Biological Assessment for the Pine Ridge Wildland Fire and Rehabilitation Plan and the Effects on Four Endangered Fish Species: bonytail (*Gila elegans*), humpback chub (*Gila cypha*), Colorado pikeminnow (*Ptychocheilus lucius*), and razorback sucker (*Xyrauchen texanus*), and their Designated Critical Habitat, and one Threatened Plant Species: Colorado hookless cactus (*Sclerocactus glaucus*)

Prepared by:
Tom Fresques
West Slope Fish Biologist, Colorado River Valley Field Office

Ken Holsinger
Botanist, Uncompahgre Field Office

Reviewed by:
Heidi Plank,
Grand Junction Field Office, Wildlife Biologist

Anna Lincoln,
Grand Junction Field Office, Ecologist

Submitted to:
Patty Gelatt,
U.S. Fish and Wildlife Service, Western Colorado Ecological Services, Supervisor

Introduction/Background

The Pine Ridge Fire was started by lightning on June 27, 2012. The fire burned primarily in pinyon juniper woodlands and sagebrush with understory grasses consisting of Indian ricegrass, Sandberg bluegrass, bluebunch wheatgrass, cheatgrass, galleta grass, prairie junegrass, and bottlebrush squirreltail. Other vegetation burned included greasewood, shadscale, and riparian vegetation consisting of tamarisk, Freemont cottonwoods, willows, bull thistle, phragmites, and canary reedgrass. The fire burned in rugged terrain located southwest of DeBeque, Colorado in Mesa County. The fire burned at elevations between 4,800 feet to 6,200 feet. The fire was fully contained/controlled on July 4, 2012 and burned a total of 13,920 acres (13,110 BLM, 810 Private).

The fire was controlled primarily by the use of fire retardant lines, natural topographic features, the Colorado River, helicopter water drops, wildland fire engines, and burnout operations. Only one mile of hand-line was constructed near private land on the fires southwest corner and no dozer line was constructed. Overall burn severity was in the low to moderate range with some high severity areas in the canyons and on small portions of river bottom. No areas of soil hydrophobicity (soils heated to the point that they preclude water penetration/absorption) were noted. Approximately 25 acres of Designated Critical Habitat for the endangered Colorado pikeminnow and razorback sucker burned during the wildfire. Vegetation burned along and near the river included cottonwood, willow, tamarisk, Canary reedgrass, phragmites, bulrush, and thistle.

Given the size of the fire and resource values at risk, a Burned Area Emergency Rehabilitation (BAER) Team was assembled on July 9, 2012 to assess post fire rehabilitation needs and write a rehabilitation plan.

The purpose of this Biological Assessment (BA) is to address and analyze both the impacts from emergency fire suppression actions taken to put out the fire, and the potential effects associated with implementation of the Rehabilitation Plan. This BA addresses four federally endangered fish species: bonytail, humpback chub, Colorado pikeminnow, and razorback sucker, and one federally threatened plant species, Colorado hookless cactus. The segment of the Colorado River located on the fires eastern edge is designated Critical Habitat for the Colorado pikeminnow and razorback sucker. Designated Critical Habitat and populations of bonytail and humpback chub are located over 40 miles downstream of the fire near the Colorado/Utah border at Black Rocks but were/are effected by water depletions associated with suppression and rehabilitation actions. Known and historic occurrence records for the Colorado hookless cactus are located within the fires northeastern and eastern perimeter in and near Sulphur Gulch. This BA was prepared by the Bureau of land Management (BLM), Grand Junction Field Office (GJFO), for submittal to the USFWS, Western Colorado Ecological Services Field Office in Grand Junction, Colorado.

Federal land management agencies must consult with the USFWS on any action which may affect listed species or designated critical habitat. Section 7(c)(1) of the Act requires a BA be completed if a listed species and/or critical habitat may be present in the action area (USFWS and National Marine Fisheries Service [NMFS] 1998). It is optional if only proposed species or proposed critical habitat is involved (USFWS and NMFS 1998). The biological assessment ensures the agency's early involvement and increases the chance for resolution during informal consultation. One of the purposes of the biological assessment is to help make the determination of whether the proposed action is "likely to adversely affect" listed species and their critical habitat.

Emergency Consultation
Section 7 regulations recognize that an emergency (natural disaster or other calamity) may require expedited consultation (50 CFR §402.05).

Where emergency actions are required that may affect listed species and/or critical habitats, a Federal agency may not have the time for the administrative work required by the consultation regulations under non-emergency conditions. Emergency consultations should be handled with as much understanding of the action agency's critical mission as possible while ensuring that anticipated actions will not violate sections 7(a)(2) or 7(d). Emergency consultation procedures allow action agencies to incorporate endangered species concerns into their actions during the response to an emergency.

An emergency is a situation involving an act of God, disasters, casualties, national defense or security emergencies, etc., and includes response activities that must be taken to prevent imminent loss of human life or property. Predictable events, like those covered in Emergency Use Permits issued by the Environmental Protection Agency for pesticide applications, usually do not qualify as emergencies under the section 7 regulations unless there is a significant unexpected human health risk.

Consultation History

July 2, 2012: The BLM met with USFW (Creed Clayton and Gina Glenne) Colorado Parks and Wildlife, and the Natural Resource Conservation Service to discuss the rehab efforts for the Pine Ridge Fire. The group discussed the specifics of the fire and decided that we would form a hand selected rehab team rather than an official BAER team. The following questions were given to team members to answer.

- What are your resource concerns?
- What info do you need?
- What info can you bring to the team?
- What are your resource objectives?
- Any ideas in regards to rehab efforts that you have experienced or read about that might work?

July 3, 2012: Email from Patty Gelatt, FWS regarding things to consider regarding the fire and T&E species and their habitats and the emergency consultation process.

July 5, 2012: Creed Clayton, FWS, flew the fire with Collin Ewing BLM and was able to look at the fire from the air. Collin mapped the retardant lines.

July 9, 2012: At a lunch meeting, BLM and FWS discussed submission of one BA for both the emergency (fire) and the rehabilitation plan. Patty Gelatt agreed that one consultation would be sufficient. Patty inquired about any available analysis on effects of retardant and fire on the Colorado hookless cactus.

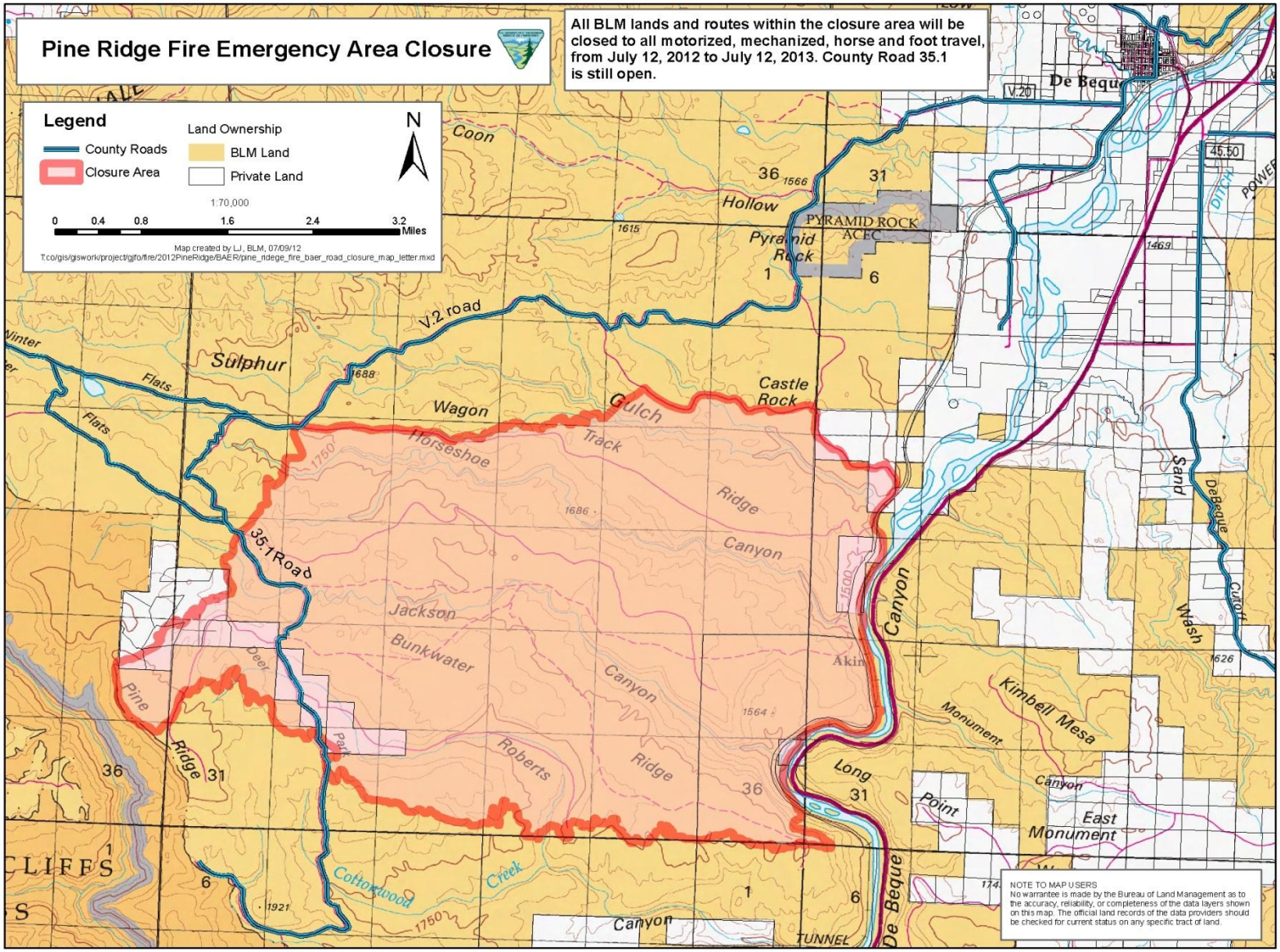
July 12, 2012: Meeting with Creed Clayton and Gina Glenne about the consultation process and update on rehabilitation work.

July 13, 2012: Creed Clayton attended a field visit to look at the burned area near the Colorado River and the outflow areas of the major tributary drainages within the fire.

Location of the Proposed Action (Fire Location)

The Pine Ridge Fire burned lands located in Township 9 South, Range 98 West, Sections 11 - 30, 32 – 36; Township 9 South, Range 99 West, Sections 24, 25, Township 9 South, Range 97 West, Sections 18, 19, 30, 31. The Pine Ridge Fire perimeter is shown on the accompanying map (Figure 1).

Figure 1. Pine Ridge Fire Perimeter/Location Map.



Completed Emergency Actions (Fire Suppression)

Primary suppression actions consisted of the dropping of fire retardant as containment lines, the use of helicopters obtaining water from the Colorado River and dropping on the fire with fire crews working on cooling those hot spots (hand crews mixing water and dirt to put out fire), and wildland fire engines using water from the Colorado River, flanking (working the active edges of the fire to suppress and minimize lateral spread) and working active portions of the fire. On the fires northeastern and eastern boundary burn out operations were completed which consisted of igniting vegetation from the BLM Road 7729A to burn out and remove/reduce fuels between the road and the active portions of the fire, and fire crews mopping up (hand crews cooling of residual hot spots within the interior of the fire with water and hand tools).

- Fire Retardant: Phos-Chek LC-95-A, 74 retardant drops over a three day period totaling 147,745 gallons

- Water Use: 194,720 gallons directly from the Colorado River = 0.60 acre-feet; 125, 595 gallons or 0.39 acre-feet of water used in retardant mix.

- Burnout Operations: ignited and burned approximately 466-acres of pinyon-juniper, sagebrush, and greasewood on the fires northeastern edge.

- Hand Line: Approximately 1-mile of hand-line (2-3 foot wide clearing of vegetation to mineral soil) was constructed on a small portion of the fires northern and southwestern edges.

Proposed Actions (Rehabilitation Plan)

The primary actions in the Rehabilitation Plan include the following:

- Construction of up to 4 new sediment retention dams to capture sediment, ash, fire retardant residues, and other debris. Each sediment retention dam and catchment area would disturb up to 2 acres of land (Figure 2).

- Cleanout of up to 19 of the 20 existing stock ponds to facilitate capture of sediment, ash, fire retardant residues, and other fire related debris. Existing material would be placed on top of the existing dam (Figure 2).

- Reconstruction of 1 existing stock pond to improve functionality and storage capacity to capture sediment, ash, fire retardant residues, and other debris (Figure 2).

- Reseeding – short-term sterile hybrid annual grass, long-term native perennial grasses & forbs in healthy pre-fire plant communities and introduced grasses in severely degraded (cheatgrass prone) pre-fire communities.

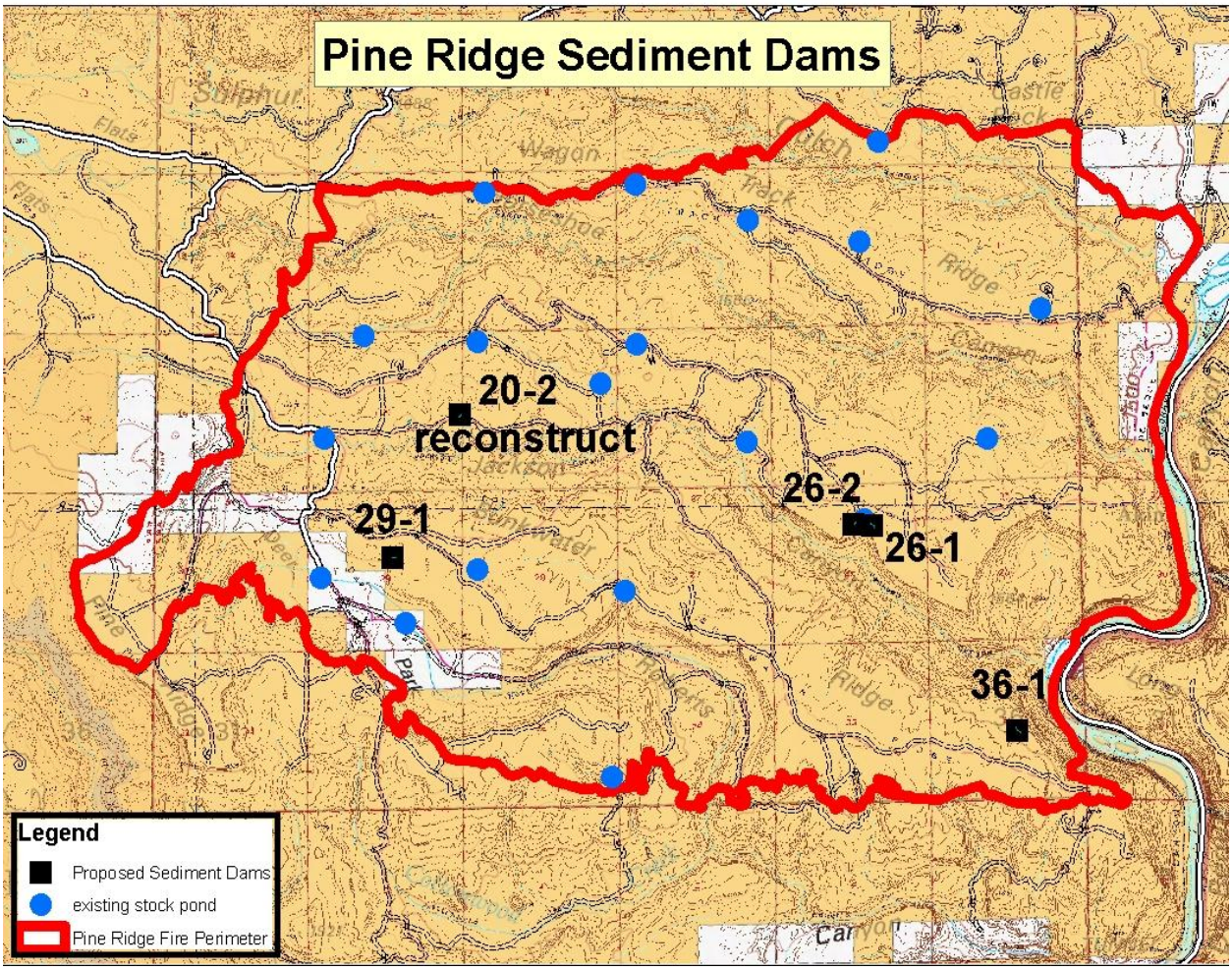
- Plateau herbicide application in severely degraded pre-fire communities to increase probability of establishing desirable plant communities.

- Road maintenance – standard measures to improve running surface and drainage to facilitate water removal and reduce rutting. Based on site visits, 9.2 miles of roads currently need maintenance to limit further gullying and user created reroutes. Periodic maintenance may be necessary after future rain events.

- Placement of two radar stage recorders to serve as early alert flood warning systems. One each at Horseshoe Canyon and Jackson Canyon

- Monitoring – reseeding efforts, erosion, ponds and retention dams, closures, roads, and weeds

Figure 2. Map of 19 Existing Ponds, 4 New Sediment Retention Dams, and 1 Pond Reconstruction



Species Considered & Species Evaluated

Fish:
The bonytail, humpback chub, Colorado pikeminnow, and razorback sucker are listed as endangered species by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA) of 1973. These four species have declined in numbers throughout their historic range in the Colorado River Basin due to habitat alteration and introduction of competitive and predatory nonnative fish species. The humpback chub and Colorado pikeminnow were listed as endangered by the U.S. Fish and Wildlife

Service (USFWS) on March 11, 1967 (32 FR 4001). The bonytail was listed as endangered on April 23, 1980 (45 FR 27713), and the razorback sucker was listed as endangered on October 23, 1991 (56 FR 54957). Critical habitat for all four species was designated simultaneously on March 21, 1994 (59 FR 13374-13400).

A Recovery Implementation Program for the four endangered fish species in the Upper Colorado River Basin was initiated in January 1988 as a collaborative program comprised of federal, state, and private cooperators. The program provides specific goals for the recovery of endangered Colorado River fish while promoting sustainable water development and use (USFWS 1987).

Plants:
The Colorado hookless cactus ("Sclerocactus") is one of a group of closely related cacti listed by the USFWS as threatened under the name Uinta Basin hookless cactus (*Sclerocactus glaucus*) on October 11, 1979 (USFWS 1979, 1990a). The basis for the decision to list the species included habitat loss; overutilization for commercial, sporting, scientific, or educational purposes; and the inadequacy of existing laws and regulations to protect the species. Recent genetic studies (Porter et al.2000), common garden experiments (Hochstatter 1993, Welsh et al. 2003), and a reevaluation of the morphological characteristics of *Sclerocactus glaucus* (Hochstatter 1993, Heil and Porter 2004) have led to a reclassification of the genus, including splitting *S. glaucus* into three species: Colorado hookless cactus (*S. glaucus*), Uinta Basin hookless cactus (*S. wetlandicus*), and Pariette hookless cactus (*S. brevispinus*) (USFWS 2007a).

Table 1. List of Species Considered

Common Name	Scientific Name	Federal Status
Bonytail	*Gila elegans*	Endangered – Critical Habitat
Humpback chub	*Gila cypha*	Endangered – Critical Habitat
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered – Critical Habitat
Razorback sucker	*Xyrauchen texanus*	Endangered – Critical Habitat
Colorado hookless cactus	*Sclerocactus glaucas*	Threatened – None
DeBeque phacelia	*Phacelia submutica*	Threatened – Proposed Critical Habitat

Description of the Species and their Habitat

Bonytail

Status. The bonytail (*Gila elegans*) (bonytail) is endemic to the Colorado River Basin (Valdez and Clemmer 1982). The bonytail is now the rarest fish in the Colorado River Basin. The current population consists of adults with very little to no recruitment (59 FR 13374 (March 21, 1994)). The bonytail is currently listed as "endangered" under the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 et. seq.), under a final rule published on April 23, 1980 (45 FR 277163). A recovery plan was approved on September 4, 1990 (USFWS 1990a) and recovery goals for the bonytail were released by the USFWS in 2002 as an amendment and supplement to the 1990 recovery plan (USFWS 2002a). The

final rule for determination of critical habitat was published on March 21, 1994 (59 FR 13374), and the final designation of critical habitat became effective on April 20, 1994.

Life History, Habitat, Distribution. The bonytail is a large cyprinid fish which has a streamlined body and typically achieves a maximum size of about 45 centimeters (cm) in total length (TL), but can reach up to 60 cm in TL and approximately 1.1 kilograms (kg) in weight (Behnke and Benson 1980, USFWS 2002a, Vanicek 1967). Adult bonytails are gray or olive colored on the back with silvery sides and a white belly. Adult bonytails have an elongated body with a long, thin caudal peduncle. The head is small and compressed compared to the rest of the body. The mouth is slightly overhung by the snout and there is a smooth low hump behind the head that is not as pronounced as on the humpback chub.

While it was historically reported as widespread and abundant in rivers throughout the Colorado River Basin, currently there are no known populations in Colorado. Bonytail had not been collected in Colorado for several years except for one individual collected in 1984 in the Black Rocks area of the Colorado River west of Grand Junction, Colorado (Kaeding et al. 1986) and one individual was captured on the Gunnison River near Delta just upstream of the GJFO field office boundary, in 1989 (USFWS 2002b). One bonytail was documented passing through the Redlands diversion dam fish ladder in 2003 (USFWS 2008a) on the Gunnsion River just above the confluence with the Colorado River; however, bonytail have not been documented passing through the government highline canal fish ladder on the Colorado River upstream of Palisade (USFWS 2008b). Bonytail have been stocked in the Colorado River in DeBeque Canyon in recent years in suitable habitat just upstream of Beavertail bend.

Little is known about the specific habitat requirements of bonytail because the species was extirpated from most of its historic range prior to extensive fishery surveys (USFWS 2002a). Bonytail are adapted to pools and eddies along warm water reaches of swift moving, mainstem rivers that are often heavily silted, but have been found in reservoir habitats as well. The species' diet consists primarily of terrestrial insects, gastropods, and caddis worms; however, in lacustrine environments they are likely to feed primarily on plankton and algae (USFWS 2002a).

Based on the breeding characteristics of other closely related *Gila* species, bonytail probably spawn between late June and early July over gravel substrate at temperatures of approximately 18 degrees Celsius (°C) (USFWS 2002a, 2002b, Vanicek and Kramer 1969). Female bonytail produce between 1,000 and 17,000 eggs. Eggs begin hatching about 9 hours after fertilization and alevins remain in the gravel for 48-120 hours before emerging. Survival rate of juveniles is about 17 to 38 percent (%) (USFWS 2002a).

Threats. Overall, bonytail and other native fish of the Colorado River Basin have been jeopardized by changes in river flow regimes by large mainstem dams and water diversions; habitat modification including degraded water quality, migratory barriers, and impacts to riparian vegetation from overgrazing; changes in water temperature; competition and predation by exotic fish species; parasites; and altered food base (Miller 1961, Minckley and Deacon 1991, USFWS 1987, USFWS 2002a). Additional threats that are significant to bonytail include hybridization with other native Gila species and pesticides and pollutants (USFWS 2002a). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. The species experienced a significant decline in abundance, starting around 1950, although the decline was poorly documented (Miller 1961, Ono et al. 1983). At the time it was listed, threats that were cited for the species included physical alterations (impoundments and diversions) and chemical changes to habitats and introductions of non-native fish (45 FR 277163 [April 23, 1980]). Water impoundments within the

Colorado River Basin have altered temperature regimes by decreasing temperatures through the release of colder water downstream from the bottom of impoundments (USFWS 2002a).

Humpback Chub

Status. Similar to the bonytail, the humpback chub (*Gila cypha*) is a large cyprinid fish endemic to the Colorado River Basin (Miller 1946). The humpback chub is currently listed as endangered under the Endangered Species Act (ESA) of 1973, as amended (ESA; 16 U.S.C. 1531 et. seq.). It was first included in the List of Endangered Species issued by the Office of Endangered Species on March 11, 1967 (32 FR 4001) and was considered endangered under provisions of the Endangered Species Conservation Act of 1969 (16 U.S.C. 668aa). The humpback chub was included in the United States List of Endangered Native Fish and Wildlife issued on June 4, 1973 (38 FR No. 106), and it received protection as endangered under Section 4(c)(3) of the original ESA of 1973. The latest revised humpback chub recovery plan was approved on September 19, 1990 (USFWS 1990b) and recovery goals for the humpback chub were released by the USFWS in 2002 as an amendment and supplement to the 1990 recovery plan (2002b). The final rule for determination of critical habitat was published on March 21, 1994 (59 FR 13374), and the final designation became effective on April 20, 1994.

Life History, Habitat, Distribution. The humpback chub is another member of the unique assemblage of fishes native to the Colorado River Basin, consisting of 35 species with 74% level of endemism (Miller 1955). The distinctive feature of this species is a prominent hump on the body, immediately behind the head. The hump is presumably an adaptation to maintain stability on the bottom of a stream in turbulent flow (Behnke and Benson 1980). Adults attain a maximum size of about 48 cm (TL) and 1.1 kg in weight (Valdez and Ryel 1997). Similar to other species of *Gila*, humpback chubs feed on benthic invertebrates but will also feed on insects floating on the surface (USFWS 1990b).

The historical distribution of the humpback chub is not well known, because the humpback chub was not described as a species until 1946; however, the original distribution of this species was presumably limited to swift, deepwater areas in the mainstem Colorado River Basin, downstream to below the Hoover Dam site (Behnke and Benson 1980, Miller 1955). In the Upper Basin in Colorado, the humpback chub has been found in the Yampa, Gunnison, Green, and Colorado Rivers. However, the greatest numbers of humpback chub in Colorado are found at the Black Rocks area of the Colorado River downstream of Grand Junction and in Utah along the Westwater section of the Colorado River (Valdez 1981, Wick et al. 1981, Valdez and Clemmer 1982). The Black Rocks area on the Colorado River below the confluence with the Gunnison River, is considered one of six extant wild populations, and is estimated to have 900-1500 individuals (USFWS 2002b). The Black Rocks population is considered a core population that contains sufficient numbers of adults to ensure genetic and demographic viability, and sub-adult numbers so that reproduction and recruitment provide self-sustainability. Core populations are the central basis for recovery because they provide secure population centers from which dispersal can occur and provide redundancy from catastrophes that may affect one or more populations (USFWS 2002b). No humpback chub have been documented passing through the Redlands canal fish ladder on the Gunnison River (USFWS 2008a). However, three humpback chub passed through the Government highline canal fish ladder above Palisade on the Colorado River in 2005 (USFWS 2008b).

The humpback chub is highly adapted to the unpredictable flood pulse conditions under the historic hydrologic regime of the Colorado River system. In general, the species prefers seasonally warm waters that are deep, fast-moving, and turbid (Woodling 1985) and they are often associated with large

boulders and narrow canyons with steep cliffs (CDOW 2007b). Adults require eddies and sheltered shoreline habitats maintained by high spring flows. These high spring flows maintain channel and habitat diversity, flush sediments from spawning areas, rejuvenate food production, and form gravel and cobble deposits used for spawning. Evidence suggests that humpback chub may spawn in gravel/cobble substrate from April to June, on the descending limb of the spring hydrograph, at water temperatures between 16°C to 22°C (USFWS 1990b). Young require low-velocity shoreline habitats, including eddy and backwaters that are more prevalent under base-flow conditions. However, they have also been found in relatively quiet waters and may use a variety of different habitats (USFWS 1990b). In the Westwater Canyon (downstream of the project area) and Black Rocks reaches, young humpback chub appear to utilize low-velocity shallow waters along shorelines with eddies and backwaters with depths averaging 2.1 feet but not exceeding 5.1 feet (Valdez et al. 1990). Alternatively, adults in the same areas were found in water averaging 50 feet (maximum depth of 92 feet) and were associated with in-stream large boulders where there were steep cliffs along the riverbanks (Valdez et al. 1982a, Wick et al. 1981).

Threats. The primary threats to humpback chub are similar to those of the bonytail and include stream flow regulation and habitat modification; competition with and predation by nonnative fishes; parasitism; hybridization with other native Gila species; and pesticides and pollutants (USFWS 2002b). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. Additional Threats to the humpback chub include reduced peak spring flows and reduced availability of shoreline eddy and deep canyon habitats (59 Fed. Reg. 13374 (March 21, 1994)).

The humpback chub population in the Grand Canyon is threatened by predation from non-native trout in the Colorado River below Glen Canyon Dam. This population is also threatened by the Asian tapeworm that has been found to infect humpback chubs in the Little Colorado River (USFWS 2002b). Currently no Asian tapeworms have been reported in the Upper Basin populations. Hybridization with the bonytail and the roundtail chub (*Gila robusta*) where they occur together is also recognized as a threat to the humpback chub. A larger proportion of roundtail chubs have been found in Black Rocks and Westwater Canyon during low flow years (Kaeding et al. 1990; Chart and Lentsch 2000), which may increase the chances for hybridization.

Colorado Pikeminnow

Status. Along with the bonytail and humpback chub, the Colorado pikeminnow (*Ptychocheilus lucius*) is included in the unique assemblage of fishes native to the Colorado River Basin. The common name for this species was changed from Colorado squawfish to Colorado pikeminnow by the American Fisheries Society (Nelson et al. 1998). The species is currently listed as endangered under the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 et. seq.). It was first included in the List of Endangered Species under the Endangered Species Preservation Act of 1966 on March 11, 1967 (32 FR 4001) and was considered endangered under provisions of the Endangered Species Conservation Act of 1969 (16 U.S.C. 668aa) prior to the enactment of the Endangered Species Act of 1973. The Colorado Pikeminnow was included in the United States List of Endangered Native Fish and Wildlife issued on June 4, 1973 (38 FR No. 106), and it received protection as endangered under Section 4(c)(3) of the original ESA of 1973. The final rule for determination of critical habitat was published on March 21, 1994 (59 FR 13374), and the final designation became effective on April 20, 1994. The latest revised Colorado squawfish (pikeminnow) recovery plan was approved on August 6, 1991 (USFWS 1991) and recovery goals, as an

amendment and supplement to the Colorado Pikeminnow Recovery Plan, were released in 2002 (USFWS 2002c).

Life History, Habitat, Distribution. The Colorado pikeminnow is the largest cyprinid fish endemic to the Colorado River Basin (Tyus 1991). Adults attain a maximum size of up to 1.8 meters (m) in TL and 36 kg in weight (Miller 1961, USFWS 2002c). Historically, the Colorado pikeminnow was found throughout lower elevation warm waters of the Colorado River Basin, from Green River in Wyoming to the Gulf of California in Mexico (Behnke and Benson 1980). Currently, reproducing populations of Colorado pikeminnow are found in the Green River and upper Colorado River basin, upstream of the Glen Canyon Dam in Arizona, and there are small numbers of individuals (with limited reproduction) in the San Juan River basin (USFWS 2002c). Colorado pikeminnow does not occur within the GJFO.

Colorado pikeminnow live in warm-water reaches of the Colorado River mainstem and larger tributaries, and require uninterrupted stream passage for spawning migrations and dispersal of young. The species is adapted to a hydrologic cycle characterized by large spring peaks of snowmelt runoff and low, relatively stable base flows. High spring flows create and maintain in-channel habitats, and reconnect floodplain and riverine habitats, a phenomenon described as the spring flood pulse (Junk et al. 1989; Johnson et al. 1995). Habitat requirements of the Colorado pikeminnow include pools, deep runs, and eddy habitats maintained by high spring flows (USFWS 2002c). Throughout most of the year, juvenile, subadult, and adult Colorado pikeminnow utilize relatively deep, low-velocity eddies, pools, and runs that occur in nearshore areas of main river channels (Tyus and McAda 1984; Valdez and Masslich 1989; Tyus 1990, 1991; Osmundson et al. 1995). In spring, however, Colorado pikeminnow adults utilize floodplain habitats, flooded tributary mouths, flooded side canyons, and eddies that are available only during high flows (Tyus 1990, 1991; Osmundson et al. 1995). Such environments may be particularly beneficial for Colorado pikeminnow because other riverine fishes gather in floodplain habitats to exploit food and temperature resources, and may serve as prey. Such low-velocity environments also may serve as resting areas for Colorado pikeminnow. River reaches of high habitat complexity appear to be preferred.

Threats. Primary threats to the Colorado pikeminnow include stream flow regulation; habitat modification; competition and predation from introduced, non-native fish species; pesticides; and pollution (USFWS, 2002c). Additional threats identified in the species' 1991 Recovery Plan were summarized as a combination of factors including direct loss of habitat and impacts caused by mainstem dams that result in reduced peak flows and increased base flows; decreased water temperatures due to the release of cold water from dams; containment of sediment that is important for forming and maintaining backwater habitats; and blockage of migration corridors (USFWS 1991).

In 1973, modification of habitat from riverine habitat to lacustrine habitat by the construction of large reservoirs was also cited as the primary threat to this species. In the Upper Basin, 435 miles of Colorado pikeminnow habitat has been lost by reservoir inundation from Flaming Gorge Reservoir on the Green River, Lake Powell on the Colorado River, and Navajo Reservoir on the San Juan River. Cold water releases from these dams have eliminated suitable habitat for native fishes, including Colorado pikeminnow, from river reaches downstream for approximately 50 miles below Flaming Gorge Dam and Navajo Dam. In addition to main stem dams, many dams and water diversion structures occur in and upstream from critical habitat that reduce flows and alter flow patterns, which adversely affect critical habitat. Diversion structures in critical habitat divert fish into canals and pipes where the fish are permanently lost to the river system. It is unknown how many endangered fish are lost in irrigation systems, but in some years, in some river reaches, majority of the river flow is diverted into unscreened

canals. The high spring flows which maintain habitat diversity, flush sediments from spawning habitat, increase invertebrate food production, form gravel and cobble deposits important for spawning, and maintain backwater nursery habitats have been reduced by flow regulation of dams and by water diversions (McAda 2003; Muth et al. 2000).

Predation and competition from nonnative fishes have been clearly implicated in the population reductions or elimination of native fishes in the Colorado River Basin (Dill 1944; Osmundson and Kaeding 1989; Behnke 1980; Joseph et al. 1977; Lanigan and Berry 1979; Minckley and Deacon 1968; Meffe 1985; Propst and Bestgen 1991; Rinne 1991). Data collected by Osmundson and Kaeding (1991) indicated that during low water years, nonnative minnows capable of preying on or competing with larval endangered fishes greatly increased in numbers.

More than 50 nonnative fish species were intentionally introduced in the Colorado River Basin prior to 1980 for sportfishing, forage fish, biological control and ornamental purposes (Minckley 1982; Carlson and Muth 1989). Nonnative fishes compete with native fishes in several ways. The capacity of a particular area to support aquatic life is limited by physical habitat conditions. Increasing the number of species in an area usually results in a smaller population of most species. The size of each species population is controlled by the ability of each life stage to compete for space and food resources and to avoid predation. Some life stages of nonnative fishes appear to have a greater ability to compete for space and food and to avoid predation in the existing altered habitat than do some life stages of native fishes. Tyus and Saunders (1996) cite numerous examples of both indirect and direct evidence of predation on razorback sucker eggs and larvae by nonnative species.

Threats from pesticides and pollutants include accidental spills of petroleum products and hazardous materials; discharge of pollutants from uranium mill tailings; and high selenium concentration in the water and food chain (USFWS 2002c). Accidental spills of hazardous material into critical habitat can cause immediate mortality when lethal toxicity levels are exceeded. Pollutants from uranium mill tailings cause high levels of ammonia that exceed water quality standards. High selenium levels may adversely affect reproduction and recruitment (Hamilton and Wiedmeyer 1990; Stephens et al. 1992; Hamilton and Waddell 1994; Hamilton et al. 1996; Stephens and Waddell 1998; Osmundson et al. 2000).

Razorback sucker

Status. The razorback sucker (*Xyrauchen texanus*) is a large catostomid fish endemic to the Colorado River Basin (Minckley et al. 1991). The razorback sucker is currently listed as "endangered" under the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 et. seq.), under a final rule published on October 23, 1991 (56 FR 54957). A recovery plan was approved on December 23, 1998 (USFWS 1998) and recovery goals were released for the Razorback Sucker in 2002, as an amendment and supplement to the Razorback Sucker Recovery Plan of 1998 (USFWS 2002d). The final rule for determination of critical habitat was published on March 21, 1994 (59 FR 13374), and the final designation became effective on April 20, 1994.

Life History, Habitat, Distribution. The razorback sucker is the fourth member of a unique assemblage of fishes native to the Colorado River Basin, consisting of 35 species with a 74% level of endemism (Miller 1955). It is one of four main stem, big-river fishes currently listed as endangered under the ESA; others are the Colorado pikeminnow, bonytail, and humpback chub. Adults attain a maximum size of about 1 meter TL and 5 to 6 kg in weight (Minckley 1973).

The razorback sucker evolved in warm-water reaches of larger rivers of the Colorado River Basin from Mexico to Wyoming. This species was once abundant through the Colorado River Basin, primarily in the mainstream and major tributaries and now is known within the Upper Colorado River Basin including the lower Yampa and Green Rivers, mainstream Colorado River, and lower San Juan River (USFWS 2002d). The Razorback Sucker is known to occur in the GJFO in both the Gunnison and Colorado Rivers. Within the Upper Colorado River Basin, naturally reproducing populations are only found in the middle Green River in Utah and in an off-channel pond in the Colorado River near Grand Junction (USFWS 2002d). From 1996-2008 twenty five razorback sucker have been recorded in the Redlands dam fish ladder (USFWS 2008a). From 2004-2008 two razorback sucker have been recorded in the Grand Valley Irrigation Dam fish ladder (USFWS 2008b).

The razorback sucker is most often found in quiet, muddy backwaters along the river (CDOW 2007c). Adult razorback sucker tend to occupy different habitats seasonally (Osmundson et al. 1995) and can do well in both lotic and lentic environments (Minckley et al. 1991). Habitats required by adults in rivers include deep runs, eddies, backwaters, and flooded off-channel environments in spring; runs and pools often in shallow water associated with submerged sandbars in summer; and low-velocity runs, pools, and eddies in winter. Spring migrations of adult razorback sucker were associated with spawning in historic accounts and a variety of local and long-distance movements and habitat-use patterns have been documented. In rivers, they usually are captured in lower velocity currents, more rarely in turbulent canyon reaches (Tyus 1987; Lanigan and Tyus 1989; Tyus and Karp 1990; Bestgen 1990; Minckley et al. 1991). An exception may be in the San Juan River, where hatchery-reared, radio-tagged adults preferred swifter mid-channel currents during summer–autumn base-flow periods (Ryden 2000). In the upper basin, bottomlands, low-lying wetlands, and oxbow channels flooded and ephemerally connected to the main channel by high spring flows appear to be important habitats for all life stages of razorback sucker (Modde et al. 1996; Muth et al. 2000). These areas provide warm water temperatures, low-velocity flows, and increased food availability (Tyus and Karp 1990; Modde 1997; Wydoski and Wick 1998). For example, in Old Charlie Wash, a managed wetland on the middle Green River, spring/summer water temperatures were 2 to 8°C higher than in the adjacent river (Modde 1996, 1997), density of benthos was 41 times greater than in other sampled habitats, and densities of zooplankton were 29 times greater than in backwaters and 157 times greater than in the main channel (Mabey and Shiozawa 1993).

Spawning extends from April through June and occurs in river bars with cobble, gravel, and sand substrates during high flows from spring runoff, when water temperatures are greater than 14°C (USFWS 2002d). Juvenile rearing habitats are in quiet, warm, shallow water associated with various river and floodplain features (USFWS 2002d). Reproduction has been adversely affected by lower water temperatures due to impoundments within the Colorado River Basin since cold water from the bottom is released downstream (USFWS 2002d). Spawning also occurs in reservoirs over rocky shoals and shorelines. Young require nursery environments with quiet, warm, shallow water such as tributary mouths, backwaters, or inundated floodplain habitats in rivers, and coves or shorelines in reservoirs.

Threats. The native fish assemblage of the Colorado River is jeopardized by large main stem dams, water diversions, degraded water quality, habitat modification, non-native fish species, and degraded water quality (Miller 1961, Minckley and Deacon 1991). Primary threats to the razorback sucker are stream flow regulation and habitat modification, including coldwater dam releases, habitat loss, and blocked migration corridors, as well as competition from non-native fish species, pesticides, and pollution (USFWS 2002d). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. Flow

recommendations have been developed that specifically consider flow-habitat relationships in habitats occupied by razorback sucker in the upper basin, and were designed to enhance habitat complexity and to restore and maintain ecological processes.

When razorback suckers were listed, the USFWS noted there was not much indication of recruitment to populations and decreasing population trends for adult fish. Habitat alterations, including water development projects that have depleted water, altered flow regimes, changed water quality, and caused habitat fragmentation and alteration; introduction of non-native fish species; and increases in water pollution from pesticides and other pollutants were among the impacts cited as contributing to the observed downward trends (USFWS 2002d).

Colorado hookless cactus

Status. The Colorado hookless cactus ("Sclerocactus") is one of a group of closely related cacti listed by the USFWS as threatened under the name Uinta Basin hookless cactus (*Sclerocactus glaucus*) on October 11, 1979 (USFWS 1990a). The basis for the decision to list the species included habitat loss; overutilization for commercial, sporting, scientific, or educational purposes; and the inadequacy of existing laws and regulations to protect the species. Recent genetic studies (Porter et al.2000), common garden experiments (Hochstatter 1993, Welsh et al. 2003), and a reevaluation of the morphological characteristics of *Sclerocactus glaucus* (Hochstatter 1993, Heil and Porter 2004) have led to a reclassification of the genus, including splitting *S. glaucus* into three species: Colorado hookless cactus (*S. glaucus*), Uinta Basin hookless cactus (*S. wetlandicus*), and Pariette hookless cactus (*S. brevispinus*) (USFWS 2007).

Life History, Habitat, Distribution. Sclerocactus is a small, ball- or barrel-shaped cactus, usually with straight (i.e., hookless) central spines; solitary ovoid to nearly globular, succulent stems approximately 1.5 to 7 inches tall; and pinkish to magenta flowers. Flowering occurs from April to May, with fruiting extending from May through June. Following flowering and fruiting, the plants turn a dull grayish green (hence the specific epithet "glaucus"). In the GJFO area, Sclerocactus occurs on gravelly or rocky surfaces on river terrace deposits, lower mesa slopes, and alluvial benches in salt desert shrub communities dominated by shadscale (*Atriplex confertifolia*) and in pinyon-juniper communities, within an elevation range of approximately 4,500 to 6,500 feet.

Threats. Several species of ground nesting bees, flies and ants are believed to be the primary pollinators for Sclerocactus. Upon fruit maturation, seeds are released and distributed via runoff, gravity and potentially by birds and insects (USFWS 1990). Predation by desert cottontails *(Sylvilagus audubonii)* has been observed at the Pyramid Rock ACEC in recent years and may be a threat to the Sclerocactus in addition to oil and gas development, collecting, grazing, and OHV use.

DeBeque phacelia

Status. This tiny, ephemeral annual plant is member of the waterleaf family (Hydrophyllaceae). The DeBeque phacelia (*Phacelia submutica*) was listed by the USFWS as threatened on June 23, 2010 (USFWS 2010). The currently known global distribution is within an approximate 10 mile radius of the town of DeBeque. Within this range, the DeBeque phacelia is further restricted to small patches of shrink-swell clay soils on moderately steep slopes of the Atwell Gulch and Shire members of the Wasatch Formation, at elevations of 4,700 to 6,200 feet.

Life History, Habitat, Distribution. The DeBeque phacelia is a pioneer species, specifically adapted to an environment where most plants cannot grow (CNHP 1995). The population sizes and current trends of this species are not well known. The germination of this ephemeral annual from the soil seedbank in any given year is highly dependent on favorable climatic conditions; a given site may contain several thousand in some years but none may be observed in other years (Burt and Spackman 1995). The yearly fluctuation in flowering must be considered when assessing potential impacts to this species.

Threats. DeBeque phacelia is threatened with destruction and modification of its seed bank and habitat due to ground disturbance from natural gas exploration, production and pipelines, other energy development, expansion of roads and utilities, the Westwide Energy Corridor, increased access to the habitat by off-road vehicles (ORVs), soil compaction by cattle, and proposed water reservoir projects.

Environmental Baseline within the Action Area

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the Action Area, the anticipated impacts of all proposed State or Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation process. The Action Area is defined at 50 CFR 402 to mean "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action". For the purposes of this consultation, the Action Area has been defined to include private land and public land administered by the BLM within the Pine Ridge Fire perimeter and the Colorado River downstream of the fire to the Colorado/Utah state line.

<u>Environmental Baseline of the Proposed Action Area</u>
The Pine Ridge Fire encompasses BLM lands (13,110 acres) and Private lands (810 acres). As the fire occurred prior to the writing of this document, the burn is now part of the environmental baseline for the Action Area. The fire burned intensely but with overall low to moderate severity. Some areas of high severity did occur within the drainages and along portions of the Colorado River. Given the topography, predominant soil types, and proximity to the Colorado River, the potential for erosion is elevated until such time as revegetation occurs. The Colorado River within and downstream of the fire includes a mix of BLM, private, and state lands. The Colorado River runs through the towns of Palisade, Grand Junction, and Fruita before exiting the state just downstream of Black Rocks. Railroad tracks and Interstate 70 run adjacent to the Colorado River for long expanses within and downstream of fire. The railroad and highway have both altered the natural characteristics of the floodplain along portion of the river since they were constructed in the 1880s.

Tamarisk and other exotic riparian species (Russian olive, phragmites, knapweed, whitetop, etc.) are also present and have impacted habitats for these fish along the river. Restoration efforts have been ongoing, and large stands of non-native vegetation have been removed on BLM lands in recent years in an attempt to restore native cottonwood and willow.

Major past and current uses of public lands within the project area include: oil and gas exploration and development; realty actions and permits such as rights-of-way; livestock grazing; recreation including camping, off-highway vehicle use, hunting and wild horse viewing, and others; water development and use; and other uses such as collection of ornamental rock and fuelwood. All of these activities have likely impacted, and will continue to impact habitats important to these threatened and endangered species across the landscape.

A number of factors contributed historically to the decline of these species, including changes in flow regime (especially the timing and amplitude of peak spring flows) associated with construction of dams and irrigation diversions, altered water quality (including sediment loads out of balance with current flow regimes, selenium from upstream sources associated with Mancos shale based soils, and lower temperatures associated with dams and, in specific areas, chemical pollutants), interference with migration to/from spawning grounds due to dams and other in-stream movement impediments (especially for the Colorado pikeminnow), competition or hybridization with introduced congeners (members of the same genus), predation on eggs, larvae, juvenile, and adult fish by introduced predatory game and non-game fishes. The USFWS and Colorado Parks and Wildlife routinely monitor the Colorado River downstream of the fire for the presence of the endangered Colorado River fished and to remove select non-native fish species.

Bonytail

Critical habitat for bonytail is located on the Colorado River from Black Rocks in Colorado downstream to the Utah border over 40 miles downstream of the Pine Ridge Fire. Wild bonytail are extremely rare in the Colorado River within the area affected by the proposed action. The last known riverine area where bonytail were common was the Green River in Dinosaur National Monument, where Vanicek (1967) and Holden and Stalnaker (1970) collected 91 specimens during 1962-1966. From 1977 to 1983, no bonytail were collected from the Colorado or Gunnison Rivers in Colorado or Utah (Wick et al. 1979, 1981; Valdez et al. 1982a, 1982b; Miller et al. 1984). However, in 1984, a single bonytail was collected from Black Rocks on the Colorado River (Kaeding et al. 1986). Several suspected bonytail were captured in Cataract Canyon in 1985-1987 (Valdez 1990). Current stocking plans for bonytail identify the middle Green River and the Yampa River in Dinosaur National Monument as the highest priority for stocking in Colorado and the plan calls for 2,665 fish to be stocked per year over the next 6 years (Nesler et al. 2003). Bonytail are stocked 3 miles downstream of the fire in suitable habitat located in DeBeque Canyon by Colorado Parks and Wildlife.

Bonytail are so rare that it is currently not possible to conduct population estimates. A stocking program is being implemented to reestablish populations in the upper Colorado River basin. From 1996 through 2004, 44,472 subadult bonytail were stocked in the Green and upper Colorado River Sub-basins. The Recovery Goals (USFWS 2002a) call for reestablished populations in the Green River and upper Colorado River sub-basins, each with greater than 4,400 adults that are self-sustaining with recruitment.

Humpback chub

Critical habitat for the humpback chub is located on the Colorado River from Black Rocks in Colorado downstream to the Utah border. Present concentrations of humpback chub in the Upper Basin occur in canyon-bound river reaches ranging in length from 3.7 kilometers (km) at Black Rocks in the Colorado River to 40.5 km in Desolation and Gray Canyons of the Green River. Other populations have been reported in DeBeque Canyon of the Colorado River upstream of the proposed action, and the Yampa and Whirlpool Canyons in Dinosaur National Monument (USFWS 1990b). Humpback chubs are distributed throughout most of Black Rocks and Westwater Canyons (12.9 km), and in or near whitewater reaches of Cataract Canyon (20.9 km), Desolation and Gray Canyons (65.2 km), and Yampa Canyon (44.3 km), with populations in the separate canyon reaches ranging from 400 to 5,000 adults. Distribution of humpback chubs within Whirlpool and Split Mountain Canyons is not presently known, but it is believed that numbers of humpback chub in these sections of the Green River are low. One

individual was recently captured in the Gunnison River in a canyon-bound reach at RM 22 (Burdick 1995).

The Yampa River is the only tributary to the Green River presently known to support a reproducing humpback chub population. Between 1986 and 1989, Karp and Tyus (1990) collected 130 humpback chubs from Yampa Canyon and indicated that a small but reproducing population was present. Small numbers of humpback chub also have been reported in Cross Mountain Canyon on the Yampa River and in the Little Snake River about 10 kilometers upstream of its confluence with the Yampa River (Wick et al. 1981; Hawkins et al. 1996).

Colorado Pikeminnow

Critical habitat for Colorado pikeminnow is located on the Colorado River from the bridge at Highway 13 in Rifle, Colorado downstream to Lake Powell. Colorado pikeminnow also have been found in the Gunnison River upstream from the confluence with the Uncompahgre River as far as the Hartland Diversion Dam (approximately 4 miles). Estimates of wild adult Colorado pikeminnow in the upper Colorado River (from Palisade, Colorado to Lake Powell) were approximately 780 fish in 2003. This population estimate includes the 15-mile reach of the Colorado River above the confluence with the Gunnison River. Fish can move up the fish passage structure at the Government Highline dam but to date, no individuals have moved above this structure. There are no specific population estimates for Colorado pikeminnow above Palisade, Colorado on the mainstem Colorado River. Other occupied habitat of wild Colorado pikeminnow includes: the Green River from Lodore Canyon to the confluence of the Colorado River; the Yampa River downstream of Craig, Colorado; the Little Snake River from its confluence with the Yampa River upstream into Wyoming; the White River downstream of Taylor Draw Dam; the lower 89 miles of the Price River; the lower Duchesne River; the upper Colorado River from Palisade, Colorado, to Lake Powell; the lower 34 miles of the Gunnison River; and the lower mile of the Dolores River in Utah.

Major declines of this native fish first occurred in the lower basin where large dams were constructed from the 1930s through the 1960s. In the Upper Basin, the following major dams were not constructed until the 1960s: Glen Canyon Dam on the mainstem Colorado River, Flaming Gorge Dam on the Green River, Navajo Dam on the San Juan River, and the Aspinall Unit Dams on the Gunnison River. To date, some populations in the Upper Basin have managed to persist, while others have become nearly extirpated. River segments where these fish have declined more slowly than in other areas are those where the hydrologic regime most closely resembles the natural condition, such as the Yampa River, where adequate habitat for important life phases still exists, and where migration corridors are unblocked and allow connectivity among life phases.

Razorback sucker

Critical habitat for razorback sucker is located on the Colorado River from the bridge at Highway 13 in Rifle, Colorado downstream to Lake Powell. Populations of razorback sucker are being augmented by stocking both in the Colorado and Gunnison Rivers. In the Upper Colorado River Basin, above Glen Canyon Dam, razorback suckers are found in limited numbers in both lentic and riverine environments. The largest populations of razorback suckers in the Upper Basin are found in the middle Green and lower Yampa Rivers (Tyus 1987). In the Colorado River, most razorback suckers occur in the Grand Valley area near Grand Junction, Colorado; however, they are increasingly rare. Osmundson and Kaeding (1991) reported that the number of razorback sucker captures in the Grand Junction area has declined dramatically since 1974. Between 1984 and 1990, intensive collecting effort captured only

12 individuals in the Grand Valley (Osmundson and Kaeding 1991). The wild population of razorback sucker is considered extirpated from the Gunnison River (Burdick and Bonar 1997).

Environmental Baseline for Threatened Plants

For the purposes of this consultation, the action area will be defined to include all lands within the perimeter of the Pine Ridge fire and those areas adjacent to the fire potentially affected by the proposed action. Major past and current uses of public lands within the project area include oil and gas exploration and development; realty actions and permits such as rights-of-way; livestock grazing; recreation including camping, off-highway vehicle use, hunting and wild horse viewing, and others; water development and use; and other uses such as collection of ornamental rock and fuelwood. All of these activities have likely impacted, and will continue to impact, animals, plants, and habitats across the landscape.

Colorado Hookless Cactus

An estimated 13 EOR (individuals or populations) of Hookless Cactus were previously documented within and adjacent to the burn area primarily in the bottom of Sulphur Gulch and one individual adjacent to county road S where the fire was effectively held by burnout operations. There are three additional known locations of cactus just north of the burn area but lie 0.1 and 0.4 miles north of the fire area and county road V 2/10. Approximately twenty surveys have occurred with negative results within and adjacent to the burn area totaling 6,420 acres.

DeBeque Phacelia

There were no previously identified populations or individuals of DeBeque phacelia within or adjacent to the fire. A review of 1:24,000 geology maps indicated no Wasatch formations of either the Shire or Atwell Gulch members occur within the fire area or along routes utilized to access the fire area. The closest proposed critical habitat occurs approximately 0.7 miles north of the northern edge of the burn area. Routes utilized to gain access to the fire area included S road and V 2/10 road which also occur no closer than 0.7 miles from the Sulphur Gulch and Pyramid Rock designated critical habitat areas. Based on the lack of habitat or known locations within or adjacent to the burn area BLM surmises there were no effects to DeBeque Phacelia or its proposed critical habitat from either the suppression actions or proposed rehabilitation actions and will not discuss the species in the remainder of the document.

Effects of the Completed Actions (Suppression) and Proposed Actions (Rehabilitation Plan)

Completed Suppression (Emergency) Actions:

Fish:

Direct:
It is unlikely but plausible that during suppression of the fire, water being taken out of the Colorado River via helicopters with buckets and suction hoses could have inadvertently entrained endangered fishes. Razorback sucker and bonytail have been stocked up and downstream of the fire area in recent years. Bonytail prefer deeper water canyon reaches not found within the area where water was taken.

To date, no Colorado pikeminnow, 2 razorback sucker, 6 humpback chub, and 22 bonytail have used the fish passage structure on the Government Highline Diversion Dam since it began operation in 2005 (Travis Francis, USFWS, personal communication). This suggests that aside from stocked fish, very few endangered fish are moving up and into the area where water was obtained from the Colorado River for suppression activities.

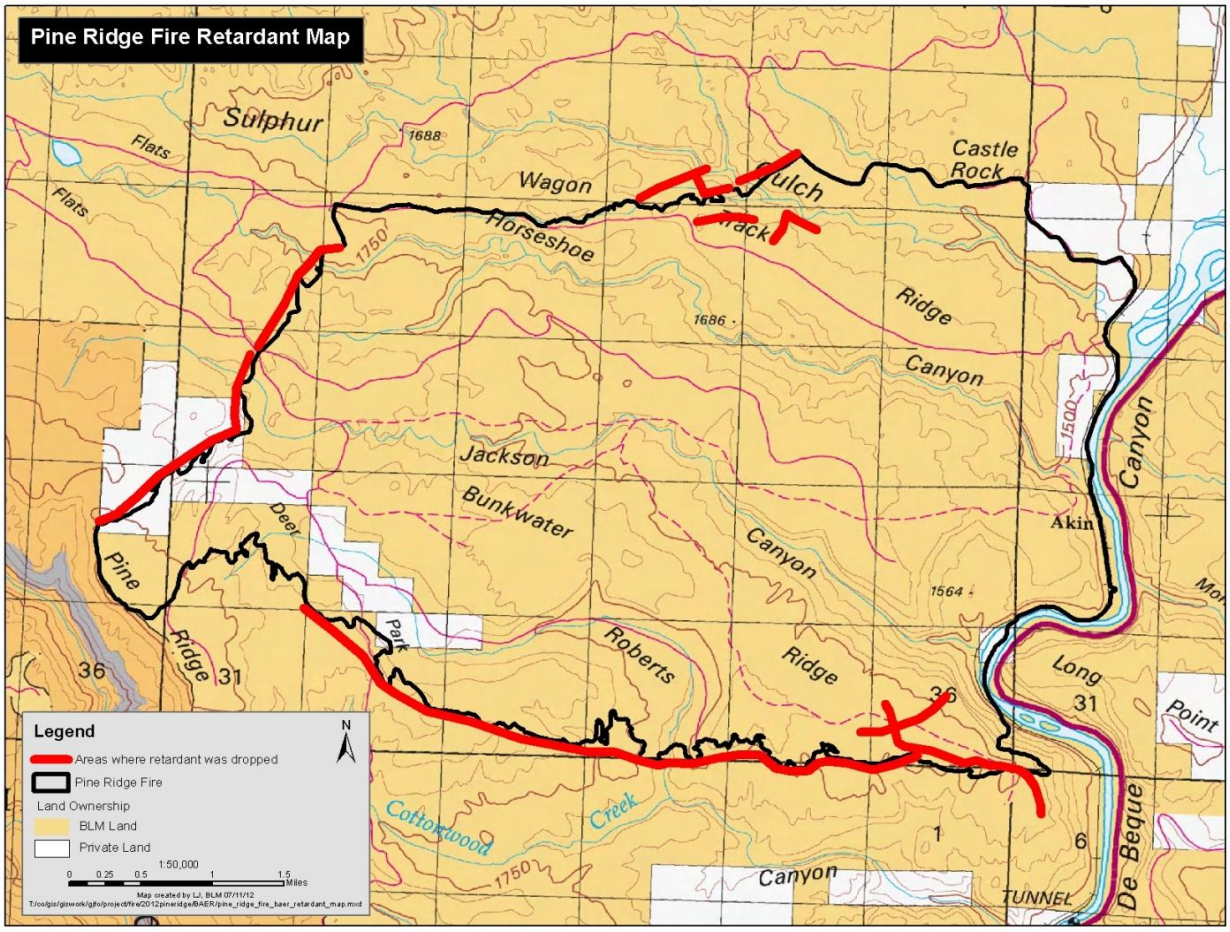
Adults of each of these fish species are highly mobile and would likely scare away from helicopters hovering above the river. Young and Larval fish would be more susceptible to potential entrainment but these fish are generally in slower velocity backwaters, side channels, and eddy habitat. The likelihood of larval endangered fish being present in the area where water was obtained is slim. Some razorback sucker and bonytail have been stocked above the fire area as far up as Rifle, but the chances of larval razorback sucker occurring in the reaches where water was taken is very slim based on their scarcity in the area. There have been sporadic reports of humpback chub in the canyon and humpback do occasionally move upstream of the Price Stubb ladder and the Government- Highline ladder. There is a small chance that bonytail, razorback and humpback could all have larvae in that area (Doug Osmundson, USFWS, personal communication). Larval fish drift mainly at night and find low or no velocity habitats after sunrise. All water was taken during daylight hours, and based on discussions with aviation personnel, primarily from the main river channel. Overall, the likelihood of capture of endangered fish was very unlikely during suppression efforts.

Indirect:

Fire Retardant

The Fire Retardant Phos-Chek LC-95-A, an ammonium phosphate based retardant, was exclusively used on the fire. The aquatic toxicity rating/data indicates that liquid ammonium phosphate is of low toxicity to the species tested (rainbow trout, fathead minnow) (MSDS - Attachment 1). Seventy-four retardant drops were made totaling 147,745 gallons. All retardant was placed in upland areas of the fire away from live water (Figure 3). Some retardant was dropped approximately 100 feet up slope from the bottom of an intermittent drainage (Sulphur Gulch) approximately 3.5 miles upstream of its confluence with the Colorado River. The nearest drop to the Colorado River was approximately 0.25 miles away on the cliff edge approximately 600 feet above the river in the southeast corner of the fire. The majority of retardant was placed well beyond 1 mile from the Colorado River on upland habitats.

Figure 3. Pine Ridge Fire Retardant Drop Map



The most toxic portion of the long-term retardants like Phos-Chek is ammonia (MacDonald et al. 1995). Un-ionized ammonia is more toxic to aquatic organisms than total ammonia (MacDonald et al. 1995, Poulton et al. 1997). Nitrates and nitrites could contribute to the toxicity of long-term retardants, but did not appear to influence the toxicity of Phos-Chek D75-F to daphnids. MacDonald et al. (1995) found that nitratenitrogen concentrations in the Phos-Chek toxicity tests were 75-160 times less than those reported to be toxic to freshwater invertebrates. Nitrite-nitrogen concentrations in a Phos-Chek D75-F toxicity study on crayfish were also 30 times less than the crayfish 96-hour LC50 (Gutzmer and Tomasso 1985). Table 2 below shows the Lethal Concentration where literature suggests that 50% of the target organisms would be killed (LC-50).

Table 2. Fish Toxicity to Long-Term Retardant Concentrates

Product	**LC50**	
	Soft Water	Hard Water
Phos-Chek D75-R	1,775 mg/L	472 mg/L
Phos-Chek D75-F	1,558 mg/L	467 mg/L
Phos-Chek 259-F	148 mg/ L	168 mg/L
Phos-Chek LC-95A	435 mg/L	960 mg/L
Phos-Chek P100-F	1494 mg/L	1932 mg /L

That formulation used on the Pine Ridge Fire

The fire area contains three primary drainages that enter directly into the Colorado River and all three are intermittent: Jackson Canyon, Horseshoe Canyon, and Sulphur Gulch. The rain events required to make these drainages flow to the Colorado River would help dilute ammonia entering these systems. In addition, upon entering the Colorado River and occupied habitat for the endangered fish, ammonia concentrations would be further diluted. The fire retardant as it is now on the landscape has been degrading in chemical strength since it was applied June 28 - 30, 2012.

A test of 1,000 gallons of mixed fire retardant was applied parallel to and within 3 meters of one stream in Oregon; results showed no immediate increase in NH_3 concentrations where retardant was applied parallel to the stream (Norris et al. 1978). During a year of monitoring after application of the retardant to near-stream ground, soluble nitrogen forms and phosphorus levels in stream water were similar to the un-treated, control watersheds (Norris et al. 1978, Norris et al. 1991).

Post-fire water quality monitoring for streams near four wildfires showed that application of fire retardant near streams but not into the stream had minimal effects on surface water quality (Crouch et al. 2006). Ammonia and phosphorus were found in streams in burned areas where retardant was not used from burning of wood and other organics, at concentrations similar to those found in areas where retardant was applied due to direct effects from the fire.

A significant rain event occurred over the Pine Ridge burn area with the heaviest precipitation on the northern half of the fire, on July 7, 2012. Based on the date of retardant application and this rain event, it is likely that ammonia concentrations are in the sublethal range where ammonia has entered water. Based on USGS estimates, this was a 10-year storm event. Ash, sediment, and some amount of fire retardant chemicals made it into the Colorado River. The burn area took more rain on July 11, 14, and 16, 2012. All of these rain events have helped to further dilute ammonia concentrations in retardant drop areas.

U.S. Fish & Wildlife Service personnel as part of annual non-native fish removal efforts, began fish sampling on the Colorado River on July 9, 2012 starting from Palisade, Colorado and continuing downstream to Fruita, Colorado through July 12, 2012. No fish kills were reported or seen (Creed Clayton, USFWS, personal communication). Given the rain events to date, it is likely that any fish kills associated with fire retardant runoff would have occurred by now if they were to occur. Ammonia concentration levels are decreasing daily and are likely below levels capable of killing fish given the dilution flows associated with both rain events and Colorado River flows. Flows associated with regional rain events boosted flows by approximately 800 cfs since the fire was started (USGS Gauge Data).

Another effect from the fire retardant used is the potential for some limited nutrient loading/eutrophication. The retardant is nitrogen based and if it enters the Colorado River via a rain event and breaks down, it eventually will become nitrogenous nutrients. Increased nutrient loading could be a problem in select slack water areas along the river. Effects include increased algae production which in turn can result in a reduction in dissolved oxygen. This could have some limited site specific effects just downstream of the burn area but would likely be quickly diluted via flows associated with the rain event and flows in the Colorado River.

For a full analysis of the potential effects of fire retardant on aquatic species, please see the Biological Assessment and Biological Opinion from the Section 7 Consultation "**Nationwide Aerial Application of Fire Retardant on National Forest System Land**" at: http://www.fs.fed.us/fire/retardant/eis_info.html

Water Use

Water use associated with fire suppression resulted in water depletions totaling approximately 1 acre-foot of water. Water depletions and the effects of reduced flows have already been analyzed and determined to be an "Adverse Effect" to the four endangered fish. In July 2008, BLM prepared a Programmatic Biological Assessment (PBA) that addresses water depleting activities in the Colorado River Basin. In response to BLM's PBA, the FWS issued a Programmatic Biological Opinion (PBO) (#ES/GJ-6-CO-08-F-0010) on February 25, 2009, which determined that water depletions from the Colorado River Basin resulting from BLM actions described in the PBO are not likely to jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker or result in the destruction or adverse modification of their critical habitat. The PBO addresses internal and external BLM projects including impoundments, diversions, water wells, pipelines, and spring developments. The FWS determined that projects that fit under the umbrella of the PBA would avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletion impacts to the Upper Colorado River Basin if they deplete relatively small amounts of water (less than 100 AF) and BLM makes a one-time contribution to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) in the amount equal to the average annual acre-feet depleted by each project. The PBO instructed BLM to make an annual payment to the National Fish and Wildlife Foundation (NFWF) to cover all BLM authorized actions that result in water depletions. The depletions associated with water used for fire suppression actions will be entered into the Grand Junction Field Office water depletion log which will be submitted to the Colorado State Office at the end of the Fiscal Year. The CSO is responsible for paying depletion fees based on the annual statewide total.

Plants

Colorado Hookless Cactus:

Direct:

There were no direct effects from suppression actions to Colorado Hookless Cactus. The burnout operations conducted on June 29th (Figure 4) did not burn down into Sulphur Gulch where the thirteen EORs are located. Field survey confirmed that no burnout related fire entered into the gulch as photo 1 indicates. Additionally, surveys conducted by Anna Lincoln, Ken Holsinger, Tom Fresques of BLM and Creede Clayton of FWS on July 13, 2012 found no burned cacti within the burnout area. The Pine Ridge wildfire did however burn across Sulphur Gulch near the mouth of the canyon and did impact the largest population of cacti in Sulphur Gulch (Figure 4 & photo 2). Field inspection on July 13, 2012 found that 16 cacti were burned over as a result of the wildfire. Within that population an additional 17 individuals were not damaged by wildfire.

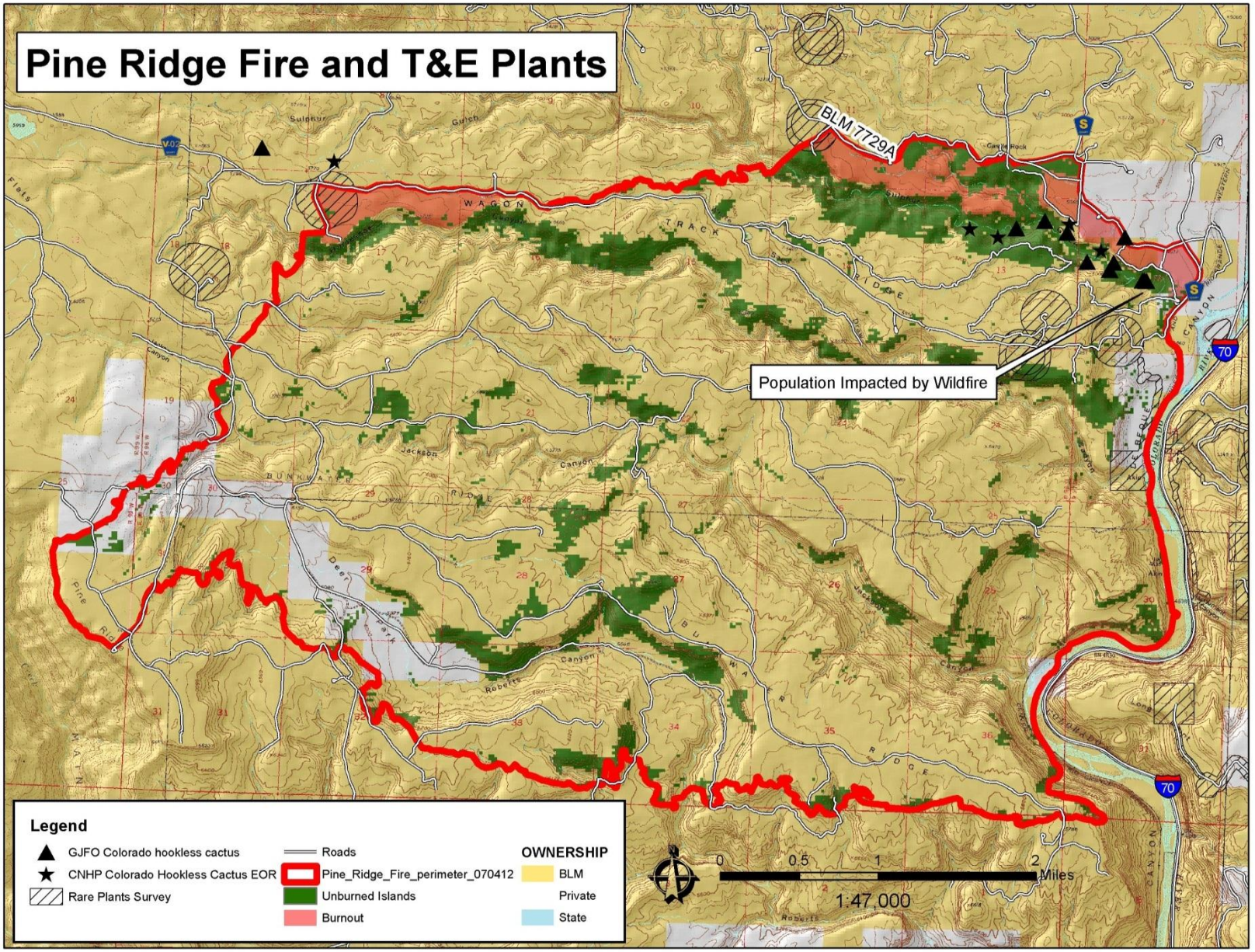
Photo 1. Sulphur Gulch from the north side (burnout side) of the canyon above occupied cacti habitat.

Photo 2. Looking southwest across the gulch where wildfire entered Sulphur Gulch and crossed impacting occupied SCGL habitat (pink flags are cacti locations).

Indirect:

Burnout operations near Sulphur Gulch began at the cold black near the bottom of the gulch where the fire came down into Sulphur Gulch and followed county road S up onto the mesa top and around to the junction of BLM route 7729a. (Figure 4) There is one known cactus location along county road S (Figure 4). This location occurs on the opposite side of the road from where burnout operations were conducted. As such no direct impacts occurred, however based on the presence of this individual it can be surmised that the greasewood and grass flat that was burned out, opposite this individual, is potential/suitable habitat for Colorado hookless cactus. Therefore, the suppression actions taken have impacted habitat by burning the perennial grasses, greasewood, and cheatgrass community that conceivably offers potential/suitable habitat for cacti. Because the burnout happened during nighttime and early morning hours the intensity of the burnout was not as high as the wildfire. Much of the greasewood still has green leaves and the perennial grasses have begun to green up as a result of monsoonal rains that have occurred since the suppression actions. Given the low intensity of the burn and the dormant nature of many of the plants within the burnout this habitat is expected to recover to pre-burn condition quickly. Burnout personnel conducted this action on foot so no vehicular traffic was on the road at the time of the operation.

Figure 4. Map of the Fire as it Pertains to T&E Plants



Proposed Rehabilitation Actions:

Fish:

Direct:
The primary effects to the endangered fish associated with planned rehabilitation actions are water depletions associated with construction of up to 4 new sediment retention dams, and extensive aerial treatment of cheatgrass with approved chemicals. Assuming proper application of approved herbicide, neither of these actions would result in direct effects. Water depletions are addressed below under indirect effects.

The results of not constructing new sediment retention dams is that increased amounts of ash, sediment, and fire retardant chemicals would be at increased risk of moving offsite and downstream into the Colorado River via the 3 primary drainages within the fire Horseshoe Canyon, Jackson Canyon, and Sulphur Gulch. The proposed structures would capture some of these materials and keep them out of the river.

Weed spraying would consist of using an aerial application of BLM approved Plateau, to serve as a pre-emergent to preclude germination of cheatgrass. Cheatgrass is present in the burn area and is likely to increase in density and spatial extent if not treated post burn.

Not treating cheatgrass could result in limited but long-term negative effects to fish habitat. Not treating cheatgrass would result in poor vegetative ground cover, reduced soil stability, increased erosion potential, and increased fire return intervals. All of these increase the risk and potential for negative effects including increased soil loss and sedimentation into the Colorado River. Increased sediment loading in the face of reduced river flows could impact habitats by narrowing the river channel, reducing habitat complexity, and reducing the creation and maintenance of important micro-habitats (backwaters, side channels, flooded bottom lands).

***Indirect*:**
The construction of up to 4 new sediment retention dams would result in water depletions totaling 1.4 acre-feet. Water depletions and the effects of reduced flows have already been analyzed and determined to be an "Adverse Effect" to the four endangered fish. In July 2008, BLM prepared a Programmatic Biological Assessment (PBA) that addresses water depleting activities in the Colorado River Basin. In response to BLM's PBA, the FWS issued a Programmatic Biological Opinion (PBO) (#ES/GJ-6-CO-08-F-0010) on February 25, 2009, which determined that water depletions from the Colorado River Basin resulting from BLM actions described in the PBO are not likely to jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker or result in the destruction or adverse modification of their critical habitat. The PBO addresses internal and external BLM projects including impoundments, diversions, water wells, pipelines, and spring developments. The FWS determined that projects that fit under the umbrella of the PBA would avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletion impacts to the Upper Colorado River Basin if they deplete relatively small amounts of water (less than 100 AF) and BLM makes a one-time contribution to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) in the amount equal to the average annual acre-feet depleted by each project. The PBO instructed BLM to make an annual payment to the National Fish and Wildlife Foundation (NFWF) to cover all BLM authorized actions that result in water depletions. The

depletions associated with water used for fire suppression actions will be entered into the Grand Junction Field Office water depletion log which will be submitted to the Colorado State Office at the end of the Fiscal Year. The CSO is responsible for paying depletion fees based on the annual statewide total.
Plants:

Colorado Hookless Cactus:

Direct:
Based on actions that could be implemented in the proposed Rehabilitation Plan, no direct effects to this species would result.

***Indirect*:**
The only foreseeable effect associated with implementation of the Rehabilitation Plan is the planned seeding of native grasses and forbs (Table 3.) in burned occupied and suitable cactus habitat. It is possible that native grasses and forbs could compete with cactus. However, given the native species to be planted it is unlikely that competition would result. The Colorado hookless cactus co-evolved with these native species within the burn area. A healthy native plant community provides the best habitat in which the cactus can flourish.

Table 3. Native perennial species to be planted

Species	Variety	pls lb/acre	total pls lb	% mix	seeds/ft2
Indian Ricegrass	Rimrock	2.7	21397.5	25.3	10.0
Bottlebrush Squirreltail	BLM accession	0.3	2377.5	2.8	1.3
Western wheatgrass	Arriba	3.6	28530	33.7	9.5
Sandberg bluegrass	UP	0.4	3170	3.7	9.6
slender wheatgrass	San Luis	2.5	19812.5	23.4	7.7
sand dropseed	VNS	0.2	1585	1.9	25.7
annual sunflower	VNS	0.9	7132.5	8.4	1.0
Western yarrow	UP/VNS	0.09	713.25	0.8	5.7

Steep Slope Mix

Species	Variety	pls lb/acre	total pls lb	% mix	seeds/ft2
Indian Ricegrass	Rimrock	3	6609	40.0	11.2
Sandberg bluegrass	UP	0.5	1101.5	6.7	12.0
slender wheatgrass	San Luis	4	8812	53.3	12.4

pls = pure live seed

Portions of occupied/suitable cactus habitat contain cheatgrass. If left unseeded, it is highly likely that cheatgrass would increase in abundance and distribution. The effects of not seeding with native species and allowing cheatgrass to proliferate include direct competition for nutrients including phosphorus and nitrogen as well as physical space. In addition, cheatgrass would reduce the fire return interval for the site and increase the risk of more frequent wildland fires which would negatively affect cactus. Cheatgrass is a poor soil stabilizer and would make the area more susceptible to erosion which would negatively affect cactus recruitment.

Cumulative Effects

As it pertains to Section 7 consultation, cumulative effects are defined as "those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation" [50 CFR 402.02]. Cumulative effects do not include any past or ongoing action, but "involve only future non-Federal actions." Future Federal actions requiring separate consultation (unrelated to the proposed action) are not considered in the cumulative effects section as they will be consulted on separately in the event of a "May Effect" determination.

A variety of activities are occurring and would continue to occur on private lands throughout the burn area and within the Colorado River corridor downstream to Utah. Declines in the abundance or range of many special status species have been attributed to various human activities on federal, state, and private lands, such as human population expansion and associated infrastructure development; oil and gas development; construction and operation of dams along major rivers; water retention, diversion, or dewatering of springs, wetlands, or streams; recreation, including off-road vehicle activity; expansion of agricultural or grazing activities, including alteration or clearing of native habitats for domestic animals or crops; and introductions of non-native plant, wildlife, or fish or other aquatic species, which can alter native habitats or out-compete or prey upon native species. Many of these activities are expected to continue on state and private lands within the range of the species, and could contribute to cumulative effects to the species within the action area of the Proposed Action.

Although cumulative impacts are limited within the burn area, there are many activities upstream that contribute to the cumulative impacts that affect endangered Colorado River fish downstream. Reasonably foreseeable future activities that may affect river-related resources within the Colorado River watershed include water diversion, including irrigation; human developments; recreational activities; natural gas development; and livestock grazing.

Determination of Effects/Rationale

Fish: (Colorado pikeminnow, razorback sucker, bonytail, humpback chub)
Water depletions have already been determined to adversely affect these four endangered fish, as discussed above under the Effects Section. Given that, both the completed emergency actions and the proposed rehabilitation actions **"MAY AFFECT, LIKELY TO ADVERSLY AFFECT"** these four endangered fish.

Rationale:

- Water depletions associated with fire suppression efforts as well as those associated with the proposed construction of up to 4 new sediment retention dams as identified in the rehabilitation plan, have/would deplete a total of approximately 2.6 acre-foot of water. Water depletions and the effects of reduced flows in the Colorado River basin have already been determined to adversely affect these fish. Water depletions are covered under a separate consultation upon which this consultation is tiered.

For all remaining suppression and rehabilitation actions, considering the current status of the bonytail, humpback chub, Colorado pikeminnow, and razorback sucker; the environmental baseline for the action area for this species; and the direct, indirect, and cumulative impacts of the actions taken and proposed, it is BLM's biological assessment that the fire suppression actions taken (Completed Actions) to suppress

the Pine Ridge Fire as well as the rehabilitation actions (Proposed Actions) proposed to minimize long-term effects of the Pine Ridge Fire **"MAY AFFECT, NOT LIKELY TO ADVERSLY AFFECT"** the federally endangered bonytail, humpback chub, Colorado pikeminnow, and razorback sucker.

Rationale:

- The USFWS Final Section 7 Consultation Handbook (USFWS 1998) states that a determination of "May Affect, Not Likely to Adversely Affect" is appropriate when effects on listed or proposed species and their designated critical habitat are expected to be insignificant.

- Existing upland ponds and proposed sediment retention dams are and will continue to effectively capture and retain sediment, ash, and fire retardant chemicals and help keep these out of the Colorado River and occupied/critical habitat.

- Given the time lag since retardant application, the proximity of retardant to the Colorado River, and stream flows needed to mobilize ash, sediment, and chemicals; changes in water quality to levels capable of producing negative effects to these fish is highly unlikely at this point.

Plants: (Colorado hookless cactus)

Upon consideration of the current status of the Colorado hookless cactus; the environmental baseline for the action area for this species; and the direct, indirect, and cumulative impacts of the actions taken and proposed, it is BLM's biological assessment that the fire suppression actions taken (Completed Actions) to suppress the Pine Ridge Fire as well as the rehabilitation actions (Proposed Actions) proposed to minimize long-term effects of the Pine Ridge Fire **"MAY AFFECT, NOT LIKELY TO ADVERSLY AFFECT"** the federally threatened Colorado hookless cactus.

Rationale:

- The USFWS Final Section 7 Consultation Handbook (USFWS 1998) states that a determination of "May Affect, Not Likely to Adversely Affect" is appropriate when effects on listed or proposed species and their designated critical habitat are expected to be insignificant.

- Based on post fire surveys, burnout operations did not enter known occupied habitat for the cactus. However, burnout operation did include suitable/potential habitat. Based on post fire surveys in reasonable proximity to known populations, no burned cactus were found in the burnout area. Previous surveys of the burnout area for other projects have also been completed and no cacti were found (Figure 4).

- Seeding with native grass seed in the area burned by the fire and the backburn area could result in some discountable competition with cactus. The effects of not seeding and allowing cheatgrass to proliferate would far outweigh the low potential of effects associated with competition between cactus and native seeded plant species.

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Attachment 1. MSDS for Phos-Chek LC-95A Fire Retardant

Material Safety Data Sheet

ICL Performance Products LP

RESPONSIBLE CARE®
OUR COMMITMENT TO SUSTAINABILITY

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification

Product Name: Phos-Chek ® LC-95A
Reference Number: AST10097
Date: December 3, 2010

Use of the substance or preparation

Fire retardant

Company/Undertaking Identification

ICL PERFORMANCE PRODUCTS LP
622 Emerson Road - Suite 500
St. Louis, Missouri 63141

Emergency telephone: In USA call CHEMTREC: 1 800 424 9300
In Canada call CANUTEC: 1 613 996 6666

General Information: +1 800 244 6169 (Worldwide)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Composition

Substance	CAS No.	%w/w	EINECS No.	Risk Phrase
Ammonium Polyphosphate Solution		> 85.0		none
Attapulgus Clay	8031-18-3	< 5.0	310-127-6	none
Iron Oxide	1332-37-2	< 5.0	215-570-8	none
Performance additives	Trade Secret	< 8.0	Listed	none

Performance additives are Company Trade Secret – Business Confidential. ICL Performance Products LP is withholding the specific chemical identity under provision of the OSHA Hazard Communication Rule Trade Secrets (1910.1200(i)(1)). The specific chemical identity will be made available to health professionals in accordance with 29 CFR 1910.1200(i)(1)(2)(3)(4).

3. HAZARDS IDENTIFICATION

Classification of the substance/preparation

None

Human health effects

On the basis of available information, this material is not expected to produce any significant adverse health effects when recommended use instructions are followed.

Environmental effects

On the basis of available information, this material is not expected to produce any significant adverse environmental effects when recommended use instructions are followed.

4. FIRST AID MEASURES

General

Likely Routes of Exposure: skin contact and inhalation.

Eye contact

This product is no more than slightly irritating to the eye based on available information. Immediate first aid is not likely to be required. However, this material can be removed with water.

Skin contact

This product is no more than slightly irritating to the skin and no more than slightly toxic when absorbed based on available information. Immediate first aid is not likely to be required. However, this material can be removed with water. Wash heavily contaminated clothing before reuse.

Inhalation

This product is not believed to pose an inhalation hazard. Immediate first aid is not likely to be required. Remove material from eyes, skin and clothing.

Ingestion

This product is no more than slightly toxic when swallowed based on available information. Immediate first aid is not likely to be required. A physician or Poison Control Center can be contacted for advice. Wash heavily contaminated clothing before reuse.

5. FIRE FIGHTING MEASURES

Extinguishing media

No special requirement.

Unsuitable extinguishing media

No special requirement.

Exposure hazard

None known.

Protective equipment

As a general precaution, firefighters, and others exposed, wear full protective clothing and a self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Avoid unnecessary exposure and remove all material from eyes, skin and clothing.

Environmental precaution

Small quantities: See below.

Large quantities: See below.

Methods for cleaning up

Contain large spills with dikes and transfer the material to appropriate containers for reclamation or disposal. Absorb remaining material or small spills with an inert material and then place in a chemical waste container. Flush residual spill area with water.

Refer to Section 13 for disposal information.

7. HANDLING AND STORAGE

Handling

Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of the material from eyes, skin and clothing.

Engineering measures

Provide natural or mechanical ventilation to minimize exposure. The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult National Fire Protection Association (NFPA) Standard 91 for design of exhaust systems.

Storage

Emptied container retains product residue. Observe all labeled safeguards until container is cleaned, reconditioned, or destroyed. The reuse of this material's container for non-industrial purposes is prohibited and any reuse must be in consideration of the data provided in the MSDS.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

OSHA and ACGIH have not established specific exposure limits for this material. This product is a water solution.

Respiratory protection

Avoid breathing vapor or mist. Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure limits are exceeded. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH / MSHA or the manufacturer. Refer to U.S. OSHA regulations 29 CFR 1910.134 or European Standard EN 149.

Hand/Skin protection

Although this material does not present a significant skin concern, skin contamination should be minimized as good industrial practice. Wearing of protective gloves is recommended. Wash hands and contaminated skin after handling.

Eye protection

Although this material does not cause significant eye irritation or eye toxicity requiring special protection, good industrial practice should be used to avoid eye contact.

Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

General information

Appearance:	red or orange liquid
Odor:	none
Solubility in Water:	> 95 %

Important health, safety and environmental information

pH:	5.0 – 6.5
Viscosity:	> 75 cps
Specific Gravity:	1.40 - 1.50 @ 25 °C
Flash Point:	Not applicable

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Product is stable under normal conditions of storage and handling.

Conditions to avoid

None known.

Materials to avoid

None known.

Hazardous decomposition

None known.

11. TOXICOLOGICAL INFORMATION

Laboratory data

ICL Performance Products LP has not conducted toxicity studies with this material and no data was found in a reasonably extensive search of the literature.

Component Data

Ammonium Polyphosphate Solution

Ingestion:	Acute oral toxicity rat LD_{50} 5000 mg/kg
Inhalation:	Rats: One hour exposure to 19.6 mg/l was non lethal
Aquatic toxicity rating:	Aquatic toxicity data indicates that liquid ammonium phosphate is of low toxicity to the species tested.

One of the components of this material has been identified as a hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200) are discussed below:

Component A (<8%w/w)

This product contains a component which, as reported by the supplier, may be harmful by inhalation, ingestion, or skin absorption. May cause eye irritation, skin irritation, and may be irritating to mucous membranes and upper respiratory tract.

Additional Component Information
These components are not expected to present an inhalation hazard during routine shipping or handling due to their physical properties as liquids. Cohesive solids are left as residues from these fire retardants after loss of all of the water. When spilled, under normal conditions fire retardant physical properties would prevent production of respirable dusts. The hazardous components present in these products could cause respiratory tract irritation and/or sensitization if conditions resulting in generation of respirable dusts are allowed.

12. ECOLOGICAL INFORMATION

Environmental toxicity

ICL Performance Products LP has not conducted environmental toxicity or biodegradation studies with this product.

Environmental Fate

ICL Performance Products LP has not conducted environmental toxicity or biodegradation studies with this product.

13. DISPOSAL CONSIDERATIONS

European waste catalog number

Unknown

Disposal considerations

This product when discarded is a hazardous waste due to one or more hazardous characteristics (D004, D006, D007) as that term is defined by the Resource, Conservation and Recovery Act (RCRA), 40 CFR 261. Certain recycling activities may qualify for an exemption from RCRA. Consult your attorney or appropriate regulatory official for information on disposal and on the recycling exemption. Recycle or dispose of in accordance with local, state, provincial, and federal regulations.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Road/Rail, Sea and Air

IMDG/UN	not regulated for transportation
ICOA/IATA	not regulated for transportation
RID/ADR	not regulated for transportation
Canadian TDG	not regulated for transportation
US DOT	not regulated for transportation

15. REGULATORY INFORMATION

EC label

Undetermined

Chemical Inventory

USA TSCA	Listed
EU EINECS	Listed
Canada DSL/NDSL	Listed

WHMIS Classification: D2(B) – Material Causing Other Toxic Effects

Additional information

SARA Hazard Notification
Hazard Categories Under Title III Rules (40 CFR 370): Immediate
Section 302 Extremely Hazardous Substances: Not applicable
Section 313 Toxic Chemical(s): Not applicable

CERCLA Reportable Quantity: Not applicable

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation.

Refer to Section 11 for OSHA/HPA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

	Health	Fire	Reactivity	Additional Information
Suggested NFPA Rating	2	0	0	
Suggested HMIS Rating	2	0	0	E E = Safety glasses, gloves, dust respirator

Reason for revision: Sections 2, 11, & 13 revised. Supersedes MSDS dated: December 5, 2007
Drafted in accordance with ECC Dir 2001/58/EC

AST10097.2120.doc