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|---|---|
| **SPECIES: Scientific [common]** | *Margaritifera falcata* [Western Pearlshell] |
| **Forest:** | Bridger-Teton National Forest |
| **Forest Reviewer:** | Randall Griebel, James Wilder |
| **Date of Review:** | 02/10/2020; review 4/25/2025 |
| **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_X__

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 |
|---|---|---|---|
| 1988 | 1 | Vicinity of Jackson Lake | WYNDD (2019) |
| 1988 | 1 | Salt River | WYNDD (2019) |
| 2004 | 2 | Jackson | WYNDD (2019) |
| 2005 | 2 | Salt River | WYNDD (2019) |
| 2011 | 12 | North of Jackson Lake | WYNDD (2019) |
| 2011 | 4 | Wind River Range | WYNDD (2019) |
| 2012 | 2 | Vicinity of Jackson Lake | WYNDD (2019) |
| 2012 | 3 | Jackson | WYNDD (2019) |

   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?

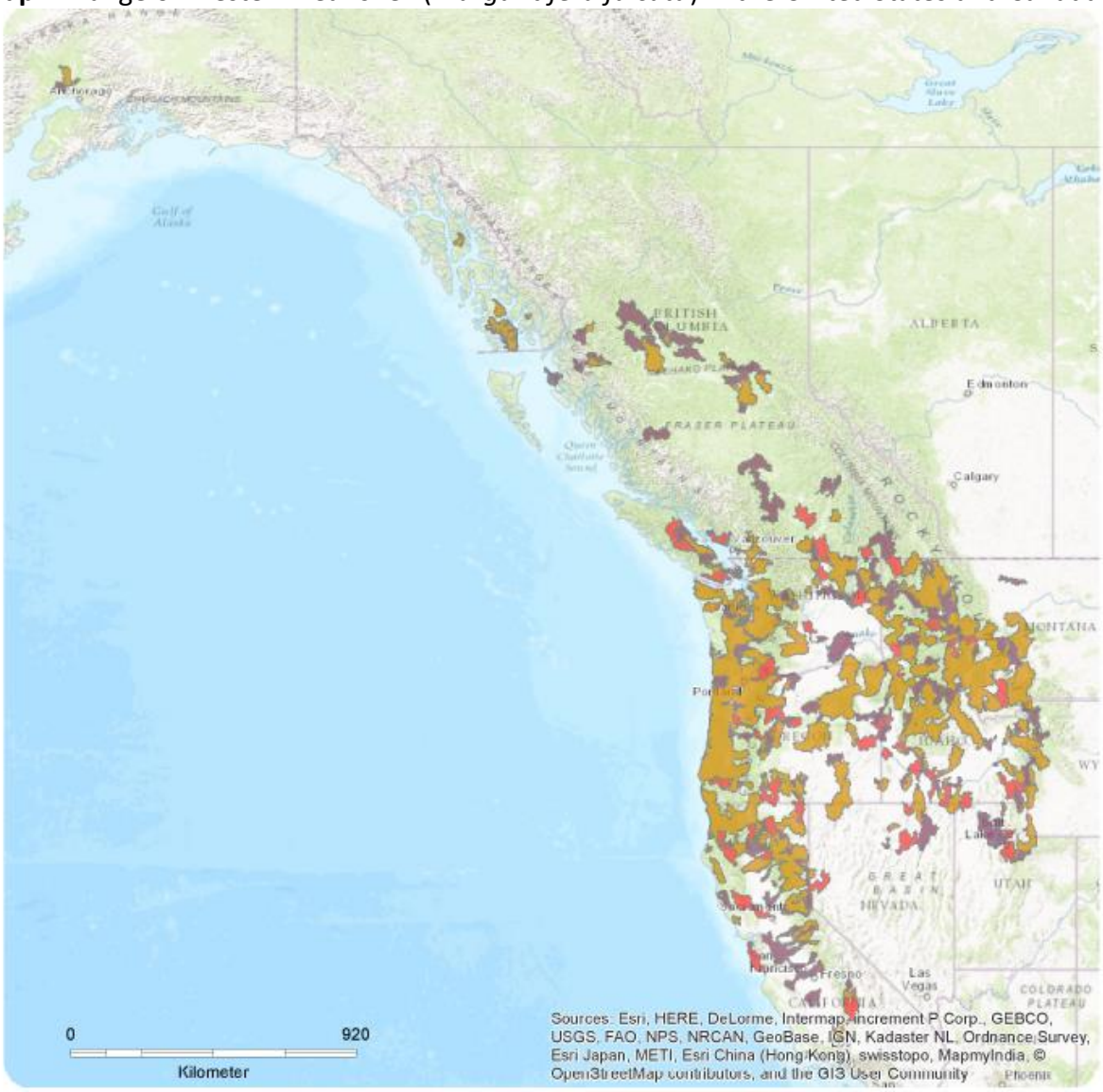
Yes ___ No___

Provide explanation for determination

N/A—occurrences have been documented since 1990.

If determination is no, stop assessment

*d.* **Map 1**. Range of Western Pearlshell (*Margaritifera falcata*) in the United States and Canada.




Range

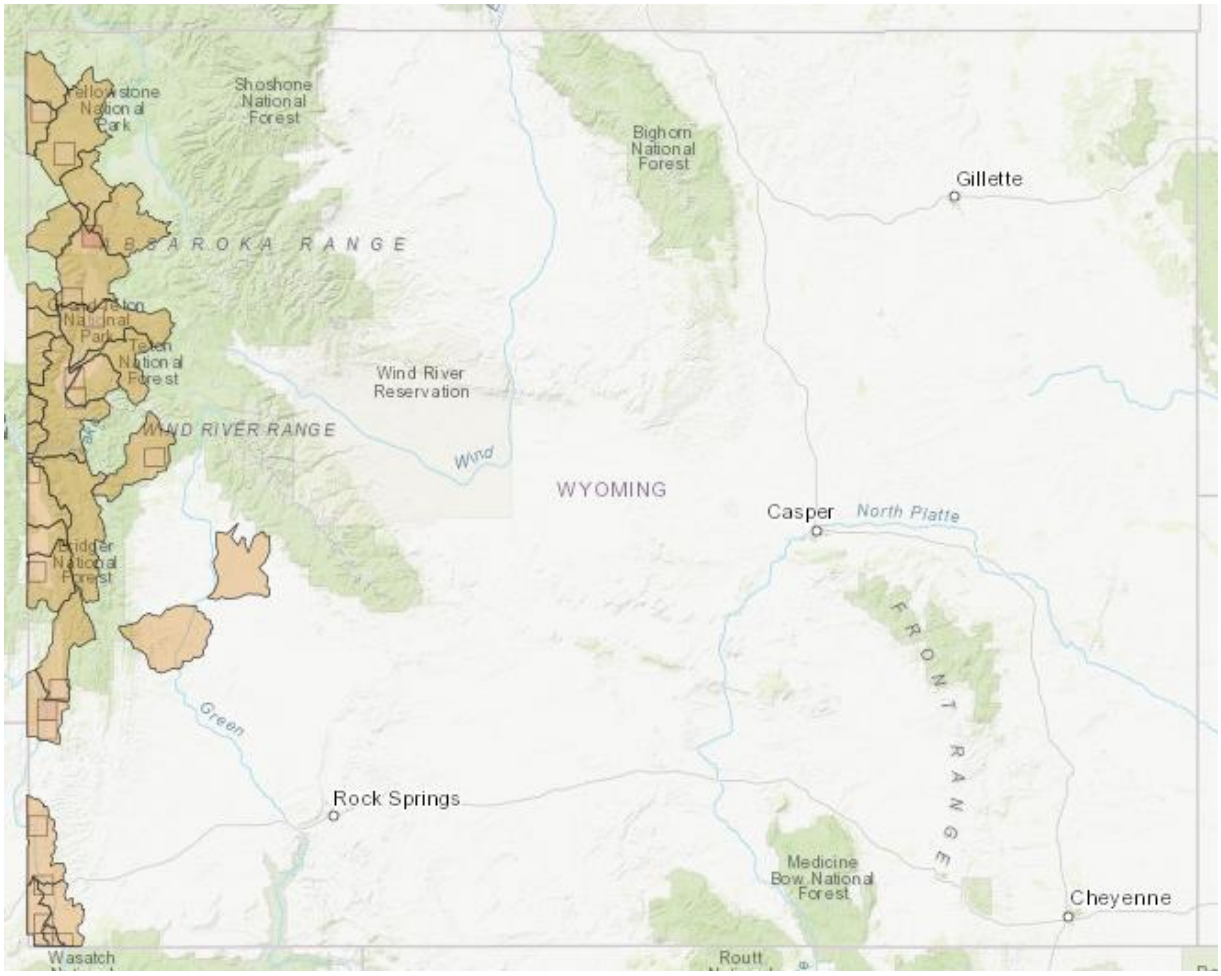
- Extant (resident)
- Possibly Extant (resident)
- Possibly Extinct

Compiled by:

Xerces Society for Invertebrate Conservation and Confederated Tribes of the Umatilla Indian Reservation

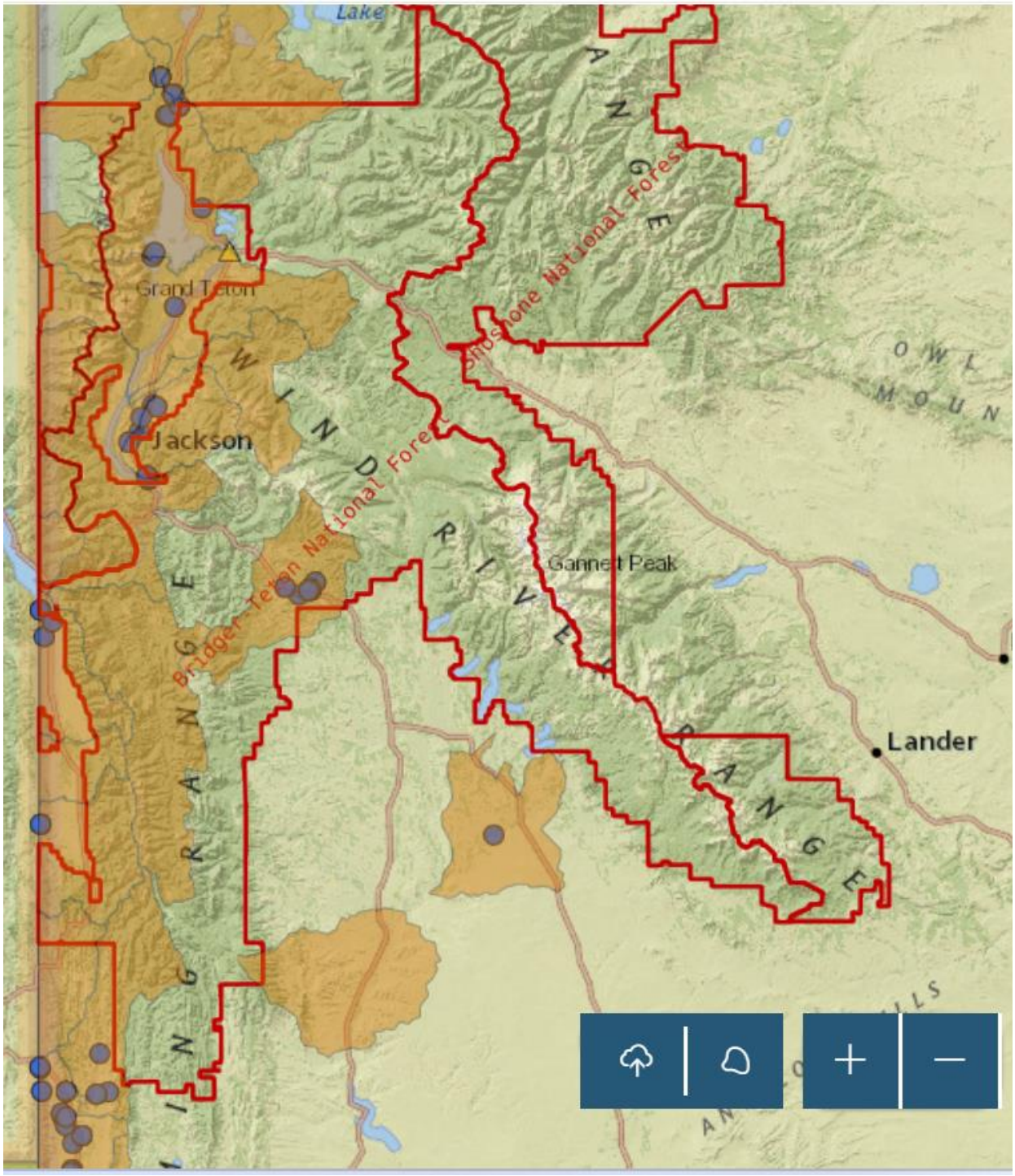
Blevins et al. (2016)

e. **Map 2**. Range of Western Pearlshell (*Margaritifera falcata*) in Wyoming.




WYNDD (2019)

f. **Map 3**. Western Pearlshell (*Margaritifera falcata*) *range and* occurrences in and around Bridger-Teton National Forest.




(WYNDD 2025)

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—Vulnerable to Apparently Secure**<br><br>*Vulnerable — 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.*<br><br>*Apparently Secure -At fairly low risk of extinction or elimination 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.* |
| **NatureServe State Status** | **S3— Vulnerable**<br><br>*At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.* |
| **WGFD** | Not Listed |
| **WYNDD** | **Species of Concern**<br><br>*Species vulnerable to extirpation at the global or state level due to:*<br>*a. their rarity (e.g., restricted distribution, small population size, low population density)*<br>*b. inherent vulnerability (e.g., specialized habitat requirements, restrictive life history)*<br>*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** | **NT—Near Threatened** |

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

| Criteria | Rationale |
|---|---|
| Distribution on the Bridger-Teton National Forest | *Margaritifera falcata* is widely distributed in western North America (NatureServe 2019), although viable populations are more sparsely distributed within its range. Populations can be found in watersheds from southeast Alaska to central California, extending east to northern Utah, western Wyoming, and western Montana (NatureServe 2019). Human activity appears to have reduced *M. falcata* ranges in Washington, Nevada, Oregon, Idaho, and California (Jepsen et al. 2010; NatureServe 2019). There have been reports of declines in distribution, population size, or obervations of populations without recruitment in California, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming; it is thought that declines in abundance are greater than declines in occupancy (NatureServe 2025).<br><br>In Wyoming, it is known from streams in Lincoln, Sublette, Teton, and Uinta Counties, including the Snake and Missouri River drainages in Yellowstone National Park, the Snake River drainage in Teton, Lincoln, and Sublette Counties, and the Bear River drainage in Lincoln and Uinta Counties (NatureServe 2019). A recent study identified 3,723 individuals at 23 sites within the Bear and Snake River drainages (Mathias and Edwards 2014).<br><br>Several recent occurrences have been observed in or in the vicinity of Bridger-Teton National Forest (Table 1, Map 3). This, along with suitable habitat distribution on the Forest and distribution off the Forest, suggests that *M. falcata* populations are likely scattered throughout the western portion of the Forest. |
| Abundance on the Bridger-Teton National Forest | There is no abundance data for *M. falcata* on the Forest. This species may be locally abundant throughout its range, but there have been reports of declines in distribution, population size, and/or recruitment in several states, including Wyoming (Blevins et al. 2016). Some historically dense populations have been drastically reduced (Blevins et al. 2016).<br><br>Based on what is known about the spatial distribution and densities of populations across its range, coupled with occurrence data for the Forest (Table 1) *M. falcata* is probably uncommon on the Forest |
| Population Trend on the Bridger-Teton National Forest | There is no population trend data for *M. falcata* on the Forest. A recent study showed that *M. falcata* has declined in overall watershed area by 17%, and recent extirpations, declining populations, and lack of recruitment have been observed in several states, including Wyoming (Blevins et al. 2016).<br><br>However, the species has been observed in numerous locations in its historic range of western Wyoming since 1985, including creeks and rivers in Teton, Lincoln, Sublette and Uinta counties, although it may have declined in the Bear River of Wyoming (Jepsen et al. 2010). Further, surveys in the state suggest the species is stable there, with numerous individuals and evidence of juvenile recruitment both observed (Mathias and Edwards 2014). |

| Criteria | Rationale |
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| | |
| Habitat Trend on the Bridger-Teton National Forest | *Margaritifera falcata* inhabits perennial rivers, streams, and creeks at depths of 1.5 to 5 feet. This species prefers clear, cold water with low velocities, low shear stress, and stable gravel substrates with some boulders, sand, silt and clay. It appears to be intolerant of sedimentation and is frequently found in eddies or pools among stones or boulders that shelter beds from scour (Blevins et al. 2016).<br><br>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).<br><br>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).<br><br>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 | Threats to *M. falcata* and other species of freshwater mussels in North America include: impoundments and loss or decline of host fish, channel modification from channelization, dredging and mining, restoration activities that impact streambanks or streambeds or dewater channels, contamination, sedimentation and scouring, nutrient enrichment, water withdrawal and diversion, thermal pollution, livestock grazing in riparian areas, shoreline development, and the introduction of non-native plant, fish and invertebrate species (Blevins et al. 2016). Additionally, the species may be threatened by low genetic diversity as a result of recent population reductions. Declines in salmonid host fish species' may have significant impacts on this species (Blevins et al. 2016, 2017).<br><br>Climate change is exacerbating many of these impacts, especially reduction in stream flow and thermal pollution in arid areas. 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 |

| Criteria | Rationale |
|---|---|
| | 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).<br><br>Invasive aquatic snails may outcompete or displace native snails, mussels, and aquatic insects. Failure to detect dreissenids and mud snails 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 mollusks by competing for food, space, and other resources (USFWS 2019). Additional monitoring is planned for 2019 with the goal of limiting the spread of recently detected New Zealand mud snails (USFS 2019). |
| Date: L. Chipman<br>Reviewer: October 4, 2019 | |

**Summary and Recommendations**

*M. falcata* are widely distributed across the Bridger-Teton National Forest and also widely distributed in areas adjacent to the Forest, although the actual number of records/occurrences is relatively small. The species has the ability to disperse across much of the Forest. There is limited abundance and trend data for *M. falcata* on the Forest but the species is likely doing well in many areas. Habitat on the Forest is in reasonably good condition and much of the habitat is within designated wilderness and is protected from many anthropogenic influences. Although reproduction in this species is complex and can be affected by numerous natural and anthropogenic influences, the presence of high quality and well connected habitat on the Forest will likely allow this species to recover from natural and anthropogenic disturbances. In summary, 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 Western Pearlshell is not a Species of Conservation Concern for the Bridger-Teton National Forest.

***Summary and Recommendation Provided by: R. Griebel (February 10, 2020).***

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