

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AA98

Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Bruneau Hot Springsnail in Southwestern Idaho

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) determines endangered status pursuant to the Endangered Species Act of 1973, as amended (Act), for the Bruneau Hot Springsnail (*Pyrgulopsis bruneauensis*). This species occurs only in a complex of related thermal springs and their immediate outflows along the Bruneau River in Owyhee County, Idaho. The primary threat to this species is the reduction of thermal spring habitats from agricultural-related ground water withdrawal/pumping. This rule implements the protection and recovery provisions afforded by the Act for this aquatic snail.

DATES: The effective date of this rule is February 24, 1993.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the Boise Field Office, U.S. Field and Wildlife Service, 4696 Overland Road, room 576, Boise, Idaho 83705.

FOR FURTHER INFORMATION CONTACT: Dr. Charles H. Lobdell at the above address (telephone 208/334-1931).

SUPPLEMENTARY INFORMATION:**Background**

Borys Malkin first collected the Bruneau Hot Springsnail in springflows at the Indian Bath tub in upper Hot Creek along the Bruneau River in 1952. The following year, W.F. Barr collected additional specimens, which were sent to the U.S. National Museum in Washington, DC (now the National Museum of Natural History) (Taylor 1982). Morrison determined that it represented a previously unknown

genus and species of springsnail of the family *Hydrobiidae*. Dwight Taylor (1982) pursued subsequent field and laboratory studies of this snail from 1959 through 1982. Based on these studies, Taylor prepared a brief physiological and biological description of the species and suggested the common name of the Bruneau Hot Spring Snail. In 1990, Robert Hershler formally described the species from type specimens collected from the Indian Bath tub in Hot Creek, naming it *Pyrgulopsis bruneauensis*, with a new common name of Bruneau Hot Springsnail (Hershler 1990).

Adult Bruneau Hot Springsnails have a small, globose to low-conic shell reaching a length of 5.5 millimeters (mm) (.22 inch) with 3.75 to 4.25 whorls. Fresh shells are thin, transparent, white-clear, appearing black due to pigmentation (Hershler 1990). In addition to its small size (<2.8 mm (.11 inch) shell height), distinguishing features include a verge (penis) with a small lobe bearing a single distal glandular ridge and elongate, muscular filament. They are dioecious and lay single round to oval eggs on hard surfaces such as rock substrates or other snail shells.

The Bruneau Hot Springsnail is found only in the springflows of Hot Creek and 128 small, flowing thermal springs and seeps along an approximately 8.5 kilometer (km) (5.28 mile) length of the Bruneau River in southwestern Idaho (Mladenka 1992). A majority (n=116) of occupied springsnail habitats are located along both shorelines of the Bruneau River up to 4.46 km (2.77 miles) above its confluence with Hot Creek while the remaining sites occur up to 4.30 km (2.67 miles) below the Hot Creek-Bruneau River confluence. Most of the springs and seeps containing springsnails are small, ranging from 0.15 square meters (m) (1.6 square feet (ft)) to 37 square m (398 square ft) in area, with a mean size of almost 1 square m (10.8 square ft). These spring sites are located primarily above the high-water mark of the Bruneau River and are separated by distances of less than 1 m (3.28 ft) to greater than 2,000 m (6,562 ft) (Mladenka 1992). The Indian Bath tub area (the type locality, now covered with sediment) and most of the springs along the Bruneau River upstream of Hot Creek are on lands administered by the Bureau of Land Management (Bureau), while most springsnail habitats downstream of the Indian Bath tub and Hot Creek are on private land.

There are no additional historic records for this species from the United

states or elsewhere. Additional surveys of thermal springs in the Bruneau and Jarbridge River Basins in southwest Idaho and the Owyhee River in southeast Oregon conducted during January, 1987, and several springs along the West Fork Bruneau River in 1990, failed to locate additional populations (Pat Olmstead, Bureau of Land Management, pers. comm.).

The species has been found in flowing thermal springs and seeps with temperatures ranging from 15.7 °C to 35.7 °C, with highest densities (>1,000 per square m (10.8 square ft)) of snails noted at temperatures ranging from 24.8 °C to 35.7 °C (Mladenka 1992). No Bruneau Hot Springsnails have been collected outside thermal plumes of hot springs entering the Bruneau River. They are found in these habitats on the exposed surfaces of various substrates, including rocks, gravel, sand, mud and algal film. However, during the winter period of cold ambient temperatures and icing, the springsnails are most often located on the undersides of outflow substrates, habitats least exposed to cold temperatures. In macicolous habitats (thin sheets of water flowing over rock faces), the species has been found in water depths less than 1 centimeter (cm) (.39 inch). Current velocity is not considered a significant factor limiting the springsnails distribution, since they have been observed to inhabit nearly 100 percent of the available current regimes. In a September 1989 survey of 10 thermal springs containing the species in the vicinity of the Hot Creek-Bruneau River confluence, the total number of snails per spring ranged from 1 to 17,319 (Mladenka 1992). Springsnail abundance generally fluctuates seasonally; abundance is influenced primarily by water temperature, spring discharge and food availability.

Springsnails appear to be opportunistic grazers as food habit studies reveal algal genera are taken in proportions similar to those found in their habitat (Mladenka 1992). However, springsnail densities are lowest in areas of bright green algal mats, while higher snail densities occur where periphyton communities are dominated by diatoms. Based on laboratory studies, springsnail growth was retarded at cooler temperatures (<24 °C).

Sexual maturity can occur at two months, with a sex ratio of approximately 1:1. Reproduction occurs throughout the year except when inhibited by high or low temperatures (Mladenka 1992). Mladenka noted reproduction occurs at temperatures between 24° and 35 °C. At sites affected

by high ambient temperatures during summer and early fall months, recruitment was seasonal, corresponding with cooler periods. Likewise, sites with cooler ambient temperatures would likely exhibit recruitment during the summer months. Springsnails use "hard" surfaces such as rock substrate to deposit their eggs. They may deposit eggs on other snails' shells when other hard surfaces are unavailable.

Common aquatic community associates of the springsnail include three molluscs: *Physella gyrina* (Say) (Physidae), *Fossaria exigua* Lea (Lymnaeidae) and *Gyraulus vermicularis* Lea (Planorbidae); the creeping water bug *Ambrysus mormon minor* La Rivers (Naucoridae), which is also endemic to the Hot Creek thermal spring complex; and the skiff beetle *Hydroscapha natans* (Hydroscaphidae). In addition, Hot Creek and several of the thermal springs support populations of guppies, *Poecilia reticulata* and a species of *Tilapia*, an exotic fish in the family Cichlidae. It is believed that guppies were originally released into upper Hot Creek at the Indian Bathtub, from which they spread downstream and into nearby thermal springs and seeps (Bowler and Olmstead 1991).

The major threat to the Bruneau Hot Springsnail is the reduction or reduced water levels in thermal spring habitats from groundwater withdrawal/mining of the regional geothermal aquifer system. Within the past 25 years, flows from the Indian Bathtub springs have decreased, thereby restricting the springnail's habitat area and reducing its numbers. Recent studies indicate that natural discharge (= recharge) prior to ground water development in the Bruneau-Grandview area equalled approximately 23,000 acre feet per year, while groundwater pumpage in the area during 1991 was approximately 34,700 acre feet (Charles Berenbrock, U.S. Geological Survey (USGS), written communication). These figures indicate that withdrawals exceeded the estimate rate of recharge by nearly 12,000 acre feet during 1991, and upwards of 26,000 acre feet in 1981, when ground water pumpage was nearly 49,900 acre feet. Mladenka (1992) noted that the springsnail population in Hot Creek may have declined generally by 50 percent from Taylor's (1982) earlier estimates of abundance, and the species has been totally eliminated in local areas such as the Indian Bathtub springs. For example, in 1964 spring discharge at the Indian Bathtub was an estimated 2,400 gallons per minute (gpm). Following increased ground water development and pumpage in the

mid-1960's, springflows at the Indian Bathtub had declined to 458 gpm by 1972. During June to July 1978, flow was down to between 130 to 162 gpm and by 1985 the spring no longer flowed during the irrigation season between July and October. Ongoing drought conditions since the mid-1980's have resulted in increased reliance on ground water for irrigated agriculture in the Bruneau basin, causing the extent of seepage at several of the springnail's spring sources to be greatly reduced in recent years. Considerable springsnail habitat has also been lost in recent years due to sedimentation from flash flooding. This is especially true for the Indian Bathtub spring area where the species was first discovered. Heavy sedimentation of gravel, sand and silt from a July 1992 flood totally covered over and eliminated remaining springsnail habitat in the Indian Bathtub and upper Hot Creek (Robinson et al. 1992).

Previous Federal Action

On May 22, 1984, the Service included in Bruneau Hot Springsnail as a category 1 candidate species in the invertebrate notice of review (49 FR 21664), based primarily on the results of field surveys conducted by Dr. Dwight Taylor. Category 1 candidates are taxa for which the Service has on file enough substantial information on biological vulnerability and threats to support proposals to list them as endangered or threatened species. The Service proposed the Bruneau Hot Springsnail for listing as endangered on August 21, 1985 (50 FR 33803). The comment period on this proposal, which originally closed on October 21, 1985, was extended to December 31, 1985 (50 FR 45443). To accommodate public hearings in Boise and Bruneau, Idaho, the comment period was reopened until February 1, 1986 (50 FR 51894). At the time of the hearings and subsequently, the Idaho Department of Water Resources (IDWR) and others questioned the Service's analysis of available scientific information. In particular, they believed that surveys of available habitat were incomplete and the analysis of human induced impacts was erroneous. In order to solicit additional information and adequately respond to these concerns, the Service on December 30, 1986 gave notice of a six month extension of the period of consideration and reopened the public comment period until February 6, 1987, to solicit additional information (51 FR 47033).

Following the six month extension period in which the IDWR proposed additional biological and hydrological

studies in the Bruneau-Grandview area, a decision was agreed upon by Idaho's two U.S. Senators and the Service to develop a multi-agency cooperative conservation plan for the springsnail. Subsequently, the U.S. Congress allocated additional monies to the Service to fund these studies starting in 1987. Information gained from the studies was to be used to develop a cooperative conservation (management) plan to achieve the conservation and protection of the Bruneau Hot Springsnail, thus removing the threats facing the species and eliminating the need to list under the Act. The three entities involved in the studies for the cooperative conservation planning efforts included the IDWR, U.S. Geological Survey (USGS), and Idaho State University. The IDWR was to accomplish three primary tasks through the studies: (1) Prepare a Geographic Information System (GIS) for the study area, (2) prepare geological maps to define the bedrock geology and record the location, elevation, flow and temperature of area springflows, and (3) evaluate and analyze Federal and State laws applicable to a conservation plan for the springsnail and assess management alternatives open to IDWR to protect springsnail habitats. The Service also provided funds for the USGS to conduct a three-phase groundwater study of the Bruneau River valley and basin. This study focused on the hydrology of the regional geothermal system and surrounding hot springs, with an overall goal to determine the cause of declining springflows affecting the Bruneau Hot Springsnail. Finally, the Service provided funds to the Stream Ecology Center, Idaho State University, to study the biological, ecological, and physiological needs of the Bruneau Hot Springsnail. The Service also entered into a short-term conservation easement with Owen Ranches, Inc., owners of much of the snail's habitat in Hot Creek and the Indian Bathtub springs. Terms of the easement included fencing to regulate livestock use to improve stream flows. Expiration of this agreement would coincide with the completion of the hydrologic studies by USGS.

On July 6, 1992, the Idaho Conservation League and the Committee for Idaho's High Desert filed a lawsuit in Federal District Court in Boise, Idaho, over the Service's failure to make a final determination on the listing of the springsnail. In order to respond to the concerns raised in the lawsuit and to ensure the accuracy of any final decision concerning the appropriateness of listing, the Service reopened the

public comment period on October 5, 1992 (57 FR 45762), for a period of 30 days, and on December 18, 1992 (57 FR 60160), for a period of 10 days.

The Service now determines the Bruneau Hot Springsnail to be an endangered species with publication of this rule.

Summary of Comments and Recommendations

In the August 21, 1985, proposed rule and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final listing decision. Appropriate State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. Newspaper notices inviting public comment were published in the Idaho Statesman and the Mountain Home News on November 18 and November 20, 1985, respectively. Two public hearings were held, the first on December 10, 1985, requested by the Idaho Department of Water Resources in Boise, and the second on January 15, 1986, in Grandview, Idaho, requested by Lieutenant Governor David Leroy and others. The comment period, which originally closed on October 21, 1985, was extended to December 31, 1985 (50 FR 45443), then again to February 1, 1986 (50 FR 51894), to accommodate these hearings. The public comment period was again reopened on December 30, 1986, until February 6, 1987 (52 FR 47033); on October 5, 1992 (57 FR 45762); and December 18, 1992 (57 FR 60160). These actions accommodated the receipt of additional information.

Comments in response to the proposed rule were received from 115 individuals and agencies. The Service considered all comments received, including oral testimony from two public hearings on the proposal to list the snail. Thirty-one of the commenters supported the proposal while 77 were opposed to the proposed action. The remaining commenters did not state an opinion on the listing; some provided new/substantive information, which has been incorporated into the final rule. The Bureau of Land Management and three conservation organizations: The Committee for Idaho's High Desert, Idaho Natural Resources Legal Foundation, Inc. and Defenders of Wildlife all supported the proposed listing. Comments opposed to the proposed listing were received from two U.S. Senators, former Idaho Governor John Evans, former Idaho Lieutenant Governor David Leroy, an Idaho State Senator and Idaho State Representative

representing Elmore and Owyhee Counties, Idaho Water Resource Board, Idaho Department of Agriculture, Idaho Water Users Association, Idaho Cattle Association, National Cattlemen's Association, Idaho Water Resources Research Institute, and Idaho Farm Bureau. Opposition to the original proposed rule was based on several factors, including possible impacts to existing and further agricultural development in the affected area; assertions that surveys of available habitat and snail distribution used to prepare the proposed rule were inadequate; and that the analysis of ground water withdrawal impacts were erroneous. Comments of a similar nature or point of concern are grouped into a number of general issues. A summary of these issues and the Service's response to each are discussed below.

Issue 1. Several commenters requested that the Service delay or preclude listing the Bruneau Hot Springsnail because too little is known regarding its present status. They believed additional snail populations may exist in other locations. Some individuals provided locations of nearby springs where "small black snails" occur. Others believed the species may be more common or widespread than the Service stated in the proposed rule. In addition, several respondents suggested that the Service initiate a comprehensive studies program for the Bruneau Hot Springsnail to develop additional information on distribution and habitat requirements prior to any final listing decision. For example, in 1985 IDWR and Idaho's then Governor John V. Evans, supported a "two-year cooperative study" as the most sensible approach to this problem.

Service Response: The listing process includes an opportunity for the public to comment and provide information that is evaluated and considered by the Service before making a final decision. Aside from previously cited studies and reports in the 1985 proposed rule (50 FR 33803), the Service has reviewed and considered new information regarding distribution and general life history for the Bruneau Hot Springsnail from a recently completed 3-year study in the Bruneau River basin (Mladenka 1992). The study examined a larger geographical area than previous studies cited in the proposed rule and reported 128 additional thermal spring or seep sites along the Bruneau River over a distance of 8.5 km (5.28 miles) containing the species. However, given that all thermal springs along this reach of river arise from a single regional geothermal aquifer (Berenbrock, USGS,

written communication), these newly discovered springsnail populations and their habitats are as threatened by continuing declines in Bruneau valley spring discharges as the remaining Hot Creek populations. Additionally, remaining populations are vulnerable to habitat alteration and loss from flash-flooding. Springsnail populations were drastically reduced in Hot Creek following a major flood (runoff) event in July 1992 (Robinson et al. 1992). In summary, the Bruneau Hot Springsnail remains endemic to a small geographic area in southwestern Idaho and is totally dependent upon thermal springflows originating from a common groundwater source for its survival.

Issue 2. Some commenters questioned whether the use of ground water for agricultural and aquacultural purposes is the primary cause of the reduced springflows in Hot Creek. They believe climatic and geologic factors may also be contributing to declining springflows and suggested that the Service conduct additional hydrology studies of the underlying aquifer and thermal springs in the Bruneau Valley prior to any listing decision on the springsnail.

Service Response: Despite the above claims, no new information was provided to contradict the Service's contention that the Bruneau Hot Springsnail is threatened by the reduction of its thermal spring habitats from agricultural-related ground water withdrawal/pumping and other threats present in the Bruneau area (see Factor A in "Summary of Factors Affecting the Species"). The USGS has developed a conceptual model of the geothermal aquifer system that characterizes the geohydrology of the aquifer system (Berenbrock, USGS, written communication). The conceptual model, using both direct and indirect evidence, also describes the hydraulic connection between the aquifer system and the series of thermal springflows along the Bruneau River containing Bruneau Hot Springsnails. Additional information in the USGS study describes how over the past 25 years, discharge from many of the springs along Hot Creek and Bruneau River have decreased, especially springflows at the Indian Bathub (Berenbrock, USGS, written communication). Spring discharge in 1964 was approximately 2,400 gpm, had dropped to between 130 to 162 gpm in June to July 1978 (Young et al. 1979), and by the summer of 1990 discharge was zero. The USGS believes that prior to extensive ground water development, recharge to the geothermal aquifer was balanced by discharge. Ground water flows northward through volcanic rocks from areas of recharge along the

Jarbridge and Owyhee Mountains to the Bruneau area, where it is discharged as either springflow or leaves the area as underflow. Natural recharge to and discharge from the regional geothermal aquifer underlying the 600-square mile Bruneau area was estimated to be approximately 22,800 acre-feet per year (Berenbrock, USGS, written communication). Of that amount, approximately 10,100 acre-feet was discharged from springflows and the remaining 12,700 acre-feet was underflow. Ground water discharge (=withdrawal) from wells for domestic and agricultural purposes began during the late 1890's (Berenbrock, USGS, written communication). From 1890 to 1978, well discharge increased from 0 to approximately 40,600 acre-feet per year. Annual well discharge has exceeded annual recharge since 1965, when the rate of increase in ground water pumpage accelerated. Pumping has caused hydraulic heads or water levels in the volcanic rock portion of the geothermal aquifer to decline more than 9.5 m (30 ft) in much of the Bruneau area and at least 23 m (70 ft) in one USGS observation well. For example, in another well, water levels declined almost 3 m (10 ft) from 1979 to 1992, or about 0.2 m (.66 ft) per year. Changes in discharge from thermal springs corresponds with changes in hydraulic head, which normally fluctuate seasonally and are substantially less during late summer than in the spring.

At this time, there is no information available on how much of the recent decline in water levels can be attributed to the effects of protracted drought conditions throughout southwestern Idaho. Total well discharge (=ground water withdrawal) has declined from a maximum of 49,900 acre-feet in 1981 to 34,700 acre-feet in 1991, in large part due to area farmer participation in the Conservation Reserve Program administered by the U.S. Soil Conservation Service. Some individuals believe that under 'normal' (non-drought) conditions, a reduction in ground water withdrawal might cause water levels to recover or possibly slow their rate of decline (Idaho Department of Water Resources (IDWR) 1992). While drought may be a contributing factor, springflows at the Indian Bath tub and water levels in USGS observation wells in the volcanic rock portion of the aquifer continued to show a steady decline during the early 1980's period of normal precipitation prior to the onset of drought conditions beginning in 1986. The USGS believes that there is very little to no recharge in the geothermal aquifer from direct

precipitation in the Bruneau area (Berenbrock, USGS, written communication) since a stable isotopic analysis of thermal waters in the Bruneau area by Young and Lewis (1982) " * * indicates that none of the hot water discharged from the geothermal system is derived from present-day, local precipitation." They go on to state that resident time calculated on the basis of reservoir (=aquifer) volume and discharge " * * is probably at least 3,400–6,800 years, and in view of recent carbon-14 analysis, perhaps as long as 25,000 years." One additional side-effect of protracted drought conditions is the increased reliance (=pumpage) on ground water for irrigated agriculture to offset lack of surface water supplies. Regardless of cause, if water-levels in the geothermal aquifer continue to decline, the Service believes all thermal springflows containing Bruneau Hot Springsnails will eventually cease to flow and their habitat will be eliminated.

Issue 3. Some commenters stated that the Bruneau Hot Springsnail is prolific and has " * * the ability to reproduce at a level that is remarkable with an increase in nine months of several hundred fold", therefore " * * it does not appear that the snail is endangered, but that the hot springs in which it exists is endangered." They believe the Service should concentrate on "positive" (alternative) measures such as maintaining captive populations or transplanting snails to other springs, rather than listing.

Service Response. Under the Act, a species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). Factor A includes "The present or threatened destruction, modification, or curtailment of its habitat or range." Absolute population numbers, total number of extant populations, or the ability to rapidly reproduce are less important to a species' long-term survival if its remaining habitat is threatened and cannot be preserved. In addition, according to section 2(b) of the Act, " * * the purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved". Once a species becomes listed as threatened or endangered, section 4(f) of the Act directs the Service to develop and implement recovery plans for that species. Recovery is the process by which the decline of a listed species is arrested or reversed, and threats to its survival are eliminated or neutralized.

Two goals of this process are: (1) The maintenance of secure, self-sustaining wild populations of species with the minimum necessary investment of resources, and (2) to restore listed species to a point where they are viable self-sustaining components of their ecosystems, so as to allow 'delisting' (U.S. Fish and Wildlife Service 1990). While the Service recognizes that captive propagation and transplantation can be valid conservation tools and assist in recovery, in the case of the Bruneau Hot Springsnail, these measures would not contribute to "maintenance of secure, self-sustaining" populations. Even if successful transplantation could be achieved, unless measures are taken to reverse the trend of declining thermal spring discharges throughout the Bruneau area, transplanted populations would eventually be subject to the same threats as existing springsnail populations and their habitats.

Issue 4. The Idaho Water Users Association, Inc. maintains that the conservation of the Bruneau Hot Springsnail should be addressed through other existing regulatory mechanisms and not through the listing process. Because " * * none of the agencies have asked for any specific regulatory consideration for the (Bruneau) area" there may be opportunities to remedy any threats to the Bruneau Hot Springsnail outside of the Act. For example, they believe the Bureau of Land Management (Bureau) should manage the snail's habitat as an Area of Critical Environmental Concern (ACEC).

Service Response: The Service acknowledges that designating an ACEC for the species on Bureau lands would recognize the unique attributes of the springsnail and its habitats. Although this designation might result in increased protection for springsnail habitats from cattle grazing on public lands, such recognition would not and could not address the primary threat to the survival of the species, which is further habitat loss due to ground water withdrawal from adjacent private lands. In any event, ACEC designations are within the purview of the Bureau and not the Service. To date, the Bureau has not considered an ACEC designation for Bureau lands associated with the Bruneau Hot Springsnail (Fred Minckler, Bureau, Boise, pers. comm.). The Idaho Department of Water Resources (IDWR) regulates ground water development in the Bruneau area. In 1982, the IDWR established the Bruneau-Grandview Ground Water Management Area (GWMA), an administrative tool which allows the

IDWR to continue to receive and retain without action applications for water permits until it can be demonstrated that sufficient water is available and the withdrawal will not adversely impact other water rights within the Bruneau area (IDWR 1992). Due to declining water levels and pressures in the area, none of the 17 applications for withdrawal within the GWMA, except those for domestic purposes, have been approved since the area was designated. Therefore, while IDWR can limit the development of new wells from the regional geothermal aquifer system, impose water conservation measures, and require meters on existing wells, IDWR possesses no authority under existing Idaho State Law to shut down existing wells for the sole purpose of protection and recovery of the springsnail. See the discussion under Factor D in "Summary of Factors Affecting the Species" for a complete discussion on the inadequacy of existing regulatory mechanisms for the Bruneau Hot Springsnail.

Issue 5. One commenter requested that the Service prepare an environmental assessment or environmental impact statement under the National Environmental Policy Act (NEPA) for the proposed listing action. It was also requested that the assessment should include a determination of the geographic area which might be affected by any potential restrictions on future ground water development and withdrawal.

Service Response: As discussed in the NEPA section of this rule, it has been determined that such analyses are not required in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the *Federal Register* on October 25, 1983 (48 FR 49244).

Issue 6. Several commenters were concerned with the impacts to agriculture that would result from listing and the potential designation of critical habitat for the Bruneau Hot Springsnail. They requested the Service to designate critical habitat during the final rulemaking process so that potential economic impacts could be evaluated.

Service Response: Under section 4(a)(3)(A) of the Act, the Secretary may designate critical habitat to the maximum extent prudent and determinable at the time a species is determined to be threatened or endangered. Critical habitat is not a management plan, but a legally described list of those areas considered essential for the conservation of the

species. In the proposed rule, the Service found that determination of critical habitat was not prudent for the Bruneau Hot Springsnail. As discussed under the "Critical Habitat" section below, the Service continues to find that designation of critical habitat for the Bruneau Hot Springsnail is not prudent at this time. Because many of the remaining populations of this species are in accessible, localized springs on public land, such designation might increase the degree of vandalism, collecting, and other human activities. Protection of this species' habitat will be addressed through the recovery process. It should be noted that a designation of critical habitat does not create a wildlife refuge or wilderness area, nor does it close the area to human activity. It applies only to Federal agencies which propose to fund, authorize, or carry out activities that may destroy or adversely modify areas within designated critical habitat. Although critical habitat may be designated on private or State lands, activities on these lands would not be restricted by a designation unless a Federal permit or other Federal involvement is present.

Issue 7. Many comment letters were received expressing concerns with the potential economic impacts to existing and future agricultural development in the Bruneau River Basin. They suggested that the Service prepare an economic analysis prior to any listing decision.

Service Response: Under section 4(b)(1)(A) of the Act, the listing process is based solely on the best scientific and commercial information available and economic considerations are not applicable. The legislative history of the Act clearly states the intent of Congress to "ensure" that listing decisions are "based solely upon biological criteria and to prevent non-biological considerations from affecting such decisions." H.R. Rep. No. 97-835, 97th Congress 2nd Session 19 (1982). Because the Service is specifically precluded from considering economic impacts in the listing process, the Service has not addressed such impacts in this final rule. Economic factors are considered in a designation of critical habitat and during the development of a recovery plan.

Issue 8. Several commenters questioned whether the Bruneau Hot Springsnail is endemic or indigenous to the area. They stated that tropical fish have been introduced into several of the thermal springs in the Bruneau basin as far back as prior to the 1940's, therefore, the snail may also have been introduced along with the fish.

Service Response: The Service has considered available scientific evidence and concludes that the Bruneau Hot Springsnail is endemic to southwestern Idaho. Hershler, in his 1990 description of the species, stated that "Pyrgulopsis bruneauensis appears closest morphologically to *P. amargosae* from the Death Valley System to the south", although the species is also biogeographically similar to other regional *Pyrgulopsis*. Hershler also believes that local endemism of the springsnail appears likely. Additionally, there are no historic records for the springsnail from the U.S. or elsewhere, and a helicopter survey of several thermal springs in the Bruneau and Jarbridge River Basins in southwest Idaho and the Owyhee River in southeastern Oregon conducted during January, 1987, did not reveal additional populations. If at some future time the species is found to be more widespread than previously thought, and threats to its continued existence are removed, the Service would consider downlisting or delisting the species.

In summary, although recent studies have noted additional thermal springflows containing Bruneau Hot Springsnails, no substantive comments were received indicating that the species is found outside of the Bruneau River Basin near Hot Creek or under a lesser degree of threat than originally thought. Opposing comments were based primarily upon concerns that listing of the springsnail would affect the allocation of water and impact agricultural development in the Bruneau Valley, rather than information concerning the species' status. Some opposing comments questioned the adequacy of the Service's data. The Service has continued to gather information regarding the status of the species since publication of the proposed rule in 1985 and believes that this final rule is thorough and appropriate. As discussed in detail in the "Summary of Factors Affecting the Species" section, the Service concludes that nearly all of the remaining populations of the Bruneau Hot Springsnail are at risk.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that the Bruneau Hot Springsnail should be classified as an endangered species. Procedures found at section 4 of the Act (16 U.S.C. 1533) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act were followed. Under the Act, a

species may be determined to be endangered or threatened due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Bruneau Hot Springsnail (*Pyrgulopsis bruneauensis*) are as follows:

A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

Activities that threaten the continued existence of the Bruneau Hot Springsnail include further agricultural-related ground water withdrawal and livestock grazing.

Ground water withdrawal and pumping threaten the springsnail through a reduction or loss of thermal spring habitats from depletion of the geothermal aquifer underlying the Bruneau area. Within the past 25 years, discharge from many of the thermal springs along Hot Creek have decreased, thus restricting the springsnails' habitat area (Berenbrock, USGS, written communication; Young et al. 1979). This is specially true for the Indian Bath tub springs, where the species was first discovered, and where springflows have now ceased and the springsnail has been eliminated. Spring discharge in 1964 was almost 2,400 gpm and had declined by the summer of 1990 to zero discharge. Beginning in the late 1890's, when ground water development for domestic and agricultural purposes began in the Bruneau area, through 1991, an estimated 275,000 acre-feet of thermal water was discharged from Indian Bath tub springs (Berenbrock, USGS, written communication). Of this amount, only 1,400 acre-feet was discharged from the spring during 1981 to 1991. The decline in discharge from the Indian Bath tub springs was noted beginning in the mid-1960's and coincided with the accelerated increase in ground water withdrawal associated with a rapid increase in the amount of lands irrigated with ground water throughout the Bruneau area. As recently as 1991, the USGS estimated that ground water withdrawals exceeded the estimated historic rate of natural recharge by about 12,000 acre-feet (Berenbrock, USGS, written communication). It should be noted that ground water withdrawals have actually declined over the past 10 years, primarily due to cropland retired from production through participation in the Conservation Reserve Program (CRP). Yet water levels in the geothermal aquifer continue to decline. The Service is concerned that the number of withdrawals may again increase in the next few years as croplands will again enter production when the current 10

year CRP program expires and/or is not renewed. In any event, if present water management practices continue, water levels in the aquifer will either continue to decline or eventually stabilize at some lower level. The decline in spring flows has been documented at the Indian Bath tub in upper Hot Creek and at least two additional springs (Berenbrock, USGS, written communication); however, springflow data has not been collected in the remaining 125 springs containing springsnails, most of which are at elevations lower than the Indian Bath tub springs. If ground water levels in the geothermal aquifer continue to decline, the Service anticipates that all remaining thermal spring habitats containing Bruneau Hot Springsnails will eventually cease to flow, causing the extinction of the species.

Cattle grazing also impacts springsnail habitats, especially those along Hot Creek. Although approximately 160 acres along Hot Creek canyon was fenced in 1990 to protect it from livestock, trespassing cattle have been observed grazing within the enclosure on several occasions since 1990 (Mladenka 1992). The cattle have trampled instream substrates and habitats causing direct springsnail mortality and displacement. For example, Mladenka noted in his study the lowest abundance estimates of springsnails at one monitoring site occurred on the same date that several hundred cattle were observed in the vicinity of the stream site. Cattle also browse and remove riparian vegetation that shades Hot Creek, allowing temperatures to reach levels affecting reproduction or possibly lethal to the species. Additionally, livestock grazing in the adjacent watershed, combined with ongoing drought conditions, has basically denuded soils and vegetation to such an extent that periodic flash floods now dump sediment into Hot Creek that has covered over and totally eliminated springsnail seep/spring habitats for almost 150 m (492 ft).

Recreational access may also be impacting habitats of the Bruneau Hot Springsnail along the Bruneau River. Makeshift dams are sometimes constructed by bathers to form thermal pools and improve conditions for bathing. Construction of these pools impacts springsnails through habitat modification as rock substrates are moved, flow is altered and sediments are trapped. These pools also alter and possibly destroy the medicolous algal habitats preferred by the springsnail as pool water levels are raised.

In summary, the cumulative effects of these factors continue to threaten the

increasingly fragmented populations of the Bruneau Hot Springsnail and their thermal habitats

B. Overutilization for Commercial Recreational, Scientific, or Educational Purposes

There are no known commercial uses for this species. Recreational use of the thermal springs and outflows, except as described in Factor A above for bathing, is not considered a significant threat. However, since whitewater boating is increasing on the Bruneau River adjacent to these thermal outflows, recreational bathing activities may have to be more closely regulated in the future. Other mollusc species have become vulnerable to unauthorized collection for scientific purposes following listing. Because the distribution of the Bruneau Hot Springsnail is restricted and generally well known, overcollection is a potential threat to the species.

C. Disease or Predation

Juvenile springsnails appear vulnerable to a variety of predators (Mladenka 1992). Damselflies (Zygoptera) and dragonflies (Anisoptera) were observed feeding upon snails in the wild. The presence of a large population of introduced guppies in Hot Creek and several of the other small thermal springs downstream along the west bank of the Bruneau River has been suggested as potentially threatening the springsnail. Mladenka (1992) observed guppies feeding upon snails in the laboratory. In addition to guppies, a species of *Tilapia* has ascended into and reproduced in Hot Creek (Bowler 1992). The presence of this new exotic predator may also constitute a threat to the Bruneau Hot Springsnail. It should be noted that medicolous habitats support neither of these two exotic fishes or dragonflies, but do harbor numerous damselflies.

D. The Inadequacy of Existing Regulatory Mechanisms

At least three State agencies in Idaho have as part of their goals and objectives the identification and protection of rare taxa and their habitats. The Idaho Department of Parks and Recreation has authority under Idaho Code Section 18-3913, 1967, to protect only plants, with animals not given special protection on Idaho lands. The Department of Fish and Game, under Idaho Code Section 36-103, is mandated to preserve, protect, perpetuate, and manage all wildlife. However, these mandates do not extend protection to invertebrate species.

The Idaho Department of Water Resources (IDWR) regulates water development in the Bruneau area. It is the policy of IDWR to regulate and conserve ground water resources from depletion or 'mining'. In *Baker v. Ore-Ida Foods, Inc* 95 Idaho 575 (1973), it was established that " * * * where continued withdrawal of the aquifer results in mining, the withdrawal would violate the Ground Water Act." However, any conservation measures imposed by IDWR to manage ground water 'mining' are only for the purpose of fulfilling senior water rights and not for the protection of fish and wildlife. At present, there is no specific allocation of either surface or ground water in the Bruneau area for the protection and conservation of fish and wildlife. In 1982, the IDWR established the Bruneau-Grandview Ground Water Management Area (GWMA) pursuant to provisions of Idaho Code Section 42-233a " * * * to identify the area as approaching the conditions of a critical ground water area" (IDWR 1992). This GWMA designation has allowed the IDWR to continue to receive and hold without action applications for water permits until it can be demonstrated that the proposed withdrawal will not adversely impact other water rights in the GWMA. Due to the continued decline in water levels in the geothermal aquifer, none of the 17 applications for withdrawal within the GWMA submitted since 1982, except those for domestic purposes, have been approved. Without recovery of water levels, IDWR does not anticipate modification of the GWMA designation any time soon. In any event, GWMA designations are intended only to maintain sufficient ground water to fulfill existing water rights and supply the needs of irrigation, and not for the protection and conservation of fish and wildlife.

The Bruneau area is located entirely within the area of an ongoing water rights adjudication (Snake River Basin Adjudication). Through a Director's Report from IDWR due in 1994, the adjudication will clarify existing water rights and water uses and will permit IDWR to eliminate water rights that are of record but are no longer utilized. The IDWR also believes the adjudication process will need to be completed prior to the development and implementation of ground water conservation measures on behalf of the springsnail that may affect existing water rights and uses since "without completing this adjudication process there is no effective way to determine the existence

or validity of water rights to serve as the basis for delivery".

Under the Idaho Ground Water Act, IDWR also regulates the construction and maintenance of geothermal (Idaho Code Section 42-238(4)) and artesian (Idaho Code Sections 42-1601 & 42-1603) wells so that they operate to conserve ground water resources and prevent unnecessary flow and waste. The IDWR in 1990 identified several artesian wells in the Bruneau area " * * * leaking water at land surface or potentially wasting water in the subsurface due to inappropriate well construction techniques" (IDWR 1992). To date no action has been taken to have these leaking wells rehabilitated so that the aquifer pressures can be preserved or increased.

In summary, the IDWR has authority to control ground water 'mining' and can limit the development of new wells in a critical ground water area, impose water conservation measures, and also require meters on existing wells. However, IDWR has stated that " * * * the Director has no authority under State law to shut down prior vested water rights in order to protect an endangered species" (IDWR 1992); or in this instance for the sole purpose of protection and recovery of habitats for the Bruneau Hot Springsnail.

The Bureau of Land Management (Bureau) manages all of the public lands containing springsnails and their habitats along Hot Creek and the Bruneau River. The Bureau issues permits for livestock grazing on these lands and grants authorizations that would lead to the drilling of new wells or increased ground water use on Bureau lands. In the past, the Bureau has shown an interest in conserving the species and has solicited input from the Service regarding impacts that may result from any proposed activities. However, the Service's comments regarding candidate species are advisory in nature. The Bureau has developed a Cooperative Agreement to fence and regulate livestock use along Hot Creek, but has not taken steps to impose additional conservation measures to protect remaining springsnail habitats on Bureau lands.

With this listing of the Bruneau Hot Springsnail, the Bureau is required to initiate consultation pursuant to section 7 of the Act on any Bureau activity or project that may affect the species. Formal consultation would result in a Biological Opinion on whether or not the activity proposed to be authorized is likely to jeopardize the continued existence of the species. With listing, the Bureau is required to insure that any activity or project they authorize would

not be likely to jeopardize the continued existence of the springsnail. Conditions that would provide protection to the springsnail and their habitats could be incorporated into permits issued or authorizations granted. The provisions of section 7 of the Act are more fully discussed later in this rule.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Flash flood sedimentation of springsnail habitats is a threat to this species. Recent summer floods and mudflows during 1991 and 1992 delivered significant amounts of sand, silt and gravel to upper Hot Creek, and as of July 1992, the Indian Bathtub was completely filled with sediment (Robinson et al. 1992). Based on comparisons made with historical photographs, a meter or more of the seep/rockface springsnail habitats in the Bathtub had been covered. Following sediment delivery from an even more recent flash flood event during late October 1992, additional springflows have been completely covered over and springsnail habitat eliminated from approximately 150m (492 ft) in upper Hot Creek below the Indian Bathtub (Committee for Idaho's High Desert 1992). While flash floods probably occurred historically, the effects of declining springflows coupled with drought conditions have resulted in the permanent elimination of springflows and filling in of springsnail habitats at the Indian Bathtub and upper Hot Creek. Additionally, livestock grazing, compounded by protracted drought conditions in southwestern Idaho, has basically denuded soils and vegetation in the upper Hot Creek watershed to such an extent that periodic flash floods deliver sediment that cannot be flushed by the remaining weak and declining springflows. Measures to protect springsnail spring/seep habitats in the Indian Bathtub and Hot Creek from the effects of flash flooding were proposed by the Bureau of Land Management years ago but never implemented. These measures included the construction of small retention dams in the Hot Creek watershed to trap runoff sediment while still maintaining thermal seep habitats.

As mentioned in Factor A, cattle graze and trample the habitat along Hot Creek. Trampling also occurs instream, causing direct Bruneau Hot Springsnail mortality.

Determination

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by the Bruneau Hot Springsnail in determining

to issue this rule. Based on this evaluation, the preferred action is to list the Bruneau Hot Springsnail as endangered. Today the species persists in a few isolated thermal springs and seeps in Hot Creek and along an 8.5 km (5.28 miles) reach of the Bruneau River characterized by temperatures ranging from 15 to 35° C. Most of these sites are no more than small seeps less than 1 square m in size separated by distances less than 1 m (3.28 ft) to greater than 2,000 m (6,562 ft). The free-flowing thermal spring and seep environments required by the Bruneau Hot Springsnail have been impacted by and are vulnerable to continued reduction from agricultural-related ground water withdrawal/pumping. The species and its habitat are also vulnerable to habitat modification from the effects of livestock grazing, recreational access and flash floods. The remaining complex of thermally related springs and their immediate outflows are not protected from the potential threats previously discussed. Existing regulations do not provide adequate protection to prevent further direct or indirect habitat losses.

Because the Bruneau Hot Springsnail is in danger of extinction throughout all or a significant portion of its range, the species fits the definition of endangered as defined in the Act. For reasons discussed below, critical habitat is not being designated at this time.

Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time a species is determined to be endangered or threatened. The Service has determined that critical habitat designation for this species is not prudent at this time. Remaining populations are restricted to a small geographic area along the Bruneau River in southwestern Idaho and vandalism could occur if their whereabouts were widely known. Regulations implementing section 4 of the Act provide that a designation of critical habitat is not prudent when a species is threatened by taking or other human activity and identification of critical habitat can be expected to increase the degree of such threat (50 CFR 424.12). Publication of critical habitat descriptions would make this species even more vulnerable to such acts and increase enforcement problems.

Protection of this species' habitat will be addressed through the recovery process and through the jeopardy standard of the section 7 consultation process. The Service believes that

Federal involvement in the areas where Bruneau Hot Springsnails persist can be identified without the designation of critical habitat. In addition, all private land owners will be notified concerning this species' habitat and the importance of protecting it. Therefore, it would not now be prudent to determine critical habitat for the Bruneau Hot Springsnail.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions may be initiated following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(e) of the act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a proposed threatened or endangered species or result in destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

The Bureau of Land Management (Bureau) is the Federal agency that is most likely to be affected by this rule. Changes in management on Bureau lands containing springsnail habitats would be subject to consultation with the Service. Bureau actions that may be affected by this proposal include the issuance of livestock grazing permits and granting authorizations that would lead to drilling of new wells or increase

ground water use. The Department of Agriculture (Department) may be required to consult with the Service on any of the following actions: An APHIS spraying program (for grasshopper and other insect control) proposed for the Bruneau-Grandview area; Department subsidized agricultural conservation or best management practices (BMP) program; and all agricultural crop subsidy programs. Other Federal or federally assisted programs affecting Federal direct loan and grant programs, loan guarantee programs, home and mortgage assistance and capital improvement loan programs, including annual operating loans of the Farmers Home Administration, would also be subject to the provisions of section 7.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt any such conduct) import or export, transport in interstate or foreign commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship that would be suffered if such relief were not available.

Requests for copies of the regulations on listed wildlife and inquiries regarding them may be addressed to the Office of Management Authority, U.S. Fish Wildlife Service, room 432, 4401 North Fairfax Drive, Arlington, VA 22203-3507 (703/358-2104).

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations

adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

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Author

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List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Regulation Promulgation

PART 17—[AMENDED]

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, is amended as set forth below:

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500; unless otherwise noted.

2. Amend § 17.11(h) by adding the following, in alphabetical order, under SNAILS, to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

• • • • •
(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
•	•	•	•	•	•	•	•
Snails							
•	•	•	•	•	•	•	•
Springsnail, Bruneau Hot	<i>Pyrgulopsis bruneauensis</i>	U.S.A. (ID)	NA	E	489	NA	NA
•	•	•	•	•	•	•	•

Dated: January 13, 1993.

Bruce Blanchard,

Acting Director, U.S. Fish and Wildlife Service.

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