# Peamouth (*Mylocheilus caurinus*)
# Conservation Status Rank Summary

March 6, 2024

For details on assessment and ranking methodology, see: *Conservation Status Assessment Definitions, Process, Rank Factors, and Calculation of State Ranks for Montana Species*

## Rarity and Trends

| Rank Factor | Date Assessed | Value | Score | Data Source | Comments |
|---|---|---|---|---|---|
| **Rarity** | | | | | |
| **Range Extent** | 2024-02-20 | Y: 36302.5 km² | 3.930 | MTNHP Range Maps | None |
| **Area of Occupancy** | 2024-03-06 | 1343 \| 1km² cells | 3.440 | MTFWP fish distribution layer | From MT Fish distribution layer |
| Number of Occurrences | | | - | | Factor not used in ranking. |
| Population Size | | | - | | Factor not used in ranking. |
| # of Occurrences in Good Condition | | | - | | Factor not used in ranking. |
| % of Area Occupied in Good Condition | | | - | | Factor not used in ranking. |
| Environmental Specificity | | | - | | Factor not used in ranking. |

Rarity is calculated by averaging weighted factor scores:
**( (3.93 × 1) + (3.44 × 2) ) / 3 = 3.60**

| Rank Factor | Date Assessed | Value | Score | Data Source | Comments |
|---|---|---|---|---|---|
| **Trends** | | | | | |
| **Short-term Trend** | 2024-01-10 | [-50.0, -20.0%] | [-0.220, -0.070] | | Noxon and Cabinet gorge reservoir make up two large components of peamouth habitat in Montana and peamouth have nearly been extirpated from those two reservoirs (Rhem et. al 2023). Brad Stephens (FWP Biologist) indicated populations in Loon, Bull and Island Lakes might be struggling, but data is limited for Loon and Island Lakes. Other populations like Placid Lake, Holland Lake, Lake Koocanusa, Flathead Lake, and the Kootenai River appear to be relatively stable (FWP unpublished data). Many other areas that historically had peamouth (like the Clearwater River and chain of lakes) they have been extirpated by non-native predators (Hill 1962; Ladd Knotek personal communication; FWP unpublished data). A report from 1962 suggested peamouth were one of the most common species present in the Clearwater Chain at that time (Hill 1962). |

| | | | | Peamouth have also been documented in fluvial environments in the middle Clark Fork, Lower Clark Fork upstream of the reservoirs, and Lower Bitterroot River by various FWP biologists during standard surveys (Personal communication with David Schmetterling, Ladd Knotek, and Jason Lindstrom; FWP unpublished data). However, observations have been infrequent and generally only a few individuals so trend data does not exist. Given the prevalence of non-native predators in these rivers it is likely that peamouth have declined from historic densities. Netting data from Swan Lake appears to show significant declines but I was not able to contact the biologist to get further context (FWP unpublished data).  Data from across the native range in Montana suggests that peamouth are doing okay in waterbodies where non-native predator loads are absent or low, and waterbodies with several species and high densities of predators have seen dramatic declines or extirpation. Northern pike seem to be a common denominator among waterbodies that have seen dramatic declines in peamouth densities. Peamouth populations are generally stable in areas without non-native predators or low abundances of them. |
|---|---|---|---|---|
| **Long-term Trend** | 2024-02-20 | [-80.0, -30.0%] | [-0.400, -0.140] | Many of western Montana waterbodies were likely peamouth habitat historically. Peamouth have been extirpated or nearly extirpated from many of these waterbodies with the introduction and expansion of non-native predatory fish species. However, damming rivers such as the Kootenai and Clark Fork Rivers likely boosted populations in the stream mileage impounded in the  reservoirs behind dams. |
| Trends score is calculated by summing weighted short and long-term trend scores:<br>**( ([-0.22, -0.07] × 2) + ([-0.40, -0.14] × 1) ) = [-0.84, -0.28]** | | | | |

# Threats

| Rank Factor | Date Assessed | Value | Score | Data Source | Comments |
|---|---|---|---|---|---|
| **Threats** | | | | | |
| Overall Threat Impact | | | - | | Factor not used in ranking. |
| Intrinsic Vulnerability | | | - | | Factor not used in ranking. |
| No threat or vulnerability data used in ranking this species | | | | | |

**Individual Threats Data**

| Threat Category | Date Assessed | Impact Score | Scope | Severity | Immediacy | Comments |
|---|---|---|---|---|---|---|
| No individual threats data used in ranking this species | | | | | | |

# Conservation Status Rank Calculation

**Raw score**

Rarity: (3.60 × 100%) + Threats: (0.00) + Trends: ([-0.84, -0.28]) = [2.76, 3.32]

Calculated Rank:          S3

| | |
|---|---|
| **Accepted Rank** | S3 |
| **Date Approved** | 2024-09-30 |
| **Approval Authority** | Montana Species of Concern Committee |
| **Rank Justification** | Species is declining and faces uncharacterized threats. |

# Supplementary Information

Montana Natural Heritage Program. 2021. Conservation Status Assessment Definitions, Process, Rank Factors, and Calculation of State Ranks for Montana Species. 18 p.
https://mtnhp.mt.gov/docs/Montana_State_Rank_Criteria_20211201.pdf

Montana Field Guide Species Account:
https://fieldguide.mt.gov/speciesDetail.aspx?elcode=AFCJB24010

Predicted Suitable Habitat Model:
https://mtnhp.mt.gov/resources/models/?elcode=AFCJB24010

# Information Needs

Information needs are assessed by considering the availability of factors used to assess species status as well as the quality of these assessments. Current information availability and quality to inform Conservation Status Rank for this species are highlighted.

| Rank Factor | Assessment Category | Value | Criteria |
|---|---|---|---|
| General Status | Status Quality | Adequate | Calculated rank has low uncertainty and is represented by a single rank (e.g. S3); accepted rank may be adjusted to a range rank (e.g. S2S3) |
| General Status | Status Quality | Poor | Rank assessed as SU or calculated rank has notable uncertainty and corresponds to a range rank with 2 or more values (e.g. S2?, S1S3, or S4S5) |
| Rarity | Range Quality | Adequate | Range polygon adequately represents area of probable occupancy and does not include substantial unoccupied areas; range may be adequately defined and still include areas of unsuitable habitat (e.g. mountain ranges for plains species) |
| Rarity | Range Quality | Marginal | Range polygon defined, but may include or exclude notable areas where the species may or may not occur on the landscape |
| Rarity | Range Quality | Poor | Range polygon not defined |
| Rarity | Habitat Quality | Adequate | Species-habitat relationship is well-defined (e.g. relevant literature or robust habitat model available) |
| Rarity | Habitat Quality | Marginal | Understanding of species-habitat relationship is adequate among some but not all habitats (e.g. literature covers similar habitats outside of Montana or habitat model performance is only somewhat adequate) |
| Rarity | Habitat Quality | Poor | Species-habitat relationship is not well understood |
| Threats | Threat Quality | Adequate | Threat Impact is a single value (including "Unthreatened") |
| Threats | Threat Quality | Marginal | Threat Impact assessed at more than one value (e.g. "High - Medium") |
| Threats | Threat Quality | Poor | Threat Impact is Unknown but Intrinsic Vulnerability is assessed |
| Threats | Threat Quality | Unknown | Threat Impact is Unknown and Intrinsic Vulnerability is not assessed |
| Trends | Recency | Current | Short-term Trend assessment date less than 10 years old |
| Trends | Recency | Out of Date but Adequate | Short-term Trend assessment date is more than 10 years old or Unknown, but species is Unthreatened |
| Trends | Recency | Out of Date | Short-term Trend assessment date more than 10 years old |
| Trends | Recency | Not Available | Short-term Trend data are not available |
| Trends | Trend Quality | Sufficient | Short-term Trend assessed at a single value or multiple values with a minimum trend greater than -10% (stable or increasing) |
| Trends | Trend Quality | Unknown but Sufficient | Short-term Trend is Unknown, but species is Unthreatened |
| Trends | Trend Quality | Poor | Short-term Trend is less than -10% (in decline) with two or more values selected |
| Trends | Trend Quality | Unknown | Short-term Trend is Unknown |

## Summary of Information Availability

Rarity is well characterized but threats are unknown and trend is uncertain.

## Summary of Information Needs

Targeted monitoring should provide information to calculate a more robust trend and may provide additional data on threats.

# Additional Threat Details

The table below contains the complete threats assessment for this species. While the Conservation Status Rank Calculation is based on cumulative, broadly categorized (Level 1) threats data, threats are assessed and tracked for more specifically categorized (Level 2) threats when available.

| Threat Category | Date Assessed | Assessed By | Data Source | Scope | Severity | Imme-diacy | Comments |
|---|---|---|---|---|---|---|---|
| **Natural System Modifications - 7.2 - Dams & Water Management/Use** | 2024-02-20 | Caleb Uerling and Jason Blakney | None | Restricted | Unknown | High | Large reservoirs occupy sections of rivers that might have been riverine peamouth habitat but also provide habitat for peamouth in many cases. These reservoirs have also traditionally been hot spots for non-native predator introductions. Operation of dams and future management of fisheries in reservoirs will likely be a factor for peamouth populations in the future. |
| **Invasive & Other Problematic Species, Genes & Diseases - 8.1 - Invasive Non-Native/Alien Species/Diseases** | 2024-02-20 | Caleb Uerling and Jason Blakney | None | Pervasive | Unknown | High | Most waters peamouth occupy are either currently occupied by non-native predators or are suitable for them. Found very little literature that looks at predator prey dynamics for peamouth. A thesis done in Idaho shows that lake trout, smallmouth bass, and perch do eat peamouth but doesn't explore the relationship in depth (Vidergar 2000). Another thesis completed in 2011 on a reservoir in Washington showed that peamouth are a prominent food source for northern pike and that the dynamic might change over time as prey base changes with northern pike density (Harvey 2011). Northern pike are a common variable among waterbodies in Montana where significant declines in peamouth have occurred (i.e., Noxon reservoir, Cabinet Gorge Reservoir, the Clearwater Chain, etc.). |
| No threats data available for this species | | | | | | | |