Wildlife Resources in the Madison-Gallatin-Henry's Lake-Island Park Geographic Region

Montana and Idaho, USA

Mike Bader
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August 2023

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Introduction

The Madison-Gallatin-Henry's Lake-Island Park geographic region in southwestern Montana and southeast Idaho, USA is part of one of the most intact, diverse and wildlife rich areas in the temperate zones of the Earth. The Greater Yellowstone Ecosystem is home to Iconic species that are symbols of Wild America include the American bison, the grizzly bear and the wolf. Predator-prey relationships continue to keep the ecosystem in balance.

In fact, this community of wildlife is nearly complete compared to what was here at the time of the Lewis and Clark Expedition with 98% of the native species still here (Craighead 2015). The Madison-Gallatin-Henry's Lake-Island Park geographic region also hosts seasonal migrations of large mammals including elk, bison, mule deer and bighorn sheep emanating from the ecosystem core in Yellowstone National Park.

Figure 1. This Region Contains Excellent Wildlife Habitat and Connectivity. George Wuerthner photo.

The role that this landscape plays in maintaining wildlife populations that live part of the year in Yellowstone National Park and connecting biodiversity to other areas of the Northern Rocky Mountains cannot be understated.

This geographic region has a high level of "species richness." According to the Montana Natural Heritage Program (2023), there are a total of 4,942 species of mammals, birds, reptiles, amphibians, fish, invertebrates, vascular plants, bryophytes, lichens and algae within Fish, Wildlife & Parks Region 3, which encompasses the Madison-Gallatin region (see Appendix). A similar assemblage is located in the Henry's Lake-Island Park area and all the species present in Yellowstone National Park also occur here although some species occur at lower densities.

There are 94 mammal species of which 22 are Species of Concern and 10 are Potential Species of Concern. Major predators/carnivores are the omnivorous grizzly bear and black bear along

with bobcat, lynx, coyote, fisher, wolf, marten, mountain lion, red fox, swift fox and wolverine. Major ungulate species are bighorn sheep, bison, elk, moose, mountain goat, mule deer, pronghorn antelope and white-tail deer.

Figure 2. The More Open Rolling Habitat on the East Side of the Gallatin Range is Excellent Habitat for Ungulates Including Elk and Moose. George Wuerthner photo.

There are 382 species of birds with 63 being Species of Concern including the American white pelican, bald eagle, golden eagle, black-backed woodpecker, Clark's nutcracker, great blue heron, great gray owl, harlequin duck, northern goshawk, trumpeter swan, sandhill crane and whooping crane.

In addition to the mammalian fauna, native fish species include Yellowstone cutthroat trout, westslope cutthroat trout and mountain whitefish, although native arctic grayling have likely disappeared. Mountain lakes have wild populations of golden trout.

The three major rivers that drain this area are the Madison and the Gallatin which both originate in Yellowstone National Park and the Henry's Fork of the Snake River beginning along the Continental Divide. The east side of the Gallatin Range drains into the Yellowstone River.

This is rugged mountain country which includes over 50 miles of the Continental Divide and the high topographical ruggedness increases species diversity, micro-climates and overlap in ecological types. "Topographically complex regions on land and in the oceans feature hotspots of biodiversity that reflect geological influences on ecological and evolutionary processes." (Badgely et al. 2017). They also note that across the world today, a disproportionate share of taxonomic diversity occurs within topographically complex regions and the trend is that topographically complex regions today feature high taxonomic and ecological diversity.

There are at least 21 peaks above 10,000 feet and four above 11,000 feet. Sitting astride the Yellowstone Plateau, the long harsh winters with deep snow leads many species to migrate into the Madison-Gallatin and Island Park areas to lower elevations where forage is easier to obtain.

Figure 3. The Lionhead Area Along the Continental Divide is a Primary Connectivity Area Between Greater Yellowstone and the Bitterroot Ecosystem in Idaho. George Wuerthner photo.

A significant amount of this area is encompassed by the Custer-Gallatin National Forest and its location adjacent to Yellowstone National Park plays a major regional role in connecting wildlife habitat found in the major wildland ecosystems of the Northern Rockies as well as recovery of species listed as threatened and endangered under the Endangered Species Act (ESA) and species proposed for listing.

Comprehensive assessments of wildlife in the Gallatin Range (Craighead 2015) and the Madison Range and Valley (Brock et al. 2006) offer more substantive detail. This report focuses on 10 major focal species or Management Indicator Species including species listed under the federal Endangered Species Act.

Landscape and Genetic Connectivity and Management Indicator (Focal) Species

Grizzly Bear

The grizzly bear is the quintessential indicator of ecosystem health. It is known as an "umbrella" species due to its wide range and specific habitat requirements including security. Brock et al. (2006) found that 300 other species are protected under the grizzly umbrella, or approx. 73% of species present.

Figure 4. Yellowstone Grizzly Bear in Autumn. U.S. Forest Service photo.

Craighead (2015) and Brock et al. (2006) describe this landscape as having great potential for population connectivity for large, wide-ranging species including grizzly bear and lynx. Sells, et al. (2023) found the Madison-Gallatin and the High Divide area along the Continental Divide to be high probability movement areas for male and female grizzly bears between the Greater Yellowstone and Northern Continental Divide and Bitterroot grizzly bear recovery areas (see Figure 5). This supports previous work from Walker and Craighead (1997) and Peck et al. (2017). Most of the Madison-Gallatin-Henry's Lake-Island Park is within the Demographic Monitoring Area for the grizzly bear in the GYE and based on verified observations is continuously occupied habitat.

"It has long been recognized by the scientific community that protected areas in isolation fail to preserve species and ecosystem processes adequately. Wildlife corridors provide connectivity, sustaining vital natural processes, wildlife populations, and biodiversity while allowing species to move in response to climate change. The Gallatin Range is a recognized wildlife corridor linking YNP to the Northern Continental Divide Ecosystem."— Noss et al. (2019) letter signed by more than 100 scientists.

Connecting the Greater Yellowstone and Northern Continental Divide Ecosystems extends the persistence of large wide-ranging species including grizzly bears by 4.3 times as long compared to remaining isolated (Newmark 2022).

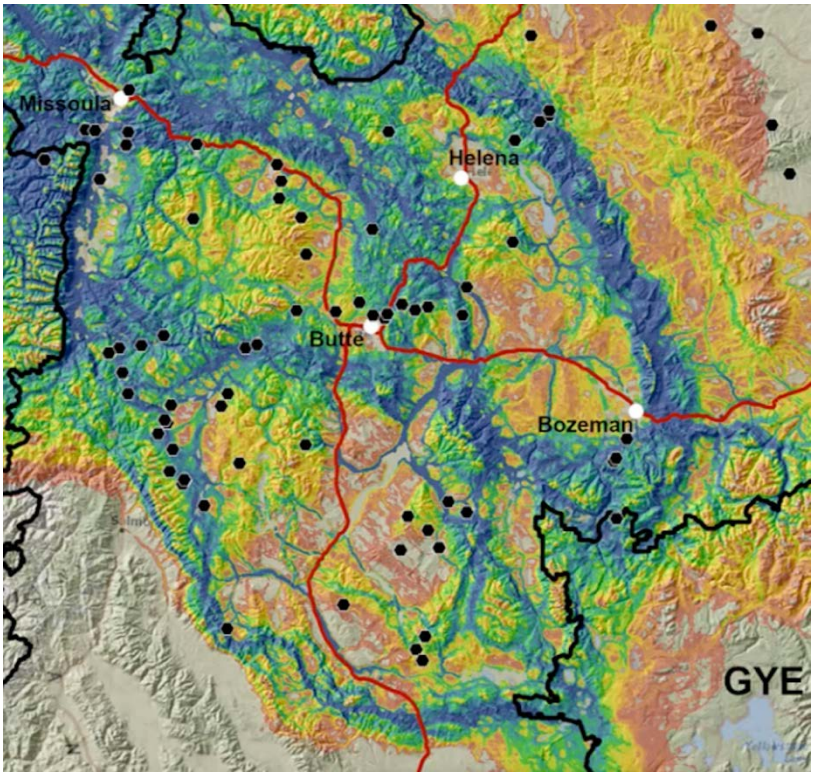


Figure 5. This Region Has High Probability Movement Areas for Grizzly Bears Between the Greater Yellowstone, NCDE and Bitterroot Recovery Areas. Source: Sells, et al. (2023) in Biological Conservation.

Following near-extinction (Mattson and Merrill 2002) and after listing as a threatened species under the Endangered Species Act in 1975 and the end of hunting seasons grizzly bears have expanded their range outside Yellowstone National Park and now occupy the entire Madison-Gallatin-Henry's Lake-Island Park geographic region (U.S. Fish & Wildlife Service 2022).

Wolves

Figure 6. National Digital Library photo.

Wolves are found throughout the Madison-Gallatin-Henry's Lake-Island Park geographic region. As a top-level predator the wolf fills an important niche in natural ecosystems and wolves maintain the predator-prey relationships that still exist in the Northern Rockies. Through their position at the top of trophic cascades wolves maintain ecosystem structure and integrity. Wolf packs keep ungulates on the move (Dellinger et al. 2019) and the risk of predation helps prevent erosion and overgrazing caused by extended and concentrated presence of ungulates, particularly in riparian areas (Ripple and Beschta 2004). For example, Ripple and Beschta present the benefits of trophic cascades with wolves at the top which include: elk foraging and movement patterns adjust to predation risk; there is increased recruitment of woody browse species; there is recovery of riparian functions, recolonization of beaver and recovery of the food web support for aquatic, avian and other fauna; channels stabilize and there is recovery of wetlands and hydrologic connectivity. Many species benefit from wolf kills helping them endure hard winters. Grizzly bears appropriate wolf kills providing a much-needed source of protein that was previously unavailable.

Wolves in the Madison-Gallatin-Henry's Lake-Island Park geographic region generally avoid the higher elevations and steeper slopes, preferring more gentle terrain for hunting and concentrating in valley bottoms and lower slopes because of the presence of ungulate prey species (Craighead 2015). Wolves are great dispersers and can move dozens of miles and follow the major ungulate species when they migrate out of the Park.

Elk

Figure 7. Bugling Bull Elk. U.S. Forest Service photo.

Elk are a major focal or Management Indicator Species on National Forest lands. The Madison-Gallatin-Island Park area is home to thousands of elk from five major herds (Paradise Valley, Gallatin, Madison Valley, Blacktail and Sand Creek herds; see Figure 8). Brock et al. (2006) conducted the Madison Valley Wildlife Assessment and found protection of elk habitat protected 322 other species and approx. 79% of species were protected under the elk

umbrella. Elk migrate throughout the area. About 70% of the Gallatin elk herd in Yellowstone National Park winters on the lower slopes of the Gallatin Range outside the Park (MTFWP Director Graham 1993).

There has been a long history of setting aside habitat to protect these elk herds. In 1910, Forest Service Chief Gifford Pinchot advocated for protection of the southern Gallatin Range as a wildlife refuge. A year later the State of Montana established a wildlife refuge in the Buffalo Horn-Porcupine drainages. Work to purchase inholdings began in 1925 and in 1947 the State of Montana purchased eight sections (5,120 acres) in the Buffalo Horn drainage to protect critical elk ranges.

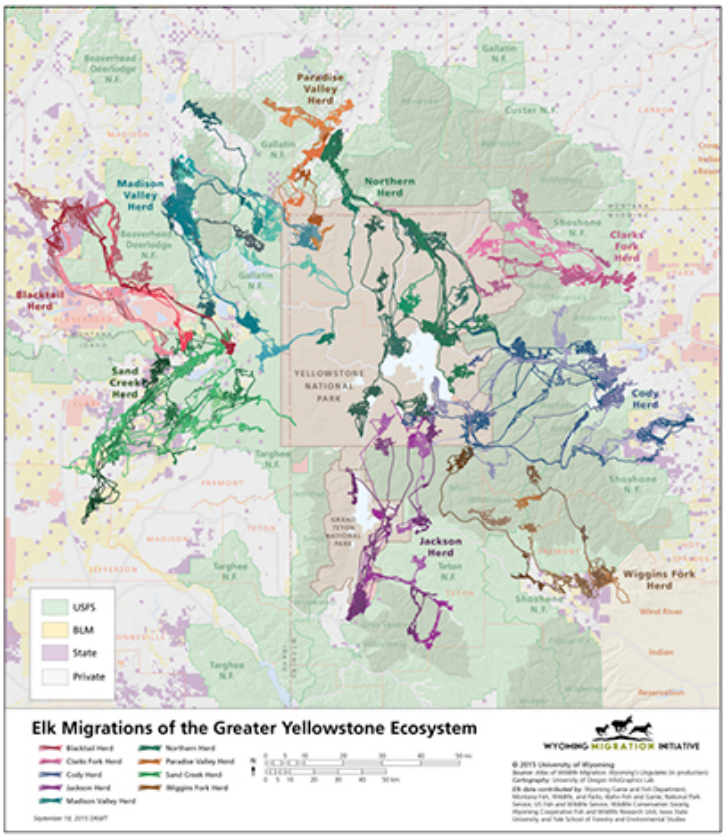


Figure 8. Map Source: Wyoming Migration Initiative.

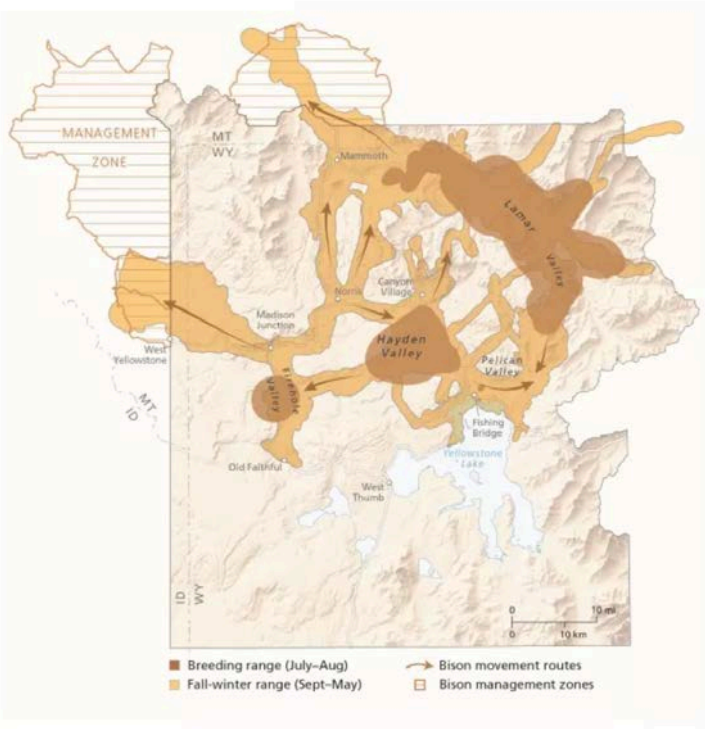
Figure 9. Bison In Winter. George Wuerthner photo.

American Bison

The bison in Yellowstone are the descendants of the last wild herd in the lower 48 states. From that couple dozen the herd has grown to more than 5,000 individuals. Each Winter numerous bison migrate out of the Park and onto adjacent National Forest lands within the Custer-Gallatin National Forest to find forage at lower elevations with less snow cover. A significant portion of the Madison-Gallatin-Henry's Fork-Island Park geographic region are within bison management zones and year-round Bison Tolerance Zones (see Figure 10).

"In winter, bison will move from their summer ranges to lower elevation as snow accumulates and dense snowpack develops. Bison migrate up to 70 miles

between summer and winter ranges. Most animals travel about 1,000 miles over the course of the year by repeatedly leaving and returning to the same areas. This means bison travel a greater distance than any other ungulate in the Greater Yellowstone Ecosystem." (National Park Service 2023).



The seasonal distribution of Yellowstone bison is shown here in comparison with the Interagency Bison Management Plan management areas.
Adapted from Atlas of Yellowstone, Second Edition. ©2022 University of Oregon

Figure 10. Bison Winter Migration Routes Into the Madison-Gallatin Area. Source: National Park Service.

Lynx

Figure 11. Lynx. U.S. Fish & Wildlife Photo.

Nearly all of the Madison-Gallatin-Henry's Lake-Island Park geographic region is occupied lynx habitat (U.S. Forest Service 2007). The Forest Service also identified the Gallatin Range as connectivity habitat for lynx which may travel north through the Bridger Range and the Island Park area for lynx moving east into Yellowstone National Park and from the Madison Range back and forth from the Gravelly Range. Carroll et al. (2001) found concentrations of lynx habitat throughout the Madison and Gallatin Ranges and along the Continental Divide.

Bighorn Sheep

There are four herds of native bighorn sheep that use portions of the Gallatin Range (Craighead 2015) and they are a focal species for alpine and subalpine habitats. Bighorn sheep frequently use the Tom Miner Basin area north of Yellowstone National Park for winter range. Other important habitat includes the Fortress Mountain, Ramshorn Lake and Twin Peak areas, the Hyalite Basin around Hyalite Peak. Migration routes link these summer ranges with lower elevation winter ranges.

Figure 12. Bighorn Sheep. U.S. Forest Service photo.

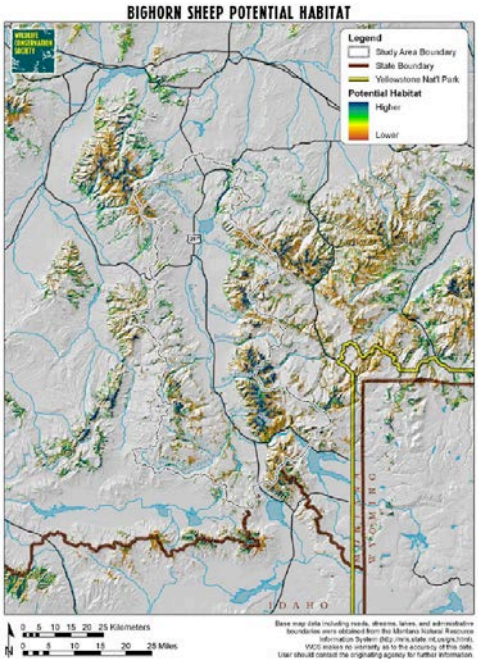


Figure 13. Map From: Brock et al. (2006).

Figure 14. The Ramshorn Lake Area Supports Concentrations of Bighorn Sheep. Joe Scalia photo.

Wolverine

Figure 15. U.S. Fish & Wildlife Photo.

Wolverine are a very rare and elusive species that depends on remote forested habitats. Brock et al. (2006) found extensive potential wolverine habitat in the Madison-Gallatin-Henry's Lake-Island Park geographic region (see Figure 16) as did Carroll et al. (2001).

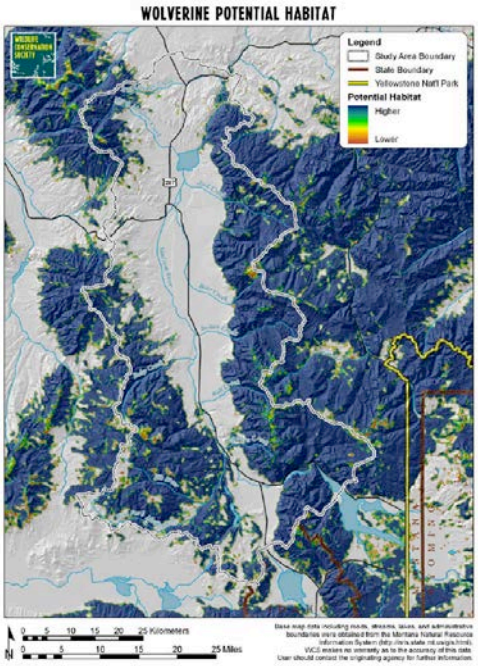


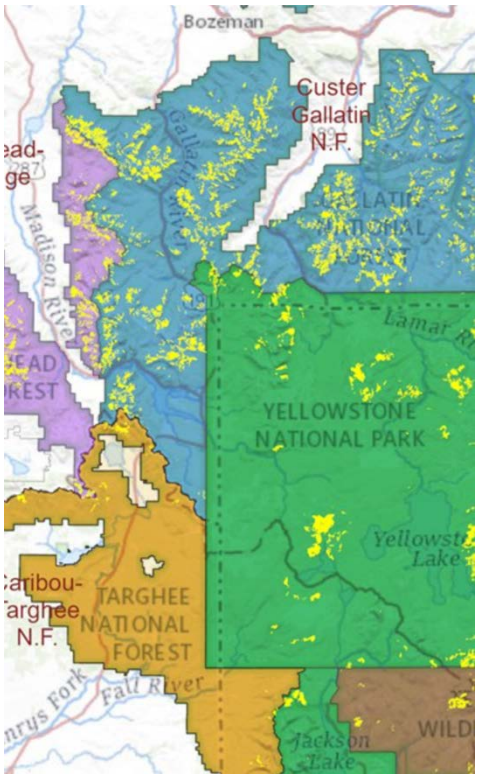
Figure 16. From: Brock et al. (2006).

Cutthroat Trout

There are two native species of trout, the westslope cutthroat and the Yellowstone Cutthroat. Both are umbrella species and Brock et al. (2006) found protection of westslope cutthroat habitat protected 288 other species or approx. 70% of species present.

Figure 17. U.S. Forest Service Photo.

Whitebark Pine



Whitebark Pine are federally listed as a threatened species and are a focal species. Whitebark Pine was formerly a major food source for grizzly bears throughout the Greater Yellowstone Ecosystem before climate change and blister rust eliminated many stands. Much of what is left is located in the Madison-Gallatin-Henry's Lake-Island Park geographic region as shown in Figure 18 and occur throughout the higher elevation mountains.

Figure 18.Whitebark Pine Distribution Shown in Yellow. Map: National Park Service.

American Beaver

Figure 19. The American Beaver is a Keystone Species. NPS photo.

The American beaver is the largest rodent in North America and is a keystone species. Beaver create wetlands used by many other species (Montana Fish, Wildlife & Parks 2023) including moose, mink, otter, muskrat, cavity nesting birds and nesting and rearing areas for waterfowl. Beavers were likely as formative to a disturbance agent to valley bottom ecosystems as wildfires and floods (U.S. Forest Service 2023). Beaver provide a host of ecosystem services including maintaining supplies of clean water, regulating flooding and stream bank erosion and providing complex habitat for fish. Beaver dams and ponds provide low-flow overwintering habitat for fish and the woody debris that beaver accumulate provides hiding cover for juvenile fish. Riparian vegetation is greatly increased by the presence of beaver which helps cool stream temperatures.

Beaver in the Madison-Gallatin-Henry's Lake-Island Park geographic region exist at higher densities than other areas of the region (see Figure 20).

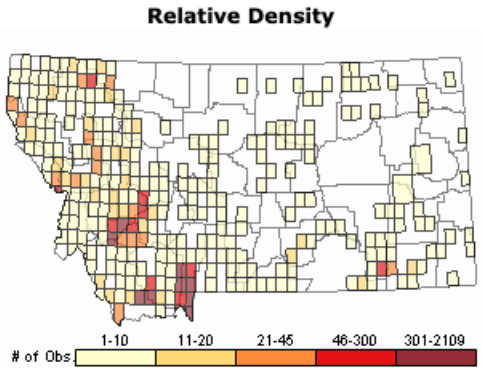


Figure 20. Beaver Density in Montana. Montana Natural Heritage Program (2023).

Figure 21. Indian Paintbrush. U.S. Forest Service photo.

Wildflowers

Among the wildlife resources are the abundance of wildflowers which carpet mountain meadows in a palette of colors. One of the most popular wildflowers in the Greater Yellowstone, the Indian paintbrush, is a Species of Conservation Concern on the Custer-Gallatin National Forest.

American Southwest.net/wyoming/yellowstone/wildflowers. shmtl shows photographs of 378 wildflowers endemic to this region.

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Appendix

Montana Natural Heritage - Species Snapshot

FWP Region | All Species | All Status | Submit | Reset

All Montana Species found in
FWP Region: 3

	Species of Concern	Potential SOC	MT Special Status	Other Status	Invasive and Pest	Total
Mammals	22	10		62		94
Birds	62	16	2	302		382
Reptiles	2			9		11
Amphibians	3			6	1	10
Fish	6	2		38	1	47
Invertebrates	27	22	6	1917	14	1986
ALL ANIMALS	122	50	8	2334	16	2530
Vascular Plants	157	27		1673	37	1894
Bryophytes	20	3		191		214
Lichens	4	2	1	269		276
Algae				2		2
ALL PLANTS	181	32	1	2161	37	2412

Detailed information including models and links can be obtained for each species at:

https://mtnhp.org/SpeciesSnapshot/?Vector=FWP_Region|3|&Species=&Rank=

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