SPECIES: Scientific [common]	*Fluminicola coloradoensis* [Green River Pebblesnail] The taxonomic treatment of F. *coloradoensis* Morrison 1940 has undergone several changes since its description (Taylor 1966, Hershler and Frest 1996, Hershler 1999, Frest and Johannes 2000). In an ongoing effort to resolve the taxonomy, Liu et al. (2013) conducted mtDNA analyses, which resulted in the unassigned Snake River basin populations being assigned to *F. coloradoensis*, as well as the re-assignment of the lower Salmon River (Idaho) populations of *F. fuscus* to *F. coloradoensis*.
Forest:	Bridger-Teton National Forest
Forest Reviewer:	Randall Griebel, James Wilder
Date of Review:	02/07/2020; reviewed 4/24/2025
Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No)	NO

FOREST REVIEW RESULTS:

1. The Forest concurs or recommends the species for inclusion on the list of potential SCC:
   Yes___ No___

2. Rationale for not concurring is based on (check all that apply):
   Species is not native to the plan area _____
   Species is not known to occur in the plan area _____
   Species persistence in the plan area is not of substantial concern ___X____

FOREST REVIEW INFORMATION:

1. Is the Species Native to the Plan Area? Yes _X_ No___

   If no, provide explanation and stop assessment.

2. Is the Species Known to Occur within the Planning Area? Yes _X_ No___

   If no, stop assessment.

Table 1. All Known Occurrences, Years, and Frequency within the Planning Area

Year Observed	Number of Individuals	Location of Observations (USFS District, Town, River, Road Intersection, HUC etc.)	Source of Information
1996	Unknown	Lower Green River, Pinedale Ranger District (Record only identified to genus level)	WYNDD 2019

2013	Unknown	Hams Fork, Taylor Creek, Lincoln Co., WY, Upper Green River Drainage	Liu et al. (2013)
2013	Unknown	New Fork and East Fork rivers, southwest of New Fork, Sublette Co., WY, Upper Green River Drainage	Liu et al. (2013)
2013	Unknown	Green River, above Telephone Island, Sweetwater Co., WY, Upper Green River Drainage	Liu et al. (2013)
2013	Unknown	LaBarge Creek, west-southwest of La Barge, Lincoln Co., WY, Upper Green River Drainage	Liu et al. (2013)
2013	Unknown	New Fork River, Hwy. 351 bridge, Sublette Co., WY, Upper Green River Drainage	Liu et al. (2013)
2013	Unknown	Green River, Warren bridge, Sublette Co., WY, Upper Green River Drainage	Liu et al. (2013)
2013	Unknown	South Fork Smiths Fork, Cokeville, Lincoln Co., WY, Great Salt Lake Drainage	Liu et al. (2013)
2013	Unknown	Salt River, Freedom, Lincoln Co., WY, Snake River Drainage	Liu et al. (2013)
2013	Unknown	Snake River, Grand Canyon, Lincoln Co., WY, Snake River Drainage	Liu et al. (2013)
2018	Unknown	Exact location unavailable: 5 sites in the Green and Snake River Basins	Tronsdad and Anderson (2018)

a. Are all Species Occurrences Only Accidental or Transient?

Yes___ No _X__

If yes, document source for determination and stop assessment.

b. For species with known occurrences on the Forest since 1990, based on the number of observations and/or year of last observation, can the species be presumed to be established or becoming established in the plan area?

Yes __X_ No___

If no, provide explanation and stop assessment

c. For species with known occurrences on the Forest predating 1990, does the weight of evidence suggest the species still occurs in the plan area?

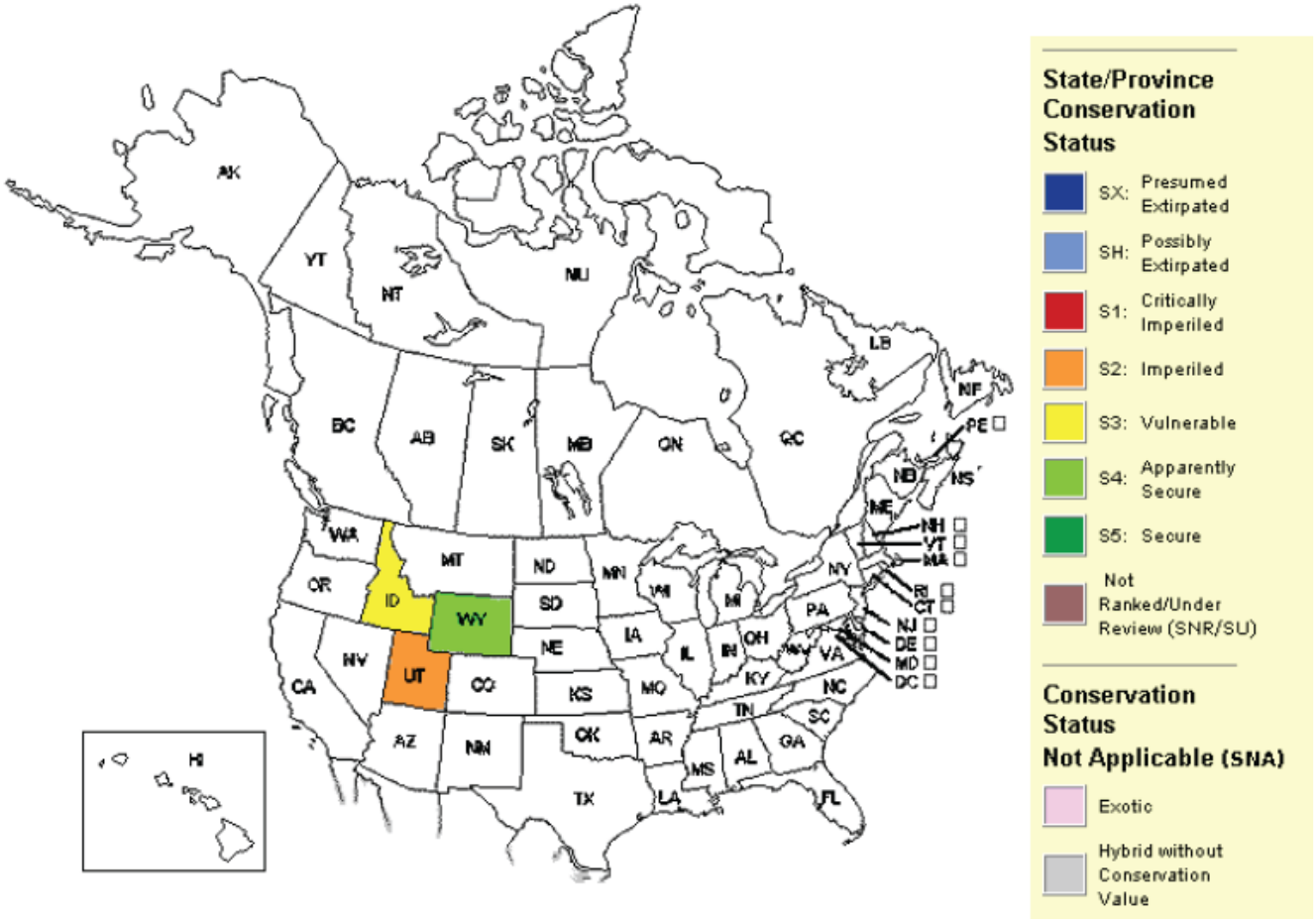
Yes ___ No___

Provide explanation for determination

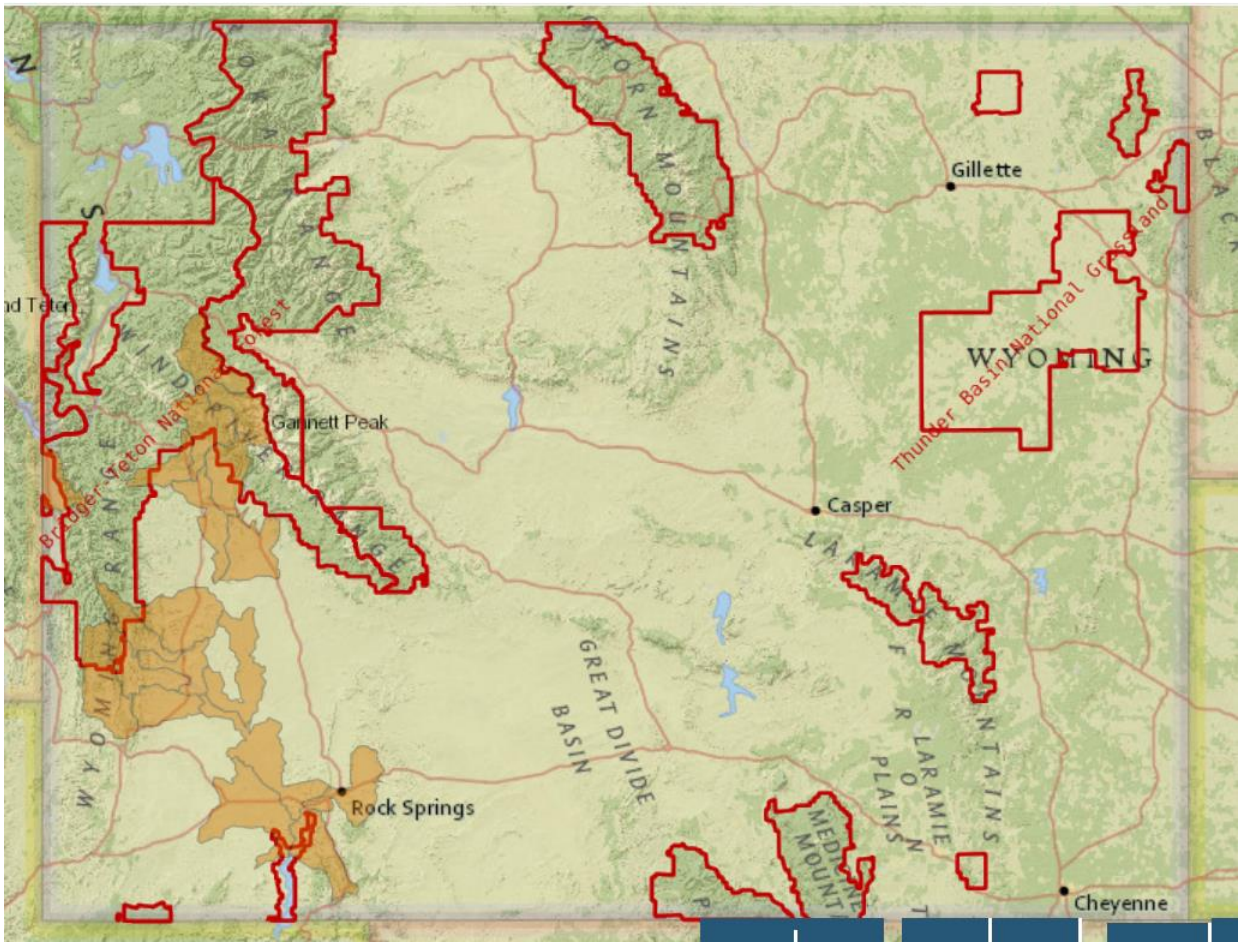
N/A—occurrences have been documented since 1990.

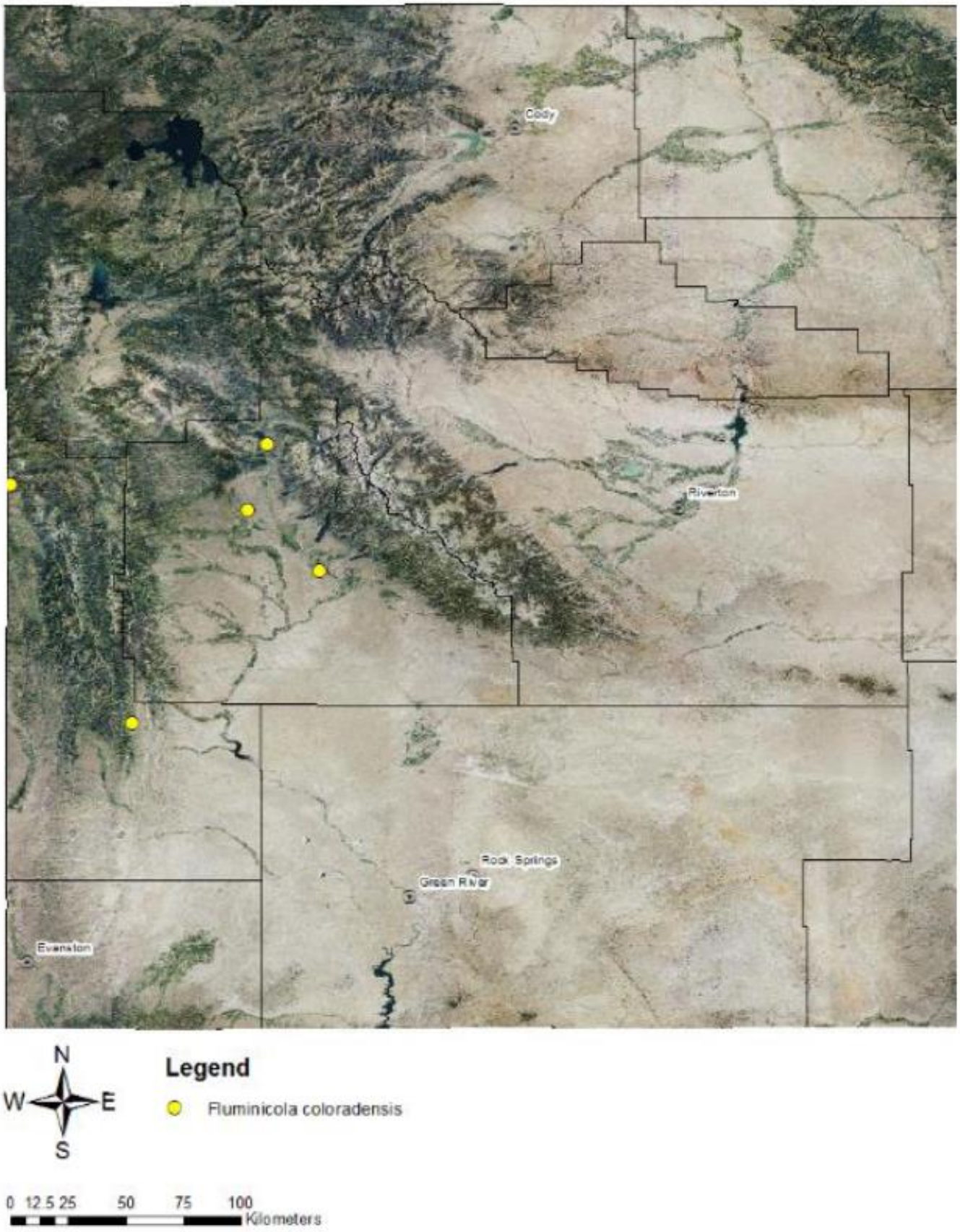
If determination is no, stop assessment

d. **Map 1**. Range of Green River Pebblesnail (*Fluminicola coloradoensis*) in the Western United States (NatureServe 2019).

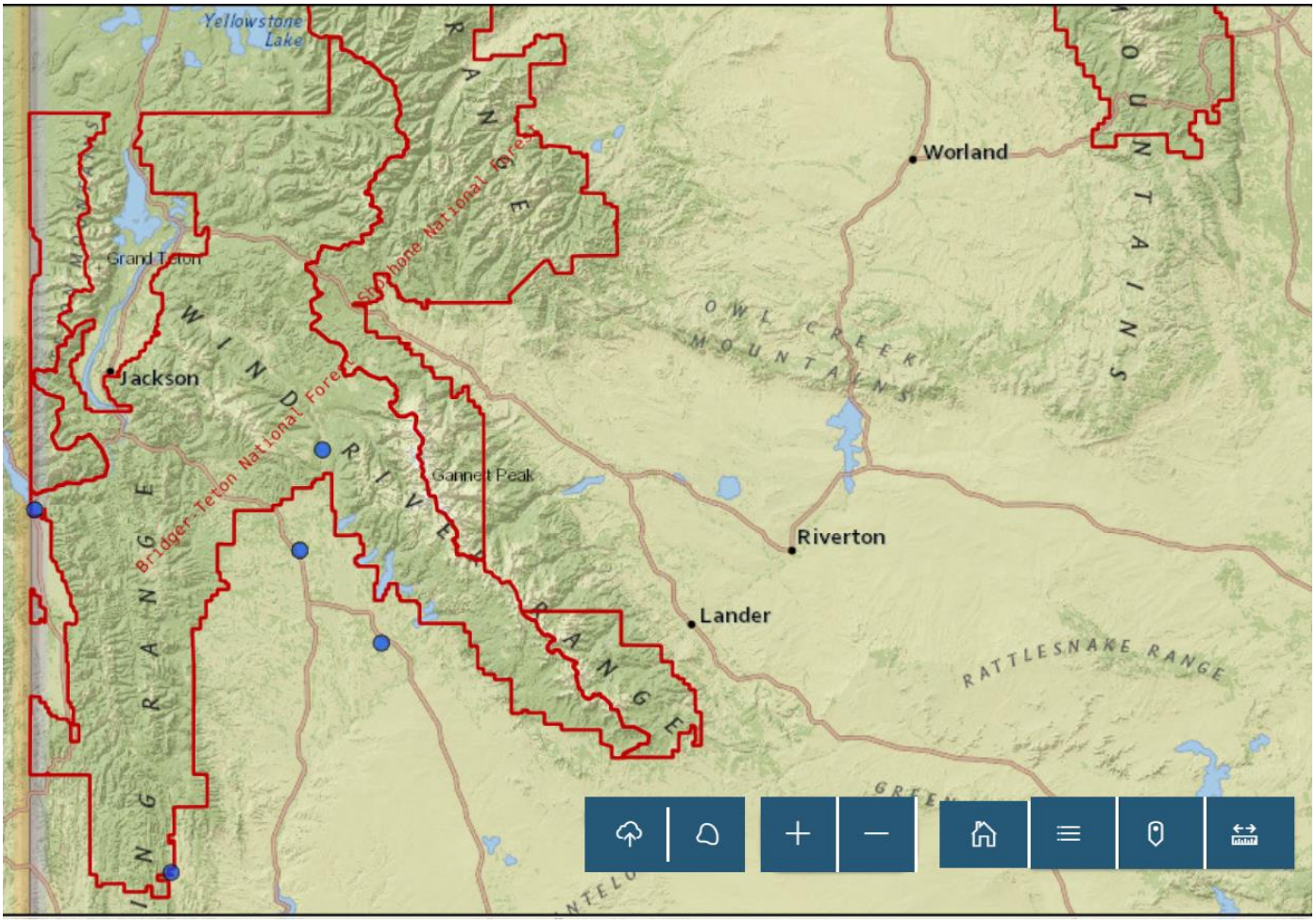


Map 2. Range of Green River Pebblesnail (*Fluminicola coloradoensis*) in Wyoming (WYNDD 2025).





Map 3. Occurrences of Green River Pebblesnail (*Fluminicola coloradoensis*) on or near Bridger-Teton National Forest (WYNDD April 2025).


Yellowstone Lake
Grand Teton
Jackson
Bridger-Teton National Forest
Shoshone National Forest
WIND RIVER RANGE
Gannett Peak
Worland
OWL CREEK MOUNTAINS
Riverton
Lander
RATTLESNAKE RANGE

3. Is There Substantial Concern for the Species' Capability to persist Over the Long-term in the Plan Area Based on Best Available Scientific Information?

Table 2. Status summary based on existing conservation assessments

Entity	**Status/Rank (include definition)**
NatureServe Global Status	**G3G4—Imperiled – Vulnerable/Apparently Secure** *At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.*
NatureServe State Status	**S4—Apparently Secure** *At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.*
WGFD	**NSSU (U), Tier #I** *Population Status: Unknown* *Limiting Factors: Unknown* *Tier I: Highest priority* *[The WGFD's Species of Greater Conservation Need (SGCN) designation process is based upon its **Native Species Status (NSS)** classification system that compares population and limiting factor variables using a 16 cell matrix. As a species moves from a placement closest to the upper left corner of the matrix (Aa/NSS1) toward the lower right corner (Dd/NSS7) the species' population status in Wyoming is considered more secure. Numerical scores were assigned to each of these variables and summed to provide a total score (i.e. NSS3). SGCN were placed into one of three tiers based on their total score: Tier I – highest priority, Tier II – moderate priority, and Tier III – lowest priority.]* (WGFD, 2017 - Wyoming Species of Greatest Conservation Need)
WYNDD	**Species of Concern** *Species vulnerable to extirpation at the global or state level due to:* *a. their rarity (e.g., restricted distribution, small population size, low population density)* *b. inherent vulnerability (e.g., specialized habitat requirements, restrictive life history)*

	c. threats (e.g., significant loss of habitat, sensitivity to disturbances)
USDA Forest Service	Not Listed
UDI FWS	Not Listed
WY BLM	Not Listed
IUCN	Not Listed

Table 3. Status summary based on best available scientific information.

Criteria	**Rationale**
Distribution on the Bridger-Teton National Forest	Historically, *F. coloradensis* was known only from the Upper Green River and Bonneville basin in northeastern Utah, Idaho, and western Wyoming, where populations are threatened by local habitat degradation (Liu et al. 2013; NatureServe 2019). Recent genetic analyses determined that *F. coloradensis* is more widely distributed than previously thought; populations of *Fluminicola* spp. in the Snake River Basin should be re-designated as *F. coloradensis*, and populations in the lower Salmon River previously classified as *Fluminicola fuscus* should also be re-designated as *F. coloradensis* (Liu et al. 2013). In Wyoming, *F. coloradensis* is known from streams in the Green, Snake, and Bear River drainages (Liu et al. 2013; WGFD 2017). Wyoming Natural Diversity Database has two documented occurrences on the BTNF in 1996 and 2016, in the Lower Green River within the Pinedale Ranger District (**Table 1**, WYNDD 2019), and in the lower Salt River near Palisades Reservoir. The Pinedale record was only identified to genus level, but the location is within the range of *F. coloradensis*. More recent and abundant collections in or near the Forest have been reported in several studies (**Table 1,** Liu et al. 2013; Tronsdad and Anderson 2018), but the locations of occurrences suggest that *F. coloradensis* naturally occurs in isolated patches with limited movement between patches.
Abundance on the Bridger-Teton National Forest	*Fluminicola* spp. often dominate the macroinvertebrate community where they occur (Hershler and Frest 1996). Tronsdad and Anderson (2018) collected 4,096 snails at 148 sites in the Snake and Green River Basins. Of the 22 known species collected, *F. coloradensis* was the fifth most numerous species collected and one of the species with the highest mean catch per unit effort (3.6 snails/min) (Tronsdad and Anderson 2018).

Criteria	Rationale
	Although the abundance of this species in Wyoming, and on the BTNF, is unclear (WGFD 2017), the above information suggests it may be common.
Population Trend on the Bridger-Teton National Forest	Population trends for this species are difficult to assess given the changes in taxonomy of that have broadened its concept (Liu et al. 2013; NatureServe 2019). Freshwater mollusks are declining worldwide (Tronsdad and Anderson 2018), and of the 50 known species and subspecies in Wyoming, 16% are critically imperiled or imperiled (WGFD 2017). However, there is no documentation of population trends in Wyoming (WGFD 2017) or on the BTNF.
Habitat Trend on the Bridger-Teton National Forest	*F. coloradensis* inhabits large springs and streams (WGFD 2017). In Wyoming, this species was found on cobbled substrate and occasionally on wood within the main channel, side channel, or margin of large streams. Snails appeared to be most abundant in ecosystems with higher standing stocks of algae, on solid substrate (e.g., wood or aquatic vegetation) and habitats with slower water velocity (e.g., backwater and margins of streams) (Tronsdad and Anderson 2018). Water quality is a vital habitat characteristic to snails. Snails require sufficient calcium levels to secrete shells. Wyoming rivers and streams generally have high concentrations of calcium that do not limit shell formation; however, granite geology probably limits snails in some parts of the state. Snail have not been observed in some areas in the Teton and Wind River Ranges, which have granite geology and very low calcium concentrations during surveys (Tronsdad and Anderson 2018). Low pH can also impede shell growth because the acidity inhibits shell secretion. The pH of water in Wyoming generally is >7, indicating that pH levels are generally not a concern in the state. The exception may be in granite geology especially during snowmelt (Tronsdad and Anderson 2018). Wyoming is still in the discovery phase in terms of its freshwater bivalve mollusks and gastropods. As such, Priority drainages and habitats have not yet been defined for the conservation of freshwater mollusks (WGFD 2017). Localized habitat degradation in the Bonneville and Upper Green basins may be the cause of the relatively small number of *F. coloradensis* populations in these basins (Liu et al. 2013). Several activities have reduced habitat quality on the Snake/Salt River Basin. Residential development throughout the Snake River, Flat Creek and Salt River valleys are directly influencing groundwater levels, water quality, and important spring streams. Additionally, flow regimes, instream habitat, and riparian function in the basin have been altered from the combined effects of Jackson Lake Dam and the levee system (WDGF 2017). In the Green River basin in Wyoming, aquatic habitat in the basin has largely been degraded by the introduction

Criteria	Rationale
	of invasive species, water development, altered flow regimes (WGFD 2017). In the Bear River Basin, irrigation diversions and water developments have altered natural flow regimes and decreased habitat connectivity (WGFD 2017).
Threats to the Species and its Habitat on the Bridger-Teton National Forest	*F. coloradensis* is vulnerable to disturbances that affect habitat availability and water quality, particularly activities that cause decreased oxygen content, increased water temperatures, or sedimentation. Threats to this species have not been thoroughly assessed, but there is localized habitat degradation in the Bonneville and Upper Green basins (Liu et al. 2013). Climate change will likely lead to water development projects that alter the timing, magnitude and duration of natural hydrographs as well as intra- and inter-annual variability in Wyoming's streams and associated riparian corridors. Increased temperatures may alter the magnitude and timing of precipitation and runoff, possibly shifting the reproductive phenology and distribution of wildlife (WGFD 2017). Invasive aquatic snails may outcompete or displace native snails, mussels, and aquatic insects. Failure to detect dreissenids and mud snail in large lakes where motorized boating occurs indicates that aquatic habitats on BTNF have a low probability of current infestations. However, there has been detection of aquatic invasive species downstream of BTNF in the Snake River Drainage and detection of New Zealand mud snails in the Salt River at the confluence of the Snake River immediately downstream of the Greys River Ranger District. These recently discovered infestations could be inadvertently spread onto BTNF by recreational watercraft and could degrade habitat conditions for native spring snails by competing for food, space, and other resources. Additional monitoring is planned for 2019 with the goal of limiting the spread of recently detected New Zealand mud snails (USFS 2019).
Date: September 15, 2019 Reviewer: L. Chipman	

Summary and Recommendations

With few observations or collections on the Forest, there is insufficient information to determine abundance, distribution, or population trends in the plan area. Although the abundance of this species in Wyoming, and on the BTNF, is unclear, recent studies suggest it may be common. Preferred habitat is relatively unaffected by forest management activities such as timber harvest or prescribed fire treatments; thus, habitat trends are likely stable on the Forest. Although aquatic habitats are currently stable on the forest, they may decrease in the future due to climate change effects. Until better information becomes available on abundance, distribution, population trend, habitat trend, threats, or other life history

characteristics, there is not a substantial concern for the species capability to persistence on the Forest over the long-term at this time, and it is recommended that the Green River Pebblesnail is not a Species of Conservation Concern for the Bridger-Teton National Forest.

Summary and Recommendation Provided by: R. Griebel (February 7, 2020).

References

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