

BEFORE THE SECRETARY OF THE INTERIOR

**PETITION TO PROTECT THE DONNER UND BLITZEN
PEBBLESNAIL (*FLUMINICOLA INSOLITUS*) UNDER THE
ENDANGERED SPECIES ACT**

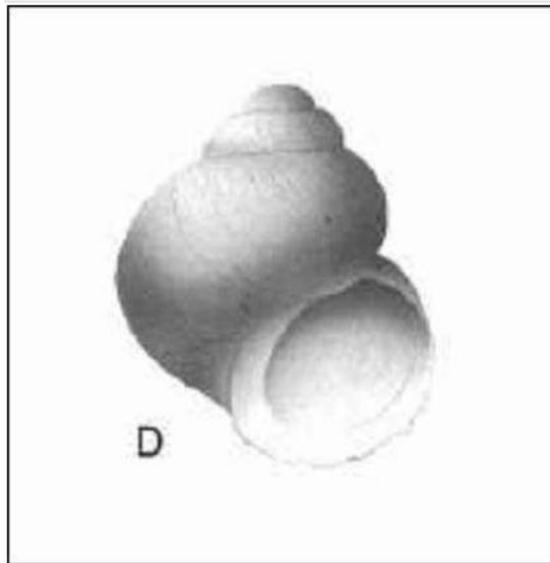


Photo: Herschler (1999)

CENTER FOR BIOLOGICAL DIVERSITY

February 14, 2024

Notice of Petition

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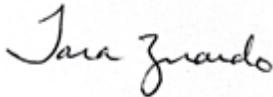
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Pursuant to Section 4(b) of the Endangered Species Act (ESA), 16 U.S.C. §1533(b); section 553(e) of the Administrative Procedure Act (APA), 5 U.S.C. §553(e); and 50 C.F.R. §424.14(a), the Center for Biological Diversity hereby petitions the Secretary of the Interior, through the U.S. Fish and Wildlife Service (USFWS), to protect the Donner und Blitzen pebblesnail (*Fluminicola insolitus*) under the ESA.

The USFWS has jurisdiction over this petition. This petition sets in motion a specific process, placing definite response requirements on USFWS. USFWS must issue an initial finding as to whether the petition “presents substantial scientific or commercial information indicating that the petitioned action may be warranted.” 16 U.S.C. §1533 (b)(3)(A). USFWS must make this initial finding “(t)o the maximum extent practicable, within 90 days after receiving the petition.” Petitioner also requests that critical habitat be designated concurrently with the listing, pursuant to 16 U.S.C §1533(a)(3)(A) and 50 C.F.R. §424.12.

The Center for Biological Diversity (“Center”) is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law, supported by more than 1.7 million members and online activists. The Center works to secure a future for all species, great or small, hovering on the brink of extinction. We submit this petition on behalf of our staff and members who hold an interest in protecting the Donner und Blitzen pebblesnail.

Submitted this 14 day of February 2024.



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Executive Summary

The Donner und Blitzen Pebblesnail (*Fluminicola insolitus*) (“pebblesnail”), also known as the Strange Pebblesnail, is a critically imperiled freshwater gastropod found only at a single spring (Page Springs) in the Donner und Blitzen River drainage in Oregon (NatureServe, 2023).

The pebblesnail’s spring is primarily threatened by recreation, water-use, drought and climate change. The Spring is in the popular Page Springs campground, with several trails allowing direct access. The pebblesnail is also threatened by climate change, pollution, and potentially invasive species.

This petition seeks ESA protection for this critically imperiled species, based on the best scientific information and in the context of the five listing factors. It also seeks to have the springs where the species occurs, and which contain the physical or biological features essential to the conservation of the species, designated as critical habitat, considering the severity of the threats facing the pebblesnail.

Introduction

Freshwater snails like the pebblesnail are not only important components of aquatic ecosystems, and often function as water-quality indicators, but are of global importance (Johnson, 2019, p.1). They are an important food source for fish, turtles, and other wildlife, and graze on algae and detritus (*Id.*).

The pebblesnail is only found at a single spring in the Donner und Blitzen River drainage in eastern Oregon. The spring where the snail occurs is within Page Springs Campground, where recreation serves as a major threat (NatureServe, 2023). Because of this restricted range, they are especially vulnerable to extinction (Johnson, 2019, p.4, NatureServe, 2023).

Biology

Taxonomy & Species Description

The Donner und Blitzen Pebblesnail (*Fluminicola insolitus*) is named after the nearby river. “Donner und Blitzen” in German means “thunder and lightning,” and the river was given its post-colonial name by German soldiers when they crossed during a thunderstorm in 1864 (Bureau of Land Management 2023c).

This snail, also known as the “Strange Pebblesnail,” is unique in the genus in featuring a broad basal process of the central radular teeth and in lacking basal cusps on these teeth (Herschler, 1999, p. 321). *Fluminicola insolitus* most closely resembles *F. turbiniformis*, which is also located in the northwest Great Basin, and with which it was at one time

confused (*Id.*). However, the pebblesnail differs from *F. turbiniformis* in the purple tint of its shell, thinner shell parietal lip, stouter lateral radular teeth, and stouter bursa copulatrix with longer duct (*Id.*).

Life History

Like other freshwater snails, the pebblesnail likely feeds on periphytic or epiphytic algae and biofilms, significantly influencing algal primary productivity (Johnson 2013, p. 248). They can vary widely in their longevity, which is dependent not only on the specific type of snail, but also on the habitat in which it occurs (Johnson 2019, p. 5). The maximum reported age of those living in streams and rivers can exceed five years and, in general, the more nutrients available to the species, the faster it grows and the shorter its lifespan (*Id.*).

Little is known about the reproductive habits of the pebblesnail specifically, however, most species of snails are separately sexed, and males fertilize the female through direct copulation, whereby females attach their eggs to a substrate, such as rocks, logs, or aquatic plants in shallow water. Species in the genus *Fluminicola* exhibit separate sexes, with both males and females. Reproduction is by copulation and cross-fertilization, and these species are believed to be semelparous (reproducing only once in a lifetime) (Washington Department of Fish & Wildlife, 2024). Eggs are laid as gelatinous capsules attached to plants, stones, or other objects from spring to autumn (Johnson 2019, p. 5). Egg clutches are laid in other shells and can contain 200 – 300 eggs (*Id.*).

Habitat Requirements

The pebblesnail is found only at a single spring complex (Page Springs) in the Donner und Blitzen River drainage in Oregon (NatureServe, 2023).

Freshwater snails, including the pebblesnail, require habitats with clean, stable substrates and high dissolved oxygen (Freshwater Mollusk Conservation Society, 2023). Snails living in nutrient-poor habitats on average tend to live longer (Johnson, 2019, p. 5). The exact water quality parameters of this spring have not been documented, however, springsnails have a low tolerance to changes in dissolved oxygen levels, particularly hypoxic (low oxygen) environments. Springsnails are also sensitive to elevated water temperatures and excess sedimentation (Hurt, 2004, p. 1173). Because of their narrow environmental preferences, springsnails are indicator species that provide insights to trends in water quality (Wells et al., 2012, p.69-77).

Range & Population Status

Springsnails thrived during the Pleistocene when large lakes covered much of the Great Basin and were widely distributed across the Western United States (Herschler, 2014, p. 693). As these waters receded, snails were isolated in remaining habitat like Page Springs. This unique evolutionary history has led to their broad, yet highly isolated,

distribution across surface waters of the northern Great Basin (*Id.* at 697). Due to limited dispersal capabilities, it is likely that this species evolved in isolation at Page Springs.

Ten percent of North America’s freshwater snails are extinct, and 64 percent are conservation targets, an imperilment rate exceeding most other major animal groups in North America (*Id.*). The abundance of freshwater snails has dramatically declined over the last century – especially those species that inhabit streams and rivers (Johnson, 2019, p.1).

The pebblesnail is currently ranked by NatureServe as a G1 Critically Imperiled species, based on it being limited to a single spring that occurs in a BLM campground, where renovation, water-use and recreational disturbance threaten the species (NatureServe, 2023). Surveys have not been conducted to determine overall abundance or population trend in the pebblesnail.

The current range of *Fluminicola insolitus* is restricted to one spring, Page Springs, which flows primarily in two small channels, and with a length of just .697km, before entering the Donner and Blitzen drainage in Oregon. Because the species occurs at only one known site, in a small, isolated range, a single disturbance – such as stream drying, excessive temperatures, and/or significant habitat degradation – would likely result in the extinction of the species.



Figure 1: Page Springs Recreation Site – red line denotes snail population (Google Earth, 2024)

Listing Factors

The Donner und Blitzen pebblesnail faces threats to its continued existence under three of the five factors and warrants protection under the ESA as an endangered or threatened species. Specifically, the springsnail is threatened by habitat destruction due to water use, recreation, cattle grazing, inadequate protections, invasive species, and climate change.

Present or threatened destruction, curtailment, or modification of habitat or range:

While the genus *Fluminicola* consists of species that range from Southern California to British Columbia, the petitioned species is known to exist only in one location in Southeastern Oregon (Hershler, 1999, p. 306-337). Due to their endemism, they are particularly susceptible to extirpation from habitat degradation resulting from multiple factors.

Recreation

The Bureau of Land Management estimates that the campground hosted almost 4,500 visitors in 2022 (BLM, 2023a), not including trail users who did not also use the campground. Recreation is a primary threat to the Donner und Blitzen pebblesnail because of its environmental sensitivity overlaid with the unfortunate occurrence that its entire range is in and near a high-use recreation area. Page Springs Recreation Area is very popular and used for a variety of activities, including camping, picnicking, hiking, birdwatching, and fishing (BLM, 2023c). In fact, Page Springs appears as one of the sites listed as the “absolute best camping” in Oregon (*That Oregon Life*, 2022), as well as on other tourist attraction websites. The Blitzen is also known for its “world class redband trout fishery” and fly fishing, advertised by the BLM as “some of the finest in Eastern Oregon.”

The springsnail occurs adjacent to the campground and to a high-use trail. There are numerous ways recreationists can cause physical and chemical damage to springs, including trampling, degrading water quality by introducing sunscreen, insect repellent, personal care products and detergents, and human waste. Recreation threatens the springsnail because it can cause trampling, soil erosion, disturbance to vegetation, water pollution, and other disturbances (Monz et al., 2021, p.631-643). Habitat conditions can also be harmed when dogs enter the springs and by introducing flea and tick treatment residues and animal waste. People cleaning fish also sometimes dispose of unused bait and fish residues in water sources near campgrounds. Visitors also frequently move rocks and debris in water sources in recreational areas, which impacts flow and substrate.

NatureServe reports that the pebblesnail’s spring set has also been impacted by renovations and water use by the BLM. The BLM mows substantial areas surrounding the spring, reducing vegetation cover with potential temperature impacts, and also likely uses herbicides and pesticides as part of the management of the recreation area. Roads in

the recreation area and campground that are managed by the BLM are another source of sediments and pollutants that could negatively impact the snail, and we could find no documentation that the BLM considers impacts to the snail before undertaking management actions.

Groundwater Depletion

Decreased spring flow and use of the springs is a major threat to freshwater snails like *Fluminicola insolitus*. By nature, all springs depend entirely on groundwater as their water source (Brown et al., 2011, p. 97-102). Reductions in the availability of groundwater to Page Springs is thus a direct threat to the pebblesnail.

The Donner und Blitzen River lies within the Greater Harney Valley Groundwater Area of Concern – a state-designated subsection of the Harney Basin in which groundwater use exceeds recharge (Oregon Water Resources Department, 2010). While “considerable recharge” occurs in the highlands of the Harney Basin, there is a groundwater budget deficit in the lowlands of about 110,000 acre-feet per year (Gingerich et al., 2022, p.1). Between 2016 and 2020, groundwater at wells nearby to the Donner und Blitzen River declined on average by 1-20 feet per year. While a measurement of average groundwater decline at the Donner und Blitzen River site was not available, the Oregon Water Resources Department has noted that the immediate area is subject to localized decline related to groundwater development (Gingerich et al., 2022, p. 66).

The agricultural use of groundwater in the Greater Harney Valley Groundwater Area of Concern has also surged in recent decades. Between 1991 and 2018, total seasonal groundwater pumpage from agricultural irrigation wells rose from 51,000 acre-feet to 140,000 acre-feet (Oregon Water Resources Department, 2010).

With no mechanism currently in place to monitor spring flows, the pebblesnail is vulnerable to spring decline and depletion, particularly when combined with drought and climate change.

Livestock Grazing

Page Springs is managed by the Burns – Andrews field office of the Bureau of Land Management (BLM) on a narrow strip of land that abuts a grazing allotment on both sides. Page Springs is directly adjacent to the Frazier Field grazing allotment, which covers 20,790 acres (BLM, 2023). The Spring’s boundaries are outside of the grazing areas, however, as discussed further below, uplands grazing can still cause harm and trespassing livestock is a constant problem wherever there is water in the arid west. We would be surprised if this is not the case at Page Springs.

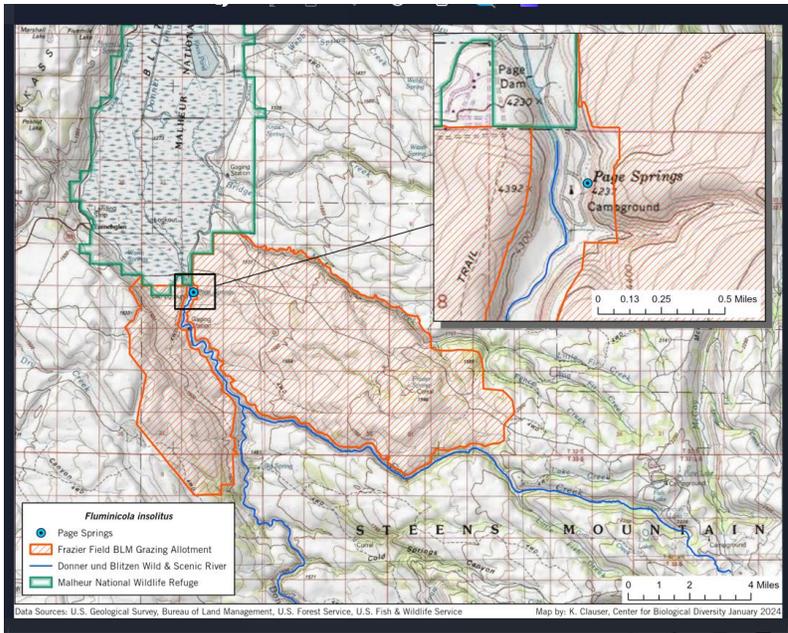


Figure 2: Map of Page Springs Campground in relation to Frazier Field Grazing Allotment (U.S. Geological Survey, Bureau of Land Management, Oregon Department of Forestry; map by Kara Clauser, Center for Biological Diversity, February 2024)



Figure 3: Map of Page Springs Campground in relation to Frazier Field Grazing Allotment (U.S. Geological Survey, Bureau of Land Management, Oregon Department of Forestry; map by Kara Clauser, Center for Biological Diversity, February 2024)

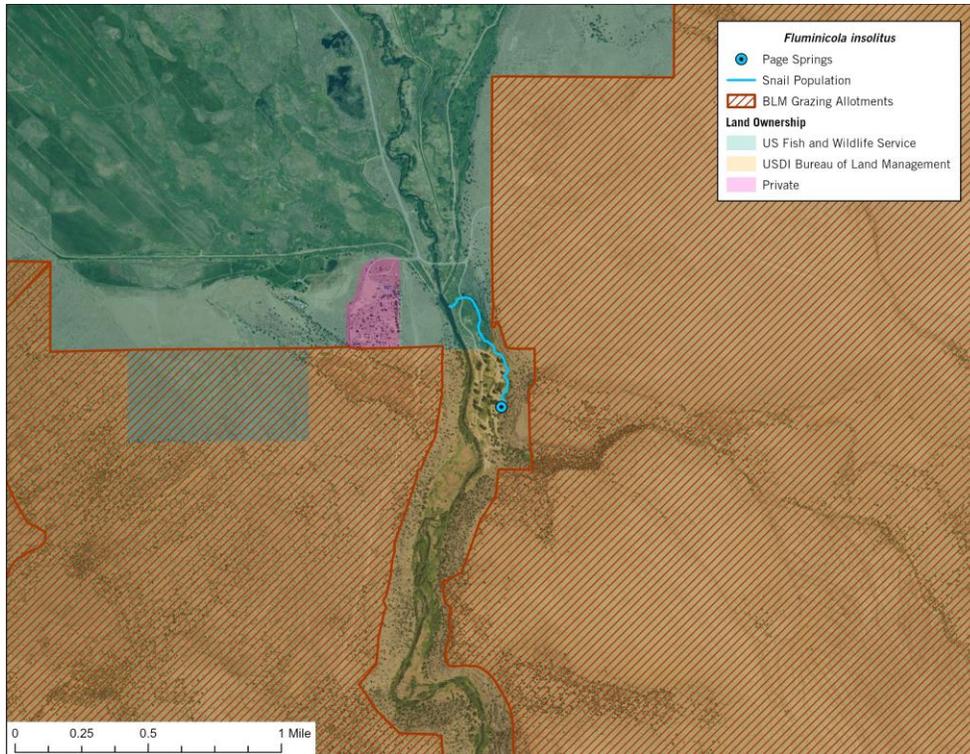


Figure 4: Map of Page Springs Campground in relation to Frazier Field Grazing Allotment (U.S. Geological Survey, Bureau of Land Management, Oregon Department of Forestry; map by Kara Clauser, Center for Biological Diversity, February 2024)

Land use activities that involve ground disturbance near riparian areas negatively impact water quality through sediment disturbance and transport (Mebane, 2001, p. 293-322). Grazing specifically can have significant detrimental effects on riparian ecosystems. Grazing impacts water quality and quantity, soil health, instream and streambank vegetation, and aquatic wildlife (Belsky et al., 1999, p. 1). Because grazing compacts soil, it can reduce groundwater infiltration rates and contribute to increased runoff and erosion (Teague, 2020, p. 1). Species richness of native plant types has been documented as lower at springs in proximity of high grazing intensity, as compared to springs with limited or no grazing (Nielson, 2019, p. 1).

Springsnails also have a narrow tolerance to changes in water chemistry. Hurt (2004) states: “Slight changes in water chemistry or temperature, particularly contamination and trampling of vegetation resulting from livestock use, can quickly eliminate a (springsnail) population” (p. 1173).

Livestock and human-caused trampling near streams and springs increases turbidity (Utah State University, 2023). Increased turbidity influences water temperature and can impact the ability of photosynthetic organisms to produce oxygen. In addition, eutrophication resulting from defecation of cattle near streams can contribute to a proliferation of algae that impacts oxygen availability. The resulting decrease in

dissolved oxygen in spring ecosystems negatively impacts sensitive aquatic organisms (EPA, 2021).

Because the petitioned species is extremely limited in its range and in its ability to adapt to ecological disturbance, grazing poses a significant risk that has the potential to extirpate the species. While the adjacent Steens Wilderness has nearly 100,000 acres that are set aside as livestock-free through a land exchange, the site locality of the species is not within that boundary.

Inadequacy of existing regulatory mechanisms:

State

The species is listed as a Sensitive Species in Oregon by the Oregon Department of Fish and Wildlife (S1, critically impaired; List 1 – threatened or endangered species). Still, there are currently no regulations protecting the pebblesnail from threats driving its extinction.

As has also been discussed above, the range for the petitioned species falls within a groundwater area designated the Greater Harney Valley Groundwater Area of Concern. This designation has allowed the Oregon Water Resources Department to restrict new well permits and to create voluntary water curtailment programs in the area. However, these mechanisms have not succeeded in abating critical groundwater conditions in the area, given that the department is seeking to invoke additional restrictions (Oregon Water Resources Department, 2023).

Unfortunately, the tightened regulations on well permitting imposed via the creation of the Greater Harney Valley Groundwater Area of Concern in 2016 are also insufficient to sustainably reduce groundwater consumption. The Oregon Water Resources Department has discussed the possibility of establishing a Critical Groundwater Area in the Harney Basin, which would allow the department to use additional mandatory and voluntary curtailment mechanisms to restrict additional well permitting. In addition, even additional water use restrictions may not be sufficient to end declines and protect the petitioned species. The additional curtailment mechanisms, if established, will aim to nudge water use toward a target level of decline (Oregon Water Resources Department, 2023).

Federal

There are no documented conservation efforts directly aimed at protecting this species or Page Springs. Page Springs is located within the Steens Mountain Cooperative Management and Protection Area (SMCMPA). The SMCMPA consists of 428,156 acres of federal public land that was set aside in 2000 under the Steens Mountain Cooperative Management and Protection Act (the Steens Act). In addition to establishing the SMCMPA and a framework for management of the area, this Act also established the

Steens Mountain Wilderness (adjacent to Page Springs) and set aside a Redband Trout Reserve in the Donner und Blitzen River (BLM, 2023).

The management plan for the SMCMPA addresses the importance of biodiversity and has set goals for very generally managing riparian health and aquatic ecosystems, but does not address aquatic invertebrates, specifically (BLM, 2000). The plan identifies priority streams within the Donner und Blitzen subbasin, but not the spring itself. The plan also fails to mention of the petitioned species, the Page Springs complex specifically, or springsnails.

As previously discussed, the petitioned species is limited to one adjacent location that is vulnerable to trampling and other grazing impacts. If the BLM is also unable to adequately manage cattle in this area, it could have detrimental effects on the habitat of the petitioned species that could lead to extirpation and extinction.

Two pebblesnails in the same genus as the petitioned species – *Fluminicola modoci* (common name: Modoc pebblesnail) and *Fluminicola virens* (common name: Olympic pebblesnail) – were listed as “Bureau Sensitive Species” (BSS) in 2019 by the BLM. These species are similar to the petitioned species in their habitat requirements; however, the petitioned species is not listed as a BSS and as such does not receive direct management attention by the BLM. Yet even if the species was designated a BSS, it would not provide adequate protection. The SSSP facilitates coordination with state and other federal agencies to support conservation goals, however, it does not provide any mandatory or enforceable protection for designated species or for habitat (BLM, 2008).

Because existing regulatory mechanisms do not adequately address threats to the habitat of the petitioned species and there are no conservation efforts targeting this species, protection under the ESA is necessary. Listing under the ESA would provide the pebblesnail with a recovery plan and the long-term funding of conservation efforts called for by scientists and necessary for the species to have any chance of survival. Conservation measures needed include surveys and mapping of all Donner und Blitzen pebblesnail occurrences, protecting and restoring their habitat to prevent further destruction, monitoring the species and the effects of habitat change on the species, and assessing activities on the pebblesnail and associated effects on its habitat, as well as the effects of minimizing or eliminating conversion of their habitat for other uses.

Other natural or manmade factors affecting the continued existence of the species:

Most freshwater gastropods that have been lost to extinction were narrow endemics with highly restricted ranges occurring in a single spring, like the pebblesnail (Johnson, 2013, p. 249). While habitat destruction contributed to most extinctions, drainage and water-use, alteration of springs, and the possible effects of exotic fish introductions were also significant (*Id.*). The Donner und Blitzen pebblesnail is also threatened by other factors, including drought, climate change, pollution, and invasive species.

Anthropogenically-induced climate change exacerbates the previously discussed threats to groundwater availability by increasing the likelihood and severity of drought. Periods of below-average precipitation prevent groundwater from recharging, adding another stress to the supply (USGS, 2018). According to the Oregon Water Resources Department, Oregon is currently in the “worst megadrought on the record.” In Spring 2023, Governor Tina Kotek signed an executive order declaring a drought emergency in Harney County, the petitioned species’ home county. The executive order warned that drought conditions would likely impact “important minimum flows for . . . natural resources dependent on adequate precipitation, stored water, and streamflows” (Office of the Governor, 2023).

Drought conditions also increase the danger of wildfires (Oregon Water Resources Department, 2023). A severe wildfire in the petitioned species’ range could catastrophically impact the population due to its small size and limited range.

Freshwater snails in general are also negatively impacted by water pollution, erosion, excessive sedimentation, groundwater withdrawal, associated impacts on surface streams, and invasive species (Johnson, 2019, p. 6; Johnson, 2013, p. 249). Freshwater gastropods are highly sensitive to contaminants, and the impacts of certain metals, fertilizers, and pesticides are well-documented, and can be lethal to them in even small amounts (*Id.* at 7). According to the BLM, the agency does spot herbicide treatments on a case-by-case basis in the area. These toxic compounds are often transported into species’ habitats via soil sediments washed into streams during storm events, or otherwise brought by human use of the area (*Id.*). This is especially true for salts and metals, (including Cu, Hg, and Zn), untreated sewage that often accompanies campgrounds, and agricultural runoff (Johnson, 2013, p. 249).

Aquatic invasive species such as the New Zealand mudsnail (*Potamopyrgus antipodarum*) pose a threat to the petitioned species. The New Zealand mudsnail is highly tolerant and adaptable and can spread rapidly in spring environments (Oregon Sea Grant, 2023). They can enter new ecosystems in several ways, including passive dispersal through birds and by attaching themselves to recreational equipment. While the New Zealand mudsnail has not been documented in the Donner und Blitzen River, specifically, at this time, the species *has* been documented in the nearby Lower Owyhee and Lower Malheur rivers and is widely distributed in the larger rivers of the Pacific Northwest (USGS, 2023).

As discussed above, the range of the Donner und Blitzen pebblesnail is extremely limited, and there is limited data on population size for the species. Small populations are at-risk demographically due to their lack of genetic diversity and limited gene flow (Lacy, 1987). Because of their small population size, they are also vulnerable to events including fire, drought, contamination, and disease.

X. Request for critical habitat:

We request and strongly recommend that Page Springs in the Donner und Blitzen River drainage be designated as critical habitat concurrent with the pebblesnail's listing. As required by the Endangered Species Act, the Secretary shall designate critical habitat concurrent with determination that a species is endangered or threatened (16 U.S.C. §1533(a)(3A)). Critical habitat is defined by Section 3 of the ESA as:

(i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and

(ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species.

16 U.S.C. §1532(5).

As part of designating critical habitat, suggested conservation measures for the Donner und Blitzen Pebblesnail include fencing off the spring and installing water monitors.

XI. Conclusion:

The Donner und Blitzen Pebblesnail is a critically imperiled freshwater gastropod found only at a single spring complex (Page Springs) in the Donner und Blitzen River drainage in Oregon. In the context of the five listing factors, the pebblesnail warrants ESA protection because it is at risk of extinction due to the threats it faces and due to its small population size and highly restricted range. There are currently no existing regulatory mechanisms that alleviate the threats facing the pebblesnail, and without ESA protection, it remains vulnerable to extinction. We urge the Service to propose the pebblesnail for listing and to designate critical habitat to ensure that it survives for future generations.

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