming Game and Fish Department. A joint 5-year management plan was drafted in 1984, updated annually and revised in 1990. This plan calls for rainbow trout stocking, kokanee augmentation stocks, surveys and regulatory management for maintenance of the lake trout trophy fishery.

As stated in Appendix C, the Division’s fishery management of the Flaming Gorge Reservoir fishery is based on a rainbow trout basic yield fishery and a lake trout trophy fishery. Their fishery management objectives also include the maintenance of kokanee catch rates; harvest of smallmouth bass; studies of forage abundance and availability and reservoir lake trout carrying capacity. The Wyoming Game and Fish Department Basin Management Plan for Flaming Gorge Reservoir is based on a rainbow trout and kokanee basic yield fishery, lake trout trophy management and lake trout and smallmouth bass wild fishery management. The management

objectives of this plan also include: brown trout stocking through 1998, with evaluation of their performance and popularity with anglers; smallmouth bass management with regulations; annual channel catfish stocking with studies on establishment and angler satisfaction; nongame fish monitoring; watershed habitat improvements; and boating facility enhancement.

A 1991 creel census survey (Schneidervin and Brayton 1992) indicated that 48% of the anglers specifically sought rainbow trout. Kokanee were sought by 24% and lake trout by 13% of the anglers. The remaining percentage is made up of the other species or combinations of species.

In the past, when rainbow trout were abundant, there was higher fishing pressure at Flaming Gorge Reservoir. As the rainbow trout fishery has declined due to competition with Utah chubs and predation by lake trout, fishing pressure has declined. Kokanee numbers are also down because of the lake trout. A large segment of the angling public are not interested in the trophy lake trout fishery. That fishery is inhibiting management that would be acceptable to more anglers. To manage stocked rainbow trout with the lake trout, larger rainbow trout must be stocked. Rainbow trout is a fish that most anglers want and have fished for on Flaming Gorge Reservoir in the past. Flaming Gorge Reservoir is a large water that can provide much more use than it is getting. If the Division could provide more angling opportunities for rainbow trout, Flaming Gorge Reservoir would get more use and be able to absorb more of the anticipated growth in angling demand in future years.

To maintain the 840,000 angler hours estimated for Flaming Gorge Reservoir in the 1995 statewide angler survey, allowing for kokanee and lake trout harvest; a current stocking of 750,000 catchable rainbow trout is required. With an improved return to the creel for larger stocks (i.e., 10" fish), 600,000 rainbow trout would be required. It is anticipated that it would the year 2000 before any increases in stocking are possible. This is the basis of the increase in stocking between the period of 1996-1999 and 2000-2004. For 1996, rainbow trout stocking needs for all sizes and strains was identified is 415,000 fish. For the year 2000, it is estimated to be 662,000. Increases beyond the year 2004 reflect anticipated increases in fishing pressure.

Comment 95 The method used by the Tribe to project stocking numbers is not clear. Angling pressure is closely related to permit fees. There will be no need for an increase in overall stocking on the reservation above current levels unless fishing pressure increases. Fishing pressure on the reservation is closely controlled by the Tribe. Stocking in 1995, 1996 and 1997 was 13,920 lbs, 10,690 lbs and 10,768 lbs, respectively. The new hatchery at Big Springs will have more than enough capacity (30,000 lbs) to meet all of the Tribal stocking needs (19,000 lbs) well past the year 2035. Fishery management plans for the reservation are not current and need to be updated. These and a Tribe stocking policy need to be finalized before a fair assessment of the impacts can be made.(United States Fish and Wildlife Service, Management Assistance Office)

Response 95 The projected numbers are based on optimum angling pressure on the Tribal fishery resource and carrying capacities of the listed waters. It is anticipated that fishing pressure on Tribal waters will increase in the future. The Tribal hatchery planned for the Big Springs site will meet more than just the identified Tribal stocking needs. For example, the stocking needs for Colorado River cutthroat trout in the CRSP-affected area waters may be

supplied by the Big Springs hatchery. The planned capacity for the Big Springs site was evaluated against meeting the total stocking needs, not just the Tribal needs. Tribal fish management plans will be updated using data now being collected on angling pressure, water chemistry and fish habitat. Any changes in the fish management of the Tribal waters will be reflected in the design of the Big Springs hatchery if the Proposed Action is selected for implementation.

Comment 96 Maintaining an annual catch rate of 50,000 smallmouth bass ≥ 12 inches by year 2001 seems a bit ambitious and probably not realistic beyond the year 2001 considering current trends and fads. (Utah Outdoor Interest Coordinating Council)

Response 96 The catch rate goal of 50,000 smallmouth bass > 12 inches by the year 2001 is probably ambitious. According to the Division, they have not come close to that figure even on Flaming Gorge Reservoir. Lake Powell is probably the only water that could. Note that the figure represents a desired catch rate not harvest. This has no bearing on the stocking needs identified in the EA.

Comment 97 The management objectives section for Strawberry Reservoir does not reflect the more current ideas of cold-shock (or sterile)/fall spawning rainbow trout or the use of splake to help deal with expanding chub populations. (Utah Outdoor Interest Coordinating Council)

Response 97 The Division has purchased sterile rainbow trout eggs to provide 500,000 rainbow trout to be stocked in Strawberry Reservoir. At the time the stocking needs were developed, sterile trout rainbow eggs were not considered an option. And, they may not be an option if the percent sterility of these commercial eggs is not adequate. The addition of rainbow trout to the Strawberry Reservoir does not affect the stocking needs identified for the other species there.

As mentioned earlier, splake are not included in the approved management plan for Strawberry Reservoir. The objective of the management plan is to provide a fishery based on species that could reproduce. The cutthroat trout was selected as a predator, and the kokanee as a competitor with the Utah chub. The addition of splake would have to be approved by those who originally put together the Strawberry Reservoir management plan. This could be evaluated in the hydrologic unit management plan for Strawberry Reservoir.

Comment 98 The continued high level of Bear Lake cutthroat stocking for the Strawberry Reservoir does not reflect the State management goals for Strawberry tributary restoration and a fishery strongly supported by natural reproduction. In addition, the Wasatch County Water Efficiency Project (WCWEP) Environmental Impact Statement included project benefits that result from re-watering the upper Strawberry River. In effect, WCWEP stated that re-watering the Strawberry River would increase natural fish reproduction thereby allowing some of the fish hatchery production (currently supporting the reservoir) to be utilized elsewhere. The fish hatchery production plan does not reflect these other Management plans/objectives. Since the State hatchery production needs of the Strawberry Reservoir are significantly large, this discrepancy should be resolved prior to using the quantities shown in Table B-2 as a basis for making decisions regarding fish hatchery production requirements. (Utah Council, Trout Unlimited)

Response 98 The stocking requests reflect the limited natural reproduction that has been observed to date. Unless or until habitat is substantially improved or other factors potentially limiting reproduction in the tributaries are corrected, it does not appear that the management goal will be met. The Division does not feel that they can put the reservoir fishery "on hold" until the land management and stream habitat changes are realized. Another problem that may affect the natural recruitment component of the fishery is the heavy predation on small trout by the larger cutthroat trout. If good numbers of adult cutthroat trout are sustained, the Division anticipates high predation on young trout. Even more natural reproduction will be required in order to get good survival of young fish. If the habitat improves and good recruitment occurs, stocking will be reduced. The Commission and Division anticipate future improvements in natural reproduction with the restored flows provided by the Daniels Replacement Project and possible future stream restoration projects. As these improvements are realized, stocking needs for Strawberry Reservoir will be decreased.

As also pointed out, the Proposed Action Alternative would only provide about 54% of the stocking demand, therefore a "savings" at Strawberry Reservoir would be absorbed by the needs at other waters. There is no need to "resolve this discrepancy" before moving ahead with the EA.

Comment 99 Stream-side incubation units could be beneficial in meeting the recruitment goal of 10 million young of year for Strawberry Reservoir. (Utah Council, Trout Unlimited)

Response 99 Stream-side incubation units could help increase the hatching success on the tributaries, but as stated above, the Division is seeing substantial predation on 3" fingerling cutthroat trout by the adult cutthroat trout. Unless an extremely high number of young of year is produced to adjust for the adult predation, it may not be worth the effort.

Comment 100 There is not a definition of "trophy" as it relates to lake trout in Flaming Gorge Reservoir. Maintaining an average of 15-21 inches does not appear at first sight to be a "trophy" to the average lake trout angler. (Utah Outdoor Interest Coordinating Council)

Response 100 The Flaming Gorge Reservoir fishery management plan does include a trophy lake trout component. A trophy fishery is defined by the Division as providing quality fishing rather than quantity. Management efforts are directed toward producing "larger than average" sized fish. Quite often the lengths listed as trophy sizes in management plans are far short of the trophy sizes that anglers seek. This is true in Utah's management plans as well as other states. To many anglers a trophy trout is 15-21 inches in length.

Appendix C Division draft stocking policy

Comment 101 Fish stocking "will only be conducted in a manner that does not adversely affect the long-term viability of native aquatic species or their habitat...". This is a very welcome policy. How is the long-term viability of native aquatic species to be measured? Does this include exotic baits used in fisheries? Accidental introduction of exotic species by boats? Does native aquatic species include species other than fish? (Peter Hovingh)

Response 101 The long-term viability of native aquatic species are being evaluated through surveys conducted by the Division's native aquatic biologists. We are unaware of the exotic live baits that you refer to. The use of live fish as bait is not allowed in Utah. The Division has observed that fewer anglers use salamanders as bait than in the past (in the early 1980s, they were sold as bait, but are no longer). Night crawlers are the most common live bait used across much of the state. Crayfish can only be used in the water where taken. The Division is seeing more and more use of artificial baits and lures.

In terms of accidental introduction of exotic species by boats, the Division encourages anglers to clean their equipment, through an aquatic education program. They have done this in the past to control the spread of aquatic vegetation and are now doing it to control the spread of whirling disease.

The native aquatic species currently being surveyed include fish, amphibians and molluscs.

Comment 102 The practice of disinfecting fish hauling trucks is superfluous if boats and rafts are not also disinfected (Peter Hovingh)

Response 102 The practice of disinfecting fish-hauling trucks is required to prevent the spread of diseases from stocked waters to the hatcheries. Once a disease is introduced to a hatchery, the ability to produce fish is hampered.

To control the movement of organisms between waters, recreationists besides anglers and boaters must also be considered. Hikers, mountain bikers, etc. move across drainages and travel across country. As our society becomes more mobile the risks of movement of organisms increases. The Division encourages the public through education to do what is needed. For example, information is available on the Internet encouraging anglers to clean equipment. They are working with groups like Trout Unlimited and Salt Lake County Fish and Game Association to put out informational materials and signs on this issue.

Comment 103 Stocking on lands closed to the public. Certainly a biological survey must be included as under Title III Section 306 (b) and this survey should be for at least one entire season, unless that season is abnormal, then several seasons should be surveyed. (Peter Hovingh)

Response 103 According to the Division's Fish Stocking and Transfer Procedures, they will stock only waters with public access. As mentioned above, surveys are being conducted by Division biologists. The length and intensity of these surveys depend on the study objective.

Comment 104 In regards to the coordination of stocking of native species with the Bonneville Basin Conservation and Recovery Team and consistency with conservation strategies and agreements, what about the Boreal toad conservation agreement alluded to in the culturing of toads? So far, these conservation agreements have not been reviewed by the public or by the herpetological community. (Peter Hovingh)

Response 104 The conservation strategy for the spotted frog has been drafted and was noticed in the Federal Register for public review on November 28, 1997. A boreal toad conservation

strategy and agreement or a conservation management plan will be drafted for Utah in the near future. This strategy or management plan will also be available for public review.

Comment 105 It is agreed that the Division will continue to manage fisheries in wilderness areas. However, I strongly object to the continued stocking of these lakes for brook trout, nonnative cutthroat, golden trout, splake and grayling and using Federal monies to raise these fish. Continued stocking of fish in wilderness lakes alters the aquatic habitat by the mere introduction and the riparian habitat by the users of this introduction. The impact statement addressing improvements of the fish hatcheries should include fish numbers that are freed up now for the wilderness areas because of the CUP fish stocking projects. I do support the goal that rainbow trout will not be stocked within currently designated wilderness areas. (Peter Hovingh)

Response 105 The species stocked in wilderness areas waters were "grandfathered" in by the Wilderness Act. Any species that were being stocked or managed prior to the Act may continue to be stocked. The Division plans to use native, Bonneville or Colorado River cutthroat trout where they can. Some waters are not suitable for them. Based on past fish management, cutthroat trout tend to survive better in lakes with low productivity levels.

Approximately 50% of the High Uintas Wilderness lakes of two acres and larger are managed as fisheries, and according to Forest information, only thirty per cent of lakes one acre and larger are managed. Seventy percent of the lakes are not managed or stocked. The Division conducted a use survey in the Uinta Mountains in 1993 (UDWR unpublished file data, Northern Regional Office, Ogden, Utah). Results indicated that one per cent of wilderness users (anglers and nonanglers) were opposed to the Division's stocking program in the wilderness area waters.

Reducing stocking alone will not necessarily reduce the use in the High Uintas Wilderness. Some areas are very attractive to all wilderness users and would be heavily used regardless of stocking levels.

Comment 106 Why are rainbow trout being singled out here? Competition by brook trout may be just as important as potential hybridization to a sport fishery, and what does wilderness have to do with rainbow trout specifically? (Utah Outdoor Interest Coordinating Council)

Response 106 Rainbow trout are not native to Utah, and are known to compete and hybridize with native cutthroat trout. It is true that while competition by brook trout may be just as likely, hybridization by brook trout is not. Rainbow trout are also being singled out because they make up the bulk of the sport fish stocking. Stocking of either of these species in wilderness areas is controversial. It is felt by some wilderness users that only native species should be stocked or that no stocking should be done at all.

Comment 107 The concept of new introductions should be controlled by out-of-State biologists, herpetologists, malacologists and crustacean biologists. There are too many stream crossings, habitats, State lines, land jurisdictions and native species to have the Division and Wildlife Board decide. (Peter Hovingh)

Response 107 By law, the Division is responsible for wildlife management in Utah. Proposals for new introductions have to go through not only the Division and the Wildlife Board but other agency review and groups like the State Resource Development Coordinating Committee, which includes a public review process.

Comment 108 Where are the fishless waters? What aquatic fauna occurs in these waters? Why not keep them fishless? (Peter Hovingh)

Response 108 There are many fishless waters in Utah. In the Uinta Mountains, 50% of the lakes 2 acres and larger are not stocked and only 30% of the lakes 1 acre and larger are managed as fisheries. There are hundreds of lakes and ponds in the Uinta Mountains alone that are fishless. The Division does not have any plans to stock most of them. Any new stocking in these waters would have to undergo review by the Division and the Forest Service.

The Division's biologists are conducting surveys as mentioned earlier (Response 69).

Comment 109 Lake Powell exhibited cyclic and inconsistent population characteristics of black crappie. (Utah Outdoor Interest Coordinating Council)

Response 109 Populations were probably cyclic; but, for the first 20 years or so as Lake Powell was filling it had a lot more consistent crappie fishery than other waters in the state have produced.

Comment 110 The statement that walleye fisheries in Utah reservoirs have been very cyclic is no more true for walleye than for fisheries of other species, all of which need to go through the typical boom and bust periods prior to reaching any form of equilibrium. (Utah Outdoor Interest Coordinating Council)

Response 110 The single species or species-limited forage populations have lead to boom and bust walleye fisheries, a species that has been observed to be more cyclic than others, such as rainbow trout, for example. The Division feels that managers should be very cautious about walleye introductions. Stocking forage, and especially new species has been difficult in the past and may become even more difficult in the future.

Comment 111 For general event stocking the requirement to stock at least 24 hours before the event so they can acclimate to their new surroundings and will be readily caught is not necessarily true and may contribute to other problems. This may unnecessarily constrain organizers and the Division. (Utah Outdoor Interest Coordinating Council)

Response 111 The Division has found through experience that most of the time, for the reasons you have mentioned, it is better to stock at least 24 hours in advance. If fish are not fed for 24 hours, they are more likely to be caught. The Division has observed greater harvest if fish are stocked at least twenty-four hours in advance.

Comment 112 The practice of co-habitating Bonneville cutthroat trout, Colorado River cutthroat trout and rainbow trout in the same hatchery facility should be carefully evaluated. (Utah Council, Trout Unlimited)

Response 112 As two independent hatchery systems are not available, the purpose of producing both species at a particular hatchery is to make the best use of the water and physical plant or raceways at the facility. Typically, cutthroat trout are produced in what is called "first pass" water, that is, water directly from the source. Rainbow trout may be cultured using this water after it has passed through the cutthroat trout, or as "second pass" water. The concern for mixing the two species and the potential hybridization is a real one that is shared by the management agencies and Tribe. Design criteria for the proposed action hatcheries will include safeguards to prevent mixing of these species.

Comment 113 Since the intent here is to evaluate the versatility of the hatcheries' production capability with respect to the listed species and size categories of fish, please amend the table as follows:

Brook trout fingerling	Add Mantua
Brown trout fingerling	Add Kamas, Whiterocks, Loa and Springville
Bear Lake cutthroat fry	Add Whiterocks and Kamas
fingerling	Add Fountain Green, Kamas, Whiterocks, and Mantua
Bonneville cutthroat	Add Kamas, Whiterocks and Mantua
Yellowstone cutthroat, fry	Add Kamas, Whiterocks and Mantua
Colorado River cutthroat, fry	Add Kamas, Mantua and Fountain Green
fingerlings	Add Kamas, Fountain Green and Mantua
Snake River, subcatchable	Add Mantua
Kokanee, fingerlings	Add Kamas, Mantua and Fountain Green
Lake trout, fry	Add Kamas, Mantua and Fountain Green

(State of Utah)

Response 113 The changes have been made as recommended.

Comment 114 One of the most difficult aspects of the process has been defining the specific fish production needs for CRSP waters. We appreciate the difficulty that the State has in "partitioning" fish from their individual hatcheries. However, by not doing so, there remains a level of uncertainty as to how we came to where we are. (Utah Council, Trout Unlimited)

Response 114 An alternative to build a cold-water and a warm-water facility dedicated to stocking only CRSP-affected area waters, was considered but eliminated during the planning process (see page 2-4). Use of the existing hatchery systems would be made where possible to increase production capacity. Because of this decision, and the existing condition of those State hatcheries, reconstruction is required to maintain the existing capacity in addition to increasing it.

See earlier comment response (Response 6). State hatcheries produce fish to be stocked not just in their region, but statewide although the Division makes stocking trips as short as possible to save money and to avoid putting more hauling stress on the fish than is necessary. State hatcheries adjust stocking schedules annually and during the year as conditions change due to droughts, floods or reservoirs being drained. The individual hatcheries are not dedicated to particular waters, but are managed as a system. Those State hatcheries included in the Proposed Action are not the only State hatcheries that stock CRSP-affected area waters. The increased capacity of the reconstructed State hatcheries will be used for production in CRSP-affected waters and conservation and recovery needs.

Comment 115 Use Water Quality instead of "1st Pass Water Quality" as heading, in column 2. (State of Utah)

Response 115 The change has been made as recommended.

Comment 116 For the Table of Evaluation Criteria add or amend the water quality data as given. (State of Utah)

Hatchery	**Corrections**
Fountain Green	N_2 103%
Loa	N_2 103%; pH 8.0
Mantua	N_2 119-128%; delete "[total gasses] and "aerator column used for gasses"
Midway	N_2 114-117%; delete "[total gasses] and "aerator column used for gasses"
Springville	DO 6.8-7.5 mg/l; pH 7.5; N2 100-104%; Hatchery building 54° F outside raceways 58-61° F.
Whiterocks	DO 7.7-9.9 mg/l
Goshen	Selenium 3.9 µg/l not mg/l
Gandy	N_2 106%; pH 7.8
Kamas	Substitute "N&S springs" for "one source"
Midway	55-59° F

Response 116 The corrections have been made as recommended.

Comment 117 The EA states and emphasizes that "..it is the increased capacity which will be evaluated in meeting the needs at these facilities." Cost efficiency data for evaluating how well this increased production capacity meets the need should, therefore, address only the increase in capacity. This will also make it possible to compare the cost efficiency of improvements at existing hatcheries with cost efficiency of new hatcheries, which have no record of pre-project

production or operating costs. Please amend the data with the information provided. (State of Utah)

Hatchery	Corrections
Big Springs	Substitute 30,000 lbs. for 20,600 lbs and change the cost per pound to $1.16
Fountain Green	Delete all but cost of improvements ($5,836,000); substitute: increase in production 47,400 lbs.; increase in O&M cost $68,300
Jones Hole	Delete all but cost of improvements ($1,674,000): substitute increase in production 88,000 lbs, increase in O&M costs $112,000 ($1.27)
Kamas	Delete all but the cost of improvements ($5,651,900); substitute increase 60,000 lbs.; increase in O&M cost $74,400 ($1.24)
Loa	Delete all but cost of all proposed improvements ($3,373,000), and Level 1 improvements ($1,994,000), substitute: increase in production (all) 92,258 lbs.; increase in O&M cost (all) $147,000 ($1.59/lb); increase in production (Level 1) 50,152 lbs.
Mantua	Delete all but cost of all proposed improvements ($4,984,000), and Level 1 improvements ($3,047,000); substitute: increase in production (all) 65,996 lb; increase in O&M costs (all) $14,000 ($.21/lb), increase in production (Level 1) 6,736 lbs.
Midway	Delete all but cost of all proposed improvements ($10,488,000), and Level 1 improvements ($4,930,500); substitute: increase in production (all) 143,338 lbs.; increase in O&M costs (all) $128,000 ($.89/lb); increase in production (Level 1) 72,536 lbs.
Springville	Delete all but cost of all proposed improvements ($6,954,000), and Level 1 improvements ($2,927,000); substitute: increase in production (all) 129,722 lbs.; increase in O&M costs (all) 129,722 lbs.; increase in O&M costs (all) $169,000 ($1.30/lb); increase in production (Level 1) 70,954 lbs.
Whiterocks	Delete all but cost of all proposed improvements ($5,144,000), and Level 1 improvements ($2,430,000); substitute: increase in production (all) 95,880 lbs.; increase in O&M costs (all) $87,000 ($.91/lb); increase in production (Level 1) 52,189 lbs.

Response 117 The EA identified, as one of its purposes, that projects be cost-effective (both capital and operations and maintenance) and/or provide the versatility to respond to future management objectives and species and/or size in the hatchery product. Another purpose is to perpetuate and increase hatchery production capabilities. Both action alternatives will maintain existing production as well as increase it.

The increased production was evaluated as to how well the need would be met (in species, numbers and pounds) under both action alternatives rather than the entire capacity of the reconstructed hatchery, as the Division must meet stocking needs on waters other than those in the CRSP-affected area (see also the response to Comment 64).

Valid comparisons between existing and post-project production costs are not available (see Response 62). The capital costs for existing hatcheries are not available, and new hatchery construction is included in both action alternatives. The production costs incorporating O&M and amortized capital costs are presented in the economic summary (Table 6, Chapter 3). For the evaluation criteria, the data will be amended to include capital costs, production capacity in pounds and O&M costs, both total and increased, where applicable.

Comment 118 Amend the water quantity information with the data provided. (State of Utah)

Hatchery	Water quality data corrections
Loa	Substitute 6200 g.p.m. for 5850 g.p.m.
Midway	Substitute "downstream" for "d/s"
Springville	Substitute "Average available flow of 7600 g.p.m." for existing information

Response 118 The changes have been made as recommended.

General

Comment 119 I could only recommend improvement of fish hatchery production if: (1) all live bait use be eliminated for catching fish; (2) movement of exotics in the future be eliminated with boat quarantines and disinfectants at boat launching sites; (3) that only public land managers decide if fish stocking is to occur and what species is to be stocked in waters managed by these agencies after a full review by a scientific advisory committee; (4) that a full inventory of all aquatic macroinvertebrate species occur to the species level with distributional maps for Utah; and (5) that no new exotics be introduced into Utah. (Peter Hovingh).

Response 119 Thank you for your input. We believe the measures already adopted by the State or included in the action alternatives address your concerns, specifically: (1) As stated above (Response 100), the use of live fish as bait, is not allowed in Utah now. Most live bait now used consists of night crawlers and crayfish, but only in the water where they are harvested. (2) Recreationists are encouraged to disinfect their equipment. The Utah Division of Parks and Recreation regulates boat use. Boat disinfection areas would be useful at waters identified as containing whirling disease. However, it is currently not possible statewide on an economic basis. (3) The Division has the legal mandate to manage fish and wildlife in the State and decides where fish stocking is appropriate. The Division's Fish Stocking and Transfer Procedures (1997), states in the native and nonnative sport fish and recreation stocking general guidelines, that input from the angling public, private landowners and other resource agencies will be considered. The process for new introductions includes a public and agency review. (4) The Division program is currently evaluating the existing records of aquatic macroinvertebrate distribution in the State. (5) New introductions in Utah must meet the requirements discussed in the Division Fish Stocking and Transfer Procedures.

Comment 120 Trout Unlimited (TU) has developed a general position and specific recommendations related to cold water fishery and ecosystem conservation. This general position states:

> Hatchery production and stocking are appropriate in the context of conserving and restoring native salmonid biodiversity and natural ecosystems, but use of hatcheries should not be substituted for proper management, which aims to restore self-sustaining wild and native salmonid populations. Where stocking is appropriately used, a rigorous program of biological risk management is required.

This position takes a firm view of when and where "hatcheries" are most appropriately used. It recognizes that hatcheries, as a tool, have a place in modern fisheries management, but that the tool should primarily serve long term conservation needs. This position also recognizes that as part of our public trust to all citizens, our first obligation is to ensure the maintenance and restoration of the fundamental life support system of the aquatic life rather than a topical treatment of the symptoms. (Trout Unlimited National)

Response 120 We can appreciate Trout Unlimited's position on the appropriate use of hatcheries as a tool, and their use in modern fisheries management. The Division's Fish Stocking and Transfer Procedures recognizes that certain waters are capable of supporting populations of desirable game fishes as a result of natural reproduction. Where there is a biological potential, the Procedures state that management should emphasize wild fish whenever practical. In general, these waters will be managed as wild fisheries and not be stocked. For waters not capable of sustaining naturally-reproducing populations, particularly the large water supply reservoirs authorized by CRSP, stocking for sport fish recreation consistent with the mission of the Division is considered an appropriate fisheries management strategy. Stocking will also be consistent with recovery and conservation agreements.

Comment 121 It is important to recognize that there is not a single "one size fits all" reason for culture and stocking. Most programs can be characterized into six categories: (1) conservation; (2) supplementation; (3) mitigation, (4) put and take, (5) introduction; and (6) fish food aquaculture. Ultimately, the Mitigation Commission and the State of Utah have all six categories with which to contend. It is clear that most of Utah's efforts have been continued species introductions and put and take or put-grow-take. (Trout Unlimited National)

Response 121 Based on our review of the six categories of culture and stocking programs, we believe that the EA deals only with: (1) conservation, (2) supplementation, (4) put-and-take, and (5) introduction. It is true that the bulk of the stocking needs identified in the EA are for put and take or put-grow-take based fisheries. The Division's Fish Stocking and Transfer Procedures identify conservation and recovery of native species for augmentation, reintroduction and establishment of refugia populations. It also identifies native and nonnative sportfish and recreation stocking, which is to be conducted in accordance with the Hatchery Production Plan, the Annual Fish Stocking Schedule, the Annual Fish Transfer Schedule, Hydrologic Unit Plans and individual Water Management Plans. These planning documents are defined in The Fish Stocking and Transfer Procedures, which is included in Appendix D. As discussed previously, the stocking needs were identified by the Division and Tribal fisheries biologists and are based

on water carrying capacities, trends in angler preferences, conservation strategies, recovery plans and other planning aids.

Comment 122 The widespread use of hatcheries and stocking continues to generate controversy nationally, because the biological risks to native assemblages and ecosystems are often ignored or hand-waved away. The assertion that the release of propagated fish is beneficial or at least benign to the ecosystem has infrequently been investigated and is generally unworthy of acceptance. The scale at which these programs operate has had an important influence on the probability of a measurable impact. There have been demonstrated successes of propagation and stocking for conservation and recovery, however, these do not traditionally receive but a small fraction of the effort or budget. (Trout Unlimited National)

Response 122 We are aware of the controversy generated by the use of hatcheries and stocking programs. Concerns as you have listed were identified during the planning process for this hatchery program. These resulted in the preparation of the stocking assessment report (BIO/WEST 1997) with its recommendation for a stocking policy and the Division's Fish Stocking and Transfer Procedures. We believe that with these actions, the impacts of the stocking program in Utah have been reduced, while retaining the capability of providing sport fish recreation opportunities. The propagation and stocking for the conservation and recovery segment of the Proposed Action, while providing a smaller percentage of the identified needs in pounds of fish stocked, is receiving a large portion of the budget. Of the total project cost estimate ($28.5 and $28.2 million for the two action alternatives), $10 million is budgeted for the warm-water hatchery. The warm water fish hatchery is predominantly for conservation and recovery stocking.

Comment 123 The social and economic costs and benefits used to justify these programs infrequently include the full range of hidden expenditures of ancillary support and administration, the costs of integrating externalities necessary for truly minimizing or managing biological risks to the recipient watersheds, the costs over the long-run, and opportunity costs associated with alternate approaches. (Trout Unlimited National)

Response 123 Thank you for your input. The EA does not include a complete economic analysis as you have described. As discussed above, the Division's Fish Stocking and Transfer Procedures, with the requirement that stocking be in accordance with among other planning documents, the Hydrologic Unit Plans and individual Water Management Plans minimizes or manages the biological risks. It also, as mentioned previously states that where there is biological potential, wild fish management should be emphasized.

An additional comment was received during the review of the draft Environmental Assessment for the Reconstruction of the Kamas State Fish Hatchery that is pertinent to this assessment and so will be addressed here.

Comment 124 I am concerned about the proposed frog stocking plan associated with warm water fish hatcheries (Draft Environmental Assessment, Revised Fish Hatchery Production Plan, August 1997) where possible cold water adapted spotted frog and boreal toad stock from the

Wasatch and Uinta region will be raised associated with a warm-water hatchery in Snake Valley (next to Nevada) or elsewhere. If such a program is to be needed and implemented, I would suggest that the Kamas State Fish Hatchery be designed at this time to accommodate this aspect of the frog recovery program for several reasons: (1) The amphibians that will benefit from this program come from the Wasatch and Uinta geographic areas;(2) the fish stocking program of the past is the prime cause of the toads disappearing from the Wasatch and Uinta Mountains: (3) Beaver Creek (which includes the Kamas Hatchery) was once occupied by spotted frogs in the 1960's ; and, (4) the upper Weber River, where spotted frogs were found in the 1960's but now have disappeared, may be re-established for spotted frogs in the future. At this time, however, the use of hatcheries appears to be a quick add-on to establish more paper benefits for the hatchery program. (Peter Hovingh)

Response 124 The identified purpose and need for the Kamas Hatchery reconstruction is to increase the coldwater fish production to satisfy long-term demands for fish not currently possible due to inadequate capability at the existing hatchery. The culture of amphibians would be outside of that purpose and need. However, there is nothing in the anticipated physical design of the Kamas State Fish hatchery that would be preclude the culture of amphibians there. As stated earlier, research needs have been identified in the Draft Spotted Frog Conservation Strategy to determine the optimum life stage (e.g., eggs, tadpoles, juveniles, or adults) for successful introductions to occur. The Draft Strategy identifies the need for the development of protocols for captive propagation and rearing; for translocation, introduction and reintroduction of spotted frog; and the identification and development of brood stock sources including identification and taking of wild sources, and potential rearing facilities. It is anticipated under the site-specific NEPA evaluation of the warm water hatchery that the ability of existing facilities, including the Kamas State Fish Hatchery, will be evaluated as an alternative.

appendices

Red Butte
Kamas
Big Springs
Jones Hole
Great Salt Lake
Midway
Whiterocks
Springville
Goshen
Provo River
Green River
Bonneville Basin
Fountain Green
Gandy
Colorado River

APPENDIX A
WORKGROUP MEMBERSHIP and plan history

The 1994 Fish Hatchery Production Plan was developed by the Fish Hatchery Production Workgroup. Members of the original Workgroup were:

Don Archer, Utah Division of Wildlife Resources
Dan Bumgarner, U.S. Fish and Wildlife Service
Buzz Cobell, U.S. Fish and Wildlife Service
Larry Dalton, Utah Division of Wildlife Resources
Don Duff, U.S. Forest Service/Trout Unlimited
Ron Groves, Ute Tribe Fish and Wildlife Department
Paul Janeke, U.S. Fish and Wildlife Service
Clark Johnson, U.S. Fish and Wildlife Service
Bill Partner, Stonefly Society
Tim Provan, Utah Division of Wildlife Resources
Lance Smith, Stonefly Society
Scott Tolentino, Utah Division of Wildlife Resources
Joe Valentine, Utah Division of Wildlife Resources

This revision was developed by the following members:

Paul Dremann, Trout Unlimited
Don Duff, U.S. Forest Service/Trout Unlimited
Henn Gruenthal, Utah Division of Wildlife Resources
Bill James, Utah Division of Wildlife Resources
Chris Keleher, Utah Division of Wildlife Resources
Tim Miles, Utah Division of Wildlife Resources
Mike Montoya, Ute Tribe Fish and Wildlife Department
Tom Pettengill, Utah Division of Wildlife Resources
Paul Thompson, Utah Division of Wildlife Resources
Bob Williams, U.S. Fish and Wildlife Service
Maureen Wilson, Utah Reclamation Mitigation and Conservation Commission
Joe Valentine, Utah Division of Wildlife Resources

Plan History

The Plan was originally submitted to the Commission by the Service in November, 1994. In the original Plan, existing hatcheries which stock CRSP-affected area waters were evaluated by the Workgroup members and the staff of the Service Fish Technology Center in Bozeman, Montana. Rehabilitation of the hatcheries was prioritized using four factors: 1. Facility condition, 2. Physical site characteristics, 3. Production potential and 4. Water supply. Specific activities at each hatchery were also prioritized, with rehabilitation of the production facilities receiving the highest priority.

Construction of new hatcheries was treated separately. These sites were to be evaluated after the feasibility studies were conducted. The total cost of rehabilitation and construction, based on this evaluation was estimated to be $28 million. A need for a 25% match to the $22.8 million provided by CUPCA 313(c) was identified to fund the rehabilitation and construction identified in the Plan.

An Environmental Assessment was written for the Plan and a Finding of No Significant Impact was signed February 2, 1995. In July 1995 the Commission, Interior, the Service, the Division, the Tribe and Trout Unlimited entered into a MOA to begin implementation of projects identified in the Plan. This MOA identified the need to revise the plan as indicated by findings of feasibility studies, site-specific NEPA analyses, and the management plan and conservation strategies for Bonneville and Colorado cutthroat trout. The Commission reserved the right to reevaluate the Plan during the development of its 5-year plans in accordance with Section 301[g] of CUPCA.

The MOA also required that a report on the assessment of the impacts of stocking be written. This report determined the positive and negative effects of past stocking practices in Utah, potential impacts of future stocking, and recommendations to avoid the potential impacts (BIO/WEST 1997). The positive effects of fish stocking listed were: improvement of sportfishing opportunities and restoration of native species. The negative effects listed were on the wild or native fauna of stocked waters. These effects are expressed through predation, competition, genetic introgression, hybridization, introduction of diseases and increased fishing pressure. An indirect effect of fish stocking is the economic benefit generated from sportfishing. In some cases, however, stocking costs outweigh the benefits. Stocking practices changed approximately 10 years ago based on poor returns of stocked fish to the creel for the costs involved. Utah has reduced their stream stocking program, recognizing that streams do not provide the same return as reservoirs. Streams still receive between 20-25 % of fish stocked in Utah.

The stocking of nonnative fish from hatcheries has been problematic for Utah's native species. Most of the major problems were not caused by recent stocking programs of the State. Impacts to amphibians, mollusks and other components of the aquatic ecosystem have primarily been affected by warm-water fish stocking, and from past (late 1800s and early 1900s) stocking practices. Most fish are now stocked in reservoirs that do not provide sufficient habitat to establish self-sustaining populations. Present stocking practices are not thought to have the same degree of impact, with the exception of smallmouth bass in Jordanelle Reservoir. In their water management plan for Jordanelle Reservoir, the Division did consider the issue of impacts to spotted frog populations in Heber Valley through transport of smallmouth bass by anglers to ponds along the river corridor (UDWR 1993, Water management plan summary sheet). The

water management plan identified the possibility of existing transports with the substantial population of smallmouth bass downstream in Deer Creek Reservoir. On potential future problems, the report stated that they will probably be due to new predators or competitors impacting native warm-water fish populations that are already at high risk (BIO/WEST 1997). The most common negative effect from cold-water species will be through competition from stocked fish (i.e., rainbow trout in streams) on wild trout populations.

The report recommended the development of a detailed, written fish stocking policy, by the Division and Tribes that incorporates planning guidelines, cutthroat trout Conservation Strategies, Upper Colorado River Basin Nonnative Fish Stocking Policy, other Conservation and Recovery Plans, and a public review process. The recommended policy should address actions to be taken where fish stocking could adversely affect biodiversity and wild populations, incorporate fish stocking procedures, consider how to handle warm-water forage and sportfish introductions, native cutthroat trout management, stocking new reservoirs, wild and trophy fisheries, illegal stocking, genetics of native fish culture and wilderness area stocking.

Hatchery feasibility studies were conducted in 1996 for several State sites[1], Jones Hole National Fish Hatchery; and Big Springs and Fort Roubidoux Tribal sites. These studies indicated that the cost of rehabilitating and constructing the hatcheries would be approximately $64 million (Appendix C, Table C-3), signifying a need to reevaluate and focus on a more limited scope, with a more realistic budget and time frame. The increased costs from the feasibility studies are based on a total reconstruction in most cases, rather than a minimal repair of facilities, on the recognition of increased construction costs and on the inclusion of contingencies.

The Commission has determined that based on this updated information, a Plan revision is required. This revision of the Plan incorporates the Mitigation and Conservation Plan (URMCC 1997) priorities, feasibility study (HRS 1996, JDK 1990a, 1990b, FishPro 1996a, 1996b, 1997), the stocking assessment report (BIO/WEST, Inc. 1997), and Division's Fish Stocking and Transfer Procedures (UDWR 1997).

[1]State fish hatcheries included those which have stocked CRSP-affected area waters: Loa, Mantua, Springville, Midway and Whiterocks. Previous studies for the Fountain Green and Kamas sites were updated to reflect 1994 costs.

appendix B
Colorado River Storage Project (CRSP) reservoirs and related waters

Flaming Gorge Unit
- Flaming Gorge Reservoir - On Green River, 42,020 surface acres
- Green River, Colorado River

Glen Canyon Unit
- Glen Canyon Reservoir - On Colorado River, 161,390 surface acres
- Colorado River (backwater areas only)

Lyman Project
- Stateline Reservoir - On East Fork of Smiths Fork, 300 surface acres

Central Utah Project
Jensen Unit
- Red Fleet Reservoir - on Big Brush Creek

Vernal Unit
- Steinaker Reservoir - offstream, water source: Ashley Creek, 820 surface acres
- Stabilized lakes:
  - Chepeta
  - Moccasin
  - Papoose
  - Whiterocks
  - Wigwam
  - Paradise Park
  - Clift

Upalco Unit (Proposed Action in Draft EIS)
- Crystal Ranch Reservoir - Proposed, on Yellowstone River, 524 surface acres
- Twin Pots Reservoir - Reservoir and dam replacement, 194 surface acres
- Big Sand Wash Reservoir - Reservoir enlargement, from 393 to 537 surface acres
- Clay Basin Settlement Pond - Proposed to be deepened, with fish cover structures added
- Lake Fork and Yellowstone Rivers instream flows and habitat improvement
- Lakes to be stabilized, Yellowstone River drainage
  - Bluebell
  - Drift
  - Five Point
  - Milk
  - Superior
  - Deer
  - East Timothy
  - Farmers
  - Water Lily
  - White Miller

Uintah Unit (Proposed Action in Draft EIS)

- Lower Uintah Reservoir - Proposed on the Uinta River, 3,300 surface acres
- Big Springs Ponds - Proposed excavation, dike rehabilitation and campground
- Uinta and White Rocks Rivers - habitat improvements, and diversion structures
- Bottle Hollow Reservoir water supply delivery
- Powerplant Canal
- Pipeline to Bullock and Cottonwood Reservoirs
- Diversions to Cedarview Reservoir
- Pole Creek diversion structure and habitat improvement
- Lakes to be stabilized, Uinta River drainage
    - Atwood
    - Crescent
    - Fox
    - Lower Chain
    - Middle Chain

Indian Commitment System

- Rock Creek minimum flows
- Midview Reservoir, fishery and recreation O&M to the Tribe, and minimum fishery pool

Title V Ute Indian Rights Settlement

- Cedarview Reservoir repair
- Pole Creek, Rock Creek, Lake Fork River, Uinta River and White Rocks River stream improvements
- Bottle Hollow Reservoir Renovation

Bonneville Unit

Starvation Collection System

- Starvation Reservoir - On Strawberry River

Strawberry Aqueduct and Collection System

- Upper Stillwater Reservoir - On Rock Creek
- Currant Creek Reservoir - On Currant Creek
- Strawberry Reservoir - On Strawberry River
- Bottle Hollow Reservoir - Offstream reservoir, water source: Uinta River, 400 surface acres
- Midview Reservoir, minimum pool
- Rock Creek, South Fork Rock Creek, Currant Creek, Strawberry River, Duchesne River and W. Fork Duchesne River, Bjorkman Hollow, Hobble Creek, Willow Creek, Sixth Water Creek, and Diamond Fork

Municipal and Industrial System

- Jordanelle Reservoir - On Provo River
- Provo River
- Utah Lake
- Stabilized lakes: Provo River drainage
    - Big Elk
    - Crystal
    - Duck
    - Fire

Island
Long
Marjorie
Pot
Star
Teapot
Wall
Washington, campground
Weir

Diamond Fork System

- Diamond Fork
- Sixth Water Creek
- Utah Lake

Spanish Fork - Nephi Irrigation System (in planning)

- Mona Reservoir
- Spanish Fork River
- Utah Lake
- Salt Creek
- Jordan River
- West Creek

Wasatch County Water Efficiency Project and Daniels Replacement Project

- Strawberry River
- Daniels Creek
- London Creek
- Rock Creek
- Creamery Ditch
- Spring Creek
- Lake Creek

Provo River Restoration Project

- Provo River

Emery County Project

- Joes Valley Reservoir - On Seely Creek, 1,170 surface acres
- Huntington North Reservoir - On Huntington Creek, 242 surface acres
- Stabilized lakes:
  - Academy Mill
  - Petes Hole
  - Soup Bowl
  - Red Pine No. 1
  - Red Pine No. 2
  - Grassy Lake
  - Blue Lake

Appendix c
MANAGEMENT OBJECTIVES AND FISH NEEDS

The CRSP has impacted Federal, State, Tribal and private lands. Constructed reservoirs have increased flat water recreational fishing opportunities and the need for artificial propagation of fish. They have also caused loss of wild and native fish habitat. A list of the CRSP-affected area waters have been identified from a Bureau of Reclamation technical publication (Water and Power Resources Service 1981), the Service report on status of mitigation recommendation (USFWS 1992, 1997) and Service correspondence to the Division (September 1992). Those waters that are managed by stocking and their fishery management objectives as defined by the Division and the Tribe, including recovery and/or conservation efforts are presented by watershed in Table C-1.

Waters or species managed by the Division of Wildlife Resources are categorized by management objective. These are listed below:

- ***Basic Yield Waters***: this type of fishery management is applied to the majority of trout fishing opportunities in Utah. The focus is on a family-oriented recreation and the habitat capability to grow fish to an acceptable size. These waters are stocked with fingerling-sized (e.g., 4 inch) fish or are sustained through natural reproduction. Catchable fish are stocked only as supplements to the fishery, they do not provide the majority of the harvest. Large fish are not the target of this management category. Standards are: an average catch rate of 0.5 fish/hour and a positive net return to the creel when comparing a pound of stocked fish versus a pound of harvested fish (i.e., for every pound of fish stocked, a pound of fish is returned to the creel. Fish in the creel may be a larger size.)
- ***Intensive Yield Waters***: these waters provide fishing opportunity where angling pressure is heavy or where habitat conditions are marginal for fish growth and survival. These waters tend to be smaller than ***Basic Yield Waters*** and are usually closer to urban centers or in heavily used recreation sites. Management includes stocking of catchable sized fish (e.g., 8 inch). These are stocked to provide immediate fishing opportunities. The fish are not intended to stay in the water body for an extended period or grow to a larger size. Family and especially youth recreation is the primary focus of this strategy. Species management is mainly limited to rainbow trout. In some heavily used waters, albino rainbow trout are stocked so that anglers can see that the waters has been stocked and fish are present. Standards are: an average catch rate of 0.5 fish/hour, a minimum of 70% return to the creel in numbers for all catchable fish stocked, an average of 500 angler-hours/acre/year and an average weight of 2.8 fish/pound for stocked catchable trout.
- ***Wild Fish Waters***: these waters are managed for fish that are the result of natural reproduction. Some waters may require stocking of hatchery fish because the habitat does not provide for enough wild fish to meet angler use (e.g., Green River below Flaming Gorge Reservoir). All wild fish waters have the habitat and potential to grow small fish to adult size for the managed species. These waters may be managed with "special regulations" involving gear restrictions and reduced or specialized harvest. Standards are: to maintain catch rates and fish sizes by species at the same standards set for the ***Basic Yield Waters*** and to maintain these standards by regulation rather than by stocking.
- ***Trophy waters***: these waters are oriented to providing quality fishing opportunities, not necessarily quantity. Management efforts are directed toward producing "larger than

average" sized fish. Trophy water can be managed though either stocking or natural reproduction. Species diversity by water has no limitations under this management concept. The standards for trophy waters are: to provide an average catch rate of 0.05 fish/hour for trophy-sized fish.

- ***Recovery***: any threatened or endangered federal and/or state species or subspecies which is threatened with extirpation or is likely to become an endangered species within the foreseeable future throughout all or a significant part of its range in Utah or the world. A management program is needed for recovery of these species with one component being augmentation stocking.
- ***Conservation***: any species with a state rating of special concern, or conservation species that is declining in its range within Utah or the world. Special Management (e.g., conservation strategies) which includes augmentation stocking will be required to stabilize and reverse this trend.

The Ute Tribe management emphasis is for the restoration of Colorado River cutthroat trout, in support of the conservation strategy and to provide coldwater sport fish opportunities on Tribal waters. The Tribe's approach to Colorado River cutthroat trout conservation and management is via a broodstock hatchery that would employ all available research to develop a design and management plan to maintain and enhance genetic diversity. The Tribe's fishery management plan is currently being revised and will be incorporated in the Plan in the future.

Considerations used in the development of fish stocking numbers (see Table B-1) are listed below:

- Since 1968, fishing on lakes and reservoirs has comprised 73% of the pressure (Lilieholm and Krannich 1996), while fishing effort on streams has averaged 27%. These values have remained relatively constant over the last 25 years.

- Trout have been the most popular sport fish in Utah. Approximately 75% of anglers fish for cold water species and 25% for warm water species. Of cold water fish caught, 30% were harvested in 1995 versus 46% in 1991 (Lilieholm and Krannich 1996).

- As the Governor's Office of Planning and Budget does not have population projects beyond the year 2020, they advised the Division to use the average rate of increase for the 1995-2020 period (1.99%/year, with 1.90%/year used toward the end of the 2020-2035 period, as the growth rate is anticipated to decrease in the future). Based on license sales figures for the 1950-1995 period, license sales have averaged 24% of the states total population. Using this value, with the projected population numbers, license sales are anticipated to reach 1.92 million by the year 2035.

- Stocking needs for waters managed by the Tribe assume the construction of the Uinta and Upalco Units of the CUP.

- A consideration of new flat waters, increased angler access, wild fish management, water carrying capacity, warm water species potential, habitat improvement projects and management by special regulation.

Table C-1. CRSP-affected area waters that are managed by stocking, with species stocked and management objectives, listed by watershed.

Water Name	Species	Management objective S=State; T=Tribe
Colorado River Watershed		
Blue Lake	Rainbow trout, unknown strain	S; Intensive yield
	Brook trout, OWHI	S; Basic yield
Colorado River	Roundtail chub	S; Recovery and conservation
	Flannelmouth sucker	S; Conservation
	Bluehead sucker	S; Conservation
Green River Watershed		
Green River Watershed	Boreal toad	S. Conservation
Academy Mill Reservoir	Brook trout, OWHI	S; Basic yield
Big Sandwash Reservoir	Rainbow trout, unknown strain	S; Basic yield
Big Springs Ponds	Rainbow trout	T; Intensive yield[1]
	Colorado River cutthroat trout	T; Intensive yield
Bottle Hollow Reservoir	Rainbow trout	T; Basic yield
	Brown trout	
	Colorado River cutthroat trout	
Cedarview Reservoir	Brook trout	T; Basic yield
	Colorado River cutthroat trout	
	Brown trout	
Chepeta Lake WR-64	Colorado River cutthroat trout	S; Basic yield
Clay Basin Reservoir	Rainbow trout	T; Intensive yield
Coyote Basin Reservoir	Brown trout	T; Basic yield
Crescent Lake U-48	Colorado River cutthroat trout	S; Basic yield
Crystal Lake A-51	Brook trout	S; Basic yield
Crystal Ranch Reservoir	Colorado River cutthroat trout	T; Basic yield
Currant Creek	Colorado River cutthroat trout	S; Wild fish
	Strawberry cutthroat trout	S; Wild fish
	Rainbow trout, unknown strain	S; Intensive yield
Currant Creek Reservoir	Bear Lake cutthroat trout	S; Basic yield
Deer Lake X-55	Colorado River cutthroat trout	S; Basic yield
Drift Reservoir Y-41	Brook trout, OWHI	S; Basic yield
Duchesne River	Rainbow trout	T; Basic yield
Duchesne River, N. Fork	Rainbow trout, unknown strain	S; Intensive yield
Farmers Lake X-23	Brook trout, OWHI	S; Basic yield
Flaming Gorge Reservoir	Rainbow trout, Eagle Lake	S; Basic yield
	Rainbow trout, Gerrard-Kam	S; Basic yield
Flaming Gorge Reservoir	Kokanee	S; Wild fish
	Lake trout	S; Wild fish

[1]As discussed above, the Ute Tribe fishery management plans are currently being revised. The state management terms used here are to merely indicate the use of fingerling vs catchable sized stocked fish in a particular water. These terms may be modified at a future date with the incorporation of the revised Tribal fishery management plan.

Water Name	Species	Management objective S=State; T=Tribe
Fox Reservoir U-47	Brook trout, OWHI	S; Basic yield
Grassy Lake Reservoir	Rainbow trout, unknown strain	S; Intensive yield
	Brook trout, OWHI	S; Basic yield
Green River	Rainbow trout, FishLk DeSm	S; Trophy
	Snake River cutthroat trout	S; Trophy
	Roundtail chub	S; Conservation
	Flannelmouth sucker	S; Conservation
	Bluehead sucker	S; Conservation
Gulf Pond	Colorado River cutthroat trout	T; Basic yield
Hill Creek Extension	Colorado River cutthroat trout	T; Conservation
Island Reservoir X-34	Colorado River cutthroat trout	S; Basic yield
Joes Valley Reservoir	Splake, hybrid	S; Basic yield
	Rainbow trout, unknown strain	S; Basic yield
Lake Fork Pond	Rainbow trout	T; Intensive yield
Lake Fork River	Colorado River cutthroat trout	T; Basic yield
Lower Uinta Reservoir	Colorado River cutthroat trout	T; Basic yield
Midview Reservoir	Rainbow trout	T; Basic yield
	Brown trout	
Milk Lake Y-25	Brook trout, OWHI	S; Basic yield
Moon Lake	Rainbow trout, unknown strain	S; Intensive yield
	Splake, hybrid	S; Basic yield
Papoose Lake WR-52	Colorado River cutthroat trout	S; Basic yield
Paradise Park Lake	Rainbow trout	S; Intensive yield
Petes Hole Reservoir	Yellowstone cutthroat trout	T; Basic yield
	Rainbow trout, unknown strain	T; Intensive yield
Pole Creek	Colorado River cutthroat trout	T; Intensive yield
Powerplant Canal	Rainbow trout	T; Intensive yield
	Colorado River cutthroat trout	
Red Fleet Reservoir	Rainbow trout, unknown strain	S; Basic yield
Rock Creek	Brown trout	T; Basic yield
Soup Bowl	Yellowstone cutthroat trout	S; Basic yield
	Rainbow trout	S; Basic yield
State line Reservoir	Rainbow trout, unknown strain	S; Intensive yield
Steinaker Reservoir	Rainbow trout, unknown strain	S; Basic yield
	Largemouth bass	S; Wild fish
	Bluegill	S; Wild fish
Strawberry Reservoir	Kokanee, Sheep Creek	S; Wild fish
	Bear Lake cutthroat trout	S; Wild fish and basic yield
Strawberry River	Rainbow trout, unknown strain	S; Intensive yield
Towave Reservoir	Colorado River cutthroat trout	T; Basic yield
Twin Pots Reservoir	Brook trout	T; Basic yield
	Rainbow trout	
	Colorado River cutthroat trout	
	Lake trout	
Uinta River	Colorado River cutthroat trout	T; Basic yield

Water Name	Species	Management objective S=State; T=Tribe
Upper Stillwater Reservoir	Bear lake cutthroat trout	S; Intensive yield
	Rainbow trout, unknown strain	S; Basic yield
Weaver Reservoir	Colorado River cutthroat trout	T; Basic yield
White Miller Lake X-54	Brook trout, OWHI	S; Basic yield
Whiterocks Pond	Colorado River cutthroat trout	T; Basic yield
	Brown trout	
Whiterocks River	Colorado River cutthroat trout	T; Basic yield
Wigwam Lake WR-54	Colorado River cutthroat trout	S; Basic yield
Yellowstone River	Colorado River cutthroat trout	T; Basic yield
Youth Camp Pond	Rainbow trout	T; Basic yield
Bonneville Basin		
Bonneville Basin	Least chub	S; Conservation
	Leatherside chub	S; Conservation
	Boreal toad	S; Conservation
	Spotted frog	S; Conservation
Great Salt Lake Watershed		
Jordan River	Channel catfish	S; Basic and intensive yield
Utah Lake Watershed		
Big Elk Reservoir A-18	Bonneville cutthroat trout	S; Basic yield
Crystal Lake A-51	Rainbow trout, unknown strain	S; Intensive yield
	Brook trout, OWHI	S; Basic yield
Deer Creek Reservoir	Rainbow trout, unknown strain	S; Basic yield
Diamond Fork River	Rainbow trout, unknown strain	S; Intensive yield
Fire Lake A-14	Bonneville cutthroat trout	S; Basic yield
Island Lake A-57	Bonneville cutthroat trout	S; Basic yield
Jordanelle Reservoir	Rainbow trout, unknown strain	S; Basic yield
	Small mouth bass	S; Wild fish
Long Lake A-37	Bonneville cutthroat trout	S; Basic yield
Mona Reservoir	Bluegill	S; Basic yield, potential recovery for June sucker in future
	Striped bass, hybrid	
Pot Lake A-8	Brook trout, OWHI	S; Basic yield
Provo River	Rainbow trout, unknown strain	S; Intensive yield
	Rainbow trout, albino	S; Intensive yield
	Bonneville cutthroat trout	S; Basic yield
	June sucker	FWS; Recovery
	Boreal toad	S; Conservation
Sixth Water	Bonneville cutthroat trout	S; Basic yield
Star Lake A-42	Bonneville cutthroat trout	S; Basic yield
Teapot Lake A-60	Rainbow trout, unknown strain	S; Intensive yield
	Brook trout, OWHI	S; Basic yield
Utah Lake	June sucker	FWS; Recovery and conservation
Wall Lake	Bonneville cutthroat trout	S; Basic yield
Washington Lake A-23	Rainbow trout, unknown strain	S; Intensive yield
	Brook trout, OWHI	S; Basic yield
Weir Lake	Grayling	S; Basic yield

Table C-2, Fish stocking needs, for the period: 1996-2035, by watershed.

Name	Species	Inches	1996		2000		2005		2010		2015		2025		2035	
			Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs
Blue Lake	Brook Trout, OWHI	3	1,000	11	1,000	11	1,000	11	1,000	11	1,000	11	1,000	11	1,000	11
Blue Lake	Rainbow Trout, unknown strain	10	1,000	450	1,000	450	1,000	450	1,000	450	1,000	450	1,000	450	1,000	450
Academy Mill Reservoir	Brook Trout, OWHI	3	3,000	32	3,000	32	3,000	32	3,000	32	3,000	32	3,000	32	3,000	32
Big Sandwash Reservoir	Rainbow Trout, unknown strain	3	45,000	547	49,500	601	55,000	668	60,000	729	66,000	802	71,000	863	77,000	936
Big Springs Ponds	Rainbow trout	8	3000	691	4000	922	5200	1,198	8000	1,843	8000	1,843	8000	1,843	8000	1,843
Bottle Hollow Reservoir	Rainbow Trout	4	6000	173	7000	202	8400	242	10800	311	12600	363	13500	389	18000	518
Bottle Hollow Reservoir	Rainbow trout	8	4000	922	3000	691	3600	829	1200	276	1400	323	1500	346	2000	461
Bottle Hollow Reservoir	Cutthroat Trout, Colorado River	4	5000	112	5000	112	5000	112	5000	112	6000	134	10000	224	10000	224
Bottle Hollow Reservoir	Brown Trout	4	10000	256	10000	256	10000	256	10000	256	10000	256	10000	256	10000	256
Cedarview Reservoir	Cutthroat Trout, Colorado River	4	4000	90	4500	101	5000	112	5000	112	5000	112	5000	112	5000	112
Cedarview Reservoir	Brown Trout	4	0	0	0		0		3000	77	4000	102	4000	102	4000	102
Cedarview Reservoir	Brook Trout	4	3000	77	5000	128	5000	128	5000	128	5000	128	5000	128	5000	128
Chepeta Lake WR-64	Cutthroat Trout, Colorado River	1	0	0	9,200	3	9,200	3	9,200	3	9,200	3	9,200	3	9,200	3
Clay Basin Settlement Pond	Rainbow trout	8	3000	691	5000	1,152	5000	1,152	8000	1,843	8000	1,843	10000	2,304	10000	2,304
Coyote Basin Reservoir	Brown Trout	4	0	0	500	13	1000	26	1000	26	1000	26	1000	26	1000	26
Crescent Lake U-48	Cutthroat Trout, Colorado River	1	0	0	4,600	2	4,600	2	4,600	2	4,600	2	4,600	2	4,600	2
Crystal Lake A-51	Brook Trout, OWHI	3	1,000	11	1,000	11	1,000	11	1,000	11	1,000	11	1,000	11	1,000	11
Crystal Ranch Reservoir	Cutthroat Trout, Colorado River	4	0	0	0	0	157000	3,517	100000	2,240	100000	2,240	100000	2,240	100000	2,240
Currant Creek	Cutthroat Trout, Colorado River	5	0	0	35,000	1,531	35,000	1,531	35,000	1,531	0	0	0	0	0	0
Currant Creek	Cutthroat Trout, Strawberry	3	35,000	331	0	0	0	0	0	0	0	0	0	0	0	0
Currant Creek	Rainbow Trout, unknown strain	10	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250
Currant Creek Reservoir	Cutthroat Trout, Bear Lake	3	10,000	94	11,000	104	12,000	113	13,000	123	14,000	132	15,000	142	16,000	151
Deer Lake X-55	Cutthroat Trout, Colorado River	1	0	0	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1
Drift Reservoir Y-41	Brook Trout, OWHI	3	1,000	11	1,000	11	1,000	11	1,000	11	1,000	11	1,000	11	1,000	11
Duchesne River	Rainbow trout	8	0	0	300	69	600	138	200	46	200	46	200	46	300	69
Duchesne River	Rainbow Trout	4	0	0	700	20	1400	40	1800	52	1800	52	1800	52	2700	78
Duchesne River, North Fork	Rainbow Trout, unknown strain	10	17,500	7,875	17,500	7,875	17,500	7,875	17,500	7,875	17,500	7,875	17,500	7,875	17,500	7,875
Farmers Lake X-23	Brook Trout, OWHI	3	0	0	6,300	68	6,300	68	6,300	68	6,300	68	6,300	68	6,300	68
Flaming Gorge Reservoir	Rainbow Trout, Gerrard-Kam	10	145,000	65,250	0	0	0	0	0	0	0	0	0	0	0	0
Flaming Gorge Reservoir	Rainbow Trout, Eagle Lake	7	250,000	38,587	0	0	0	0	0	0	0	0	0	0	0	0
Flaming Gorge Reservoir	Rainbow Trout, Eagle Lake	14	20,000	24,696	0	0	0	0	0	0	0	0	0	0	0	0
Flaming Gorge Reservoir	Rainbow Trout, Eagle Lake	10	0	0	660,000	300,300	730,000	332,150	820,000	373,100	910,000	414,050	1,100,000	500,500	1,300,000	591,500

Table C-2, Fish stocking needs, for the period: 1996-2035, by watershed.

Name	Species	Inches	1996		2000		2005		2010		2015		2025		2035	
			Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs
Fox Reservoir U-47	Brook Trout, OWHI	3	0	0	8,100	87	8,100	87	8,100	87	8,100	87	8,100	87	8,100	87
Grassy Lake Reservoir	Brook Trout, OWHI	3	2,500	27	2,500	27	2,500	27	2,500	27	2,500	27	2,500	27	2,500	27
Grassy Lake Reservoir	Rainbow Trout, unknown strain	10	4,000	1,800	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250
Green River	Rainbow Trout, FishLK DeSm	7	7,000	1,080	0	0	0	0	0	0	15,000	2,315	15,000	2,315	15,000	2,315
Green River	Cutthroat Trout, Snake River	7	15,000	1,801	10,000	1,200	8,000	960	8,000	960	8,000	960	8,000	960	8,000	960
Gulf Pond	Cutthroat Trout, Colorado River	4	0	0	0	0	400	9	400	9	400	9	400	9	400	9
Hill Creek Extension	Cutthroat Trout, Colorado River	4	1000	22	2000	45	2000	45	4000	90	8000	179	10000	224	10000	224
Island Reservoir X-34	Cutthroat Trout, Colorado River	1	0	0	1,650	1	1,650	1	1,650	1	1,650	1	1,650	1	1,650	1
Joes Valley Reservoir	Rainbow Trout, unknown strain	5	30,000	1,687	30,000	1,687	30,000	1,687	30,000	1,687	30,000	1,687	30,000	1,687	30,000	1,687
Joes Valley Reservoir	Splake, hybrid	5	35,000	1,750	35,000	1,750	35,000	1,750	35,000	1,750	35,000	1,750	35,000	1,750	35,000	1,750
Lake Fork Ponds	Rainbow Trout	8	300	69	1000	230	2000	461	3200	737	3500	806	3500	806	3500	806
Lake Fork River	Cutthroat Trout, Colorado River	4	2000	45	2000	45	5000	112	8000	179	8000	179	8000	179	8000	179
Lower Uintah Reservoir	Cutthroat Trout, Colorado River	4		0	0	0	0	0	187000	4,189	120000	2,688	120000	2,688	120000	2,688
Midview Reservoir	Brown Trout	4	8000	205	10000	256	12000	307	15000	384	16000	410	16000	410	16000	410
Midview Reservoir	Rainbow Trout	8	10000	2,304	10000	2,304	12000	2,765	15000	3,456	16000	3,686	16000	3,686	16000	3,686
Milk Lake Y-25	Brook Trout, OWHI	3	1,750	19	1,750	19	1,750	19	1,750	19	1,750	19	1,750	19	1,750	19
Moon Lake	Splake, hybrid	5	0	0	0	0	10,000	500	10,000	500	10,000	500	10,000	500	10,000	500
Moon Lake	Rainbow Trout, unknown strain	10	12,500	5,625	12,500	5,625	15,000	6,750	15,000	6,750	15,000	6,750	18,000	8,100	18,000	8,100
Papoose Lake WR-52	Cutthroat Trout, Colorado River	1	0	0	1,300	0	1,300	0	1,300	0	1,300	0	1,300	0	1,300	0
Paradise Park Lake	Rainbow Trout	10	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250	5,000	2,250
Petes Hole	Cutthroat Trout, Yellowstone	1	4,000	1	4,000	1	4,000	1	4,000	1	4,000	1	4,000	1	4,000	1
Petes Hole	Rainbow Trout, unknown strain	10	6,000	2,700	8,000	3,600	8,000	3,600	8,000	3,600	8,000	3,600	10,000	4,500	10,000	4,500
Pole Creek	Cutthroat Trout, Colorado River	4	500	11	1000	22	3000	67	3000	67	3000	67	3000	67	3000	67
Powerplant Canal	Rainbow Trout	4	180	5	0	0	0	0	0	0	0	0	0	0	0	0
Powerplant Canal	Cutthroat Trout, Colorado River	4		0	500	11	500	11	1500	34	1500	34	1500	34	1500	34
Powerplant Canal	Rainbow trout	8	120	28	0	0	0	0	0	0	0	0	0	0	0	0
Red Fleet Reservoir	Rainbow Trout, unknown strain	7	60,000	9,261	60,000	9,261	66,000	10,187	72,000	11,113	78,000	12,039	84,000	12,965	90,000	13,891
Red Fleet Reservoir	Rainbow Trout, unknown strain	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rock Creek	Brown Trout	4	7000	179	9000	230	10000	256	12000	307	13000	333	13000	333	13000	333
Soup Bowl	Cutthroat Trout, Yellowstone	1	1000	0.4	1000	0.4	1000	0.4	1000	0.4	1000	0.4	1000	0.4	1000	0.4
Soup Bowl	Rainbow Trout	10	2000	900	2000	900	2000	900	2000	900	2000	900	2000	900	2000	900
Stateline Reservoir	Rainbow Trout, unknown strain	10	10,000	4,500	10,000	4,500	10,000	4,500	10,000	4,500	10,000	4,500	10,000	4,500	10,000	4,500
Steinaker Reservoir	Rainbow Trout, unknown strain	7	90,000	13,891	99,000	15,281	110,000	16,978	120,000	18,522	122,000	18,831	134,000	20,683	145,000	22,381
Strawberry Reservoir	Kokanee, Sheep Creek	3	1,100,000	10,395	1,000,000	9,450	0	0	0	0	0	0	0	0	0	0
Strawberry Reservoir	Rainbow Trout, Sand Creek	3	1,000,000	12,150	0	0	500,000	6,075	800,000	9,720	800,000	9,720	800,000	9,720	800,000	9,720
Strawberry Reservoir	Cutthroat Trout, Bear Lake	3	3,000,000	28,350	3,000,000	28,350	3,000,000	28,350	0	0	0	0	0	0	0	0

Table C-2, Fish stocking needs, for the period: 1996-2035, by watershed.

Name	Species	Inches	1996		2000		2005		2010		2015		2025		2035	
			Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs
Strawberry Reservoir	Cutthroat Trout, Bear Lake	5	200,000	8,750	350,000	15,312	350,000	15,312	800,000	35,000	800,000	35,000	800,000	35,000	800,000	35,000
Strawberry River	Rainbow Trout, unknown strain	10	2,500	1,125	2,500	1,125	2,500	1,125	2,500	1,125	2,500	1,125	2,500	1,125	2,500	1,125
Towave Reservoir	Cutthroat Trout, Colorado River	4	3000	67	7000	157	7000	157	7000	157	8000	179	8000	179	8000	179
Twin Pots Reservoir	Rainbow Trout	4	4200	121	4200	121	3500	101	5400	156	4500	130	6300	181	7000	202
Twin Pots Reservoir	Rainbow trout	8	2800	645	1800	415	1500	346	600	138	500	115	700	161	0	0
Twin Pots Reservoir	Cutthroat Trout, Colorado River	4	6000	134	6000	134	8000	179	8000	179	8000	179	8000	179	8000	179
Twin Pots Reservoir	Lake Trout	4	0	0	2000	32	2000	32	2000	32	2000	32	2000	32	2000	32
Twin Pots Reservoir	Brook Trout	4	3000	77	5000	128	5000	128	5000	128	5000	128	5000	128	5000	128
Uinta River	Cutthroat Trout, Colorado River	4	6000	134	8000	179	8000	179	10000	224	10000	224	10000	224	10000	224
Upper Stillwater Reservoir	Rainbow Trout, unknown strain	10	10,000	4,500	10,000	4,500	11,000	4,950	12,100	5,445	13,200	5,940	14,300	6,435	15,500	6,975
Weaver Reservoir	Cutthroat Trout, Colorado River	4	0	0	3000	67	5000	112	6000	134	7000	157	8000	179	8000	179
White Miller Lake X-54	Brook Trout, OWHI	3	1,100	12	1,100	12	1,100	12	1,100	12	1,100	12	1,100	12	1,100	12
Whiterocks Pond	Brown Trout	4	0	0	1000	26	1000	26	1000	26	1000	26	1500	38	2000	51
Whiterocks Pond	Cutthroat Trout, Colorado River	4		0	1000	22	1000	22	1000	22	1000	22	1500	34	2000	45
Whiterocks River	Cutthroat Trout, Colorado River	4	1000	22	1000	22	1000	22	1000	22	3000	67	4000	90	5000	112
Wigwam Lake WR-54	Cutthroat Trout, Colorado River	1	0	0	1,100	0	1,100	0	1,100	0	1,100	0	1,100	0	1,100	0
Yellowstone River	Cutthroat Trout, Colorado River	4	2500	56	3500	78	8500	190	8500	190	8500	190	8500	190	8500	190
Youth Camp Pond	Rainbow Trout	4	180	5	1050	30	1750	50	1250	36	4050	117	4050	117	5400	156
Youth Camp Pond	Rainbow Trout	8	120	28	450	104	750	173	250	58	450	104	450	104	600	138
Jordan River	Rainbow Trout	10	2,000	900	2,050	923	2,250	1,013	2,500	1,125	6,900	3,105	8,200	3,690	9,600	4,320
Jordan River	Rainbow Trout	10	5,000	2,250	5,100	2,295	5,600	2,520	6,300	2,835	2,750	1,238	3,300	1,485	3,800	1,710
Big Elk Reservoir A-18	Cutthroat Trout, Bear Lake	1	7,400	3	7,400	3	7,400	3	7,400	3	7,400	3	7,400	3	7,400	3
Crystal Lake A-51	Rainbow Trout, unknown strain	10	0	0	3,000	1,350	4,000	1,800	4,000	1,800	0	0	0	0	0	0
Deer Creek Reservoir	Rainbow Trout, unknown strain	10	40,000	18,000	80,000	36,000	89,920	40,464	97,847	44,031	109,920	49,464	126,062	56,728	150,294	67,632
Diamond Fork River	Rainbow Trout, unknown strain	10	8,000	3,600	8,176	3,679	8,992	4,046	10,000	4,500	1,374	618	1,636	736	1,920	864
Diamond Fork River	Rainbow Trout, unknown strain	10	1,000	450	1,022	460	1,124	506	1,250	562	10,992	4,946	13,088	5,890	15,360	6,912
Fire Lake A-14	Cutthroat Trout, Bear Lake	1	0	0	0	0	2,500	1	2,500	1	2,500	1	2,500	1	2,500	1
Island Lake A-57	Cutthroat Trout, Bear Lake	1	0	0	0	0	7,000	2	7,000	2	7,000	2	7,000	2	7,000	2
Jordanelle Reservoir	Rainbow Trout, unknown strain	10	0	0		0	68,000	30,600	68,000	30,600	0	0	0	0	0	0
Jordanelle Reservoir	Rainbow Trout, FishLK DeSm	7	23,000	3,550	20,000	3,087	15,000	2,315	15,000	2,315	0	0	0	0	0	0
Jordanelle Reservoir	Rainbow Trout, unknown strain	5	645,000	36,281	483,750	27,211	0	0	0	0	68,000	3,825	68,000	3,825	68,000	3,825
Long Lake A-37	Cutthroat Trout, Bear Lake	1	3,900	1	3,900	1	3,900	1	3,900	1	3,900	1	3,900	1	3,900	1
Pot Lake A-8	Brook Trout, OWHI	3	400	4	400	4	400	4	400	4	400	4	400	4	400	4
Provo River	Cutthroat Trout, Bonneville	7	10,000	1,200	10,000	1,200	10,000	1,200	0	0	0	0	10,000	1,200	10,000	1,200
Provo River	Rainbow Trout, unknown strain	10	4,000	1,800	4,088	1,840	4,496	2,023	5,000	2,250	13,740	6,183	16,360	7,362	19,200	8,640
Provo River	Rainbow Trout, unknown strain	10	7,000	3,150	13,000	5,850	15,000	6,750	15,000	6,750	0	0	0	0		0

Table C-2, Fish stocking needs, for the period: 1996-2035, by watershed.

Name	Species	Inches	1996		2000		2005		2010		2015		2025		2035	
			Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs
Provo River	Rainbow Trout, unknown strain	10	7,000	3,150	12,000	5,400	14,000	6,300	14,000	6,300	1,000	450	1,000	450	1,000	450
Provo River	Rainbow Trout, unknown strain	10	0	0	0	0	0	0	0	0	5,496	2,473	6,544	2,945	7,680	3,456
Provo River	Rainbow Trout, unknown strain	10	10,000	4,500	10,220	4,599	11,240	5,058	12,500	5,625	2,100	945	2,100	945	2,100	945
Provo River 10	Rainbow Trout, albino	10	1,000	450	1,000	450	1,000	450	1,000	450	0	0	0	0	0	0
Provo River 11	Rainbow Trout, albino	10	2,100	945	2,100	945	2,100	945	2,100	945	0	0	0	0	0	0
Sixth Water	Cutthroat Trout, Bear Lake	5	0	0	10,000	437	10,000	437	10,000	437	10,000	437	10,000	437	10,000	437
Star Lake A-42	Cutthroat Trout, Bear Lake	1	2,400	1	2,400	1	2,400	1	2,400	1	2,400	1	2,400	1	2,400	1
Teapot L A-60	Rainbow Trout, unknown strain	10	6,000	2,700	7,000	3,150	8,000	3,600	8,000	3,600	0	0	0	0	0	0
Teapot Lake A-60	Brook Trout, OWHI	3	500	5	500	5	500	5	500	5	500	5	500	5	500	5
Wall Lake	Cutthroat Trout, Bonneville	1	0	0	1,700	1	1,700	1	1,700	1	1,700	1	1,700	1	1,700	1
Wall Lake	Cutthroat Trout, Yellowstone	1	1,700	1	0	0	0	0	0	0	0	0	0	0	0	0
Washington Lake A-23	Brook Trout, OWHI	3	8,000	86	8,000	86	8,000	86	8,000	86	8,000	86	8,000	86	8,000	86
Washington Lake A-23	Rainbow Trout, unknown strain	10	6,000	2,700	8,000	3,600	10,000	4,500	10,000	4,500	0	0	0	0	0	0
Weir Lake	Grayling	2	1,000	1	1,000	1	1,000	1	1,000	1	1,000	1	1,000	1	1,000	1
	TOTALS		7,032,150	345,616	6,299,406	531,340	5,696,722	581,579	3,718,597	629,422	3,704,772	627,280	3,972,890	732,144	4,240,254	841,361
Bonneville basin	Least chub	1.5	0	0	200,000	171	200,000	171	200,000	171	0	0	0	0	0	0
Bonneville basin	Leatherside chub	4	0	0	0	0	200,000	6,298	200,000	6,298	200,000	6,298	0	0	0	0
Colorado River	Bluehead sucker	6	0	0	0	0	0	0	0	0	100,000	6,307	100,000	6,307	100,000	6,307
Colorado River	Bluehead sucker	11	0	0	0	0	0	0	0	0	100,000	49,779	100,000	49,779	100,000	49,779
Colorado River	Flannelmouth sucker	6	0	0	0	0	0	0	0	0	100,000	6,307	100,000	6,307	100,000	6,307
Colorado River	Flannelmouth sucker	11	0	0	0	0	0	0	0	0	100,000	49,779	100,000	49,779	100,000	49,779
Colorado River	Roundtail chub	6	0	0	0	0	100,000	5,249	100,000	5,249	100,000	5,249	0	0	0	0
Colorado River	Roundtail chub	11	0	0	0	0	100,000	39,797	100,000	39,797	100,000	39,797	0	0	0	0
Jordan River	Channel catfish	14	10,000	8,232	20,000	16,464	20,000	16,464	20,000	16,464	20,000	16,464	20,000	16,464	20,000	16,464
Jordanelle Reservoir	Smallmouth bass	1.5	400,000	343	0	0	0	0	0	0	0	0	0	0	0	0
Mona Reservoir	Wiper	3	20,000	216	0	0	0	0	0	0	0	0	0	0	0	0
Utah Lake	June sucker	8	0	0	350,000	84,582	350,000	84,582	350,000	84,582	1,500	362	1,500	362	0	0

Table C-2, Fish stocking needs, for the period: 1996-2035, by watershed.

Name	Species	Inches	1996		2000		2005		2010		2015		2025		2035	
			Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs	Numbers	Lbs
	TOTALS		430,000	8,791	570,000	101,218	970,000	152,561	970,000	152,561	821,500	180,340	421,500	129,000	420,000	128,637
Bonneville basin	Boreal toad	0	0	0	200,000	0	200,000	0	200,000	0	0	0	0	0	0	0
Bonneville basin	Spotted frog	0	0	0	200,000	0	200,000	0	200,000	0	0	0	0	0	0	0
	TOTALS	0	0	0	400,000	0	400,000	0	400,000	0	0	0	0	0	0	0

Table C-3. Updated hatchery costs (taken from Division 1/30/97 handout and feasibility reports).

Facility	1994 Plan cost estimates	1997 Feasibility Studies cost estimates	1997 cost estimates; first priority items[2]
STATE			
Loa	1,472,000	3,373,000	1,994,000
Mantua	1,818,000	4,984,000	3,047,000
Midway	5,070,000	10,488,000	4,930,500
Springville	1,414,000	6,954,000	2,927,000
Whiterocks	1,105,000	5,144,000	2,430,000
Fountain Green	3,316,000	5,847,000	5,847,000
Kamas	3,051,000	5,652,000	5,652,000
Glenwood	435,000	-	-
Wahweap	708,000	-	-
Goshen	5,000,000[3]	10,851,000	5,059,000
Gandy		5,918,000	3,589,000
Subtotal	23,389,000	59,211,000	35,475,000
USFWS			
Jones Hole	823,000	1,674,000	1,674,000
Horsethief	520,000	-	-
Hotchkiss	250,000	-	-
Ouray	2,920,000	-	-
Subtotal	4,513,000	1,674,000	1,674,000
TRIBE			
Big Springs	522,000	2,983,000	2,983,000
Total	28,424,000	63,868,000	40,132,500

[2]For those State hatcheries evaluated in the 1997 feasibility studies, costs were outlined on a priority basis. These costs reflect the first priority items only. These include: water supply protection and some level of increased production. The costs for the other hatcheries remain the same.

[3]This amount is based on an estimate to construct either Goshen or Gandy Warm Springs hatchery site.

Division Water Management Plans for Jordanelle Reservoir, Strawberry Reservoir and Flaming Gorge Reservoir.

Jordanelle Reservoir (based on 9/30/93 revision). Jordanelle Reservoir is managed as a basic yield fishery (see definitions) based on a primary species-rainbow trout with secondary species-smallmouth bass.

The standard objectives for this basic yield fishery is to maintain an average catch rate of 0.5 fish/hour or 4 oz/hour; to provide a positive net return to the creel when comparing a pound of stocked versus a pound of harvested fish; and to maintain the following average sizes for harvested fish:

Species	Size (inches)	
	Average	Range
Rainbow trout	11	(9-15)
Smallmouth bass	10	(7-14)

The specific objectives are:

1. Monitor success of the rainbow trout fishery. Adjust the stocking rate to provide 10-12 inch yearling trout by June 1. Maintain a catch rate that meets the basic yield fishery standard objectives. Catch rate, harvest and total fishing pressure will be estimated once the reservoir has been filled. With projected stocking quotas and filling schedule, 366,000 angler hours in 1995 and 503,000 angler hours in 1996 are expected.
2. Monitor growth and survival of stocked 3 inch rainbow trout and anticipate need for stocking 5 inch fish to maintain fishery.
3. Establish smallmouth fishery by year 2000. Introduce from Deer Creek Reservoir.
4. Restrict harvest of smallmouth bass to fish > 12 inches. Maintain an annual catch of 50,000 smallmouth bass $\geq$ 12 inches by year 2001.

Fish populations will be monitored during the spring each year using gill nets and electrofishing gear. Seining surveys may be used to assess smallmouth bass reproduction. An angler survey will be completed when the reservoir is full (possibly 1998).

Strawberry Reservoir (based on the 1987 Environmental Assessment for Plans to Restore the Strawberry Valley Fishery)

Strawberry Reservoir is managed as a basic yield fishery with the Bear Lake Bonneville cutthroat trout as the primary species. Secondary species include kokanee salmon and sterile rainbow trout (Note, sterile rainbow trout stocking was discontinued in 1995, as the chemical sterilant, methyl testosterone, must be registered for use with the Food and Drug Administration before its use may be continued). Management objectives are:

1. Maintain cutthroat trout as an integral component of the fishery. The reservoir and its egg-taking station will be the major source of Bear Lake Bonneville cutthroat trout eggs for the hatchery system and for requests from other states.
2. Provide 1,200,000 hours of recreational angling yearly from fish produced by natural recruitment and put-grow-and-take stocking of salmonids.
3. Achieve an average catch rate of 0.4 fish (averaging at least 12 inches long) per hour.
4. Produce 10,000,000 cutthroat trout young-of-year from the tributaries each year.
5. Collect 6,000,000 cutthroat trout eggs yearly from the spawn taking operation at the Strawberry egg-taking station.

Flaming Gorge Reservoir (based on a draft initial water management plan, to be revised in 1998, with hydrologic unit management plan).

Flaming Gorge is managed jointly by the Utah Division of Wildlife Resources and the Wyoming Game and Fish Department. A joint 5-year management plan was drafted in 1984, updated annually and revised in 1990. Major

components of this plan call for maintenance stocking of rainbow trout, augmentation of kokanee salmon stocks, surveys and regulatory management directed toward maintenance of the lake trout stock as a trophy fishery.

Flaming Gorge is managed as a basic yield fishery based on primary species of rainbow trout, kokanee salmon and lake trout; and on secondary species of smallmouth bass. Brown trout and mountain whitefish occur incidentally.

Based on a 1991 creel census survey, 48% of the anglers specifically sought rainbow trout. Kokanee were sought by 24% and lake trout by 13% of the anglers. The remaining percentage is made up of the other species or combinations of species.

The standard objectives for this basic yield fishery is to maintain an average catch rate of 0.5 fish/hour or 4 oz/hour; to provide a positive net return to the creel when comparing a pound of stocked versus a pound of harvested fish; and to maintain the following average sizes for harvested fish:

Species	Size Range (inches)
Rainbow trout	(9-15)
Lake trout	(15-21)
Kokanee salmon	(8-14)
Smallmouth bass	(7-14)

the Specific objectives are:

1. Monitor success of the rainbow trout fishery. Adjust areas of trout planting and relative mix of strains planted to meet the standard objectives. A catch rate of 0.20 fish/hour in areas stocked will be deemed successful. Catch rate will be computed from total fishing pressure of all species.
2. Maintain annual kokanee salmon catch of 45,000 fish and size of spawning stocks at $\geq$ 15 inches. If lake trout predation is found to limit kokanee salmon abundance and harvest, these harvest targets may be maintained by augmenting the naturalized population with hatchery plants of strains currently found in the reservoir.
3. Determine the reservoir's carrying capacity of lake trout. Studies will be conducted to determine the state of trophic balance of lake trout and their prey. An interim objective is to increase the harvest of 36+ inch lake trout through a protective slot regulation. Lake trout constitute a trophy element of the fishery. The standard objective for the Trophy Waters management concept is to provide an average catch rate of 0.05 fish/hour for trophy sized fish. As creel information is currently computed using total fishing pressure for all species, a lake trout catch rate of 0.03 fish/hour will be considered successful. Lake trout catch, 36 inches and larger should be maintained at or above 1,000 fish/year.
4. Stimulate general angler interest in the smallmouth bass fishery and increase harvest of bass $\leq$ 12 inches. The project goal is to increase annual catch to 50,000 fish and harvest to 15,000 fish.
5. Monitor forage abundance and availability. Studies will document prey availability and utilization. Predator/prey balances will be manipulated to protect the basic yield fishery and provide a trophy lake trout element.

Current monitoring programs include creel census, fishery trend netting, lake trout trend netting , pelagic fish trawling and hydroacoustic surveys. Research projects include lake trout consumption determination, kokanee salmon/Utah chub foraging interaction and kokanee salmon shoreline spawning assessment.

In the past, when rainbow trout were abundant, there was higher fishing pressure at Flaming Gorge Reservoir. As the rainbow trout fishery has declined due to Utah chubs and lake trout, fishing pressure has declined. Kokanee numbers are also down because of the lake trout. A large segment of the angling public are not interested in the trophy lake trout fishery. That fishery is inhibiting management that would be acceptable to more anglers. To manage stocked rainbow trout with the lake trout, larger rainbow trout must be stocked. Rainbow trout is a fish that most anglers want and have fished for on Flaming Gorge Reservoir in the past. Flaming Gorge Reservoir is a large

water that can handle much more use than it is getting. If the Division could provide more angling opportunities for rainbow trout, it would get more use and be able to handle a lot of the anticipated growth in anglers.

To maintain the 840,000 angler hours estimated for Flaming Gorge Reservoir in the 1995 statewide angler survey, allowing for kokanee and lake trout harvest; a current stocking of 750,000 catchable rainbow trout is required. With an improved return to the creel for larger stocks (i.e., 10" fish), 600,000 rainbow trout would be required. It is anticipated that it would the year 2000 before any increases in stocking are possible. This is the basis of the increase in stocking between the period of 1996-1999 and 2000-2004. For 1996, rainbow trout stocking needs for all sizes and strains is 415,000 fish. For the year 2000, it is 662,000. Increases beyond the year 2004 reflect anticipated increases in fishing pressure.

appendix D
Division fish stocking and transfer procedures

The document referred to below is included in the bound copy of this Fish Hatchery Production Plan Final Environmental Assessment, which is available by contacting the Mitigation Commission. For more information about the Utah Division of Wildlife Resources, visit their website at: www.wildlife.utah.gov

STATE OF UTAH	**NO. W2ADM-1**	**NO. PAGES 19**
DIVISION OF WILDLIFE RESOURCES	**EFFECTIVE DATE: September 24, 1997**	
AQUATICS	**APPROVED BY: John Kimball**	
SUBJECT: FISH STOCKING AND TRANSFER PROCEDURES **DISTRIBUTION: ALL DIVISION EMPLOYEES**		

APPENDIX E
site-specific FEASIBILITY REVIEW

Big Springs Tribal Hatchery

The Big Springs Hatchery proposal is for a facility to provide Colorado River cutthroat trout brood stock, a stable supply of eggs for Tribal, State and Federal needs, fingerling and yearling cutthroat for recovery needs, trophy fish for a specialized recreational fishery and other trout species. Potential production at this facility is estimated to be: 100,000 Colorado River Cutthroat trout (12,926 lbs), 954 broodstock (1,545 lbs), 34,400 brown trout (7,425 lbs) and 35,600 brook trout (7,803 lbs); for a total of 170,954 fish with a weight of 30,000 lbs. The Youth Camp facility consists of a small raceway used by the Tribe to hold salmonids for immediate and continuous stocking of reservation waters. Recommended improvements are for summer rearing of Colorado River cutthroat trout, brook and brown trout.

Water supply is secure, providing 5 to 6 cfs of water with adequate pressure to provide for gravity feed. Water quality information: temperature range: 43 to 46 °F; dissolved oxygen: 6.6 to 8.0 mg/l. At Youth Camp, a constant supply of water is available with flows ranging from 10 to 20 cfs.

The proposed hatchery cost, including the work to be completed at the Youth Camp facility is $2,983,000, with an operating budget estimate of $34,828.

Feasibility study recommendations for Big Springs include development of the water supply, hatchery buildings and production facilities, outdoor production tanks, waste treatment, residence and visitor facilities. Youth Camp improvements include: the addition of a raceway adjacent to the existing raceway, storage building, fencing, predator netting and piping.

Feasibility report items are listed below:

A. Project requirements
   1. NEPA compliance
   2. Planning and design

B. Feasibility study recommendations
   1. Site work
   2. Utilities
   3. Residence
   4. Hatchery buildings
   5. Production units
   6. Water supply system
   7. Waste treatment

Fountain Green State Fish Hatchery

This proposal is for a new hatchery, up gradient from the existing site. Rainbow, cutthroat, and tiger trout and kokanee are produced at the Fountain Green Fish Hatchery. Current production is 59,250 lbs and 359,304 eyed eggs. With enhancements, production is estimated to be 106,650 lbs.

The available water supply ranges from 7.6 to 12.7 cfs. Water quality information: temperature, constant 54°F, dissolved oxygen, 8.2 to 9.4 mg/l. Water rights are shared with Fountain Green, Fountain Green Irrigation Company and PacifiCorp. A 1992 agreement between PacifiCorp and the State allows the hatchery to relocate closer to the spring and to have first use of the water. The proposed site has the topography for gravity flow and provides the hatchery use of all available water with no effect on the irrigation company.

The irrigators withdraw as much as 40% of the water from the existing penstock during the irrigation season (March to November). This impacts the water supply at a critical time, limiting fish production.

The existing operation budget is $181,000. The total project cost estimate is $5,836,000, with an estimated future annual operation budget of $249,300.

Proposed improvements include relocation to the new site and construction of a new facility.

Project requirements and feasibility study recommendations are:

A. Rehabilitation requirements
   1. NEPA compliance
   2. Planning and design
   3. Negotiate water rights agreements with Fountain Green Irrigation Company, Fountain Green City and PacifiCorp

B. Feasibility study
   1. Water supply and drain system
   2. Water treatment
   3. Production units
   4. Buildings and support units
   5. Site work
   6. Residences (2)
   7. Visitor facilities

Jones Hole National Fish Hatchery
Rainbow trout, Snake River cutthroat trout, brown and brook trout for Flaming Gorge Reservoir, other CRSP affected-area waters and the Ute Indian Tribal needs are produced at the Jones Hole Hatchery. This facility produces 175,000 lbs, of which about 90 % are rainbow trout. With feasibility study enhancements, production is estimated to be 263,000 lbs.

Water supply ranges from 18 to 34 cfs and water quality data: D.O.: 8.0 mg/l; pH 7.8; and temperature: 54 °F.

The project cost estimate is $1,674,000. The annual post-project operating budget is estimated to be $446,000.

Oxygen supplementation and a new bank of raceways are needed to increase production. Water chilling units in the hatchery building to retard egg development and fish growth to spread out fish production over a larger portion of the year may be needed as well.

Rehabilitation requirements and improvement needs are:

A. Rehabilitation requirements
   1. NEPA compliance
   2. Planning and design

B. Improvement needs
   1. Water supply systems
   2. Production units
   3. Support facilities
   4. Visitor facilities

Kamas State Fish Hatchery
The proposal for Kamas State Fish Hatchery is reconstruct the facility on the existing site. Rainbow, brook, lake and cutthroat trout and grayling are produced at the Kamas Fish Hatchery. It is currently producing 80,000 lbs and 33,520 eyed eggs. Production with the planned improvements is estimated to be 160,000 lbs.

A water supply of 7.2 cfs is available. Water quality information: temperature, 49 °F, combined spring flows, dissolved oxygen, 8.2 mg/l. The site allows gravity flow through the system.

The total project cost estimate is $5,651,900, with a post-project operating budget of $231,500.

Nitrogen removal an oxygen supplementation system is needed to increase production. The deteriorated raceway system must be replaced to maintain the current production level. Feasibility study recommends complete reconstruction to include raceways, hatchery building, waste treatment and supporting facilities.

Rehabilitation requirements and feasibility study recommendations are:

A. Rehabilitation requirements
   1. NEPA compliance
   2. Planning and design

B. Feasibility study
   1. Water supply systems
   2. Disease prevention measures
   3. Waste treatment
   4. Production units
   5. Buildings and support facilities
   6. Site work
   7. Residences (2)
   8. Visitor facilities
   9. Site studies

Loa State Fish Hatchery

The proposal is to rehabilitate and improve facilities at the existing site. Rainbow trout stocked to non-reproducing planting sites, and a small amount of brook and brown trout are produced at the Loa Hatchery. Current production is 125,348 lbs, with an operating cost of $166,362. With implementation of the feasibility study recommendations, production is estimated to be 217,606 lbs, with an operating cost of $313,000.

Loa hatchery has a water supply of 14 cfs. This comes from two springs, one with a constant temperature of 54 °F and the other 62 °F. Dissolved oxygen ranges from 7.01 to 7.7 mg/l.

The project cost estimate is $3,373,000 for full feasibility study implementation. Project costs to achieve level 1, or the highest priorities is $1,994,000. This would include oxygen supplementation, raceway covers and feed systems, hatchery building upgrades and water supply improvements.

Most critical to the future of Loa's operation is existence of whirling disease near the hatchery and chronic flooding caused by overflow of an irrigation canal directly above the hatchery with water from reservoirs found to contain whirling disease.

Needed actions and feasibility study improvements are:

A. Rehabilitation requirements
   1. NEPA compliance
   2. Planning and design
   3. Evaluate need to mitigate loss of wetland habitat due to spring development

B. Feasibility study recommendations
   1. Water supply systems
   2. Disease prevention measures
   3. Water treatment

4. Waste treatment
5. Production units
6. Hatchery buildings and support facilities
7. Site work
8. Visitor facilities
9. Studies

Mantua State Fish Hatchery

The proposal is to rebuild Mantua State Fish Hatchery on the existing site. Rainbow trout catchables and cutthroat trout fingerlings are produced at Mantua Fish Hatchery. Current production is 69,064 lbs (this includes about 10,000 lbs brood fish), with an annual operating cost of $207,611. Implementing feasibility study recommendations will increase this production to 135,060 lbs .

The water supply is from the Upper and Lower Maple Creek Springs, and ranges from 6.4 to 9.1 cfs. Water quality information: temperature range: 44 to 48 °F; dissolved oxygen range, 7.6 to 8.0 mg/l.

The full project cost estimate is $4,984,000, with an estimated annual operating cost of $222,000. Project costs to achieve level 1, or the highest priorities for Mantua Hatchery is $3,047,000. This would provide for a new hatchery building, brood stock raceways and one set of production raceways, oxygen supplementation and support systems.

Production at Mantua is restricted in May, when station loading is peaked, or in September, when water supply is lowest. Production is limited by available oxygen.

The recommended improvements are: relocate incubators and tanks, construct new raceways to provide for a 3 pass gravity flow system; add oxygen supplementation; develop a modified bloodstock program with 4 year classes of fish; protect water supply system; add disease prevention measures; construct new hatchery buildings and renovate existing one.

Actions and feasibility study recommendations:

A. Rehabilitation requirements
   1. NEPA compliance
   2. Planning and design
   3. Seek agreement with irrigators to get first use of spring water

B. Feasibility study recommendations
   1. Water supply systems
   2. Disease prevention
   3. Water treatment
   4. Waste treatment
   5. Hatchery building and support facilities
   6. Site work

7. Visitor facilities
8. Studies

Midway State Fish Hatchery

The proposal is to rebuild this facility on the existing site. Rainbow trout, a small portion of which are an albino strain are produced at the Midway Fish Hatchery. Current production is 161,264 lbs, with an operating cost of $317,863. With feasibility enhancements, production is estimated to be 304,602 lbs.

The water supply is made up of flows from Main Spring, which vary from 3.7 to 11.4 cfs, and a series of seeps with flows ranging from 13.7 to 20 cfs. The water quality information: temperature range: 55 to 59 °F; dissolved oxygen, 4.4 to 5.4 mg/l. The water supply contains elevated levels of carbon dioxide and calcium carbonate hardness.

The Phase I project cost estimate is $4,930,500, with an annual operating cost of $390,536. The recommended improvements are for the water supply system, production units, fencing and new residence.

The full project cost estimate is $10,488,000, with an O&M cost of $466,000.

Production capacity is restricted by flows available from January through May, with maximum loading in mid-May. Production is limited by the amount of oxygen available to the fish.

Proposed improvements include protection of the water supply, new covered raceways arranged as a two pass system with gravity flow; oxygen supplementation, low phosphorus feed to reduce phosphorus discharges, cleaning waste drain lines, new buildings with administrative, storage, lab, garage and shop space; site work, fencing residence and visitor information.

Needed actions and feasibility study recommendations include:

A. Planning and engineering
   1. NEPA compliance
   2. Planning and design.

B. Feasibility study recommendations
   1. Water supply systems
   2. Disease prevention measures
   3. Water treatment
   4. Waste treatment
   5. Production units
   6. Hatchery building and support facilities
   7. Site work
   8. Visitor facilities
   9. Residences
   10. Studies

Native Aquatic Species and Warm-Water Hatchery

The 1996 feasibility study (FishPro 1996b) for the culture of native aquatic species, evaluated hatcheries at both the Goshen Warm Springs and Gandy Warm Springs sites to meet all native aquatic species needs. It was envisioned that the Goshen Warm Springs site would be the primary facility used for the immediate large program needs (i.e., June sucker), and Gandy Warm Springs would be a satellite facility. The estimated cost for these facilities was $16.8 million ($10.9 million for the Goshen Warm Springs site, plus $5.9 million for the Gandy Warm Springs site). This amount did not include land purchase. For purposes of the CUPCA 313(c) project, the propagation needs for only those species impacted by CRSP (except those included in the Colorado River Recovery Implementation Plan) were identified. It was determined that either the Goshen Warm Springs or the Gandy Warm Springs site plus a smaller, interim facility at Red Butte Reservoir, or an acceptable alternate site would be included to meet a proportion of the propagation equal to the cold-water species needs. The smaller, interim site was included to meet the immediate needs of culturing the endangered June sucker. The warm-water sport fish needs (channel catfish for the Jordan River) will also be incorporated. It is anticipated that these facilities can be completed for $10 million. An operation budget has not yet been developed.

The water supply and water quality characteristics of the two sites are summarized below:

	Goshen Warm Springs	Gandy Warm Springs
Water supply	12 cfs available for use	15 cfs available
Temperature	71 °F	82 °F
pH	7.5	7.78
Oxygen	5.3 mg/l	7.3 mg/l
Alkalinity	250 mg/l	200 mg/l
Nitrogen gas pressure	127.6%	106.4%

Needed actions and study recommendations are listed below:

A. Project requirements
   1. NEPA compliance
   2. Planning and design
   3. Land acquisition

B. Feasibility study
   1. Water supply
   2. Water treatment
   3. Production units
   4. Buildings and support units
   5. Site work
   6. Residences
   7. Visitor facilities

Springville State Fish Hatchery

The proposal is to renovate the existing facilities. Catchable rainbow trout make up almost all of the production at the Springville Hatchery. In 1996 a small kokanee program was added. Current production is 172,106 lbs, and operating costs are $302,490. With feasibility study recommendations, production is estimated to be 301,829 lbs.

The water sources are springs with an average flow of 16.8 cfs available to the hatchery. Water quality information: temperature, 54 and 58 to 61 °F for raceways in the building and outdoor, respectively and dissolved oxygen, 6.8 mg/l.

Project costs to achieve level 1 improvements are $2,927,000, with O&M costs estimated to be $373,084. Level 1 improvements would provide water supply systems, oxygen supplementation, production units and building upgrades.

Loading conditions in April control the maximum production capacity of the site. Production is limited by the amount of oxygen available to the fish.

Feasibility study recommendations include oxygen supplementation located to establish a three-pass system; new west raceways with improved velocity conditions, with one unit to receive cooler water for kokanee production.

Needed actions and study recommendations are listed below:

A. Rehabilitation requirements
   1. NEPA compliance
   2. Planning and design

B. Feasibility study recommendations
   1. Water supply systems
   2. Disease prevention measures
   3. Water treatment
   4. Waste treatment
   5. Production units
   6. Hatchery building and support facilities
   7. Site work
   8. Visitor facilities

Whiterocks State Fish Hatchery

The proposal is to renovate the existing facilities. Rainbow trout, kokanee and cutthroat trout are produced at the Whiterocks Fish Hatchery. Current production is 35,511 lbs, with operating costs of $141,094. With feasibility study enhancements, production is estimated to be 87,700 lbs.

The water supply flows range from an average low of 5.6 cfs to an average high of 7.5 cfs. Water quality information: temperature range: 47 to 51 °F and dissolved oxygen, 7.7 to 8.1 mg/l.

The total project cost estimate is $5,144,000. Project costs to achieve level 1 improvements for the Whiterocks facility is $2,430,000, with an estimated O&M budget or $187,176. Level 1 improvements would cover replacement of the hatchery building and aeration tower, and oxygen supplementation, monitors and alarms for the existing raceways.

April loading conditions control the maximum production of the station. Oxygen supplementation is needed to increase production in April.

Feasibility study improvements include: oxygen supplementation, reconfiguration and replacement of raceways, to include covered raceways, a three pass system, a new hatchery building for incubation and early rearing needs.

Rehabilitation requirements and feasibility study recommendations are:

A. Rehabilitation requirements
   1. NEPA compliance.
   2. Planning and design.
   3. Acquire land for water supply or investigate reuse system or well.

B. Feasibility study recommendations
   1. Water supply system
   2. Disease prevention measures
   3. Water treatment
   4. Waste treatment
   5. Production units
   6. Buildings and support facilities
   7. Site work
   8. Visitor facilities
   9. Residences
   10. Studies and design services

appendix F
meeting the need

Those hatcheries in the Draft EA that are best capable of producing identified species and size classes of fish based on programs and comparison with criteria are listed below. The listings are based on knowledge of past performance and/or water quality and supply characteristics.

COLD WATER

Species	Size class	Facility
Brook Trout	fingerling	Kamas, Whiterocks, Loa, Big Springs, Jones Hole, Mantua
Brown Trout	fingerling	Big Springs, Jones Hole, Kamas, Whiterocks, Loa, Springville
Cutthroat Trout		
Bear Lake	fry	Fountain Green, Mantua, Jones Hole, Whiterocks, Kamas
	fingerling	Fountain Green, Kamas, Whiterocks, Mantua
Bonneville		Fountain Green, Jones Hole, Kamas, Whiterocks, Mantua
Yellowstone	fry	Fountain Green, Jones Hole, Kamas, Whiterocks, Mantua
Colorado River	fry	Whiterocks, Big Springs, Jones Hole, Kamas, Mantua and Fountain Green
	fingerling	Whiterocks, Big Springs, Jones Hole, Kamas, Fountain Green, Mantua
Snake River	subcatchable	Jones Hole, Kamas, Whiterocks, Fountain Green, Mantua
Kokanee	fingerling	Whiterocks, Kamas, Mantua, Fountain Green
Lake Trout	fry	Big Springs, Kamas, Mantua, Fountain Green
Rainbow Trout	all	All

WARM WATER

For the warm water species identified to be cultured (See Chapter 1, Table 2), either the Gandy or Goshen site would provide an adequate permanent hatchery, based on the feasibility study results. An interim facility to meet the immediate needs for June sucker recovery could be located at Red Butte, or another suitable site.

The culture needs of the native aquatic species were reevaluated after the feasibility study was completed (FishPro, 1996b). Those species which are found in CRSP-affected area waters were focused on and the needs from the feasibility study were reduced (these are the needs listed in Table B-2). The immediate needs for culture (years 2000-2014) are for June sucker, least chub, boreal toad and spotted frog. The remaining species, leatherside chub, roundtail chub, flannelmouth sucker and bluehead sucker are additional needs to be accommodated later (year 2005-2035). The Division believes that the feasibility study facility design at either site would adequately meet the needs of the native fishes. This design could be located at one site, or divided between the two proposed sites, with Gandy serving for growout. The feasibility report design for Goshen would need to be modified with the addition of 0.5 to 1 acre ponds for growout of native and sportfish, circular tanks to accommodate sportfish culture and facilities to accommodate an increase in boreal toad and spotted frog culture to be substituted for the raceways which would not be included. An anticipated modified total cost of $10 million (original feasibility study cost: $16,751,000) would allow for the desired production of native species and warmwater sportfish for the CRSP-affected area waters.

evaluation criteria

FACILITY	WATER QUALITY	WATER TEMPERATURE	WATER SUPPLY SECURITY	COST EFFICIENCY	WATER QUANTITY	PHYSICAL SITE LAYOUT
Cold-water species[1]						
Big Springs	DO 6.6-8.0 mg/l N_2 111% pH: 7.72 Alkalinity: 56 mg/l	43-46 ºF	secure water supply diversion 100 ft downstream open springs	Cost: $2,983,000[2] Increased production: 30,000 lbs Post Project O&M: $34,828	Spring source provides from 5 to 6 cfs Uintah Dam toe water available in future.	Tribal Trust lands; diversion downstream spring; gravity flow system; 7500 ft elevation U-shaped river valley
Ftn. Green	DO 8.2 -9.4 mg/l N_2 103% CO_2: 12.6 mg/l pH: 7.7 Alkalinity: 264 mg/l	54 ºF	Secure water supply open to surface	Cost: $5,836,000 Increased production: 47,400 lbs Post Project O&M: $249,300	Flows range from 7.6 to 12.7 cfs	UDWR property; new up gradient site, gravity flow system
Jones Hole	DO: 8.0 mg/l pH: 7.8	54 ºF	Secure water supply open springs	Cost: $1,674,000 Increased production: 88,000 lbs Post Project O&M: $446,000	Flows range from 18 to 34 cfs	Existing Federal facility, remote site, gravity flow system, with pumping at degassers
Kamas	DO 8.2 mg/l N_2: 116-135% CO2: 29.7-35.7 mg/l pH: 7.2-7.39 Alkalinity: 210-265 mg/l	52 ºF, north and south springs 42 ºF, Cedar Gulch 49 ºF, combined	Water supply on site; covered springs	Cost: $5,651,900 Increased production: 60,000 lbs Post Project O&M: $ 231,500	Spring sources provide a total of 7.2 cfs	UDWR property, constructed 1928, some raceways rebuilt 1950s, 7,000 ft elevation gravity flow system

[1]See also Appendix E, for more detail

[2]See also Table 6, Chapter 3, for complete information.

evaluation criteria

FACILITY	WATER QUALITY	WATER TEMPERATURE	WATER SUPPLY SECURITY	COST EFFICIENCY	WATER QUANTITY	PHYSICAL SITE LAYOUT
Loa	DO 7-7.7 mg/l; N_2: 103% pH: 8.0 Alkalinity 102 mg/l	54-62 °F	Upgradient canal from reservoirs known to contain whirling disease may flood hatchery during high runoff.	Level 1[3] costs: $1,994,000 Increased production: 50,152 lbs Post Project O&M: $252,700	Springs provide 14 cfs year-round	UDWR property, built 1935; renovated 1962; 7,200 ft elevation;
Mantua	DO: 7.6-8.0 mg/l N_2:: 110-117% pH: 7.9 Alkalinity: 175 mg/l	44-48 °F	Agreements with Mantua City for low flow use-1/3 of upper springs. Springs open	Level 1 costs: $3,047,000 Increased production: 6,736 lbs Post Project O&M: $124,295	Maple Creek Springs flows range from 6.4 to 9.1 cfs	UDWR property, pumping now used to operate facility. Gravity flow available.
Midway	DO 4.4-5.4 mg/l pH 7.3 [effluent] N_2 114-117% Alkalinity 315 mg/l Phosphorous loading limit.	Main springs 55-59 °F;	Water source covered.	Level 1 costs: $4,930,500 Increased production: 72,536 lbs Post Project O&M: $390,536	Main spring flows range from 3.7 to 11.4 cfs. Additional flows available downstream of Main spring range from 13.7 to 20.2 cfs.	UDWR property, rearing facilities built 1920s, building constructed 1940; gravity system
Springville	DO 6.8-7.5 mg/l pH: 7.5 N_2 : 100-104% Alkalinity 92 mg/l	Hatchery building 54 °F Outside raceways 58-61 °F	Springs open to fish and spotted frog upstream	Level 1 costs: $2,927,000 Increased production: 70,594 lbs Post Project O&M: $373,084	Flows average 16.8 cfs	UDWR property east and west of Main St.. Hatchery built 1909, gravity system

[3]Level 1 funding would only implement the highest priority activities. These are: water supply protection and some level of increased production. In some cases it also includes the replacement of unsafe buildings.

evaluation criteria

FACILITY	WATER QUALITY	WATER TEMPERATURE	WATER SUPPLY SECURITY	COST EFFICIENCY	WATER QUANTITY	PHYSICAL SITE LAYOUT
Whiterocks	DO 7.7-9.9 mg/l pH 7.5 N_2 104-111% Alkalinity: 240 mg/l	47-51ºF	Spring source on Tribal land, open. Lease expired.	Level 1 costs: $2,430,000 Increased production: 52,189 lbs Post Project O&M: $187,176	Various springs: provide flows of 5.6 to 7.5 cfs	UDWR property, facilities built 1923, office and residence 1960s;
Youth Camp	DO 6.5-10.8 mg/l N_2 101.5% pH 7.44 Alkalinity. 81 mg/l	31-60 ºF, low late fall through spring	The secure water supply is exposed to upstream fish.	Cost: $162,000, included in Big Springs rearing total: 5,129 lbs-some from Big Springs	Pole Creek, Uinta River and Big Springs provide 10 to 20 cfs.	Tribal Trust lands; existing raceway
Warm-water/Native species						
Goshen	DO 5.3 mg/l N_2 127.6% pH 7.5 Alkalinity 250 mg/l Selenium 3.9 µg/l	71 ºF	Spring source open	Cost: $10,851,000 (without land acquisition, see discussion p. C-2) Immediate: 1,155,00; (138,893 lbs) additional: 804,000 (173,107 lbs)	Warm Springs ditch to be developed as a protected spring-12 cfs available.	Privately-owned land Pump station and headtank needed.
Gandy Springs	DO 7.3 mg/l N_2 106% pH 7.8 Alkalinity 200 mg/l	82 ºF (will need cooling to 70 ºF)	Spring source open	Cost: $5,900,000 (without land acquisition; see discussion p. C-2) Above is the total program goal for both facilities.	Springs feeding Warm Springs Creek; supply of 15 cfs available.	Undeveloped BLM and private land. No pumping needed.