North Star Nature Preserve Management Plan

DRAFT - DECEMBER 2025

OPEN SPACE & TRAILS · PITKIN COUNTY

PARKS & OPEN SPACE
CITY OF ASPEN

ACKNOWLEDGMENTS

The North Star Nature Preserve Management Plan is a product of Pitkin County Open Space and Trails and City of Aspen Parks, Trails and Open Space with collaboration from Aspen Valley Land Trust, White River National Forest, Colorado Department of Transportation, Aspen Center for Environmental Studies, Roaring Fork Conservancy, Pitkin County Healthy Rivers and Streams, and a working group with representatives from the East of Aspen Caucus, commercial operators and the general public..

Pitkin County
Open Space and Trails
530 East Main Street
Aspen, CO 81611

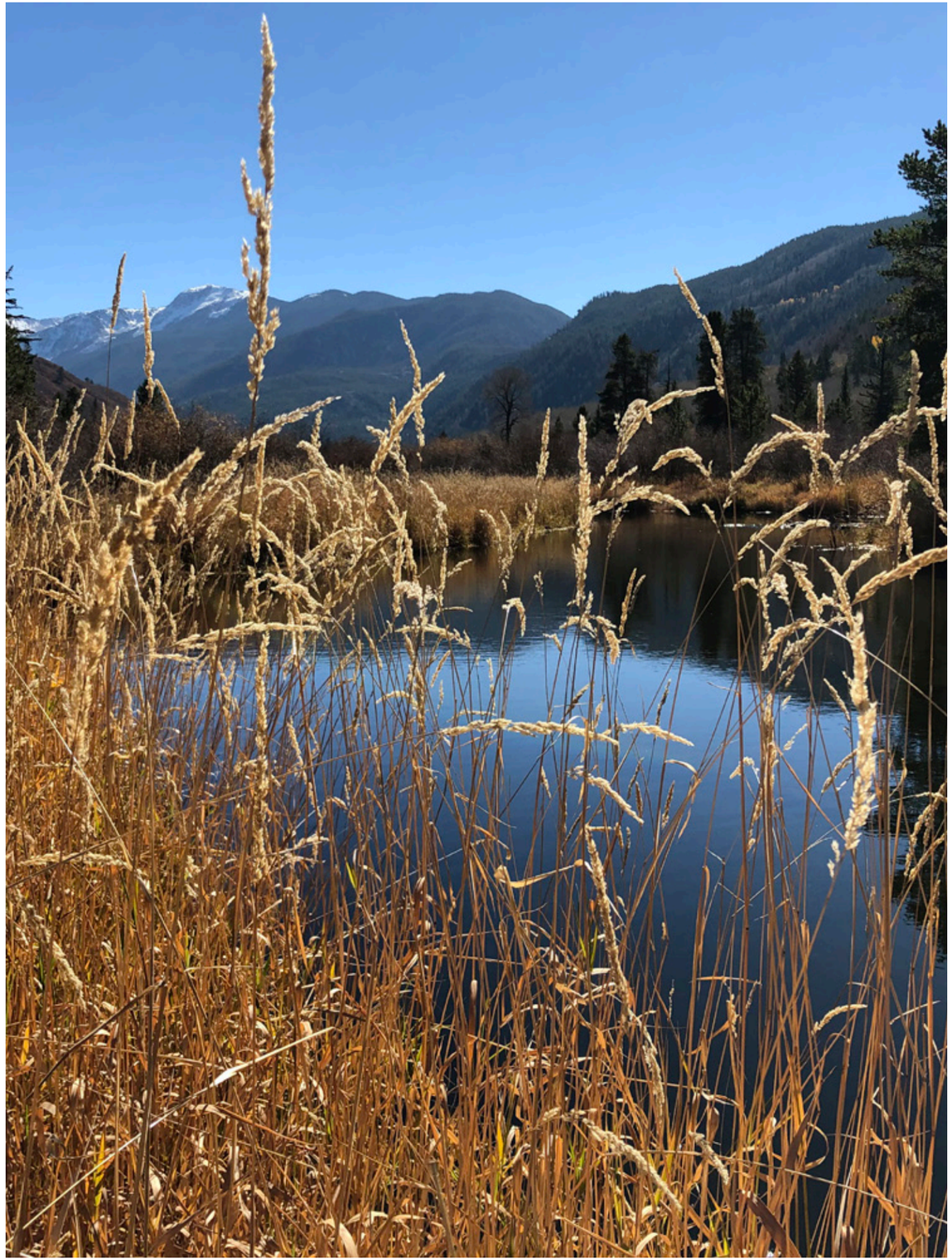
MISSION

The mission of the Pitkin County Open Space and Trails Board of Trustees is to acquire, preserve, maintain and manage open space properties for multiple purposes including, but not limited to, recreational, wildlife, agricultural, scenic and access purposes; and to acquire, preserve, develop, maintain and manage trails for similar purposes.

The Pitkin County Home Rule Charter provision authorizing the Open Space and Trails Program defines open space and trails as follows:

“Open Space” shall be defined as primarily undeveloped lands and waters which meet one or more of the following criteria: Within public scenic view planes; bounding or within urbanized areas; incorporating or protecting significant wildlife habitat; preserving historic agricultural and ranching activities; protecting riparian or wetlands areas; protecting other public lands from the impacts of development, and preserving cultural, historic, and archaeological resources lying within properties which are otherwise acquired for their customary Open Space characteristics.

“Trails” shall be defined as access ways, either separate from or within County and State Road rights-of-way, meeting one or more of the following criteria: preserving historic routes of ingress and egress to public lands and waterways; providing access to and from recreational or urban destinations; providing transportation or recreational opportunities throughout the Roaring Fork Watershed.



THE NORTH STAR NATURE PRESERVE MANAGEMENT PLAN ALIGNS WITH THE 2011 PITKIN COUNTY STRATEGIC PLAN IN VARIOUS ASPECTS.

The Pitkin County Strategic Plan identifies three core focus areas: "Flourishing Natural and Built Environment," "Livable and Supportive Community" and "Prosperous Economy." The goal is for the three focus areas to work together to achieve the County's vision and mission.

FLOURISHING NATURAL AND BUILT ENVIRONMENT

Success Factor 1: Conserved natural resources and environment
North Star Nature Preserve protects lands with significant wildlife, recreational, and scenic values. Management actions control noxious weeds, restore ecosystem functions, and monitor and protect water quality.

Success Factor 2: Responsibly maintained and enhanced county assets
This plan update builds upon past actions, focusing on maintaining the preserve in an environmentally sensitive way and using education and enforcement to encourage proper use and care of public lands and assets.

LIVABLE AND SUPPORTIVE COMMUNITY

Success Factor 4: Access to recreation, education, arts and culture
Actions support continued protection of access to the river as well as interpretive and educational opportunities.

PROSPEROUS ECONOMY

Success Factor 4: Responsible and accountable stewardship of County assets.
Open Space and Trails strives to maintain and enhance the health, function, and resiliency of the natural resources and ecosystems of North Star Nature Preserve.

PLAN SUMMARY

MANAGEMENT CONTEXT

The North Star planning area, beginning at the US Forest Service's Wildwood Lane and following the Roaring Fork River north to the Stillwater Bridge Take-out at the boundary of North Star Nature Preserve, comprises a complex management landscape with numerous public land managers, private properties, and a state-managed waterway and highway. To provide management direction for a more seamless system, Open Space and Trails (OST) works closely with our partners in the area; however, OST does not have management authority over activities at Wildwood or within the river.

- Pitkin County Open Space and Trails (OST) owns the North Star Nature Preserve parcel. Aspen Valley Land Trust (AVLT) holds a conservation easement on this parcel.
- City of Aspen and OST jointly own the James H. Smith parcel.
- The White River National Forest owns and manages the land at the Wildwood Put-in.
- Colorado Parks and Wildlife (CPW) manages the wildlife in the area.
- The Colorado Department of Transportation (CDOT) manages Highway 82 and the associated right-of-way, with OST holding a lease for the portions adjacent to North Star.
- The river also passes through a parcel owned by the Aspen Center for Environmental Studies (ACES) and a series of private properties with various landowners.

OUTREACH HIGHLIGHTS

To facilitate a collaborative update to the management of North Star, OST assembled a working group of land managers and non-profit partners, neighbors, commercial operators, and river users. This working group reviewed area research to craft a desired condition statement for North Star and set management goals and actions. OST colelcted public input through an online survey in the summer of 2025. The survey aimed to understand general usage patterns and public sentiment toward current and potential management strategies. A total of 770 responses were collected.

KEY UPDATES

The first management plan and each subsequent update focused on preserving a mosaic of high-quality native ecological communities that support biological diversity while allowing public access. The acquisition values outlined in the 2002 Conservation Easement include the area's natural, scenic, habitat, wildlife, recreational, and open space values. This plan update reflects those broad acquisition values and refines them into conservation values to reflect both scientific knowledge and community input.

This plan also presents a desired conditions statement in alignment with the conservation values. This statement has been updated and clarified based on feedback from the public survey, working group input, and the property's vision and values captured in previous plans.

Ecological trends at North Star point toward improved habitat and successful rewilding efforts with observable benefits to wildlife over time. This plan update seeks to ensure that safeguards and proactive management strategies are in place to protect and promote the desired conditions and conservation values. The following points summarize the intent of the updates to the management strategies included in this plan:

- Ecological restoration and support of natural processes allow the river to remain dynamic through a passive management approach.
- North Star remains an accessible nature experience that offers meaningful connections to the landscape.
- Recreational use is spatially and temporally concentrated, benefiting wildlife by creating predictable patterns of human use.
- Emphasis on respectful user behavior continues with proactive peak-use strategies.
- A transparent, measurable indicator-and-threshold approach is established to track key ecological and visitor-use attributes, ensuring continued progress toward the desired conditions. Response options, based on scientific research and best practices, may be implemented to address changing conditions or situations when thresholds are approached.

MANAGEMENT DIRECTION

CONSERVATION VALUES

The diverse and interrelated components that contribute to North Star's ecological and social value include:

- Biodiversity and Ecosystem Integrity
- River System
- Riparian Area, Wetlands, and Beavers
- Wildlife and their Habitats
- Community

DESIRED CONDITIONS

North Star Nature Preserve provides long-term protection of biodiversity, natural ecosystem processes, landscape connectivity, and opportunities to connect with nature. Management efforts restore natural processes and promote ecological resilience in the face of challenges, including climate change, upstream water diversions, and agricultural land use legacies. Habitat complexity exists across the property to benefit diverse wildlife species as well as the continued provision of ecosystem services for the Roaring Fork Watershed, including flood protection, hydrological function, wildfire fuel break, and air and water quality. North Star in its entirety is managed first and foremost for ecological integrity and resilience, while allowing human presence in limited areas for environmental education, research, respectful recreation, and access to nature.

INDICATORS AND THRESHOLDS

Indicators translate the aspirational nature of the desired conditions into measurable attributes OST and partners track over time to evaluate changes in conditions. Thresholds ensure that conditions remain acceptable for the selected indicators. This plan establishes indicators and thresholds for the following topics:

Conservation Value	Topic	
Biodiversity and Ecosystem Integrity	• Biodiversity • Invasive species • Landscape permeability	
River System	• Floodplain connectivity • River system dynamism • Floodplain connectivity	• Aquifer function • Hydrologic conditions • Water quality
Riparian Area, Wetlands, Beavers	• Beavers • Riparian condition • Wetland integrity and function	
Wildlife and Habitat	• Bird diversity • Habitat condition	• Plant communities • Wildlife diversity
Community	• Commercial use • Compliance • Education • Enforcement • Overall river use	• Peak use • Recreation disturbance • Recreation use • River user experience • Safety

QUICK FACTS

Total Acreage: 248 acres

North Star provides important ecosystem services, including clear air and water, as well as protection from floods and wildfires. The estimated annual value of these ecosystem services exceeds $1 million.[1]

Over 192 plant species identified.

At least 95 bird species and 12 mammal species are known to occur.

Properties:
North Star Nature Preserve:
Acquisition Date: 1978
Parcel Size: 170 acres
Purchase Price: $1,030,000
Funding Partners: Pitkin County General Fund, The Nature Conservancy, and Land and Water Conservation Fund
Easement: AVLT

James H. Smith:
Acquisition Date: 2001
Parcel Size: 78 acres
Purchase Price: $6,745,000
Funding Partner: City of Aspen

Trail Miles:
- 1-mile of the East of Aspen Trail
- 0.6-mile natural surface trail
- 1.6-mile Nordic loop

1 Colorado State University's Colorado Conservation Data Explorer (CODEX)

MANAGEMENT STRATEGIES

** Indicates a new or significant update included in this plan.*

POLICIES

West Side Public Access Closure (Wildlife Zone)	The west side is permanently closed to public access to protect wildlife habitat and allow natural ecological processes to function with minimal human disturbance.
Designated Recreation Locations	Public recreation is limited to designated trails, corridors, and river access points to concentrate use and minimize impacts to wildlife and sensitive habitats.
Regulations Strictly Enforced*	Regulations are strictly enforced to ensure public safety, resource protection, and promote responsible visitor behaviors. .
Wildlife Closures*	Seasonal or temporary closures may be implemented to protect wildlife during critical stages such as nesting, calving, or migration.
Flow Level & River Temperature Closures	River access may be restricted or closed when flow levels or water temperatures pose risks to public safety or aquatic ecosystem health.
Quiet Zone	Audible music and disruptive noise are prohibited to protect wildlife and maintain a nature-oriented visitor experience.
Voluntary River Use Group Size Limits*	Voluntary limits on river group size of six are encouraged to reduce crowding, enhance safety, and lessen impacts to wildlife and other visitors.
Peak River Use*	River use during peak periods is proactively managed to prevent overcrowding, reduce conflicts, and protect ecological conditions and visitor experience.
Downed Trees	Naturally fallen trees are retained to support habitat complexity and ecological function unless removal is necessary for safety or infrastructure protection.
Beaver Dams	Beaver dams are protected as valuable ecological features and are not removed except when required to address safety or infrastructure concerns.
Memorials	New memorials are not permitted.
Public Paragliding Use	Paraglider landing is permitted subject to specific conditions.
Nordic Use and Grooming*	Nordic skiing and grooming are allowed only where consistent with wildlife protection.
Commercial Use: River Outfitters (Guiding/ Instruction & Shuttle Operations)*	A limited number of permitted commercial river outfitters may operate under conditions that prioritize conservation, and safety.
Commercial Use: Landing Zone	Commercial use is permitted within the established landing zone subject to established limits and regulations.
Special-Use	Special-use activities require permits and are approved only if they align with conservation priorities and do not adversely affect ecological resources or visitor experience.
Maintenance	Maintenance activities are conducted in a manner that prioritizes resource protection, minimizes disturbance, and supports long-term stewardship.

GOALS AND ACTIONS

Conservation Value: Biodiversity and Ecosystem Integrity	
Goal 1: Provide ecosystem services for public benefit, such as flood protection, fire protection, and clean air and water.	
1.1	Cultivate and participate in landscape-level conservation and wildfire resilience partnerships.
Goal 2: Control invasive species to the greatest extent possible with the least environmental impact.	
2.1	Control noxious vegetation.
2.2*	Monitor/manage Aquatic Nuisance Species (ANS) if concern of presence in the Upper Roaring Fork arises.
Goal 3: Protect and support the overall biodiversity of plants and animals.	
3.1	Monitor overall native plant biodiversity.
3.2	Monitor avian and mammalian species diversity.
3.3*	Prioritize habitat protection and enhancement activities in known biodiversity hotspots.
Goal 4: Maintain and enhance landscape permeability to allow animals of all sizes to move through and across North Star Nature Preserve. Preserve and improve the migratory corridors for elk and deer.	
4.1*	Address and prevent impediments to animal movement to the greatest extent possible.
4.2*	Use the Pitkin County land-use referral process (for both redevelopment and new projects) to minimize impacts on migration and movement corridors.
Conservation Value: River System	
Goal 5: Instream habitat contributes to the overall health and resilience of the stream ecosystem, meeting the needs of diverse aquatic and terrestrial species.	
5.1*	Encourage instream and near-channel habitat complexity.
5.2	Conduct macroinvertebrate monitoring to track overall, long-term river health.
Goal 6: Maintain floodplain connectivity as natural channel meander occurs via streambank erosion and sediment deposition processes, allowing the river system to operate in a dynamic state.	
6.1	Monitor groundwater and streamflow.
6.2	Monitor channel form and change through time.
Goal 7: Maintain good water quality and continue efforts to maintain and/or increase water quantity, ensuring this stretch of the Roaring Fork River has adequate flow, temperature, pH, and oxygen levels, and limited harmful pollutants to support native aquatic life.	
7.1*	Monitor water quality. Coordinate with regional partners to address acute and chronic water quality concerns in the upper Roaring Fork River.
7.2*	Keep water quantity in the Roaring Fork River as close to natural, undiverted levels as possible. Seek a hydrograph (seasonal streamflow) which mimics natural stream systems, with a late spring/early summer peak and a slow decline toward late summer baseflow levels.
Conservation Value: Riparian Area, Wetlands, Beavers	
Goal 8: Promote riparian area recovery toward a more naturalized state, with increasing habitat complexity, and protect beaver complexes across North Star as effective ecosystem engineers.	
8.1*	Encourage natural geomorphological and ecological succession processes, primarily through a passive rewilding management approach.

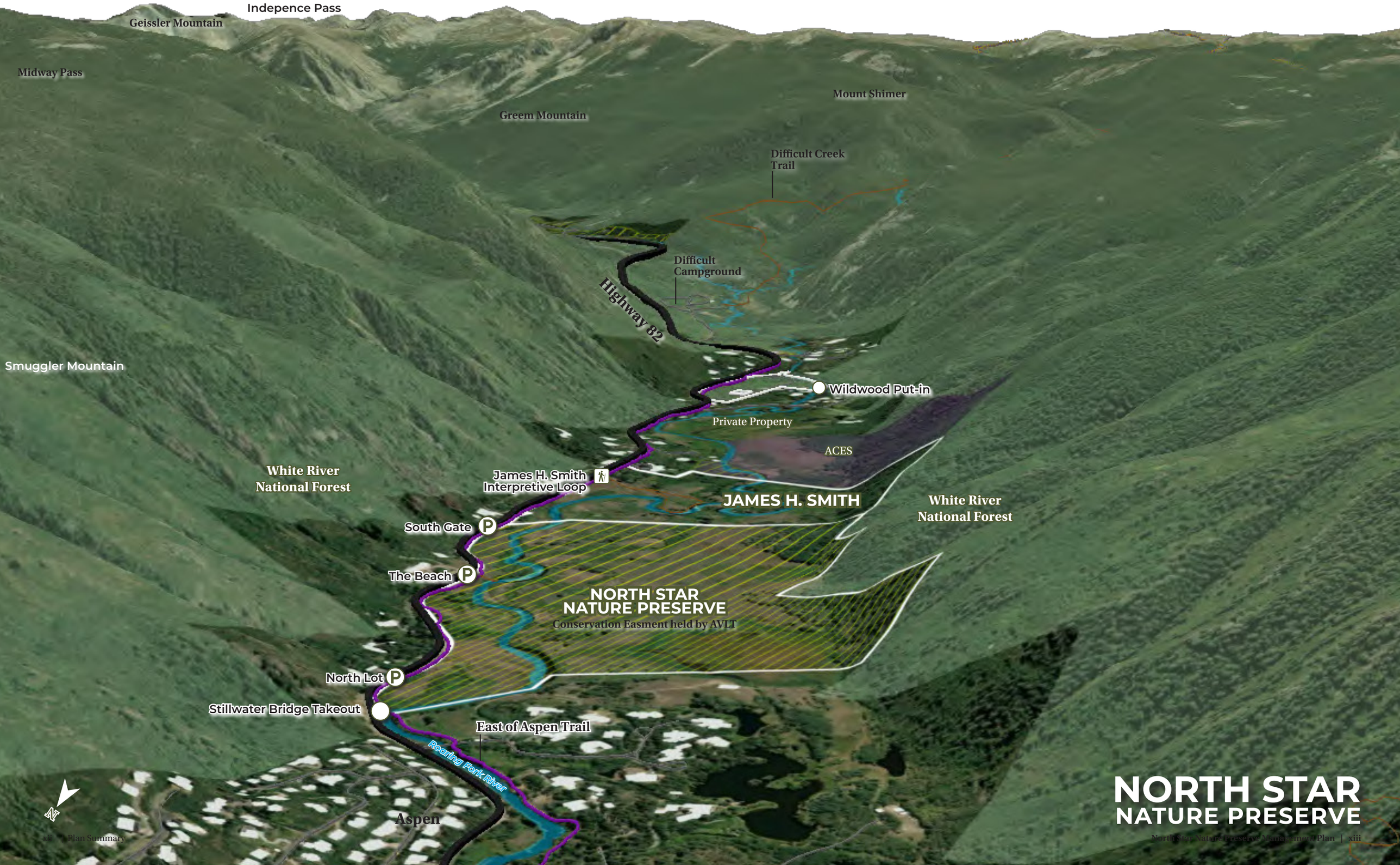
8.2*	Encourage beaver presence as effective ecosystem engineers, influencing the river channel, hydrology, wetlands, and vegetation in a natural, dynamic way.
Goal 9: Preserve wetlands to ensure the provision of ecosystem services and habitat for diverse flora and fauna.	
9.1*	Maintain and/or increase wetland extent and function, as feasible within climatic and hydrologic constraints.
9.2*	Monitor the fen wetland restoration area to ensure functionality is maintained.
Conservation Value: Wildlife and Habitat	
Goal 10: Maintain diverse habitat types (aspen forests, riparian areas, wetlands, open water, meadows, and shrublands) in good condition across the Preserve, hosting native plant communities and local fauna.	
10.1	Continue long-term plant community monitoring.
10.2	Promote persistence and integrity of native plant communities to provide forage and habitat for pollinators and all animals.
10.3	Promote recruitment in all forest types for long-term viability.
10.4*	Protect and enhance bird breeding habitat.
Goal 11: Provide habitats for diverse wildlife species, including songbirds, raptors, waterfowl, wading birds, herpetofauna, and large and small mammals, to use, live, and thrive.	
11.1	Monitor terrestrial wildlife species.
11.2	Monitor avian species.
11.3	Monitor indicator species to assess functionality of key habitat types for wildlife.
11.4*	Conduct habitat condition evaluation and utilization in conjunction with wildlife surveys.
Conservation Value: Community	
Goal 12: Serve as a living classroom, fostering and facilitating scientific research, community connection, and environmental education.	
12.1	With our educational partners, provide a naturalist presence at Wildwood and North Star to engage visitors and educate them on the ecological importance of the area.
12.2	Facilitate and support educational programming and volunteer opportunities to build a following, maintain relationships, and foster environmental and stewardship education.
12.3*	Develop, implement, and update education and communication initiatives.
Goal 13: Ensure the volume, type, and distribution of recreational and river use remain within a manageable and predictable range, allowing wildlife to adapt and thrive and utilize the river corridor during times with minimal (recreational) disturbance by tracking key indicators and adjusting management strategies as conditions change.	
13.1	Concentrate and regulate visitor use so that activity stays within designated areas and predictable timeframes.*
13.2	Coordinate commercial river use as a management tool to provide controlled public access that supports informed, respectful experiences, reduces parking pressure/congestion at access points, reduces private-use impacts, and enhances safety through structured scheduling, group size limits, and required education.*
13.3	Explore the potential expansion of the Nordic loop on James H. Smith.*
13.4	Explore and implement strategies to address trail safety on the East of Aspen Trail.*
13.5	Improve accessibility of river access points for people with mobility challenges.*

Goal 14: Ensure user behavior supports the desired conditions, reflecting environmental awareness and respect for wildlife, by maintaining a seamless system of clear, consistent, and enforceable rules with strong compliance.	
14.1*	Coordinate regulations across jurisdictional boundaries to limit the issues created by inconsistency.
14.2	Ensure ranger and enforcement staffing can effectively communicate, and enforce regulations and policies (see Policy Section), Title 12 and the additional regulations specific to North Star have been established to ensure that visitor use impacts on wildlife are minimized and to facilitate predictable and non-threatening behaviors.
14.3	Fund enforcement positions to help manage the parking and access at Wildwood and encourage user behavior shifts.
14.4*	Update and install consistent regulatory, wayfinding, education, and interpretive signage to educate and inform the public about the ecological value of the area, regulations, and management efforts.
Goal 15: Maintain limited, functional and safe access points, parking, and trails, while minimizing ecological impacts, reducing congestion, and promoting respectful use.	
15.1*	Use limited, available parking as a tool to manage visitor use and congestion and continue to explore and implement strategies to facilitate alternative modes of transportation.*
15.2	Manage congestion at the Stillwater Bridge take-out.
15.3*	Manage congestion and vehicle flow at the Wildwood put-in.*
15.4	Complete the land exchange to transfer ownership of the Wildwood area from the USFS to Pitkin County Open Space and Trails.

MANAGEMENT PLAN OVERVIEW

The 2025 North Star Nature Preserve Management Plan provides updated guidance on the ecosystem and visitor use management for North Star, for both the near and long term.

- **Plan Summary** provides a condensed overview of the Plan Update, highlighting the key updates and proposed management strategies to help readers quickly understand the plan's purpose and direction.
- **Section 1** tracks the acquisitions leading to the open space that exists today and celebrates the numerous accomplishments made since the original 1989 plan.
- **Section 2** details the current conditions, complete with references to relevant studies. A more detailed history of North Star and all studies are located on the **North Star website**.
- **Section 3** summarizes the plan update process as well as feedback from stakeholders and the community. Appendix A contains the full engagement results.
- **Section 4** provides an implementable and adaptable management direction, including response options, which is a product of research, assessment of current conditions, and stakeholder/public input.


Indepence Pass
Geissler Mountain
Midway Pass
Mount Shimer
Greem Mountain
Difficult Creek Trail
Difficult Campground
Highway 82
Smuggler Mountain
Wildwood Put-in
Private Property
ACES
White River National Forest
James H. Smith Interpretive Loop
JAMES H. SMITH
White River National Forest
South Gate
The Beach
NORTH STAR NATURE PRESERVE
Conservation Easment held by AVLT
North Lot
Stillwater Bridge Takeout
East of Aspen Trail
Roaring Fork River
Aspen
NORTH STAR
NATURE PRESERVE

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APPENDIX:

1. INTRODUCTION

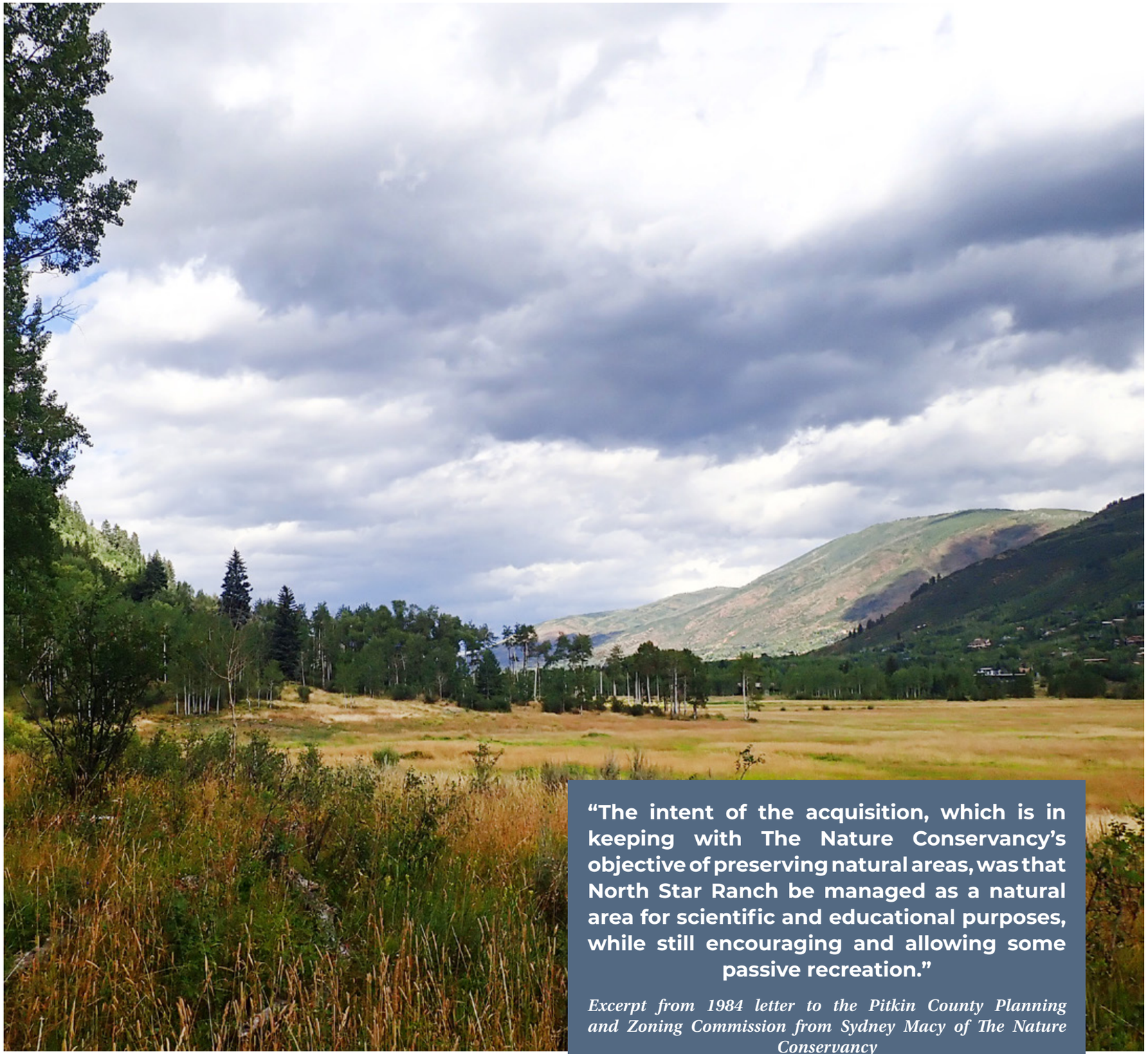
North Star Nature Preserve is an important place in the Roaring Fork Valley, both ecologically and for its role in connecting people with and experiencing the natural environment. North Star is a nature preserve first and foremost. One can't help but be thankful for the team of individuals who recognized North Star Ranch in the 1970s as an ecologically critical parcel on the edge of Aspen that needed to be protected from development. The 245-acre parcel encompasses significant wetland and riparian communities and wildlife habitats, improves air and water quality, provides an amenity for low-impact recreation and visual enjoyment, serves as a living classroom, replenishes groundwater, and provides flood abatement and river recharge. Conserving these resources has become even more critical as development on neighboring lands, increased visitation, population growth, and the impacts of climate change intensify.

Many of the attributes that made North Star such an important place to protect in the 1970s are also what make it a popular destination for locals and visitors today. While the acquisition language acknowledged the property's value as both open space and for limited recreational uses, its growing popularity over time requires a greater management focus. Science-based decision-making guides management to ensure that recreation does not have a negative impact on the property's ecological resources. Partnerships with land managers and private property owners have been and will continue to be critical to achieving a seamless system, as the term "North Star" often encompasses a much broader area than Pitkin County's owned assets. Ecological studies and monitoring indicate that adaptive management and partnerships support a dynamic, healthy, ecological community.

1.1 PURPOSE AND NEED

The 2025 North Star Nature Preserve Management Plan Update provides a long-term vision for the management objectives of the North Star Nature Preserve property as well as a framework to guide near- and mid-term adaptive management. Building on decades of management and research, this update refines, rather than replaces, the foundational principles carried forward from previous management plans to protect and restore the ecosystem processes that support biological diversity within North Star.

Since its acquisition, management of the North Star Nature Preserve has been and continues to be based on ecology and conservation biology. Over time, best practices and management strategies have evolved in response to knowledge gained, changing conditions, and emerging technologies. The introduction and growth of paddleboarding, beginning in 2014, along with the ease of accessing public information, have significantly altered the use of the river corridor and the pressure at access points, exceeding what was



"The intent of the acquisition, which is in keeping with The Nature Conservancy's objective of preserving natural areas, was that North Star Ranch be managed as a natural area for scientific and educational purposes, while still encouraging and allowing some passive recreation."

Excerpt from 1984 letter to the Pitkin County Planning and Zoning Commission from Sydney Macy of The Nature Conservancy

anticipated in the 2000 North Star Nature Preserve Management Plan. While previous plans addressed these pressures, and management of the preserve and the river corridor have been trending positively since the 2015 North Star Nature Preserve Management Plan, an important focus since the 2020 North Star Nature Preserve Management Plan has been to implement visitor use management strategies and complete a Visitor Use Management (VUM) Study. A VUM study was conducted in 2024 in alignment with the Interagency Visitor Use Management Council (IVUMC) framework, a nationally recognized approach for balancing visitor experience with resource protection.

Following the IVUMC process, Pitkin County Open Space and Trails (OST) and VUM consultants evaluated patterns of use and collected data on visitor numbers, parking capacity, and perceptions of crowding, alongside ecological monitoring data, to assess use levels and ecological considerations. The resulting recommendations support OST's adaptive management approach by emphasizing the need to monitor crowding in addition to overall use, track parking relative to capacity, and administer peak-use protocols that minimize conflicts between people and wildlife. These findings were reviewed with a working group and integrated into the 2025 North Star Nature Preserve Management Plan Update to ensure that visitor use is managed proactively, maintaining the quality of the visitor experience and the ecological integrity of North Star.

The 2025 North Star Nature Preserve Management Plan Update focuses on North Star Nature Preserve, specifically, as well as strategies to address river use that begins on U.S. Forest Service (USFS) land upstream. The purpose of the 2025 North Star Nature Preserve Management Plan Update is to help OST and its partners achieve a goal-oriented, adaptive land management planning process. It sets measurable goals aligned with conservation values, identifies ongoing and new action items, and establishes a Desired Condition Statement to guide future decision-making, along with accompanying indicators and thresholds to monitor and assess change.

Through this plan, OST and its partners can prioritize, coordinate, and budget activities aimed at advancing North Star's desired conditions. Plan updates are conducted every five years, supporting OST's adaptive management approach. Updates will include a check-in to assess current conditions, a review of completed actions, and the identification of needed adjustments to ensure progress towards the desired future conditions.

1.2 ACQUISITION HISTORY

In 1966, the Aspen Area Master Plan was adopted, allowing the construction of up to 1,500 houses on North Star Ranch. However, landowner James H. Smith rejected this scale and proposed a 350-residence planned unit development in 1973, which Pitkin County commissioners denied in an effort to slow down development in the area. In 1974, North Star Ranch was rezoned to limit development to 36 units to preserve the rural atmosphere.

This led to discussions about converting part of the ranch into open space. Pitkin County sought a fifty-fifty matching grant of $575,000 from the Federal Land and Water Conservation Fund to acquire the key 175-acre portion of North Star Ranch, which was fundamental for local wildlife and recreational activities. When funding was delayed in 1977, The Nature Conservancy provided interim financing. Smith retained portions of the ranch, and on November 30, 1977, The Nature Conservancy completed a "gift-sale" for the land, which was transferred to Pitkin County in December 1978. Although federal funding decreased to $75,000, Pitkin County covered the shortfall mainly through federal PILT (Payment in Lieu of Taxes) funds.

The preservation of North Star became a model for a city-county conservation program using land acquisition. The North Star Nature Preserve Resource Management Plan was created in 1989, followed by a revised plan in 2000. In 2001, OST and the City of Aspen acquired the adjacent 70-plus-acre James H. Smith parcel for $6.75 million. Since 2015, both properties have been managed under the North Star Nature Preserve Management Plan.

TIMELINE

Late 1800s to 1930s - Stillwater: A local playground and tourist attraction

1898 - A steam yacht operates on the Stillwater section of the Roaring Fork River, offering evening entertainment.

Early 1900s - People partake in the "romance" of skating up the Roaring Fork River to the mouth of Difficult Creek.

1920s - Stillwater is advertised as a visitor attraction. The Stillwater Club offers music and dancing.

The Barrailler family homesteads 360 acres east of Aspen called North Star Ranch. Ranching further alters the hydrology via drainage ditches and willow clearing to increase usable acreage.

1937 - Upstream Diversion

Twin Lakes Transmountain Diversion System begins operations. Diversions continue to the present day, diverting up to 40% of the headwater flows from the Roaring Fork River through North Star annually.

1900 1910 1920 1930 1940 1950 1960 1970

Early degradation through ranching and water diversions *(1820s - 1970s)*

1800 to Late 1800s - Beaver Trapping

Fur trade leads to extensive beaver trapping for pelts, decreasing the beaver populations to near extirpation, resulting in reduced riparian and channel complexity and altering the hydrology and ecology of the area.

1949 to 1977 - Cultivating the Land

1949 - James H. Smith acquires North Star Ranch. Smith moves his family to North Star and cultivates the land as a pasture for livestock and hay production.

Wetlands are drained via ditch digging, and willows are cleared to create more agricultural meadows.

Reduced river flows from upstream diversion reduce habitat complexity; mosquito control and flood mitigation become a focus.

1966 to 1974 - Development Threatens North Star's Future, but Conservation Prevails

1966 - Aspen Area Master Plan zones North Star for up to 1,500 houses.

1973 - James H. Smith submits a development application for 350 homes.

1974 - Pitkin County rezones to reduce development potential to 36 units (AF-1 zoning), significantly reducing development pressure.

1977/78 - Pitkin County, with help from The Nature Conservancy and the Land and Water Conservation Fund, acquires North Star Ranch as the first Pitkin County Open Space parcel.

Photos: Aspen Historical Society, Miggs Durrance photo/courtesy of Morgan Smith, and Greg Poschman (kids with tubes at North Star).


Circa 1900


1920s


1950

1977

FIND MORE HISTORY


1966

TIMELINE

1980 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025

Conservation and Baseline Protection *(1978 - 2015)*

1980s - ACES Management

1981 - ACES manages the land, as the Pitkin County Open Space Program does not yet exist.

The original North Star committee recommends managing the landscape both for wild nature's intrinsic values and for people to enjoy as a place where wildlife and a peaceful natural setting could be easily accessed.

1989 - North Star Resource Management Plan

ACES and Pitkin County partner to create long-term management objectives for North Star, marking the first formal plan.

Plan Highlights:

- Establish an ecological protection framework in the face of development pressure in and around Aspen to protect the land up and down river and east to west across the valley as a critical link in the Roaring Fork Valley ecosystem.
- Management goals focus on protecting wetlands, riparian areas, and biological diversity.
- Establish the river as the boundary between the protected wildlife sanctuary and the public areas of the preserve, with access provided by the three spur trails.

1990s - Open Space and Trails Designation

1990 - Voters approve the Open Space and Trails program.

ACES recommends OST assume management as capacity grows.

1999 - North Star Nature Preserve is designated as an OST property.

2000 - North Star Nature Preserve Resource Management Plan

Plan Highlights:

- Emphasis is on balancing ecological protection with recreational interests.
- Management focus is on passive actions that assist the natural ecosystem processes that control the representation of different vegetational communities and hydrological regimes.
- Establish parameters for paragliding operations.

Starting in 2007 - First paddleboards on North Star; however, paddleboard use is not yet widespread.

2001 - James H. Smith Open Space Interim Plan

James H. Smith parcel is purchased jointly with the City of Aspen, adding 78 acres to North Star.

Plan Highlights:

- Focus is on maintaining or enhancing existing native plant communities and improving the quality of wildlife habitat on the property, including the protection of the great blue heron rookery.
- James H. Smith Interpretive Trail to allow pedestrian access and non-maintained Nordic and snowshoe use.

2002 - AVLT Conservation Easement

Places permanent protections on the North Star Nature Preserve parcel for the benefit of natural, scenic, wildlife habitat, and recreation values, including prohibiting public use of property west of the river.

Restricts future development and regulated commercial uses to those approved in the management plan.

2010 to 2014 - Rise of Paddleboarding and Social Media

2010 - Increasing pressure on recreational hot spots begins as smartphones become widely available (2012) and social media explodes.

2011 - 2013 - Recreational pressures at North Star start picking up significantly.

2014 - Paddleboarding at North Star gains popularity and becomes the predominant watercraft on the river.

2015 - North Star Nature Preserve Management Plan (Major Update)

Plan Highlights:

- Address the increase in river recreation in response to the popularity of tubing and the resulting trespassing and party atmosphere.
- Undertake comprehensive ecological studies and initiate active restoration projects.
- Introduce a commercial permitting system as a management strategy in partnership with USFS to rein in unregulated commercial activities that occur on the USFS Wildwood parcel, and address congestion and safety concerns at access points.
- Launch education and enforcement strategies, including staffing the area with ACES naturalists.

Ecological Restoration and Adaptive Management *(2015 - present)*

2020 - Updated Management Plan

Plan Highlights:

- Expand focus on ecological resilience, increased capacity, and habitat improvement.
- Formalize and enforce limited parking to control use. Bolster ranger capacity and presence for on-site enforcement and safety.
- Begin pursuing a land exchange to secure management authority at Wildwood.

2023 - Wildwood Addendum

Coordinate key OST regulations and enforcement capabilities at the USFS's Wildwood Put-in.

2023 - Biodiversity and River Use Update

Responds to the concerns about commercialization; caps commercial operations to five operators.

Reviews bird and wildlife survey reports; reports show primarily positive trends.

2025 - North Star Nature Preserve Management Plan (Major Update)

Plan Highlights:

- Continue adaptive ecological and visitor use management strategies with emphasis on mitigating congestion at access points and improving management on peak use days.
- Formalizes indicators and thresholds to ensure continued progress towards the desired conditions for the preserve.


1985

1985


2005


2015


2025


2019

1.3 PROPERTIES AND EASEMENTS

FEE-SIMPLE PROPERTIES

Area acquisitions of 248 acres of open space parcels represent a joint investment of approximately $7,850,000.

North Star Nature Preserve

Located between Highway 82 and the eastern flank of Aspen Mountain, southeast of the City of Aspen, the property encompasses a stretch of the Roaring Fork River, as well as wetlands and significant wildlife habitat. The James H. Smith Open Space is located directly to the south.

Year of Acquisition: 1978
Owner: Pitkin County
Acreage: 170 acres

Easements and Encumbrances

Date: September 3, 2002
Conservation Easement Held By: Aspen Valley Land Trust (AVLT)
Conservation Values: Natural, ecological, wildlife habitat, scenic, open space, recreational, and aesthetic features
Management Considerations: The easement established that public use west of the Roaring Fork River is prohibited in perpetuity, and no increase in recreational use above that allowed in the management plan will be permitted. As the grantor of the conservation easement, Pitkin County retains ownership of the property and management responsibilities, including an obligation to update the management plan every five years.
Reception No.: Reception No. 472502 and No. 472164

James H. Smith Open Space

Located directly south of North Star Nature Preserve and north of a 65-acre parcel owned by the Aspen Center for Environmental Studies (ACES).

Year of Acquisition: 2001
Owners: OST, City of Aspen
Acreage: 78 acres
Reception No.: 459083

RECREATION EASEMENTS AND LEASE AGREEMENTS

Spizzirri Trail and Parking

Date: 2011
Holder: OST
Management Considerations: An easement adjacent to the South Gate Parking Pull-out was granted to allow for parking and the trail on the private parcel that crosses to the west side of Highway 82. Improvements and maintenance activities are allowed.
Reception No.: 583731

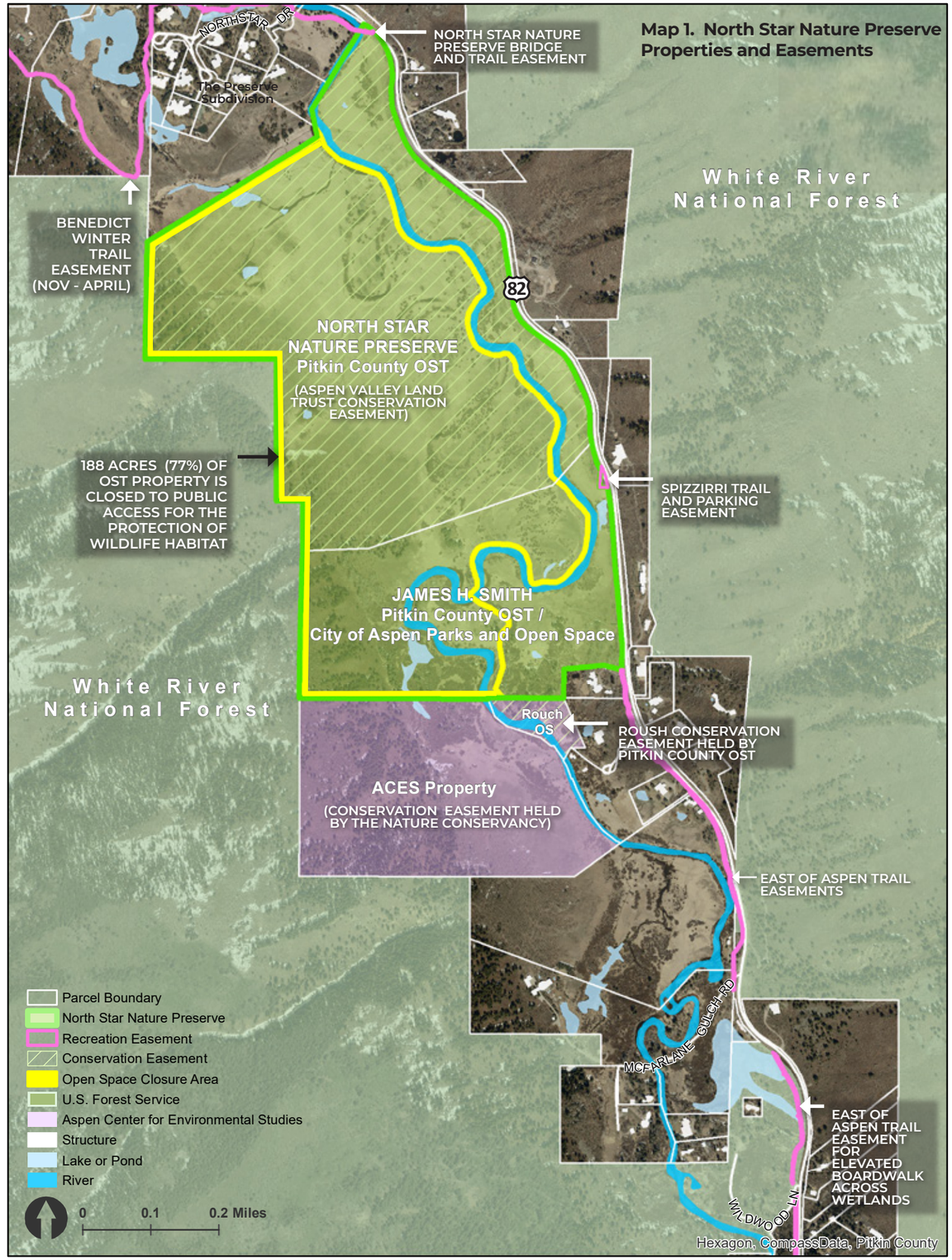
CDOT Boundary and Lease Agreement

Date: 2021 (20-year lease to be renewed in 2041)
Owner: Colorado Department of Transportation (CDOT)
Reception No: 679610
Management Considerations: Highway 82 was not fully constructed in accordance with the deeds originally recorded for the CDOT right-of-way. Open Space and Trails reached a boundary agreement with CDOT and AVLT, and corrections were made to the recorded documents. Open Space and Trails and CDOT signed a 20-year lease agreement that enabled OST to complete improvements to the parking areas and to enforce Title 12 regulations.

SURROUNDING LAND USE

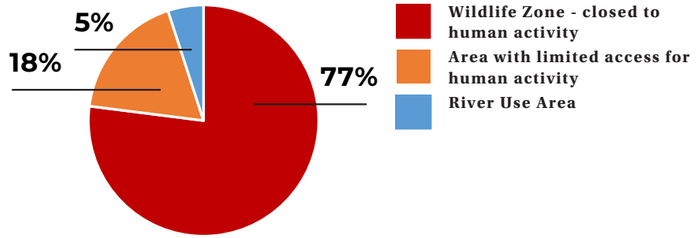
North Star Nature Preserve's northern boundary marks the edge of the City of Aspen Urban Growth Boundary east of Aspen. The surrounding properties are zoned primarily 10-Acre Agriculture/ Residential (AR-10). The North Star Nature Preserve subdivision to the north is zoned 2-Acre Residential. Construction of both new and redeveloped properties, primarily on the east side of Highway 82, has been and continues to be a persistent presence.

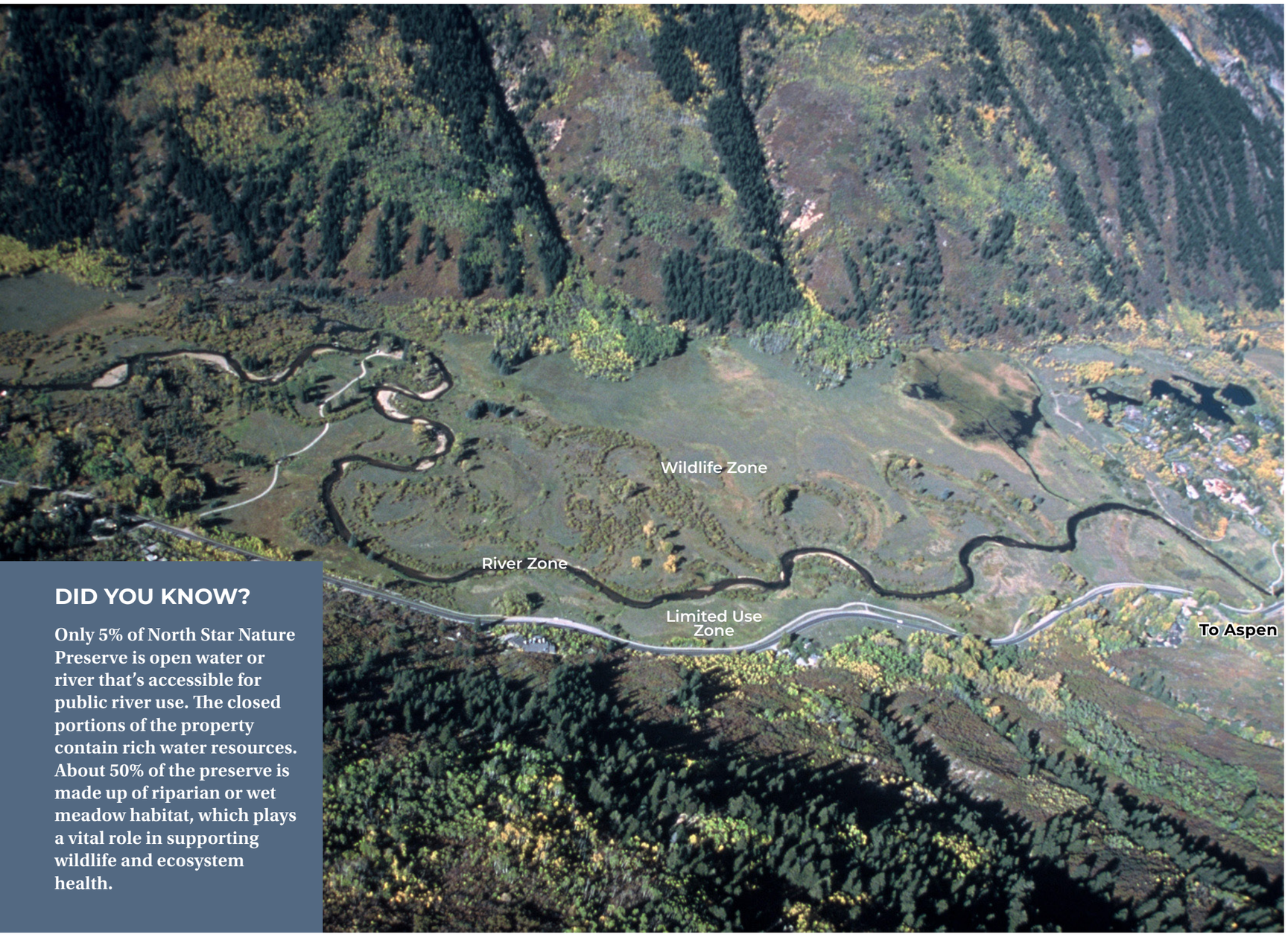
To the west, North Star is bordered by the White River National Forest, which includes the permit area for Aspen Mountain Ski Area. The Roaring Fork River running through North Star is under the State of Colorado's jurisdiction. ACES owns two properties south of North Star. The Nature Conservancy holds a conservation easement over the larger, 65-acre parcel to the west of the river, and OST holds an easement on the smaller, 4.35-acre Roush parcel to the east of the river (Reception No. 505401).



1.4 MANAGEMENT ZONES

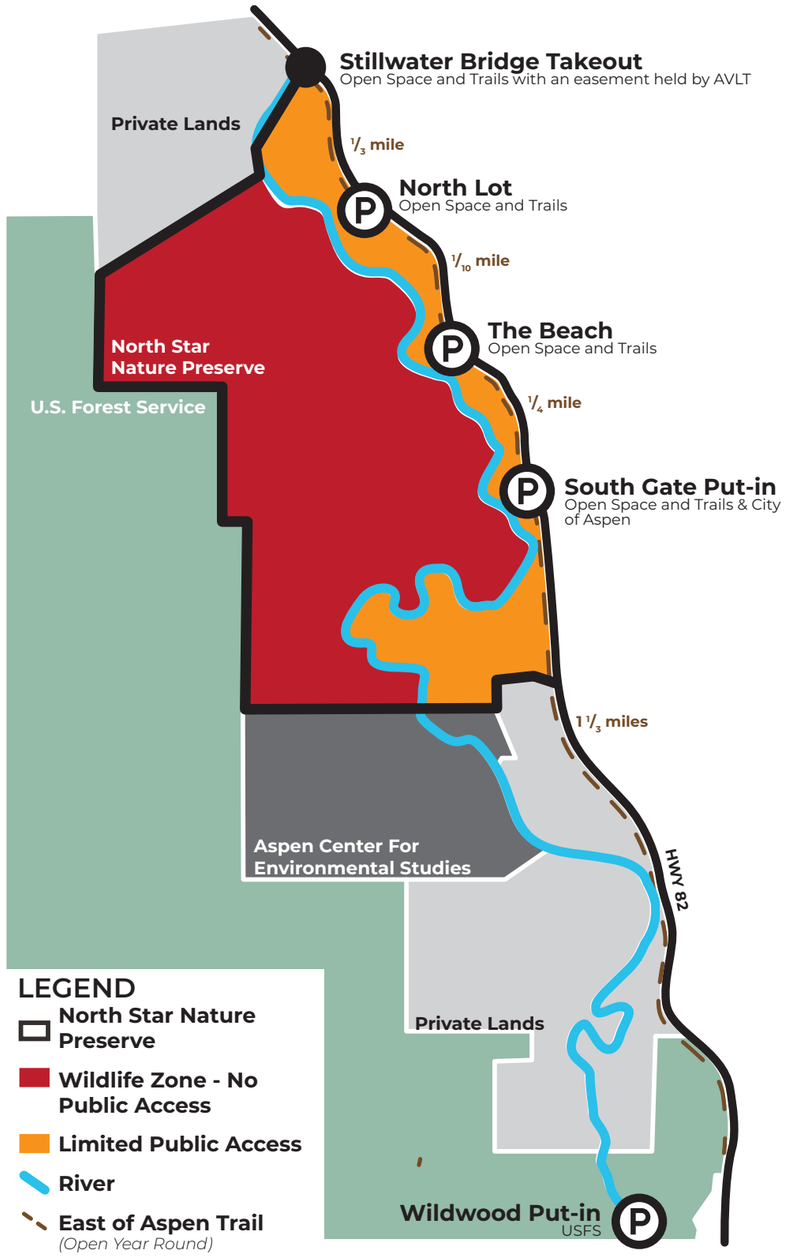
The 1989 North Star Nature Preserve Management Plan established zones to guide management. All land west of the river was and remains closed to public access. Public access was, and remains, limited to the river corridor, the East of Aspen Trail, the James H. Smith Interpretive Loop, and the three river access points along the river, including The Beach.





DID YOU KNOW?

Only 5% of North Star Nature Preserve is open water or river that's accessible for public river use. The closed portions of the property contain rich water resources. About 50% of the preserve is made up of riparian or wet meadow habitat, which plays a vital role in supporting wildlife and ecosystem health.



1.4 ACCOMPLISHMENTS

The 2025 North Star Nature Preserve Management Plan Update builds upon past accomplishments and celebrates the investments made since the initial North Star Nature Preserve Management Plan was adopted. Since 1981, 28 studies have been completed, with 22 conducted between 2015 and 2025. Between 2020 and 2025, approximately $2.2 million has been invested in ecological and visitor use studies, on-site restoration projects, habitat improvements, outreach and education, and capital improvements. Highlights of recommendations and actions completed to date are listed in Table 1; progress updates on the conditions at North Star are further detailed in Section 2.

North Star Nature Preserve Investments 2020-2025	
Ecological Studies and Restoration	**$371,133**
Outreach and Education	**$190,283**
Capital Improvements and Maintenance	**$1,455,018**
Visitor Use Management Study	**$143,710**
Total Investment	**$2,160,144**

Table 1. List of Management Accomplishments

North Star Management Accomplishments	Year	Biodiversity and Ecosystem Integrity	River System	Riparian Area, Wetlands, and Beavers	Wildlife and Habitats	Community
Formalized avian monitoring protocol	2020-2024	■			■	
Established North Star Nature Preserve name, reinforcing the conservation purpose.	Late 1970s	■	■	■	■	
ACES stewardship initiated managing most of the Preserve for wildlife and the portion from the river the highway for controlled public access.	1981		■		■	■
ACES implemented low-impact, year-round environmental education programs (skiing, snowshoeing, hiking).	1981					■
ACES developed an early partnership with the Aspen Kayak School to share natural history with users.	1980s	■				■
ACES led community thistle-pulling events to address invasive species	1980s	■			■	
Conducted willow planting efforts to stabilize collapsing riverbanks.	1980s			■	■	
Planted cottonwood arc along an old oxbow, enhancing wildlife cover for elk and providing material for beavers.	1980s		■	■	■	
Continued the recreation closure on the west side of the river	1989 - ongoing	■	■	■	■	■
Tracked Great Blue Heron activity	2000-2017, ongoing	■			■	
Completed comprehensive geomorpholgical assessment	2011, 2014		■			
Established and monitored permanent vegetation transects/plots	2014, 2017, 2023	■			■	
Funded and supported the ACES Naturalist program to educate summer users about the property's ecological resources	2015 - ongoing	■	■	■	■	■
Formalized and maintained the dawn to dusk closure	2015 - ongoing	■	■	■	■	■
Evaluated data and trends in key indicators (species diversity, detections by habitat type, etc.)	2015 - ongoing				■	
Facilitated scientific research · Aspen Global Change Institute - installed iRON Soil Moisture Monitoring Station (2015) · USGS – installed NGWOS Soil Moisture Monitoring Station (2022)	2015-ongoing	■				
Established and monitored Management Indicator Species	2015, 2017, 2021, 2025	■			■	
Restored and stabilized critical bank instability - FAILED	2015	■	■	■		
"Float Like a Native" Campaign / North Star Aspen Website Launch	2016					■
Roaring Fork Conservancy educational float trips (3-4 per season)	2006 - ongoing					■
Conducted avian surveys (avian point transects, diurnal raptor surveys, and nocturnal bird surveys)	2017, 2020-21; 2025	■			■	
Monitored macroinvertebrate communities and water quality	2017, 2023	■	■			
Monitored stream channel geometries (fluvial geomorpology)	2017		■			
Refresh interpretive signage	2017					■
Monitored fishery	2018	■	■			
Completed hydraulic modeling of the Preserve and developed flood inundation maps	2018		■	■		
Ranger capacity increased with one additional full time ranger (formally a seasonal position)	2018	■		■	■	■
Completed comprehensive vegetation mapping to national standards	2018	■			■	
Continue recreational use monitoring protocol: spot counts and camera counts.	2018 - Ongoing	■			■	
Conducted beaver surveys to determine the number and location of active lodges, important forage areas, and identify other areas of beaver activity	2018, 2023, 2025		■	■		
Formally adopted dynamic equilibrium as the goal for the river system (process-based ecological recovery, encouraging mobility of the channel within the floodplain to maintain connectivity and succession)	2018/2020		■	■		
Conducted floristic inventory, analysis and floristic quality assessment	2018	■			■	
Supported the Colorado Parks and Wildlife elk study with funds and access	2019-2020	■			■	
Enhanced foraging areas for waterfowl and wading birds, including great blue herons	2019-2022	■			■	
Implemented the fen wetland restoration project (2019-2021) · Confirmed the age of the fen · Monitored restoration project for success and managed adaptively (2021-ongoing) · Conducted precision control of reed canarygrass within the restoration area (2022-2025)	2019-2023	■	■	■		
Increased natural resource staff capacity to adaptively manage ecological conditions	2019, 2023, 2025	■	■	■	■	■
Left fallen trees onsite and in channel as feasible to add woody debris and channel complexity	2020 - ongoing	■	■	■		
Established and enforced a Quiet Zone	2020	■	■	■	■	■
Implemented and enforced prohibition of dogs	2020	■		■	■	
Installed the Heather Hopton Bird Blind	2021				■	■
Obtained a CDOT right-of-way lease to enable OST Rangers to enforce regulations and improve parking functionality	2021					■
Installed a seasonal port-a-potty at Wildwood in partnership with USFS	2021		■			■
Contracted spatial evaluation of restoration opportunities at North Star	2022	■	■	■	■	
Initiated discussions with USFS on a land exchange to convey the Wildwood parcel to Pitkin County to increase enforcement capacity	2022		■		■	■
Reviewed aquatic life monitoring strategy for upper Roaring Fork River with partners (CPW, RFC)	2023	■	■			
Signed an agreement with the USFS to increase joint enforcement of regulations at Wildwood including: no glass and no dogs	2023		■		■	■
Removed practice of double parking at Wildwood to reduce congestion and improve safety	2023					■
Completed parking improvements at South Gate, the Beach, and the North Lot.	2024					■
Completed visitor access improvements at the Stillwater Bridge Takeout	2024					■
Incorporated a Grey Wolf Policy: no interference with predator-prey interactions	2025	■			■	■
Completed Visitor Use Management study and ecological monitoring peer-review	2025					■
Established low flow closures, voluntary for the general public and mandatory for commercial operators	2020 - ongoing		■	■		■
Created a Beaver Dam Policy · Avoided disturbance of side channels where beavers are active · Utilized outreach methods to inform visitors of beaver dam presence · Established 50ft terrestrial buffer zones and river-based quiet zones around lodges, dens, and activity (e.g., foraging) areas as feasible	2020 - ongoing		■	■		■
Supported the Watershed Biodiversity Initiative with funds and staff engagement for the benefit of all OST assets, including North Star	2020-2022	■		■	■	
Invested in outreach and education · Roaring Fork Conservancy Middle School Field Trips (13 programs at North Star in 2024 · ACES Programs – Birding / West Side Tour / Evening with the Elk · ACES Naturalists · · "Rethink Your Float" Campaigns	2020-2025	■	■	■	■	■
Preserved standing dead trees for bird nesting sites	2020, 2024, ongoing	■			■	
Conducted general wildlife surveys (via terrestrial visual encounter surveys and wildlife camera monitoring) approximately every 5-7 years	2021-2022; 2025	■			■	
Coordinated with CDOT on parking signage for the highway right-of-way between Wildwood and the takeout.	2021-2024					■
Funded a USFS Forest Protection Officer	2022 - ongoing		■		■	■
Explored methods for reed canarygrass control	2022-2024	■			■	
Implemented a new groundwater hydrology monitoring program with guidance from hydrologist	2022-ongoing	■	■	■		
Wetland delineation at Wildwood	2023	■	■	■	■	
Conducted an investigation of the red-winged blackbird decline	2023-2024	■		■	■	
Monitored sagebrush seed set for seed collection and dispersal opportunities	2023-2025	■			■	
Preserved mature aspen and cottonwood trees via sufficient basal fencing for age-class diversity and avian nesting habitat	2023-2025	■		■	■	
Planted trees and shrubs to advance recruitment in wetland/riparian areas	2023, 2024, 2025	■	■	■	■	
Reseeded areas of bare ground with custom North Star native plant seed mix	2023, 2025	■			■	
Supported Roaring Fork Safe Passages with funds and staff engagement providing technical advice to benefit wildlife via landscape permeability	2024 - ongoing	■			■	■
Tested mechanical rootstock stimulation to promote sapling regeneration	2024-2025	■			■	
Installed protective fencing to exclude browsing herbivores in key areas to support forest health via successful tree regeneration	2024, 2025	■	■	■	■	
Increased OST Ranger staff capacity to adaptively manage visitor use	2024, 2025		■		■	■
Continued annual noxious vegetation control (no broadcast spraying) · Geospatial field mapping tool developed (2023) · Developed North Star-specific weed monitoring protocol (2024)	Annually	■			■	

2. EXISTING CONDITIONS

2.1 NATURAL RESOURCES AND BIODIVERSITY

North Star Nature Preserve is managed primarily to support natural processes and ecological resilience. To benefit wildlife, plants, and the overall function of the ecosystem, human activity is prohibited on 188 acres, or 77% of the property. This closure has been in effect since 1989 and is characterized by a high level of public compliance . Scientific monitoring studies reinforce that this closure has a positive overall effect on native flora and fauna. It also serves as an effective visitor management strategy that has been successfully implemented in natural areas nationwide to protect ecosystems.

ECOLOGICAL CONTEXT

North Star Nature Preserve is a key part of the local landscape, characterized by its wide valley floor and undeveloped space at the edge of Aspen. As much of the valley floor is developed downstream from North Star, this area serves as an important sanctuary within the broader landscape. Though it is far from pristine due to its agricultural land-use history, North Star Nature Preserve hosts several distinct plant communities, provides abundant wildlife habitat and a migratory corridor, and offers a high degree of biodiversity protection. The mosaic and diversity of habitat types make the property's cumulative ecological value greater than the sum of its individual habitat types.

Additionally, the area hosts wetland complexes that provide critical ecosystem services in the headwaters of the Roaring Fork River, including water storage, flood mitigation, water filtration, and invaluable riparian and wetland habitats. Allowing the river to be dynamic, with the help of beavers, helps ensure North Star is a place where natural processes predominate.

PHYSICAL SETTING

Topography, Geology, and Soils

North Star Nature Preserve is situated near the terminus of a wide, low-gradient valley created by the retreating Roaring Fork Glacier at the end of the Pleistocene Epoch (about 11,000 years ago). The glacier's terminal moraine deposits acted as a dam, behind which material accumulated to create a thick deposit (more than 300 feet deep) of glacial outwash, and lake and stream sediments.[1] This created the present-day valley floor, across which the river migrates over time.

Soil surveys indicate that much, but not all, of the area within North

1 Ecological Communities and Fluvial Geomorphology Baseline Report for North Star Nature Preserve (2015)

SEASONAL MIGRATION ROUTE FOR ELK

North Star Nature Preserve provides an important link for seasonal elk migrations across the valley bottom between Richmond Ridge and Smuggler Mountain.

Map 2. North Star Nature Preserve Ecological Context

Star exhibits characteristics of wetland soils, which are defined by saturated, anaerobic conditions. Histosol soils - a peat-forming wetland soil type - were found in the northwest portion of the property and define the boundaries of the only fen at North Star.[2] Super-saturated conditions and cool temperatures in this area create conditions in which plant growth exceeds decomposition, leading to peat formation. Peat accumulates very slowly in this ecotype; fens are often referred to as “old-growth” wetlands. Open Space and Trails has completed significant restoration work to preserve this fen. See the “Fen Project Update” on page 32 for details.

The southern portion of the James H. Smith Open Space, located west of the river, also supports several rich organic soils. In contrast, drier soil types exist at the base of the mountains along the western edge of the property, characterized by mixed conifer forests, Gambel oak, and Sagebrush shrublands.

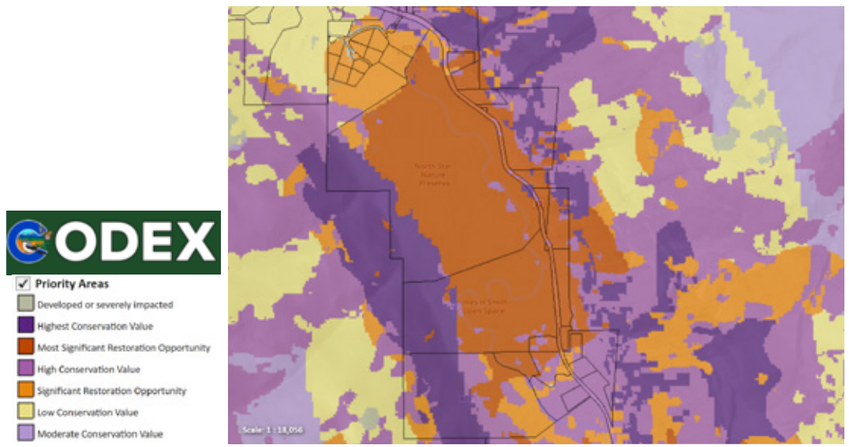
Aspen Global Change Institute (AGCI) operates and maintains two soil moisture monitoring stations on the Preserve as part of its iRON network, which tracks soil moisture and precipitation across an elevational gradient in the Roaring Fork Valley. One station is in an aspen grove, and the other is situated nearby in the transitional community closer to the wetlands. Soil moisture is monitored at depths of 2 inches, 8 inches, and 20 inches.[3] Results show that both locations are mostly wet in late spring and early summer and dry out over the course of the summer. Long-term monitoring of these conditions will help track the impacts of climate change on the local scale and can be correlated with vegetation data collected at these locations. For example, 20-inch soil moisture data analyzed by AGCI in 2025 revealed that the minimum soil moisture has decreased by about 40% over the period of record in the transition zone, while there is no statistically significant trend in the aspen grove location. Possible drivers of this trend include reduced precipitation, shifts in land-surface conditions, and increased evapotranspiration; however, further research is needed to elucidate the underlying mechanisms

Channel Morphology and Bank Stability

The Roaring Fork River currently travels about 4,900 linear feet through North Star. Aerial photographs and historic images reveal that the river formerly extended and migrated over a larger portion of the valley floor, following a more sinuous, meandering path until approximately 1900.

A notable straightening of the channel occurred in the 1900s, likely due to beaver trapping, near-extirpation from the landscape, land-use changes toward agricultural activities, upstream water diversions, and natural geomorphological changes. In 1937, the Independence Pass Transmountain Diversion System (IPTDS) began diverting water from the headwaters of the Roaring Fork River and routing it through a tunnel to Twin Lakes and the Front Range. This system continues to divert an average of 40,000 acre-feet of water

2 Wetland Fen Assessment and Floristic Inventory (2018)
3 https://snoflo.org/report/flow/Colorado/twin-lakes-tunnel-at-e-portal/comparison



ROARING FORK HEADWATER DIVERSION

The Independence Pass Transmountain Diversion System (IPTDS) was originally decreed for irrigation use. In 1976, a change in water rights decree was granted, allowing the IPTDS to be used for a variety of other purposes, including municipal use. The 1976 decree also imposed volumetric limits were imposed, setting the maximum allowed in a single year at 68,000 acre-feet, and the maximum over a 10-year period at 570,000 acre-feet (annual average of 57,000 acre-feet). The constraints on water diversions are most often not annual limits, rather other conditions, such as the available supply at the diversion points, provisions for IPTDS operating as a supplement to available Arkansas River supplies, and other factors.

annually. This diversion typically occurs between May and September, resulting in a flow reduction in the Roaring Fork River, which has contributed to the narrowing of the river channel through North Star. Land conversion to agriculture in the mid-1900s removed willows and denuded streambanks, leading to increased erosion and channel straightening. Additionally, ditches were dug to dry out the land and increase the usable agricultural acreage. This activity drained wetland areas and likely lowered groundwater levels at North Star.

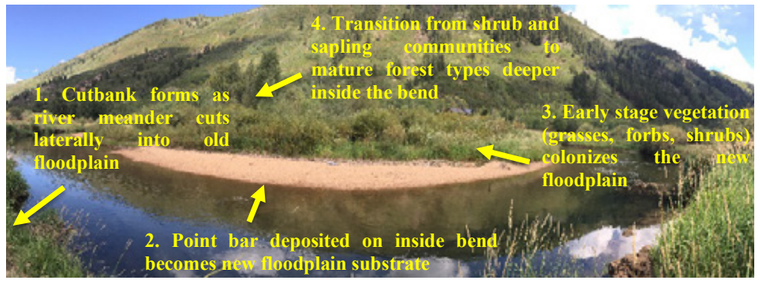
The river's current path through North Star has remained relatively consistent since the 1950s and is currently operating in a dynamic state, which is appropriate for an unconfined floodplain river reach in this region. Rates of lateral channel migration vary from 0.12 - 0.33 meters per year , with an overall average of 0.25 meters per year.[4] Sediment and bank material that is eroded get deposited on the next downstream point bar in a natural process, and the particle size of streambed sediment is consistent with expectations for a low-gradient floodplain.[5] The river is well connected with its floodplain and is not incised.

Tall, eroding banks can be found in several areas at North Star, likely the result of past channelization that cut off meanders. Because much of the bank material is highly erodible sand and gravel, high flows can undercut vegetated land, causing bank collapse. The abundance of eroding streambanks is evidence of the river's repossession of the valley floor and provides habitat for aquatic and riparian wildlife. As this natural river process continues over time, the river will continue to develop a meander pattern suitable for present-day river levels and reach dynamic equilibrium.

The trend toward a naturalized riparian area is also confirmed by cross-section analyses that reveal channel narrowing over the past 70 years, which coincides with the transition away from agricultural land use. Channel width ranges from seven meters on straight segments with riparian vegetation to 32 meters across on segments with actively growing meanders. The channel narrowing observed is controlled by both hydrological modifications (decreased peak flows due to upstream water diversions) and increased bank cohesion (increased woody vegetation density).

4 North Star Fluvial Geomorphology Report 2017
5 North Star Fluvial Geomorphology Report 2017

Figure 1. Meander vegetation communities display appropriate transitions from pioneer species on newly created bars up to mature forest types deeper into the floodplain.



North Star Nature Preserve Fluvial Geomorphology and Aquatic Life Monitoring Report, 2017

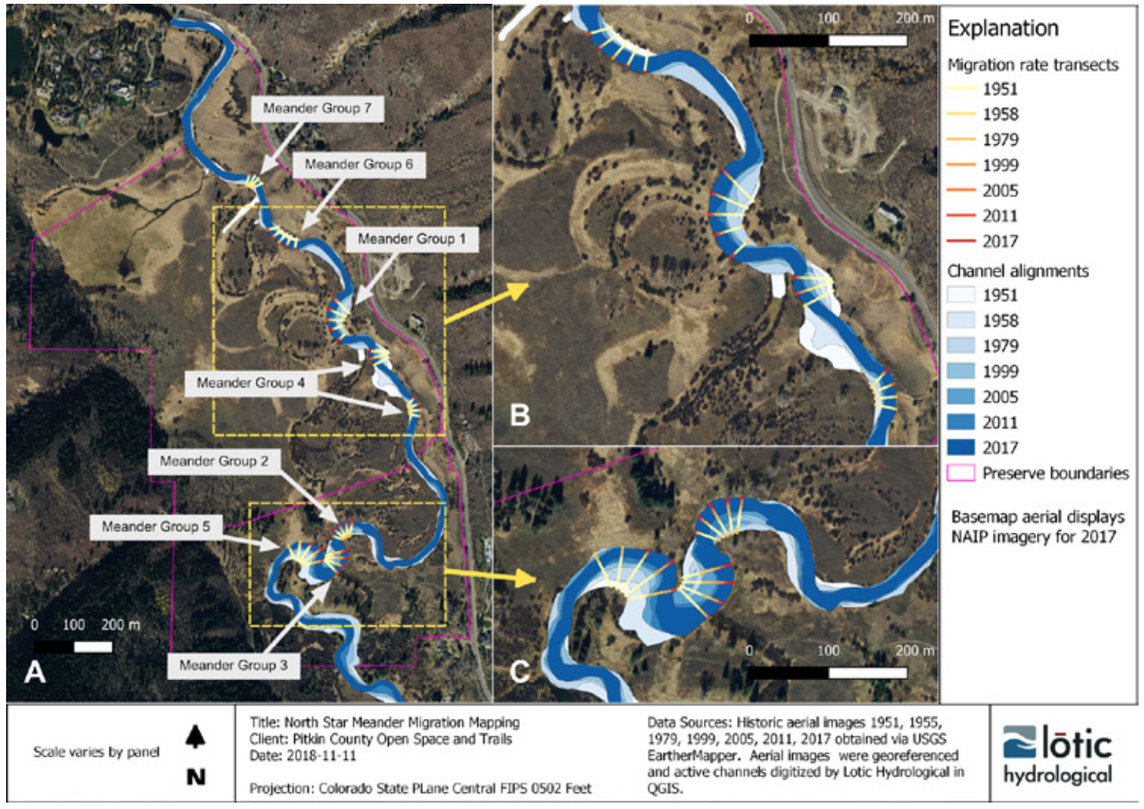
Water and Riparian Resources River Flows

Significantly impacted by trans-basin diversions, the Roaring Fork River through North Star now exists in a state altered from its historic, natural conditions. The U.S. Geological Survey (USGS) maintains a stream gauge 2,200 feet downstream of the property, which is used to monitor and assess flow levels through North Star.[6] There are no major tributaries or diversions between the upstream end of North Star and the stream gauge, though groundwater contributions from the wetland areas and springs on the west side of North Star likely contribute some water to the river year-round. Mean annual streamflow for the complete period of record of 1965-2019 is 92 cubic feet per second (cfs); mean annual streamflow for 2004-2024 is lower at 81 cfs.

Peak flow is a valuable metric for river monitoring as this is when the water has the most power to move sediment and change channel morphology, and/or overflow onto the floodplain. The lowest recorded peak flow was in 2012 at 140 cfs. The highest peak flows occurred in 1985 and 1995, with both years reaching a peak of 2,230 cfs. The average peak flow from 1965 until 2019 was 881 cfs. The duration of spring runoff is also of interest, both for channel morphology and groundwater recharge, and can be gleaned from stream gauge data. Flood event return intervals indicate that flows exceeding 500 cfs occur approximately every two years. At this level, water begins to inundate the vegetated areas of the fen and other low-lying areas. The IPTDS greatly impacts the hydrology of the Roaring Fork River in any given year, as it diverts water out of the Roaring Fork River upstream of North Star.

6 https://nwis.waterdata.usgs.gov/nwis/nwismap/?site_no=09073400&agency_cd=USGS

Figure 2. Mapping historical channel alignments from aerial photographs provides a basis to develop quantitative estimates of lateral movement in active meander zones. This figure shows that channel migration is occurring, which confirms floodplain connectivity.



North Star Nature Preserve Fluvial Geomorphology and Aquatic Life Monitoring Report, 2017

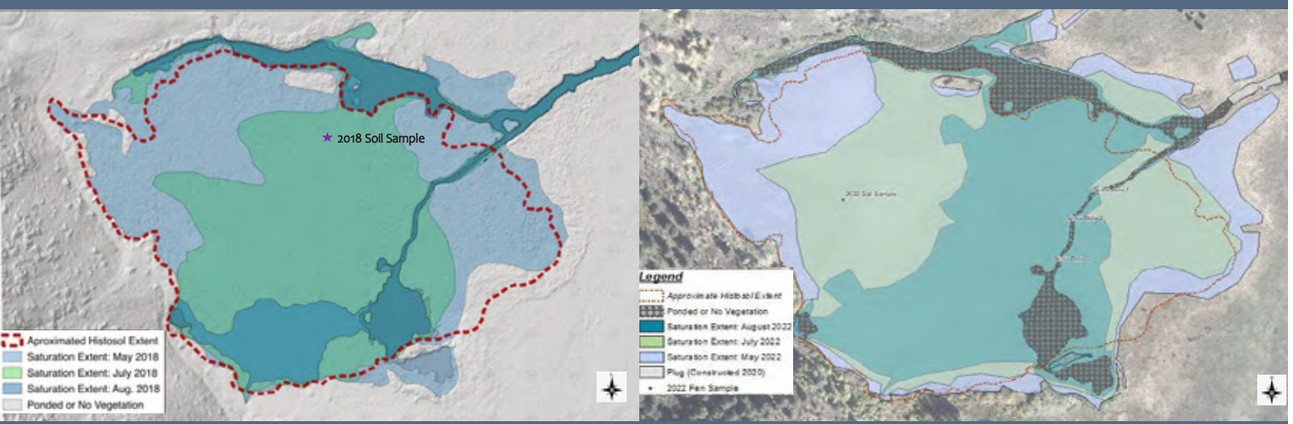
IMPLEMENTATION UPDATE

WETLAND FEN RESTORATION

A fen is a peat-forming wetland characterized by saturated conditions where organic matter production exceeds decomposition. They are rare and ecologically significant in the state of Colorado. At North Star, there is one fen that covers 14 acres in the northwestern corner and is believed to be over 8,000 years old.[1] . This area often retains standing water and is home to a variety of plants and animals, including waterfowl and amphibians. The dominant plant is beaked sedge, along with bog watercress and water smartweed. Reed canarygrass, a non-native species, grows in some drier areas.

In 2018, a drought significantly dried out the fen, revealing that an old drainage ditch was removing too much water from it. To fix this, OST worked with experts from 2019-2021 to design and implement a wetland restoration project. By plugging the drainage ditch with soil and planting native wetland plants, this project slowed down water outflow and enhanced the value of this valuable wetland. Since then, diligent field monitoring and maintenance have been a priority to ensure project success. In 2022, quantitative monitoring showed that the restoration increased wetland hydrology and reduced non-native grass cover. The saturated area of the fen was approximately 27% larger in July 2022 and 70% larger in August 2022 compared to the same months prior to restoration. This results in improved soil moisture for peat growth and wetland health, which in turn enhances the habitat for wildlife and native plants. Now, great blue herons, ducks, many songbird species, and moose frequent the area.

1 Fen Vegetation and Hydrology Monitoring Report 2022



Map 4. Interpolated soil surface saturation extents observed within the fen during the summer of 2018 and 2022.

Groundwater

Groundwater is a critical component of the ecological value of North Star and its wetland habitats. Groundwater is recharged from snowmelt, spring runoff, overbank flooding from the river, and seeps and springs near the base of the mountains on the western edge of the property. Open Space and Trails implemented a groundwater monitoring program, tracking depth to groundwater at six locations across North Star throughout the growing season. Results show that groundwater in most areas is closely tied to river levels, but that some areas are sustained by seeps or springs.

Wetlands

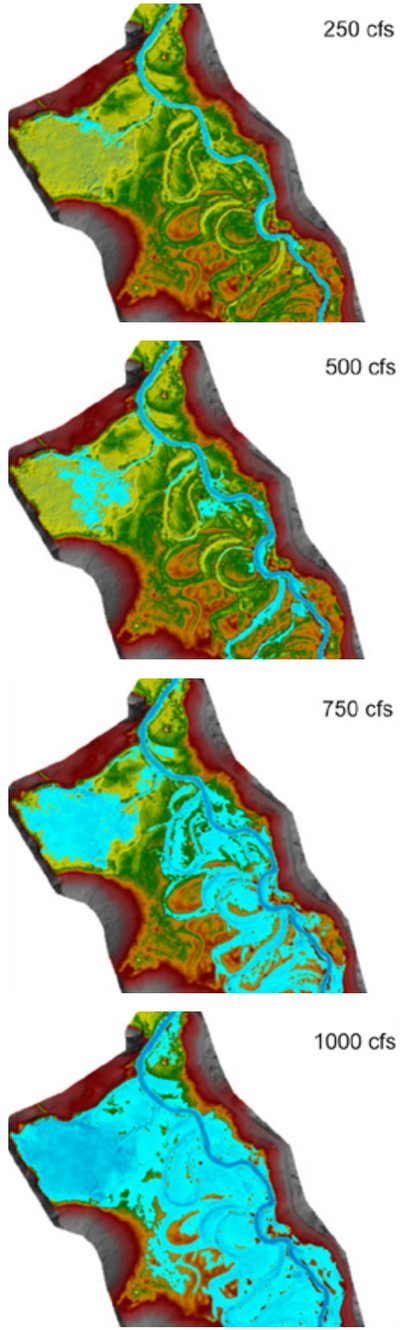
There are approximately 50 acres of wetlands and riparian areas within the preserve. A 2014 assessment of these areas found that this represents approximately a 30% reduction compared to the pre-agricultural conditions, likely a result of beaver removals, willow clearing, ditching or draining, and upstream water diversions.

The IPDTS remains the biggest threat to the wetlands at North Star, as flow reductions cause soils that were historically saturated to dry out. Combined with the effects of climate change, when soils dry out, a shift in vegetation follows, which can favor non-native and invasive species. The 2023 vegetation monitoring survey found that in one riparian willow community, there had been an increase in the cover of reed canarygrass from 19.5% in 2017 to 44.6% in 2023. The existing wetlands, however, continue to provide resources such as shelter, food, water, and space that benefit many wildlife species, as well as ecosystem services like water storage, filtration, flood mitigation, and carbon sequestration that benefit humanity.

VEGETATION

The flora at North Star remains moderately impacted by historic agricultural activities, a legacy that will endure. The Floristic Quality Assessment (FQA) is a standardized method for evaluating the impact of human disturbances on plant community composition and for monitoring changes in plant communities over time. The FQA results for North Star are relatively low (Mean C-Value = 4.5), but not surprising given the property's history and the number of species that are highly tolerant of the human disturbance present at North Star. Even so, overall plant biodiversity is high across the property, largely due to the diverse range of habitat types that are present. A total of 192 plant species have been documented to date. No rare plants have been found, but one uncommon plant, the slender spire orchid, was reported in 2017. Quantitative surveys in 2023 found species richness and floristic quality remained similar between 2017 and 2023. Two of the five monitoring locations (the sagebrush and riparian willow transects) showed notable increases in non-native introduced perennial grasses. There was little change observed in the other three monitoring locations. A slight shift toward more native plant species and an absence of Canada thistle and houndstongue, noxious weeds controlled by OST, were noted in the sampled transects.

Figure 3. Inundation extents associated with overbanking flows from the Roaring Fork River.



North Star Nature Preserve Fen Hydrological Restoration Plan, 2018

Plant Communities

Plant communities at North Star are formally mapped, described, and classified into alliances and associations in accordance with the U.S. National Vegetation Classification system. Detailed locations, descriptions, and analysis can be found in the North Star Vegetation Mapping and Floristic Inventory Report (2019). Overall, 14 different alliances and 15 plant associations exist at North Star.

- Forest communities: Aspen forest, Douglas fir forest, narrowleaf cottonwood riparian forest, blue spruce forest.
- Shrub communities: Gambel oak shrubland, mountain big sagebrush/sticky rabbitbrush shrubland, mountain willow wet shrubland, shrubby cinquefoil wet shrubland.
- Herbaceous plant communities: Smooth brome ruderal grassland, beaked sedge wet meadow, reed canarygrass ruderal marsh, field sedge wet meadow.

Five permanent vegetation monitoring sites are established, one within each of the following plant communities, to track trends and changes over time.

- Aspen Forest Community
- Transitional Community – between anthropogenic upland grasslands and the wet meadows
- Sagebrush Community
- Willow Riparian Community
- Cottonwood Riparian Community

Aspen Forest Community

Aspen forests occur at the western edge of the property and along the bike path east of the river. The understory is comprised of a mix of native shrubs, forbs, and grasses, nonnative grasses, and noxious weeds, including the plumeless thistle, yellow toadflax, and houndstongue. Compared to 2017, the 2023 data showed very little change, exemplifying the stability of vegetation cover over the monitoring period.

In 2017, a report noted that aspen trees were being heavily browsed by ungulates, with healthy regeneration occurring in some areas but not in others. Although the aspen stands at North Star are small, they are biodiversity hotspots, providing disproportionate importance to the area as they offer high invertebrate prey diversity and density, which in turn support a multitude of bird species. Small herbivory protection fences were installed in 2024 in a few locations, which have effectively supported tree regeneration by reducing browse pressure and allowing some young trees to grow taller.

Transitional Community

Non-native grasslands cover a significant portion of the area and are now predominantly dominated by smooth brome. Native species account for less than 10% of the cover, and the noxious weeds plumeless thistle, mullein, and yellow toadflax are all present, although they are being controlled. Reed canarygrass, a non-native, wetland-adapted plant, has formed dense monocultures in some areas. It can outcompete native vegetation and is difficult to remove. Patches of wet meadows also exist in the transition zone, supporting native sedges and rushes, but are often dominated by the invasive meadow foxtail. Compared to 2017, the 2023 data showed very little change in this plant community, with a total absolute vegetative cover of 58.1%, which is almost entirely comprised of herbaceous species.

Sagebrush Community

This area is dominated by mountain big sagebrush and sticky rabbitbrush, with a mix of native and non-native grasses and native forbs. Noxious weeds such as plumeless thistle, mullein, and toadflax are present, and ongoing control measures are in place. Sticky rabbitbrush is quite resilient to grazing and is doing well, while there has been little natural regeneration of mountain big sagebrush observed during the period of study.

Willow Riparian Community

The existing willow shrublands are the most developed in the southern part of North Star, along the Roaring Fork River, and next to most of the low-lying oxbow wetlands. These remaining shrublands contain

VEGETATION COMMUNITY EXAMPLES

Young Aspen Forest along trail

Planted Blue Spruce

Beaked Sedge Wetland Association

Douglas Fir Forest

Sagebrush and Sticky Rabbitbrush Shrubland*

Reed Canarygrass

Narrowleaf Cottonwoods along Roaring Fork River*

Mountain Willow Wet Shrubland

Patches of Wet Meadow (dark green) intermixed in the drier upland non-native Smooth Brome Grassland

Narrowleaf Cottonwood - Willow Riparian Habitat along intermittent stream*

Non-Native Smooth Brome Grassland

Location of vegetation transect

a significant amount of non-native pasture grasses. Willow is a preferred species for beavers to cut and chew; there is no concern about overharvesting, since the number of cut stems represents a small percentage of the available forage, and beaver herbivory encourages vigorous sprouting and regrowth in willows.

Cottonwood Riparian Community

There are scattered stands of cottonwoods, with the understory dominated by non-native agricultural grasses. North Star is at the upper elevational range of narrowleaf cottonwood, and historical images suggest there were no cottonwoods before settlement. Numerous young sprouts were observed in 2017, though they were heavily browsed. It is unknown whether regeneration happens from the shoots of older trees or from new seedlings. Similar to the Aspen Forest Community, small stands have been protected from browsing by fencing pods; the results are encouraging, with significantly more regeneration observed inside the pods within one year. Transect monitoring in 2023 noted no major changes since 2017.

Noxious Weeds:

Nine plant species found at North Star are Colorado-listed noxious weeds; none are List A species, while seven are List B. Of the seven List B species, yellow toadflax, sulphur cinquefoil, and plumeless thistle are slated for elimination, which requires the removal or destruction of all emerged and growing plants. The other four List B species are slated for suppression by the State of Colorado, which involves reducing their vigor, decreasing their propensity to spread, and mitigating negative effects in infested areas. Open Space and Trails has developed a North Star Noxious Weed Monitoring Protocol and implements best-known integrated pest management practices to control noxious weed species.

WILDLIFE

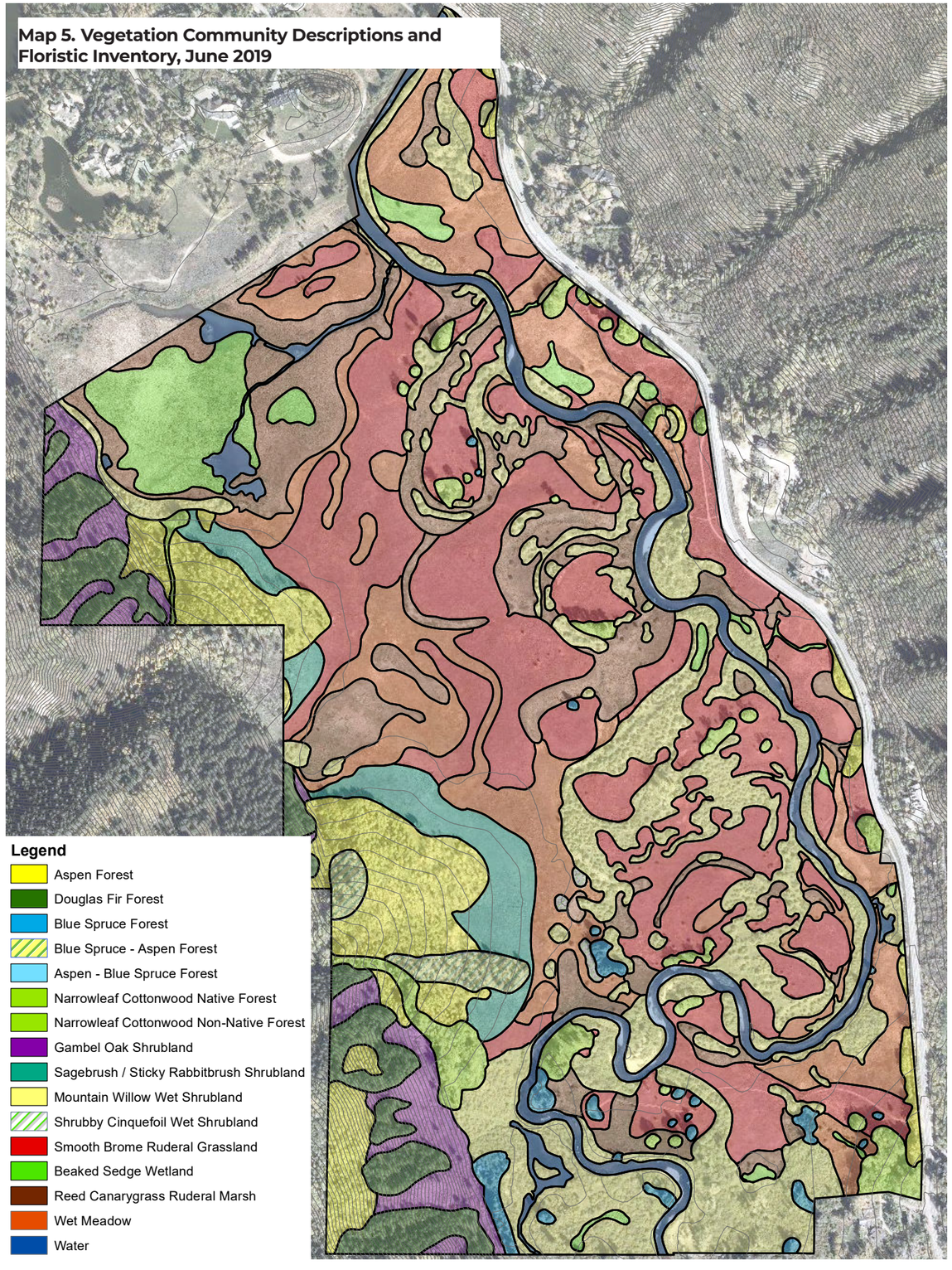
Comprehensive mammal and bird surveys were most recently completed in 2021, with targeted studies on great blue herons (2018) and beavers (2018 and 2025). ***Overall, the results indicate that diverse wildlife species continue to utilize North Star Nature Preserve and rely on this open space for water, food, shelter, migration corridors, and foraging and/or breeding habitats throughout the year.*** The extent of wetland and riparian habitats at North Star contributes to its high value for wildlife, as 85% of Colorado's wildlife species rely on riparian habitats at some point in their lives.

The strict closure of the west side of North Star remains an effective management strategy that

Table 2. Vegetation Types

North Star Vegetation Types by Percent of Acres		
Mapped Vegetation Type	**Acres**	**% of Area**
Aspen Forest	**18.6**	**7.5%**
Douglas Fir Forest	**10.8**	**4.4%**
Narrowleaf Cottonwood - Mountain Willow	**2.5**	**1.0%**
Narrowleaf Cottonwood Ruderal Riparian	**5.2**	**2.1%**
Blue Spruce Mesic Forest	**5.1**	**2.1%**
Gambel Oak – Snowberry Shrubland	**8.2**	**3.3%**
Mountain Big Sagebrush / Sticky Rabbitbrush Shrubland	**8.2**	**3.3%**
Mountain Willow Wet Shrubland	**46.6**	**18.8%**
Shrubby Cinquefoil Wet Shrubland	**0.3**	**0.1%**
Beaked Sedge Wetlands	**10.0**	**4.0%**
Smooth Brome Ruderal Grassland	**58.2**	**23.5%**
Reed Canarygrass Ruderal Marsh	**29.0**	**11.7%**
Wet Meadow Foxtail Ruderal Wet Meadow / Clustered Field Sedge Wet Meadow	**32.7**	**13.2%**
Water	**12.0**	**4.8%**
Total	**247.26**	**100%**

Map 5. Vegetation Community Descriptions and Floristic Inventory, June 2019



benefits all wildlife, especially species sensitive to human activity. Additionally, the dusk-to-dawn closure is a critical management measure that provides animals with reliable periods to move through North Star without human disturbance. Monitoring has confirmed that wildlife activity peaks during crepuscular hours, as expected based on animal behavior science. Appendix XX includes a table listing all wildlife species known or suspected to be present at North Star, along with their conservation status.

Management Indicator Species

Management Indicator Species (MIS) are species selected for targeted monitoring and study because their welfare is an indicator of the welfare of other species using the same habitat, or to assess the impacts of management actions on a particular area. Management indicator species, including mammals and birds, are studied at North Star as an integral part of adaptive management efforts for various habitat types. The MIS were defined in 2011 and have been studied following the same protocols since 2014. The objective is to track trends over the long term, rather than relying on point-in-time observations. The **2024 Wildlife Monitoring Report** provides details on North Star's MIS, and the "Monitoring Update" on page 39 provides a status summary.

Mammals

Ungulates

North Star provides excellent habitat for elk, deer, and moose, with riparian shrublands and wet meadows offering nutritious forage, and nearby forested areas providing production and rearing habitat and cover. The property is heavily used by elk throughout the year. In the spring and fall, North Star serves as an important elk migratory corridor across the valley floor, connecting their winter range on the sunny southern slopes of the Smuggler Mountain area to the cooler, northern aspects that comprise their summer range closer to Richmond Ridge and Bell Mountain. North Star also provides cover, forage, and rearing habitat in the summer, as well as great habitat for mating activities in the fall, with open meadows on timbered slopes adjacent to each other. Elk detections in 2021 were higher than in 2017 and 2014. North Star is used regularly by elk during mating season. Mule deer use North Star in large numbers during the non-winter months to forage, rest, migrate, and rear their young.

Moose presence at North Star increases as regional moose populations increase. The wetlands provide excellent moose habitat, and moose sightings are increasingly common, to the point where human-moose conflicts have become a growing concern for Colorado Parks and Wildlife (CPW) officials and Open Space Rangers. Conflict potential is higher if dogs are present, as moose perceive them as a threat and may become aggressive around dogs. Ranger and naturalist education have focused on canine-moose conflicts in recent years, and compliance with the dog prohibition on the river is high. Moose cows, bulls, and calves are all observed regularly at North Star.

Small Mammals

Small-mammal surveys at North Star confirm abundant use of North Star by a variety of species. Squirrels, voles, chipmunks, gophers, mice, rabbits, and muskrats reside here and provide an important prey base for mammalian and avian predators. Species documented over the years include American red squirrel, deer mouse, golden-mantled ground squirrel, least chipmunk, northern pocket gopher, bushy-tailed woodrat, long-tailed vole, montane vole, southern red-backed vole, mountain cottontail, muskrat, snowshoe hare, western jumping mouse, and the Wyoming ground squirrel. The number of northern pocket gophers and voles has increased. The Wyoming ground squirrel population has decreased since 2014 to the point where none have been documented since 2017. Badgers are also known to occur at North Star, but none have been formally documented recently. According to Colorado Wildlife Science, reintroducing the Wyoming ground squirrel to North Star may encourage badgers and other predators to return, as could improving soil conditions. Bat surveys have not been conducted to date, but a few species are expected to occur at North Star.

Eleven predator species are known to inhabit the area: black bear, American marten, coyote, American mink, bobcat, short-tailed weasel, long-tailed weasel, mountain lion, red fox, raccoon, and striped skunk. Gray wolves and grizzly bears were present in the upper Roaring Fork Valley in the 1940s but have since been extirpated.

MONITORING UPDATE

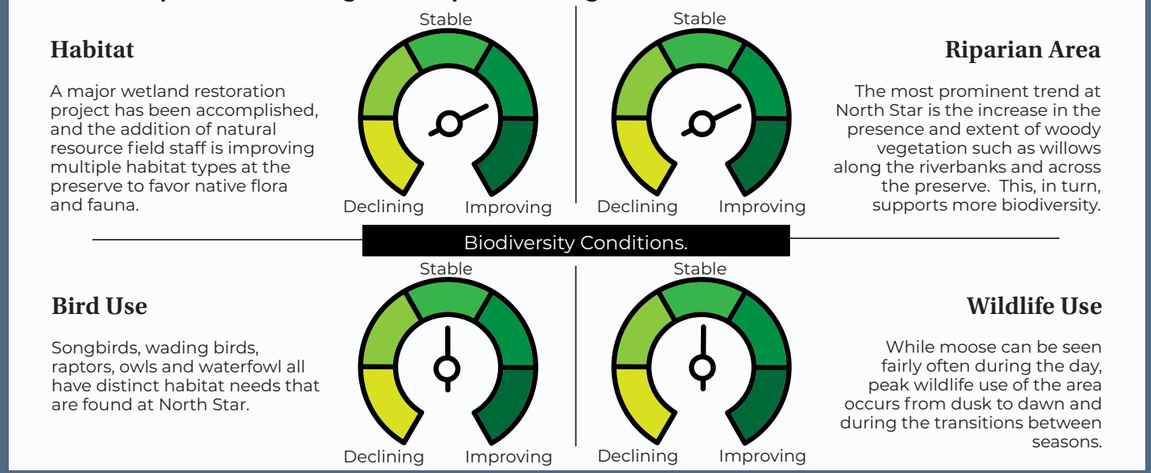
MANAGEMENT INDICATOR SPECIES

The Management Indicator Species (MIS) concept is a key part of adaptive management. Managers cannot measure everything of potential interest within an ecosystem, so the choice of what to measure is critical. Table 3 lists the species studied at North Star, organized by habitat. Regular monitoring of these species creates a dataset that shows long-term trends, not just yearly changes.

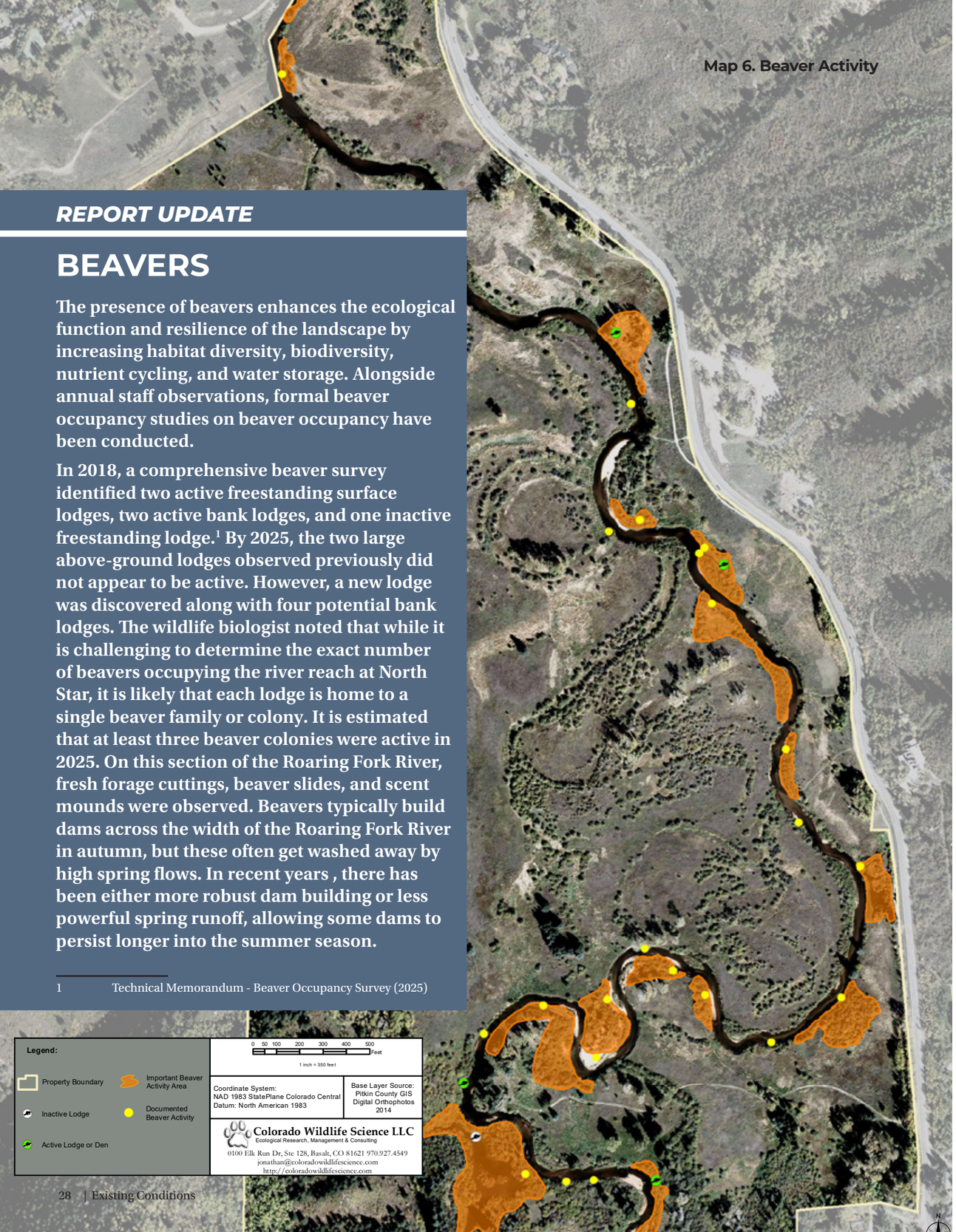
Table 3.Management Indicator Species

Habitat	Management Indicator Species	Status Update (as of 2024)
Aspen Forest	Warbling Vireo	Slight increase, not statistically significant
Riparian Shrublands	Lincoln's Sparrow	Statistically significant upward trend
	Song Sparrow	Statistically significant upward trend
Emergent Wetlands	Red-winged Blackbird	Declining trend
Riparian Woodland	Yellow Warbler	Significant upward trend
	Western Flycatcher (*formerly known as Cordilleran flycatcher)	Increasing trend, not statistically significant
Broad-scale Riparian Specialist	American Beaver	Increasing, no statistical analysis
	Great Blue Heron	No nesting, continued foraging presence, no statistical analysis
Broad-scale Habitat Generalist	Rocky Mountain Elk	Stable, more detections in 2021 than 2014 or 2017, but not enough data for statistical trend analysis

Management actions can impact physical and biotic elements, creating desirable conditions for diverse animal species. Monitoring animals provides insight to habitat condition and use on North Star.



Most MIS are stable or increasing, but red-winged blackbirds, which indicate the health of emergent wetlands, are declining at North Star. Habitat loss is the main threat, with additional impacts from water diversions, overgrazing, human development, and predators. Research shows that red-winged blackbird populations are also decreasing regionally, especially due to issues in their winter habitats, like pest control in Mexico. While efforts at North Star can't address these larger problems, its wetland habitats there are protected, and ongoing fen restoration may help improve conditions for these birds.



REPORT UPDATE

BEAVERS

The presence of beavers enhances the ecological function and resilience of the landscape by increasing habitat diversity, biodiversity, nutrient cycling, and water storage. Alongside annual staff observations, formal beaver occupancy studies on beaver occupancy have been conducted.

In 2018, a comprehensive beaver survey identified two active freestanding surface lodges, two active bank lodges, and one inactive freestanding lodge.[1] By 2025, the two large above-ground lodges observed previously did not appear to be active. However, a new lodge was discovered along with four potential bank lodges. The wildlife biologist noted that while it is challenging to determine the exact number of beavers occupying the river reach at North Star, it is likely that each lodge is home to a single beaver family or colony. It is estimated that at least three beaver colonies were active in 2025. On this section of the Roaring Fork River, fresh forage cuttings, beaver slides, and scent mounds were observed. Beavers typically build dams across the width of the Roaring Fork River in autumn, but these often get washed away by high spring flows. In recent years , there has been either more robust dam building or less powerful spring runoff, allowing some dams to persist longer into the summer season.

1 Technical Memorandum - Beaver Occupancy Survey (2025)

The gentle river gradient, wide valley, and abundant willow and cottonwood trees at North Star provide important beaver habitat in the upper Roaring Fork Valley. Beavers were once plentiful in this area, but trapping significantly reduced their populations by the mid-1900s. While trapping decreased, neighbors or property owners likely tried to control beaver populations before Pitkin County acquired the land. Since then, beaver numbers at North Star have increased, although some anti-beaver activity likely continues on nearby private property.

Birds

North Star Nature Preserve is a National Audubon Society Important Bird Area, recognized as a hot spot for birding and bird conservation. Formal avian monitoring of songbirds, raptors, owls, waterfowl, and wading birds has occurred regularly at North Star since 2000. Regular monitoring enables OST to build long-term datasets and identify important trends over time that are beyond the inherent year-to-year variability. As of 2020, at least 86 bird species have been formally documented at North Star during the breeding season. More general reports indicate more than 100 bird species use the area. Avian species richness remained relatively consistent from 2001 to 2020. ***In 2020, species diversity was reported as 3.49 (on a scale of 1.5 to 3.5), confirming the significant avian biodiversity for which North Star is known locally and regionally.***

The most common birds at North Star documented during 2020 songbird surveys were the yellow warbler, American robin, song sparrow, violet green swallows, and road-tailed hummingbirds. For raptors, Golden eagle, bald eagle, northern goshawk, great-horned owls, northern saw-whet owls, American kestrel, Cooper's hawk, osprey, and red-tailed hawk have all been documented at North Star. Ospreys and red-tailed hawks likely breed near North Star, while a known Cooper's hawk nest exists within the property and was active during the most recent surveys of 2021. The avian dataset at North Star comprises 17 points that have been surveyed across 12 monitoring efforts (2001-2004, 2006-2008, 2011, 2013, 2015, 2017, and 2020), yielding 4,041 detections of 82 species during the monitoring period. The calculated Shannon Index of avian species detected by means of the point-transect protocol varied from a low of 2.86 in 2006 to a high of 3.49 in 2020.

REPORT UPDATE

SENSITIVE BIRDS

North Star is home to many bird species known to be sensitive to human activity. Data analysis indicates a statistically significant positive trend from 2000 to 2020, suggesting that habitat conditions at North Star may have improved for species sensitive to human disturbance. The ratio of sensitive bird species to species tolerant of humans increased at North Star during the 2000-2008 monitoring period.[1] In 2020, the ratio of sensitive bird species, such as the Fox Sparrow and Western Flycatcher, compared to habitat generalists and species tolerant of humans, such as the American Robin and Black-billed Magpie, was 4.4 to 1.

1 Avian Monitoring Report 2011

At least seven species of waterfowl (American coot, Canada goose, cinnamon teal, gadwall, green-winged teal, mallard, and pied-billed grebe) likely breed at North Star.[7] Waterfowl nest and feed in the oxbows and slow backwater areas of North Star, which serve as a refuge during occasional flooding. Migrating ducks use North Star heavily as a stopover, while the open water is utilized regularly by resident ducks. ***Several ground-nesting bird species use North Star, and the limited access corridors and west-side closure help protect these birds and their nests.***

AQUATIC LIFE

Macroinvertebrates

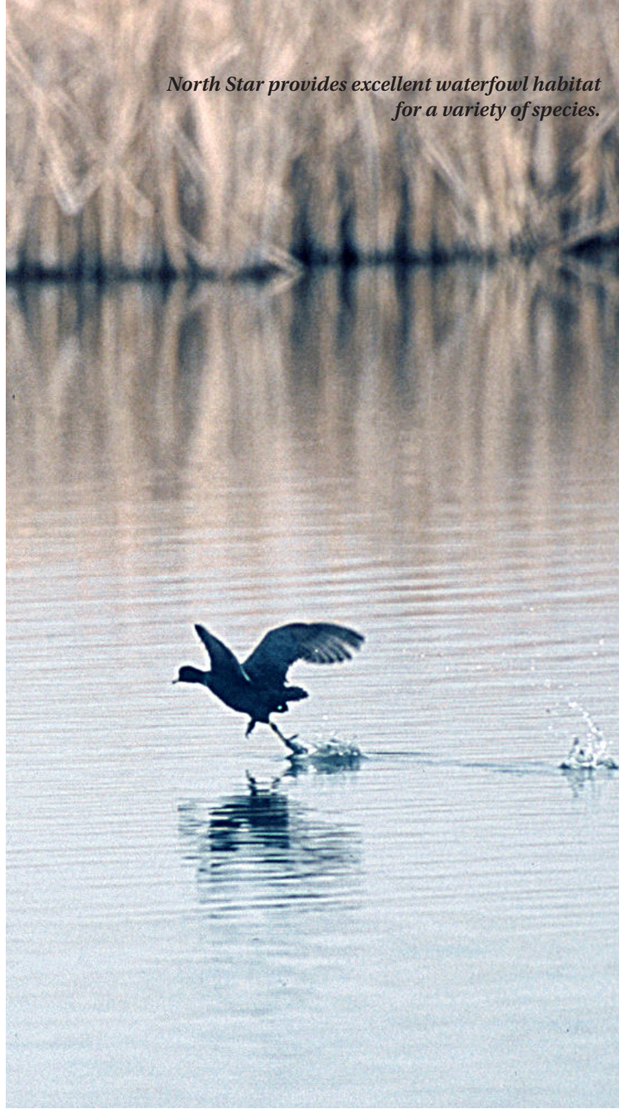
Benthic macroinvertebrates—the aquatic insects, worms, and crustaceans that live in the streambed—serve as a strong indicator of localized water quality conditions. Macroinvertebrate community assessments indicate that overall water quality is well above the state's threshold. High proportions of macroinvertebrates in the collector-gatherer feeding guild were found in sampled reaches, which is unsurprising given the aquatic habitat types present throughout North Star. Macroinvertebrate biomass

7 2017 NSNP Fluvial Geomorphology and Aquatic Life Monitoring Report

Bears captured on a wildlife camera.

Beaver dam

Moose on the Preserve in 2018. 2017 was the first year Moose were formally documented on the property.



North Star provides excellent waterfowl habitat for a variety of species.

Deer at the Preserve in fall

A beaver on North Star

Red-winged blackbird - North Star

A herd of elk gather on North Star during the winter. Craig Turpin photo

Stocked trout beneath the North Star pedestrian bridge.

Elk crossing the river in the evening

REPORT UPDATE

GREAT BLUE HERONS

Great blue heron populations in Colorado are stable, and the species is not a major conservation concern. However, special consideration is given to this charismatic species, as it has received significant attention from the public. For years, volunteers and community members, particularly Heather and Charlie Hopton, monitored the heron activity at North Star. In 2018, OST conducted a formal Great Blue Heron Colony Assessment. This assessment codified standard monitoring methods, consolidated information from local volunteers, and mapped key habitats of the heron.[1]

Unusual in its high elevation and location in spruce trees, the great blue heron colony at North Star fluctuated in numbers and declined over time. The colony relocated from the west side of the river to the east side in 2006 and established upstream of North Star on private property. As of 2017, great blue herons have not actively nested on North Star.

Research indicates that several factors can contribute to the relocation of heron colonies. The many potentially contributing factors include nest stand health, nest tree species, distance to foraging areas, human disturbance, weather conditions during nesting periods, predator populations (eagles, owls, raccoons, bears, martens, and skunks), and natural colony movement. Recreational activities near the colony have greatly increased in the last decade. In 2015, a quiet zone buffer was established around the colony to minimize human disturbance. Other disturbances, such as construction noise, highway traffic, and neighboring barking dogs , have also increased in the area, with limited mitigation options.

Despite these challenges, high-quality foraging areas persist at North Star. There are at least five potential replacement nest stands within North Star that have been protected from the beavers with appropriate fencing following biologist recommendations. Herons continue to forage in and around North Star, with notable activity at the restored fen site.

1 Technical Memorandum - Great Blue Heron Colony Assessment (2018)

is limited in this stretch of river by minimal riffle habitat (i.e., low gradient, small substrate predominates). Macroinvertebrate sampling was conducted by Roaring Fork Conservancy (RFC) in 2023. Comparisons with studies by other organizations (USFS, City of Aspen, and Colorado Department of Health and Environment) on the upper Roaring Fork River outside North Star reveal that macroinvertebrate community health declines downstream of North Star, as the river enters Aspen.

Fish

Fisheries are an excellent indicator of overall watershed health, but serve as a weaker indicator of localized water quality conditions due to the high mobility of individual fish. They can easily migrate through stream networks, traveling many miles of stream and through various habitat types. Colorado Parks and Wildlife historically conducted fish sampling within this stretch of the river, but relocated that sampling upstream.[8] Brook trout, brown trout, and mottled sculpin were observed within the stream reach during the last sampling at North Star in 2018; no native cutthroat trout were documented. Fewer fish were present, and most fish were relatively small compared to upstream and downstream reaches of the Roaring Fork River, which is unsurprising given the low gradient and small substrate here. The greatest numbers of fish were found near undercut banks, highlighting the importance of these habitat areas in the low-complexity channels that dominate this section of the Roaring Fork River. The river through North Star likely serves as a pass-through reach for salmonid populations, but may also supply shallow and slow backwater habitat types that are utilized by some fish species during their younger life stages.

Colorado Parks and Wildlife aquatic biologists did not identify any critical or degraded conditions that produced relatively low fish biomass in North Star. Rather, the fishery is limited by food supply, which is naturally limited by the habitat types and substrates that dominate the reach. With the low gradient and associated small substrate being the primary factors affecting fish habitat here, there is little potential for fishery improvements within this reach. Like elsewhere along the Roaring Fork, fishery populations are supplemented by CPW stocking efforts from time to time.

Fish kill events have occurred above or at North Star in recent history, in association with the water quality issues in Lincoln Creek and at Grizzly Reservoir, which are linked to high levels of naturally occurring toxic metals. This is a relatively new challenge, exacerbated by climate change, as warmer, drier conditions lead to lower streamflow and higher water temperatures, which reduce the natural dilution of metals and increase their toxicity to fish.

Reptiles/Amphibians

Comprehensive reptile and amphibian monitoring has not been conducted at North Star to date, but these species are recorded in general wildlife surveys. According to CPW biologists, there is a strong likelihood that boreal toads, a State of Colorado endangered species, could use this area as a suitable habitat if it is present. Maintaining wetland habitat would be beneficial to the area's reptiles and amphibians. In 2021, the Western terrestrial garter snake was formally documented in this area for the first time.

SPECIAL STATUS SPECIES:

The Canada lynx and the gray wolf are the only federally listed species that have the potential to occur on or adjacent to North Star. The Roaring Fork Watershed is part of the gray wolf's historic distribution, but wolves were eradicated in Colorado by the 1940s. Since 2015, the U.S. Fish and Wildlife Service restored gray wolves in coordination with Wyoming, Idaho, Montana, New Mexico, and Arizona. There are now wolves known within Colorado, including naturally dispersing and reproducing wolves observed in 2021. Colorado Parks and Wildlife has subsequently developed a Colorado Wolf Restoration and Management Plan (CWRMP) to guide the fulfillment of the planning components of the statutory requirements outlined in CRS 33-2-105.8. Consult the CWRMP for information regarding Colorado wolf reintroduction and legal status. Now that gray wolves have been reintroduced to the area, it is likely that they will occur at North Star at some point. The property provides suitable habitat for several other sensitive species, as designated by the State of Colorado, USFS Region 2, Colorado Natural Heritage Program, or the Bureau of Land Management. Sensitive species at North Star include the boreal toad, cutthroat trout, northern leopard frog, river otter, Pacific marten, hoary bat, pygmy shrew, Townsend's big-eared bat, bald eagle, and numerous bird species. Of the sensitive species, only the bald eagle, Pacific marten, goshawk, olive-sided flycatcher, and loggerhead shrike have been formally documented at North Star.

There are 32 sensitive bird species that have been detected at North Star to date, and they are designated by one or more governmental agencies or conservation organizations as having special status or being in decline. The complete list can be found in the 2024 North Star Wildlife Monitoring Report.

8 (K. Bakich, CPW aquatic biologist, pers. comm., 2022)

Map 7. Wildlife Species Maps

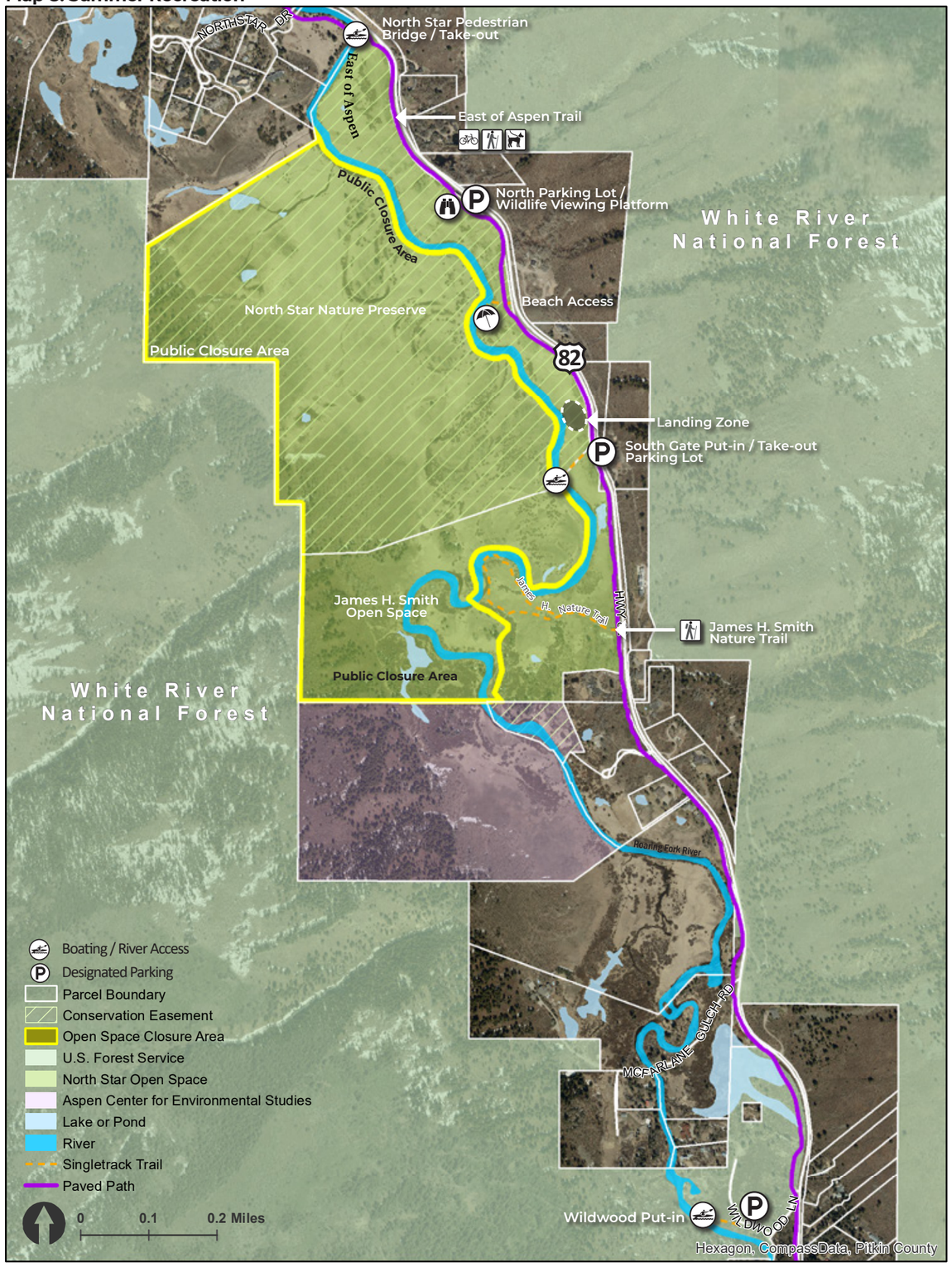
2.2 VISITOR USE

VISITOR USE MANAGEMENT

For decades, recreation at North Star was minimal and largely unmonitored. In the 1990s and early 2000s, kayaking, canoeing, and paragliding were the primary recreational draws. In 2011, boosted by the growth of social media and smartphones, floating from Wildwood through North Star gained popularity among tubers during the peak summer season, resulting in a significant increase in recreational river use. With no shared regulations or consistent messaging from the Wildwood Put-in downriver to North Star, unmanaged recreation led to a party-like atmosphere and challenges with trespassing. Tubes often popped mid-float, prompting people to exit the river to reach the highway through private properties. Unregulated commercial activity occurred as shuttles dropped off floaters, and an increased parking demand along Wildwood Lane raised serious concerns about access and safety.

Prior to 2015, the 2000 North Star Nature Preserve Management Plan limited commercial river use to a single operator; however, there were no limits on the operator's group size or number of launches. Furthermore, the commercial limit in the 2000 North Star Nature Preserve Management Plan did not apply to the Wildwood Put-in on USFS lands, where most of the unregulated use originated. In response, the 2015 North Star Nature Preserve Management Plan established a permit system across jurisdictional boundaries with the USFS to regulate the commercial use of the river and outlined several other strategies to manage visitor use of the river corridor and the preserve. The intent of the changes to the commercial permits was to alleviate parking congestion at the access points, as well as educate floaters about the importance of the preserve and key regulations, and mitigate the party-float atmosphere that developed. With this coordinated commercial permit system, every shuttle, hotel, and taxi service that dropped off passengers at the river was required to participate in training and share etiquette and ecological awareness messages

Map 8. Summer Recreation



Map 9. Winter Recreation

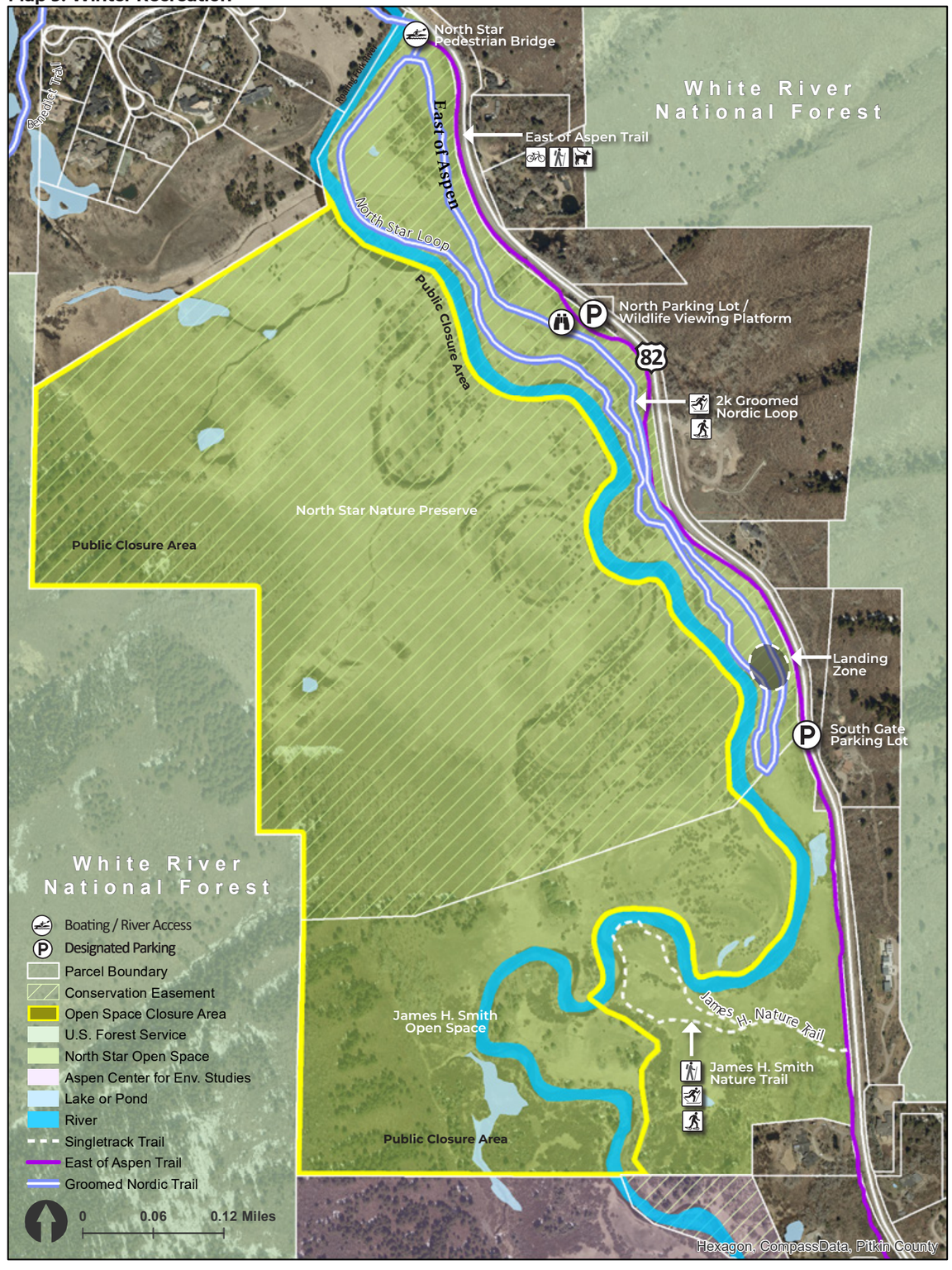
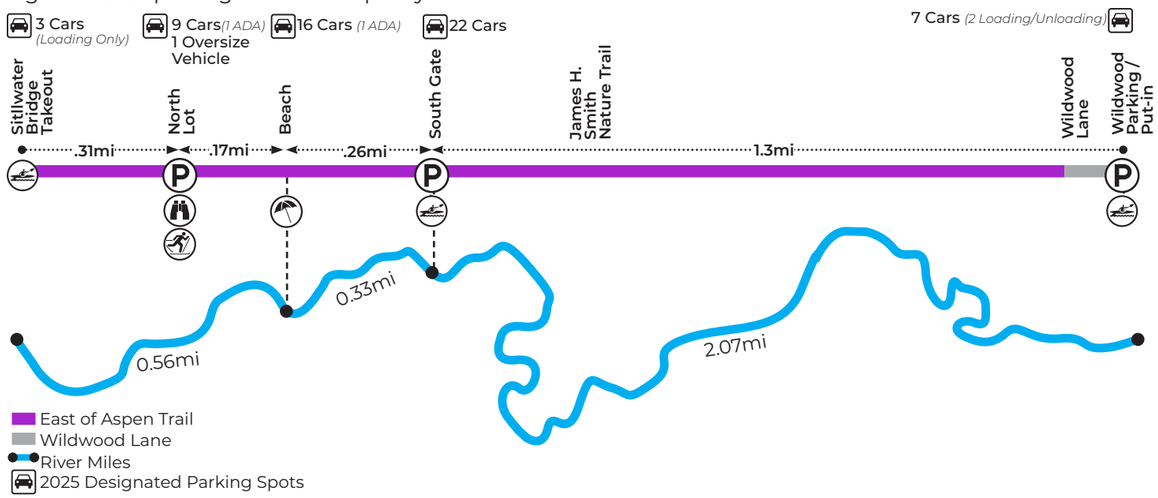


Figure 4. 2025 parking areas and capacity



with their clients. Open Space and Trails also invested in education and enforcement to help shift user behavior toward more respectful recreation.

In 2014, the introduction of paddleboards made floating the river a more accessible and popular activity for a greater number of age groups and experience levels. Compared to a kayak or canoe, paddleboards were less expensive and could be easily transported and inflated at the put-in. By 2020, paddleboarding had become the primary method for floating the river.

The 2020 North Star Nature Preserve Management Plan was a continuation of efforts to adapt and strengthen visitor use management. It included new rules that limited commercial launches, enforced quiet-zone regulations, closed the river to commercial use at low-water levels, and formalized parking at access points. Open Space and Trails also began to work with the USFS on a land exchange to gain greater management authority at Wildwood.

In 2023, concerns from neighbors about commercialization prompted the Pitkin County Board of County Commissioners to cap the number of commercial operators to five and institute stricter launch schedules. By 2024, formalized parking areas had been established to manage congestion for the 2024 and 2025 seasons. A visitor use management study was also conducted.

PARKING AREAS AND ACCESS POINTS

Limited public access between the river and Highway 82 has been accommodated within specific corridors that were established in 1989, along with the closure of the west side of the river to public access. There is no public access to North Star from USFS lands to the west of the property.

Designated Parking

Improvements to three parking areas, completed in 2024, provide 48 parking spaces for access to North Star:

- North Parking Lot: 8 parking spaces, 1 ADA space, and 2 oversized vehicle spaces
- The Beach Parking Lot: 15 parking spaces and 1 ADA space
- South Gate Parking Lot: 21 parking spaces

The North and South Gate Parking Lots are used year-round and are plowed in the winter. South Gate and The Beach offer information kiosks, bike racks, and paddleboard racks. No trash receptacles or restrooms are provided.

Stillwater Bridge Take-out

Improvements to an informal pullout at the Stillwater Bridge, where most river users take out after floating the river, were completed in 2024 to accommodate three vehicle staging areas designated for 10-minute loading. An information kiosk and paddleboard racks are provided.

Informal Pull-outs

Between the Stillwater Bridge Take-out and the North Parking Lot, there are two informal pull-outs on the Highway 82 shoulder. This parking within the highway right-of-way can accommodate approximately ten vehicles. Open Space and Trails coordinates with CDOT to sign and close all other areas adjacent to North Star along Highway 82.

Wildwood Put-in and Parking Area

While on USFS land and not a part of North Star, most river users begin their float from the Wildwood Put-in. There are seven signed parking spaces and two vehicle staging spaces. The practice of double-parking was eliminated in 2023.

DESIGNATED RECREATION LOCATIONS

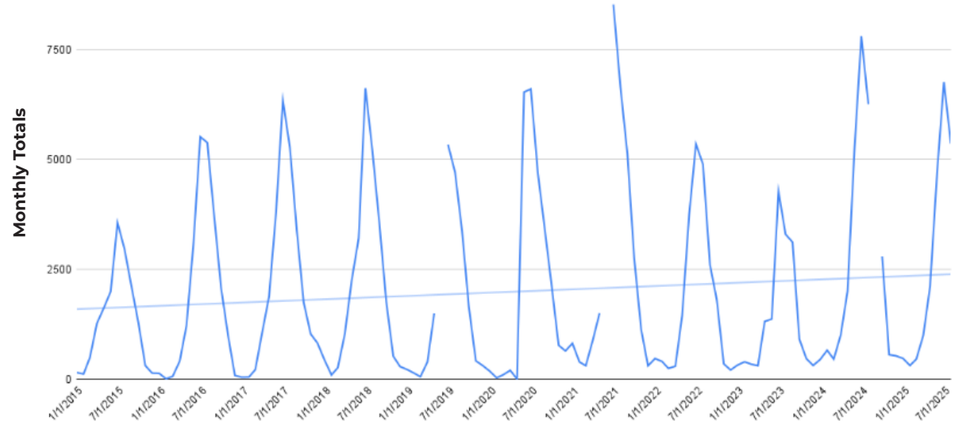
Designated recreation locations within the limited use zone between the river and the East of Aspen Trail and Highway 82 include: (see Map 8 and 9).

Trails

East of Aspen Trail

The East of Aspen Trail runs parallel to Highway 82 along the eastern side of North Star. Mostly surfaced with crusher fine, it provides a slower, winding route connecting Aspen and Difficult Campground. Portions of the trail have been upgraded to meet Americans with Disabilities Act (ADA) standards in 2015 and 2023. See Figure 6 for trail counts since 2015.

Figure 5. East of Aspen Trail Counts 2015-2025



Wildlife Viewing Platform

There is a wildlife viewing platform that is accessed from the East of Aspen Trail near the North Parking Lot. The platform includes interpretive signage, seating, and a viewing scope.

James H. Smith Interpretive Loop

The James H. Smith Interpretive Loop Trail is accessed via the East of Aspen Trail. This 0.4-mile natural surface trail provides a peaceful year-round pedestrian route around the south end of the preserve. The trail does not provide river access.

Roaring Fork River and River Access Corridors

The public has the right to float on most of the major river systems in Colorado, such as the Roaring Fork River, if they enter and leave the river from public property and do not touch the bottom or banks. The float trip through North Star is a popular summer recreation experience. Most river users launch on USFS property at Wildwood Lane and take out at the Stillwater Bridge Take-out on the north end of North Star. Open Space and Trails has been collecting river use counts consistently since 2018 (see Figure 7). River use is generally reflective of yearly river flows, temperatures, and precipitation, and fluctuates in response to social trends. River use is highly concentrated during a three-month season, from June to August, and within that season, use is greatest on weekends and holidays. Daily use peak is considered to be between 2:00 p.m. and 4:00 p.m. (see Figure 11).

At North Star, public river users are confined to the Roaring Fork River and designated access corridors,

including South Gate, The Beach, and the Stillwater Bridge Take-out. Three public access corridors provide a pedestrian connection from East of Aspen Trail to the river's edge:

- South Gate: Used as a river launch and take-out, and to launch watercraft in high water when upstream bridges become problematic or low flows when the voluntary closure is in place upstream.
- The Beach: The only place along the river float from Wildwood to the Stillwater Bridge Take-out where people are permitted to beach watercraft or access the water from the parking area. This was established through the 2000 North Star Preserve Management Plan. The Beach is heavily used during peak summer months by families with young children and people seeking a sandy spot next to the river.
- Stillwater Bridge Take-out: Used mainly as a take-out for river users, but also sees use from people hanging out on the bridge and swimming in the river.

Public use has remained generally stable from 2018–2025, with year-to-year fluctuations but no meaningful long-term change. Excluding the unprecedented global events of 2020, the total annual number of river users fluctuated between approximately 6,000 and 9,000. With the vast majority of use occurring in June, July, and August.

Figure 6. Overall River Use and Weather Trends (May to September)

Commercial use is tracked annually by operator reports and has a high level of accuracy. Public use is captured through camera data, located at James H. Smith. Available camera data varies by year and is currently collected from May 1 to September 30.

****cfs=cubic feet per***

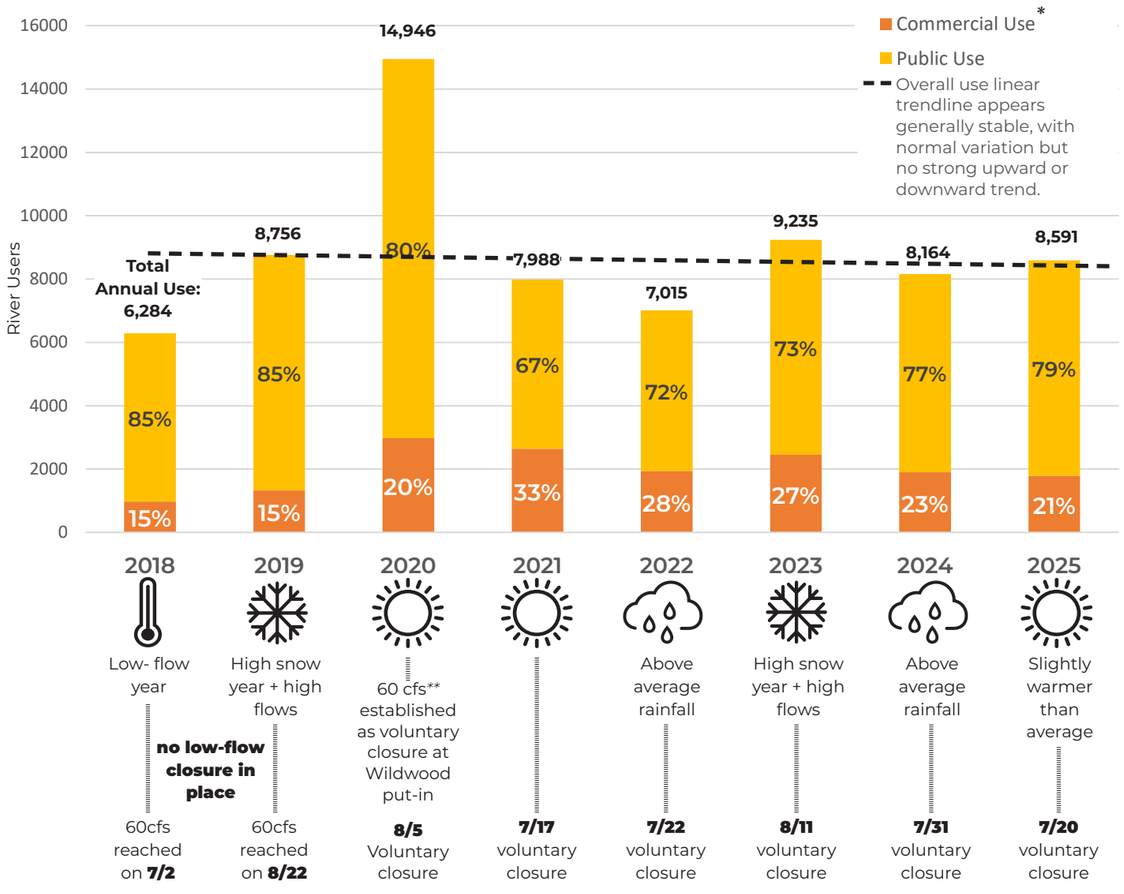
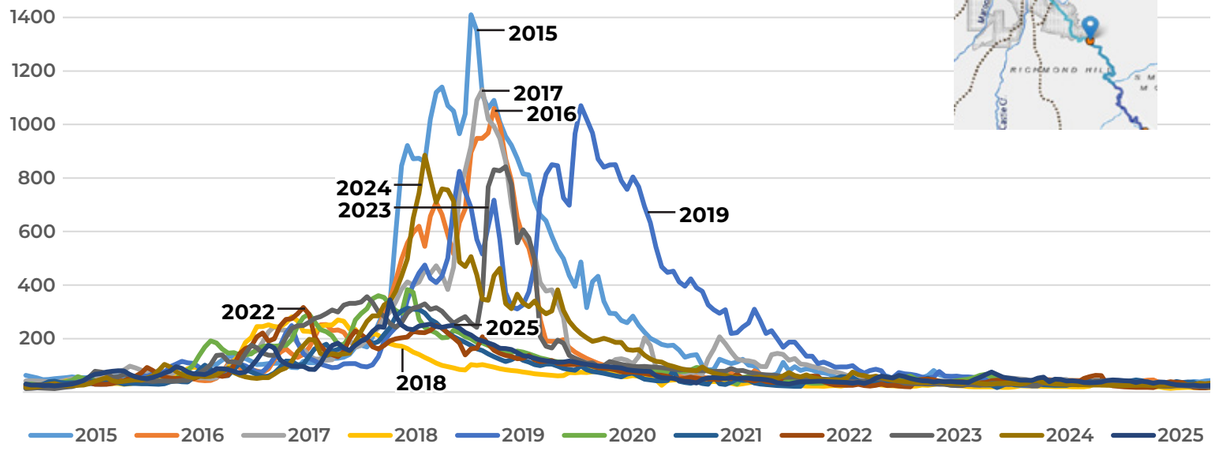


Figure 7. Roaring Fork River flows above Aspen (2015-2025)



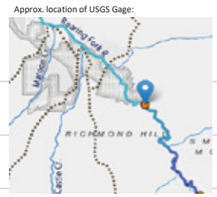
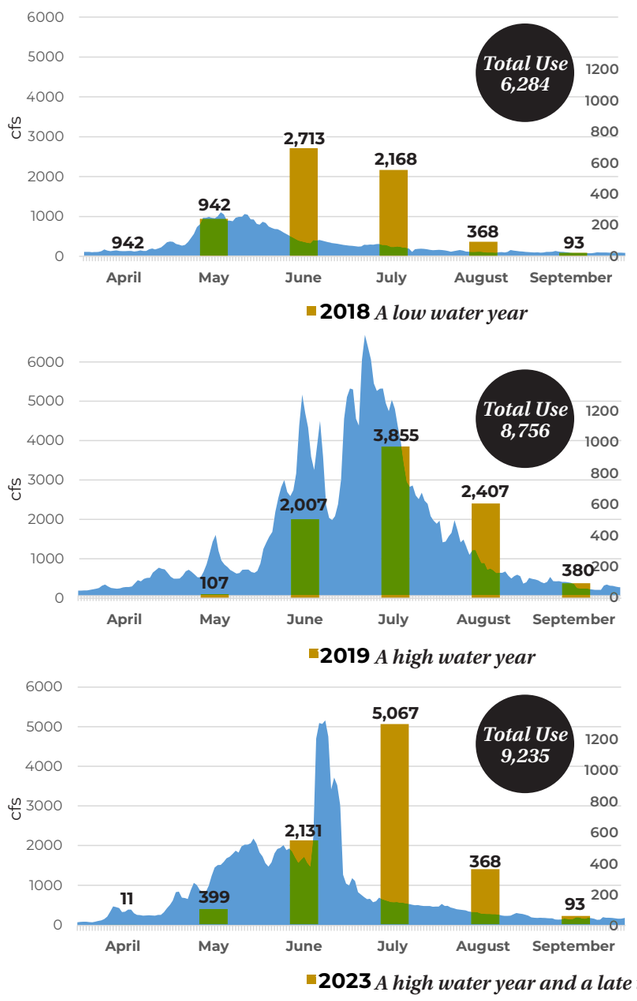
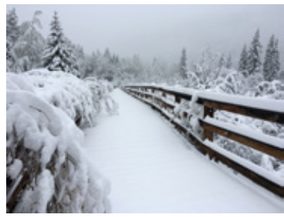


Figure 8. River Flows and River Use Numbers



There are several factors that affect total annual river use and year-over-year fluctuations, including fluctuating river levels and seasonal and daily weather patterns.

May 11, 2018 - North Star Beach



May 21, 2019 - East of Aspen Trail

Annual weather variations: these two photos, taken in May 2018 and 2019, show how dramatic the difference in weather can be year to year at the North Star Nature Preserve.

REPORT UPDATE

VISITOR USE MANAGEMENT STUDY & ECOLOGICAL MONITORING REVIEW

The 2025 Visitor Use Management (VUM) Study and Ecological Protocol and Management Review was conducted by a consultant group to provide a data-driven basis to: 1) understand current recreational river use conditions; 2) provide peer review of ecological monitoring; 3) evaluate potential impacts of recreational river use on ecological, social, and operational conditions; and 4) identify ecological monitoring and visitor use management strategies to achieve desired conditions.

Key Findings

Visitor Crowding Thresholds

Visitor crowding on the river itself is relatively low, with conditions that remain within acceptable tolerance levels for the majority of river users. Through working group and partner discussions, a tolerance range of 6 people per viewscape (PPV) was identified as an appropriate benchmark for maintaining a high-quality, quiet, and nature-oriented experience. At thresholds of less than or equal to 6 PPV, daily river use was within acceptable limits for all but the busiest short periods in July.

Parking Congestion

While the river corridor can accommodate most current use without significant crowding felt on the river, the primary operational constraint is parking congestion at the Wildwood Put-in. Congestion occurs at the Wildwood Put-in long before river crowding becomes an issue.

Ecological Monitoring

The existing monitoring program is fundamentally sound and comprehensive, with robust protocols for data collection, handling, and long-term tracking across multiple resource areas. The peer review also underscored that the program's design, documentation, and data management processes meet accepted scientific standards, lending credibility to trend analyses, condition assessments, and decision-making based on the monitoring results.

Recommendations

- **Monitor peak river use and peak wildlife activity to avoid temporal conflicts (e.g., early morning or evening wildlife use).**
- **Ongoing monitoring supported by measurable indicators and thresholds, including ecological indicators, crowding on the river (PPV), and Vehicles at One Time (VAOT).**
- **Peak use management strategies.**
- **Consider arrival management tools, such as public and commercial group size limits, timed-entry commercial launches, or commercial drop-off spacing.**

Table 4. River User Crowding

Crowding-related capacity estimates (24-hour daily downstream recreational river use)

Time exceeded per day (9:00 a.m. to 7:00 p.m.)	PPV <= 4	PPV <= 6	PPV <= 8
Not exceeded	33	151	269
<10 minutes per day	95	229	362
30 minutes per day	216	370	524
60 minutes per day	349	549	749

Table 5. Put-in Parking Capacity

Wildwood capacity estimates (24-hour daily downstream recreational river use)

	Estimate
Wildwood Put-in parking-related capacity (Current Condition)*	130 people
Wildwood 15-minute drop-off only capacity**	362 people

*Assumptions: Design capacity of parking at Wildwood is 8 parked vehicles at one time. Average commercial shuttle occupancy = 6 people per vehicle. Average private vehicle occupancy = 3 people per vehicle.
**Assumptions: Wildwood is 8 15-minute drop-off only spaces. Each space can accommodate up to 2 drop-offs per hour. Maximum daily VAOT of "displaced Wildwood Put-in parking demand" is estimated to be ~23 VAOT. Maximum daily total VAOT is estimated to be ~70 VAOT.

Figure 9. River Use Season and Monthly River Use Totals

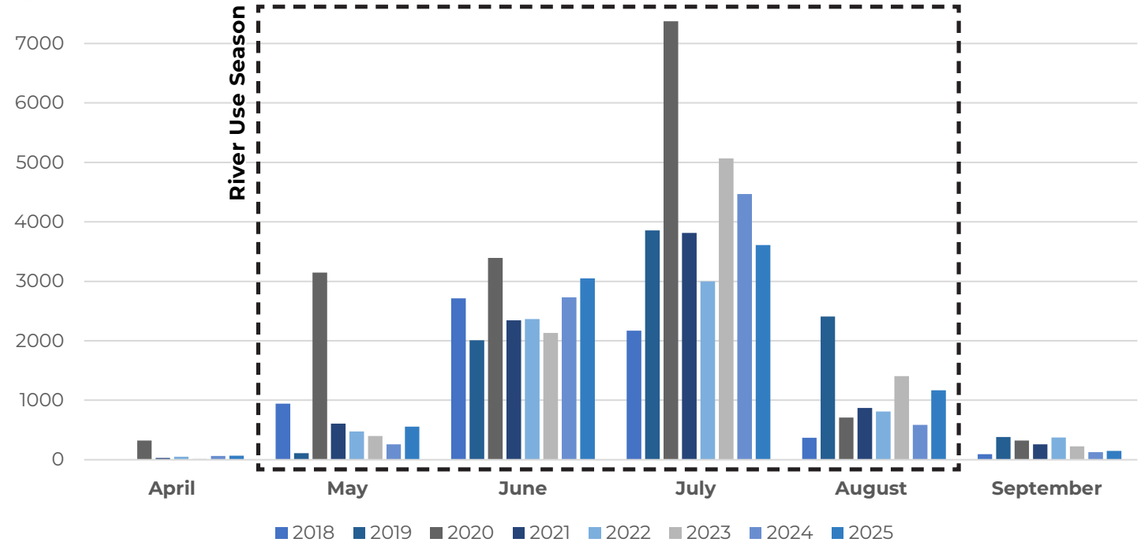
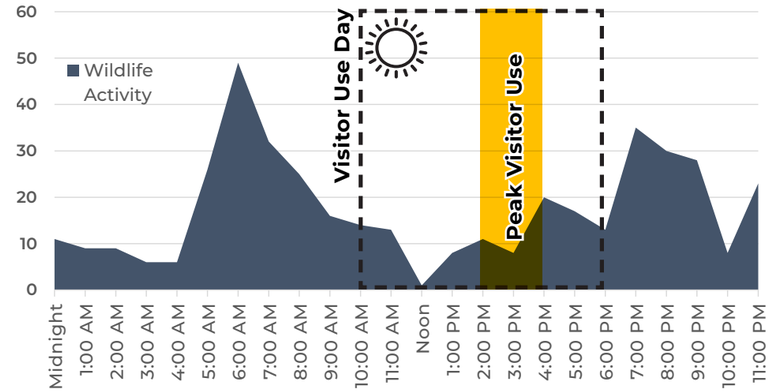
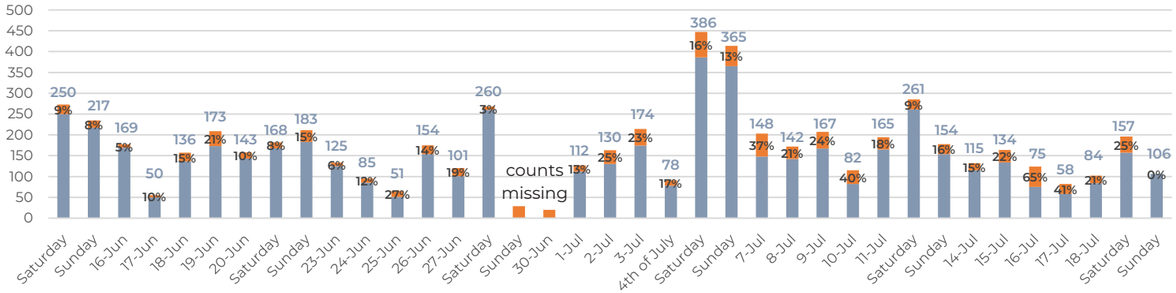


Figure 10. Peak Use and Wildlife Activity



Peak river use is largely concentrated between 2:00p.m. to 4:00p.m. June to August. River use is distinct from the periods when wildlife species are most active or dependent on North Star (dawn/dusk and spring/fall). Predictable patterns of human activity create benefits for wildlife through known timeframes and areas of reduced disturbance.

Figure 11. Peak Use Days and Public versus Commercial Users (June to July 2025)



During 2025 peak season, river use exceeded visitor crowding thresholds on one day: on the weekend after the 4th of July. On the busiest weekend, commercial use represented 16-19% of overall use.

North Star Landing Zone

The North Star landing zone at South Gate is used by paragliding pilots launching from Aspen Mountain. The landing zone is open year-round, with most landings occurring from June to September. Paragliders and hang-gliders are allowed to land in the designated landing zone only. Non-commercial, public paragliding landings are limited to 30 per weekday and 50 on weekend days (established in the 2000 North Star Nature Preserve Management Plan). Recreational hang-glider landings are limited to five per day.

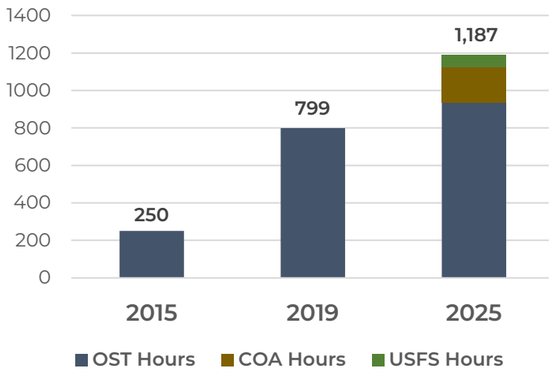
Nordic Loop/Winter Use Areas

In winter, a Nordic loop on the east side of the river is groomed for both classic and skate skiing at North Star. The terrain offers a beginner-level, mellow, contemplative skiing experience. The loop is also open to snowshoe use, but walking on the loop is prohibited. Ungroomed winter use is allowed on the East of Aspen Trail and on the Jame H. Smith Trail. Skiing is prohibited between April 15 and November 30 - a limitation established in the 2000 North Star Nature Preserve Management Plan. Refer to Table 6. for annual Nordic use and season length.

Table 6. Nordic Skiing Participation

North Star Nordic Skiing				
Season	**Use Numbers**	**Season Length**	**Total Days**	**Average Daily Users**
2024/2025	**2,040**	**11/16 to 3/22**	**126 days**	**16**
2023/2024	**6,141**	**12/1 to 4/8**	**129 days**	**48**
2022/2023	**5,152**	**11/22 to 4/18**	**147 days**	**35**
2021/2022	**3,423**	**12/1 to 4/16**	**136 days**	**25**

Figure 12. North Star Ranger Patrol Hours



ENFORCEMENT

North Star Nature Preserve is one of the three most frequently patrolled properties by OST rangers, along with the upper Rio Grande Trail (from Woody Creek to Aspen) and Smuggler Mountain Open Space. Ranger presence at North Star and Wildwood has increased over time, with noticeable improvements in visitor behaviors and compliance with rules and regulations. In 2025, 38% of total OST ranger patrol time was dedicated to North Star, up from 17% in 2019. In 2019, OST rangers patrolled North Star for about 800 hours during the busy summer months (May-September). By 2025, this increased to approximately 935 OST patrol hours during the summer months.

Rangers increased staff capacity by creating two new full-time ranger positions between 2020 and 2025, and funding two Forest Protection Officers (FPOs). In 2025, City of Aspen rangers added 189 hours of patrol time, and the FPOs added 63 hours to bring the total enforcement hours at North Star to 1,187 hours in 2025. In response to North Star's increasing popularity and changing visitor use patterns, rangers prioritized patrols in the area and made adjustments, such as staggered shifts, to extend patrol coverage into the evening hours, ending patrols just before dusk.

Citations and Safety Incidents

Compliance with the North Star regulations has improved. In particular, between 2015 and 2025, there was a reduction in violations of regulations on "no audible music," "no glass," and "no dogs". Citations and warnings issued by rangers in North Star most frequently addressed dogs off-leash or dogs within closed areas, violations of or failure to obtain special-use permits, and trespassing in areas closed to protect wildlife habitat. The variety of jurisdictions, including homeowners' associations (HOAs) and neighborhoods, and the presence of leashed dogs permitted on the East of Aspen Trail continue to pose challenges to enforcing the "no dogs" regulation. In 2025, 30 tickets were written at North Star, representing 48% of all OST citations written system wide. The issuance of tickets at North Star is higher than other properties because education is pursued rather than a ticket-first, strict enforcement policy which results in two warnings prior to a ticket at other properties. The number of tickets written at North Star has generally been declining. In 2021, 42 tickets were written, representing 67% of total tickets system wide.

The number of safety incidents and medical calls on the East of Aspen Trail has varied since 2020 from zero to four, with a slight upward trend.

Wildwood Put-in

The presence of FPOs, increased ranger patrols, and ACES naturalists at the Wildwood Put-in has led to better management and compliance with parking regulations and river access, although the area still experiences crowding on peak-use days. To maintain access to homes, the preschool on Wildwood Lane, and the fire lane, organizing and regulating parking has remained a focus since the 2015 North Star Nature Preserve Management Plan was adopted. In 2023, the practice of double parking in the available parking spaces was eliminated, effectively halving the number of parking spaces.

COMMERCIAL AND SPECIAL-USE

Commercial uses at North Star have been limited to river and paragliding operations since the 2000 North Star Nature Preserve Management Plan. Permit language, which outlines the requirements and responsibilities of commercial operators, is periodically revisited and updated as needed to ensure that commercial use aligns with management needs. Permits include group size, launch times, vessel types, fees, and reporting requirements (see Section 4 for non-commercial regulations regarding permits).

Commercial River Use

In 2025, OST issued five permits to river operators and shuttle services. Those operators reported 1,785 total commercial users - roughly 21 percent of the total river use documented with the motion-triggered camera placed at the James H. Smith property. All permitted commercial operators receive an educational update from OST rangers prior to the start of the season. Rangers report that commercial guests demonstrate a high level of preparedness and adherence to regulations. In 2025, zero citations were issued to either clients of commercial operators or commercial operators.

The number of reported commercial users increased between 2015 and 2025, as the 2015 North Star Nature Preserve Management Plan allowed for an increase in commercial permits and shuttles to mitigate impacts from parking, traffic, and unregulated commercial use. However, the percentage of commercial users relative to public users stayed stable (about a quarter to one-third of all users) from 2020 to 2025. Commercial operations helped ease parking pressure, limit group sizes, and educate users.

Commercial Paragliding

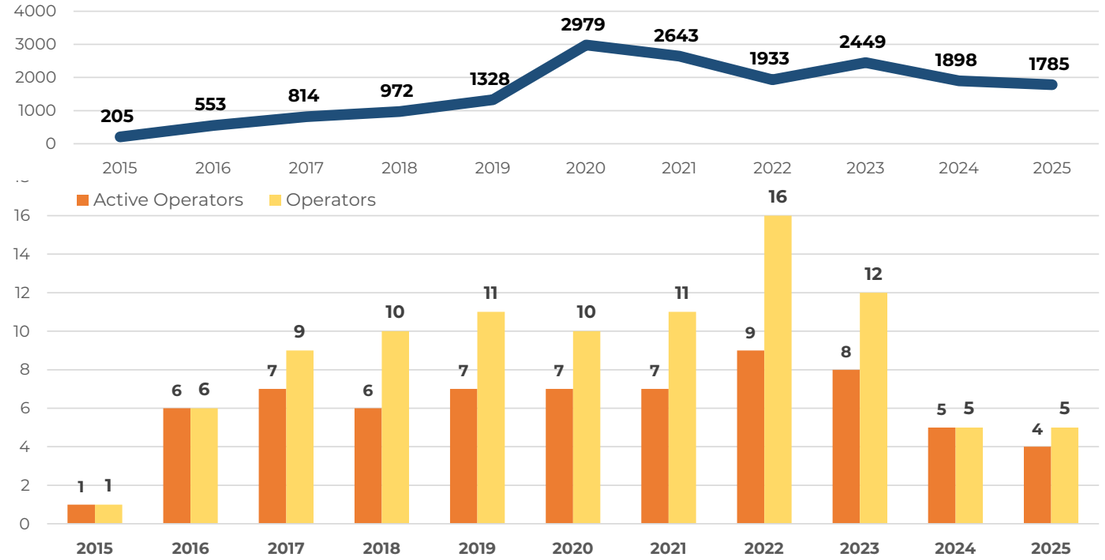
Since the 2000 Management Plan (with an amendment in 2004), one commercial permit has been issued and actively utilized for the landing zone at North Star.

Special Uses

Some of the special uses at North Star that align with the Special Use Policies (See Section 4.6) include:

- The Aspen Global Change Institute (AGCI) operates two soil moisture monitoring stations on the preserve; see Section 2.1 for more details on this program.
- In 2023, the US Geological Survey and, Colorado Water Science Center installed a snow and soil monitoring station on North Star as part of the *Next Generation Water Observing System*. One of the key priorities is to improve the ability to measure and model snow water resources and soil moisture conditions within the Upper Colorado River Basin.
- Local service clubs host conservation trash clean-ups.

Figure 13. Annual Commercial Users and Permitted Operators



Prior to the 2015 North Star Management Plan, only one commercial operator was permitted to float North Star. However, there is no record of unmanaged commercial operators using North Star prior to this date. The 2015 Management Plan enabled OST to issue commercial permits to more than one operator.

EDUCATION

Signage and Interpretation

Signage at North Star is an important tool for managing visitor use and encouraging behavior that aligns with nature preserve etiquette. Messaging is updated over time to reflect best practices, and emerging trends and needs are identified annually in coordination with OST's partners. Wayfinding, regulatory, and informational signage that is consistent with the 2014 Signage Design Guidelines is placed at the access points to the preserve. Additional interpretive signs and exhibits were incorporated at key sites, including the bird blind located on the James H. Smith Parcel, the wildlife viewing platform, and the Wildwood Put-in. Since 2015, signage has been added to the river corridor on private property and within the preserve to communicate important regulations to paddlers and boaters, such as "No Trespassing – Float Through Only", to raise awareness about quiet zones and encourage floaters to protect home and habitat. In addition to permanent signage, various sandwich board signage is used to communicate timely and pertinent information about wildlife, river conditions, and voluntary or mandatory closures.

Open Space and Trails also educates visitors and community members about the preserve by providing off-site information that people can access prior to arriving at the property. Tactics include a website, social media updates, and direct outreach to commercial operators, hotels, and lodges.

Programs

The 2015 North Star Nature Preserve Management Plan established a partnership with ACES to place naturalists on-site at North Star to educate summer visitors about the property's special ecological resources and inform visitors about the regulations for floating the river. Since its inception in 2016, the ACES Naturalist Program has been a vital management tool. The naturalists have a physical presence at the Wildwood Put-in and are encouraged to roam throughout North Star. Over the years, OST staff have addressed feedback to ensure that naturalists do not just function as parking attendants; opportunities for naturalists to help with outreach, data collection for scientific monitoring and visitor use, and mentorship have been developed. The number of naturalists present fluctuates each year depending on availability. For example, between 2020 and 2025, housing constraints led to there being one naturalist paired with a ranger rather than having two naturalists on-site.

The ACES partnership includes ten annual educational programs that take place on North Star, providing program participants with an intimate opportunity to learn about the property and its wildlife and help foster responsible stewards. Naturalists and the education programs have been very well received. ACES program offerings have included:

- North Star Birding: Songs of Breeding Birds, South Side of the River, Early Migration, Fall Birds.
- Walk on the Other Side: One program offered each in July, August, and September.
- Evening of the Elk: Three programs offered in October.

Open Space and Trails partnered with the RFC to lead float tours on North Star as part of its watershed programs, which also take place on other OST properties. The tours offer the public the opportunity to learn more about North Star in a small group setting. The tours are well-received and provide an important background for first-time visitors. The Watershed Explorations have been taking place since 2016, with an average of three programs each summer.

Since 2020, OST has worked with RFC to educate school groups through the "North Star Ecology – Riparian Assessment" program. Since 2021, when this initiative began, between five and 13 programs take place each year, with about 200 students participating annually, providing an opportunity for middle schoolers throughout the valley to experience and learn about the preserve and why it is protected. The programs reach a diverse group of participants that reflects the demographics of the Roaring Fork Valley. A parallel program was developed on Open Space properties in Redstone.

Table 7. North Star Program and Participation

North Star Programs			
Year	**North Star Birding**	**Walk on the Other Side**	**Evening of the Elk**
2025	**32**	**19**	**18**
2024	**31**	**17**	**19**
2023	**36**	**17**	**20**
2022	**30**	**25**	**29**
2021	**31**	**19**	**18**
2020	**26**	**13**	**19**

Table 8. North Star Youth Programs and Participants

North Star Youth Programs				
Year	**Youth Programs**	**Youth Participants**	**Adult Programs**	**Adult Participants**
2025	**5**	**97**	**3**	**37**
2024	**13**	**266**	**2**	**21**
2023	**8**	**144**	**3**	**30**
2022	**9**	**194**	**4**	**43**
2021	**12**	**276**	**2**	**20**
2020	**1**	**12**	**2**	**22**

3. PLANNING PROCESS

3.1 PLANNING FRAMEWORK

The 2025 North Star Nature Preserve Management Plan Update builds on previous management plans, refining rather than reinventing the foundation for conservation. This update is designed to streamline future planning efforts by establishing a clear Desired Future Condition Statement that will serve as the central reference point for evaluating progress and guiding adaptive management. Future updates will commence with this shared aspirational statement, an assessment of current conditions, a review of all actions, and the identification of necessary adjustments. The 2025 planning process focused on both continuing ongoing management and implementing new actions. As a near- to mid-range planning tool, it provides a framework for prioritizing and budgeting management efforts that advance OST's mission and core values.

PHASE 1: DATA COLLECTION AND POLICY REVIEW

The initial planning phase for the 2025 North Star Nature Preserve Management Plan Update involved reviewing relevant plans and policies, preparing up-to-date maps, and evaluating ecological monitoring reports and existing conditions. Information collected is summarized in Section 2. Open Space and Trails developed management plans for North Star and all the county's properties based on conservation biology and ecological best practices, while managing properties for multiple and sometimes conflicting uses. Ecological data, focusing on vegetation, wildlife, and hydrology, have been consistently collected and monitored since 1981. While river and trail use have been collected at the preserve since 2018, and public surveys have been conducted as part of the management planning, the 2025 North Star Nature Preserve Management Plan Update seeks to incorporate scientific data to better understand visitor use dynamics. The VUM Study provides a more rigorous understanding of the quality of the visitor experience and its impacts on the property's ecology. It also incorporates public feedback and input from a working group to formalize a Desired Condition Statement that guides proactive and adaptive management of the preserve.

PHASE 2: COMMUNITY OUTREACH

An extensive public engagement process ensured that the 2025 North Star Nature Preserve Management Plan Update reflects the community's interests, partner expertise, and on-the-ground perspectives. Beginning in January 2025, OST hosted a visitor use management presentation and a question-and-answer session to recap the VUM Study and introduce the planning process. A working

"The number of visitors who seek a destination, visitor activity types, visitor needs and desires, and the technologies that visitors use change over time and vary from place to place. These changes may be sudden or they may occur gradually over years or decades. As visitors' motivations, circumstances, and preferences change, so do behaviors, activities, and needs. Managers of federal lands and waters ("managers") have learned to adjust, often quickly, to changing visitor use dynamics. Amid these changes, it may be useful to check in with managers, Indigenous people and Tribal Nations, the public, and other interested groups and communities on what makes an area distinctive and valued: a steadfast vision, rooted in the past but with an eye to the future."

The Desired Conditions Guidebook
The Heart of Visitor Use Management
Edition One | September 2023

group of representatives from commercial operators, surrounding neighborhoods, the public, land managers, and partner organizations was convened in February 2025 and met three times from March through September 2025 to review past management plans and provide input on the Desired Future Conditions Statement and emerging strategies. Broader public participation included an open house in June 2025 and a public survey that was open from June to July, reaching residents, visitors, and interested organizations. Open Space and Trails also presented to the East of Aspen Caucus and met key agency partners, including USFS, City of Aspen, ACES, CPW, CDOT, and AVLT, to coordinate and align management goals across jurisdictions.

PHASE 3: DRAFT PLAN DEVELOPMENT

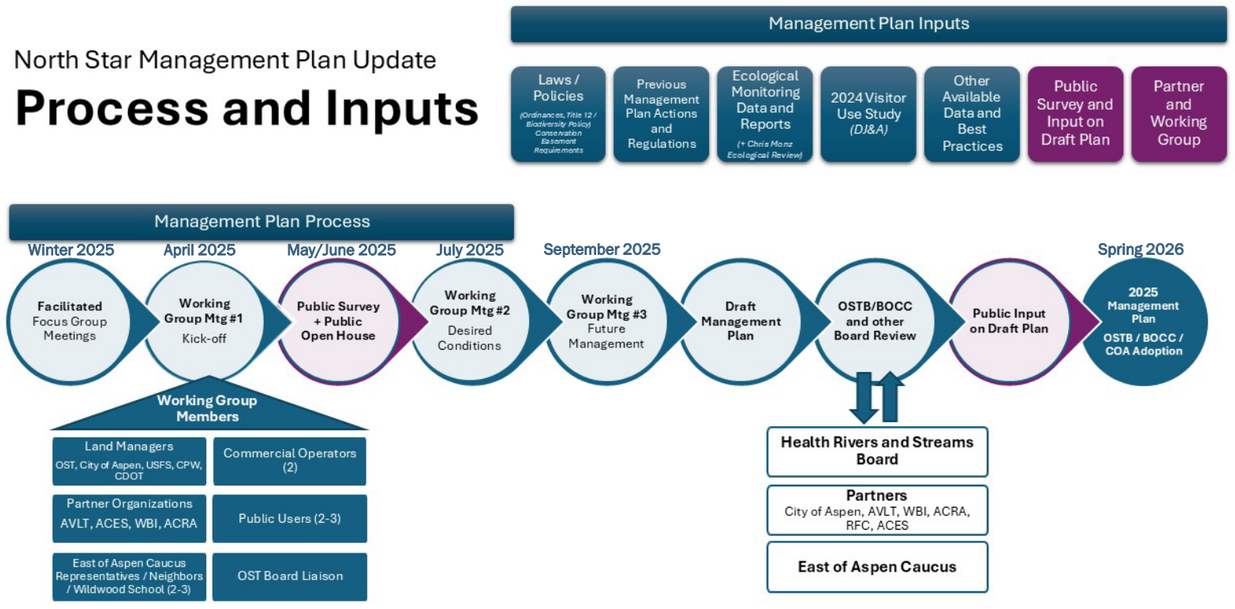
Building on the foundation of collaboration, the drafting of the 2025 North Star Nature Preserve Management Plan Update centered on conservation values— namely, the river system, riparian areas, wildlife and their habitats, biodiversity, and the community. With guidance from the working group and input from technical experts and partner agencies, these values were used to frame the 2025 North Star Nature Preserve Management Plan Update's management goals and actions, ensuring that every strategy directly supported the long-term protection of North Star.

Additional text to be added

PHASE 4: FINAL PLAN REVISIONS AND ADOPTION

Additional text to be added

Figure 14. Plan Update Process



PLAN INPUTS

Plan inputs include natural resource monitoring and reports, input from the public collected through both field intercept and community surveys, working group meetings, outreach events, an East of Aspen Caucus meeting, and partner comments. Refer to the list below for the 2025 North Star Nature Preserve Management Plan Update inputs, with links as available:

Title 12

Open Space and Trails Policies and Objectives

Studies and Reports

- 2025 North Star Visitor Use Management Study
- 2025 North Star Ecological Protocol and Management Review
- 2025 North Star Nature Preserve American Beaver Activity Update – Colorado Wildlife Science
- 2023 North Star Quantitative Vegetation Monitoring
- 2022 Fen Vegetation and Hydrology Monitoring Report-Post Restoration
- 2020-2021 North Star Wildlife Monitoring Report
- 2020 North Star Baseline Fen Vegetation Monitoring Report
- 2020 iRON Vegetation and Soil Moisture Monitoring Report for Aspen and Wetland Transition Community at North Star Nature Preserve – Aspen Global Change Institute (in prep.)
- 2019 Vegetation Type Map, Community Descriptions, and Floristic Inventory – Peak Ecological Services, LLC
- 2018 Riverbank Stabilization Assessment (2017) and Recommendations – Black Creek Hydrology, LLC
- 2018 North Star Nature Preserve Fen Hydrology Restoration Plan. Lotic Hydrological (lead) with Buscher Soil, Peak Ecological, and DHM Design.
- 2018 Groundwater Hydrology Monitoring Report – Western Ecological Resources, Inc.
- 2018 Great Blue Heron Study Technical Memo – Colorado Wildlife Science
- 2018 Fen Hydrology Monitoring Report – Buscher Soil & Environmental. Inc.
- 2018 Beaver Occupancy Study Technical Memo – Colorado Wildlife Science
- 2017 Wildlife Monitoring Report – Colorado Wildlife Science
- 2017 Wetland Fen Assessment & Floristic Inventory – North Star Nature Preserve – Peak Ecological Services, LLC
- 2017 Technical Memo – North Star Nature Preserve Vegetation Monitoring – Peak Ecological Services, LLC
- 2017 Fluvial Geomorphology and Aquatic Life Monitoring Report – Lotic Hydrological
- 2015 Groundwater Level Baseline Report Technical Memo – Golder Associates
- 2015 Ecological Communities & Fluvial Geomorphology Baseline Report – Golder Associates
- 2014 Geomorphic Assessment North Star Nature Preserve – Golder Associates
- 2012 Upper Roaring Fork River Aquatic Life Use Assessment – SK Mason Environmental, LLC & Timberline Aquatics, Inc.
- 2011 Geomorphic Assessment of the Roaring Fork River and Impacts of Groundwater Changes on Wetlands — Miller Ecological Consultants, Inc., and Ayres Associates
- 2011 Avian Monitoring Report (2000 - 2008) – Colorado Wildlife Science
- 2000 Preliminary Hydrologic and Biological Characterization – Colorado School of Mines, Anne Hickey, K. Kolm, and John Emerick
- 1999 Report of Findings Vegetation Monitoring on Commercial Use Site – ESCO Associates Inc.
- 1999 Ecological Characterization Report – Colorado School of Mines, Anne Hickey, and John Emerick
- 1986 Water Resource Analysis of North Star Ranch – Enartech Inc.
- 1981 North Star Vegetation Inventory – Western Resource Development Corp.

Management Plans / Addendums

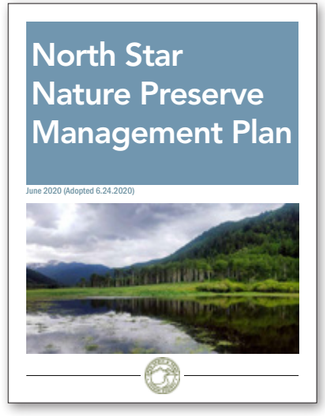
- 2023 North Star Biodiversity and River Use Update
- 2023 Wildwood Addendum / WRNF-2023-07 Occupancy and Use Restrictions
- 2020 North Star Nature Preserve Management Plan
- 2015 North Star Nature Preserve Management Plan
- 2004 North Star Nature Preserve Management Plan Amendment
- 2000 North Star Nature Preserve Management Plan
- 1989 North Star Nature Preserve Management Plan

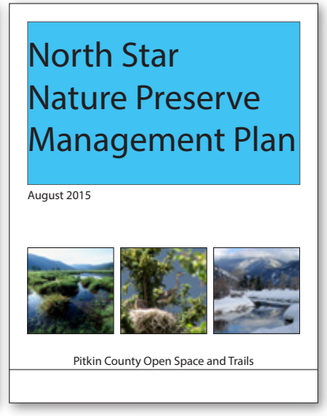
Public Input

- 2025 Community Survey

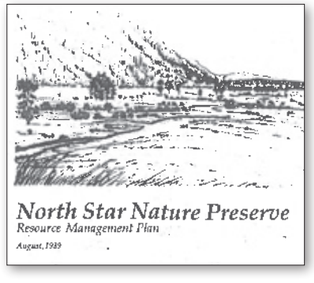
North Star Working Group

- April 2025 Meeting Minutes
- July 2025 Meeting Minutes
- September 2025 Meeting Minutes





Existing and previous plans for North Star and the surrounding area provide the planning foundation for the current management.



3.2 PUBLIC COMMENT

In the summer of 2025, OST conducted a public survey to gain a deeper understanding of visitor experiences, values, and preferences for management at North Star Nature Preserve. A total of 770 participants shared input, providing both quantitative data and extensive written feedback. The results offer a clear picture of community priorities: strong support for habitat protection, thoughtful management of recreation, and a shared desire to preserve the tranquility and ecological integrity that define North Star.

COMMUNITY SURVEY SUMMARY

The following provides a summary of the community survey. The full results can be found in Appendix x. Survey results help identify general themes, opportunities for improvement, and support for future actions; they do not represent a vote, nor are they a statistically valid sampling.

Visitation and Use Patterns

Nearly all respondents (99%) reported having visited North Star. The most popular activities included floating the river (65%), walking or running on the East of Aspen Trail (65%), viewing scenery from Highway 82 (90%), and wildlife observation (52%). Less frequent but important uses included birding, Nordic skiing, e-biking, and educational programs. Visitors reported deliberately timing their trips to avoid busy periods (84% plan visits on weekdays, during early or late season, or outside peak hours) to reduce parking congestion and maintain solitude.

Visitor Values and Motivations

The survey revealed that visitors are primarily motivated by nature-based values rather than recreation or challenge.

- 92% visit to enjoy natural scenery
- 78% seek tranquility
- 77% come to observe wildlife

Only 9% of survey respondents noted that they visit North Star for a physical challenge, underscoring that North Star is viewed as a refuge for peace and connection with nature rather than adventure recreation.

Access and Transportation

The most frequently used access points included Wildwood (57%), the East of Aspen Trail (52%), and Stillwater Bridge Take-out (45%). Most floaters use a single vehicle (63%) and some use a bicycle (46%) to reach North Star and shuttle between the put-in and take-out. Respondents expressed concern about congestion and unsafe conditions at the Wildwood Put-In, recommending that vehicle traffic be limited and alternative transportation options, such as walking, biking, and shuttle access, be expanded.

Satisfaction and Experience Quality

Overall satisfaction was reported to be high. North Star received a 4.2-star average rating during a respondent's typical visit. When asked about levels of use and crowding (a question also asked in 2020), many expressed concerns about overcrowding, particularly at the Stillwater Bridge Take-out (50% reported frequent overcrowding) and at Wildwood (49% reported frequent overcrowding). However, only 25% indicated that there was frequent crowding on the river itself. A visual test confirmed sensitivity to crowding; visitor preference declined sharply once more than six people were visible in a single viewscape. This finding highlights how crowding directly diminished the sense of solitude and quiet enjoyment that visitors seek.

<Insert chart from 2020 plan to show change over time to this question>

Environmental and Wildlife Concerns

Respondents expressed strong concern for wildlife and habitat impacts, identifying disturbance, noise, and erosion as top issues:

- 46% reported wildlife disturbance as a serious problem
- 43% flagged audible music as a concern
- 29% noted interference with beaver dams
- Compaction, trampling, and human waste were also raised as concerns

Support for Current Management Strategies

There was broad public support for existing management tools designed to protect ecological resources and improve visitor behavior:

- 91% supported training requirements for commercial guides
- 90% supported limits on group size
- 88% favored limits on the number of groups per hour
- 84% supported required environmental education for commercial users
- 80% supported zero-tolerance policies for dogs and loud music
- Respondents also expressed openness to voluntary closures during wildlife-sensitive periods or low river flows

Future Management

When asked about desired future conditions, respondents placed high levels of importance on habitat and ecosystem health and providing a place where people can connect with and appreciate nature:

- 87% said it is very important that North Star provides effective wildlife habitat
- 82% valued its role in protecting water quality and flow
- 79% prioritized healthy riparian areas
- 77% valued it as a place where people can connect with and appreciate nature
- In contrast, 47% said river recreation access was "very important," indicating strong community importance for conservation outcomes

When considering future management, most participants supported voluntary compliance, group size limits, and education; however, opinions diverged on potential restrictive or fee-based systems.

When asked to agree with this statement: "It's more important to me that people can access the river freely than to regulate and/or limit access through timed-entry permits, reservations, or other strategies," respondents were split: 42% strongly agreed or agreed, and 49% strongly disagreed or agreed.

Most, 71%, strongly agreed or agreed with the required education of non-commercial, public river users, and 87% strongly agreed or agreed with limits on group size.

Many management strategies for managing parking and river launches require the completion of the Wildwood land exchange. Respondents were asked to rate their level of support for management strategies should the land exchange occur. Many supported creating a vehicle turnaround (67%) and installing real-time parking lot cameras (59%). Only 30% supported timed-entry permits or reservations, and 34% supported paid reservations.

A majority (56%) supported further restricting the commercial use of the river, 32% favored maintaining current levels, and only 4% supported expansion. Open-ended responses suggested a sense that the commercialization of the river experience is occurring, which in some cases revealed tension between locals and visitors, as commercial use is most closely associated with tourism. Many recommended caps on total commercial user days and prioritizing local access over tourists.

Themes of Write-in Comments

- Habitat Protection: Preserve wildlife and fragile ecosystems
- Opposition to Commercial Use: Many want to ban or significantly restrict operators
- Overuse and Loss of Tranquility: Frequent comparisons to "water park atmosphere" or similar verbiage and calls for reduced numbers
- Rewilding Support: Strong enthusiasm for wetland restoration and beavers
- Divided on Permits: Some favor limits, others fear exclusion or barriers to access
- Local Access: Requests to prioritize residents over tourists
- Better Enforcement: Calls for more ranger presence and stricter penalties
- Low-Impact Access: Preference for biking, walking, and shuttles
- Appreciation for Staff: Many thank OST for stewardship
- Misinformation and Adaptive Management: Some confusion persists about what is legally allowed under the conservation easement and the role of adaptive management

DRAFT PLAN FEEDBACK

To be included.

3.3 PARTNER COMMENTS

North Star partners were provided an opportunity to review the draft plan and provide comments. ADD SUMMARY OF COMMENTS ONCE RECEIVED. Refer to Appendix X for the partner letters.

- White River National Forest (WRNF)
- Aspen Valley Land Trust (AVLT)
- City of Aspen
- Aspen Center for Environmental Studies (ACES)
- Aspen Snowmass Nordic Council (ASNC)
- Aspen Chamber Resort Association (ACRA)
- Roaring Fork Conservancy (RFC)
- Wildwood School
- Healthy Rivers and Streams Board (HRSB)
- Colorado Parks and Wildlife (CPW)
- Aspen Global Change Institute TBD?

3.4 RELEVANT PLANS AND POLICIES

2003 EAST OF ASPEN/ INDEPENDENCE PASS MASTER PLAN

This plan addresses the North Star Nature Preserve area. Relevant to North Star, the East of Aspen Caucus supports the maintenance and management of the area through management plans and recommends that these plans be referred to and reviewed by planning-area residents to obtain their input as they are developed and updated. Management plans should address the commercial use of publicly owned open space, and such use should be managed in a way that does not conflict with or curtail the enjoyment of the open space by other users. The plan supports the efforts of a mosquito control district.

TITLE 12 OF THE PITKIN COUNTY CODE

All properties and trails managed by Pitkin County Open Space and Trails are subject to the regulations set forth in Title 12 of the Pitkin County Code. Individual properties are subject to additional terms set forth in their respective management plans.

OPEN SPACE BOARD POLICIES

Protection of Natural Biodiversity and Management of Human Use (adopted 2016):

This policy requires that human uses on Open Space and Trails properties are managed in a manner that preserves and protects native biodiversity. The Open Space and Trails program seeks to rely on the best available science to guide management decisions, inform specialized habitat management needs, and identify opportunities to restore healthy, natural functions in degraded habitats. Spatial or temporal closures or other appropriate mitigation strategies are supported to protect sensitive habitats from recreational impacts.

Climate Policy (adopted 2025):

This policy requires climate considerations on OST properties.

2014 PITKIN COUNTY OPEN SPACE AND TRAILS SIGNAGE DESIGN GUIDELINES

The 2014 Signage Design Guidelines cover materials, graphics, types, templates, installation, and maintenance for signs on Pitkin County Open Space and Trails properties.

2015 PITKIN COUNTY NORDIC TRAILS PLAN

The Nordic Plan outlines the vision for the Nordic system in Pitkin County, highlighting North Star Nature Preserve as a site for a “mellow, contemplative ski.” It considers future Nordic skiing areas and prioritizes equipment and staff needs for a seamless system. The Nordic Plan suggests Nordic skiing on the East of Aspen Trail, recommends expanding the parking area at North Star, and improving trail connections, including the Benedict Trail-to-North Star Route.

The Aspen Snowmass Nordic Council has modeled anticipated changes in temperature and precipitation. According to the model outputs, average daily minimum temperatures in Aspen are projected to rise by approximately 2.2°F to 3.9°F by 2090, depending on greenhouse gas emissions. Average maximum temperatures are projected to increase by 1.8°F to 3.6°F over the same period.

A different model from the Rocky Mountain Research Station was used to understand how snow water equivalent (SWE) and snow residence time (SRT) (the duration of time that snow stays on the ground) would change in the future. In Aspen’s ecoregion, snow water equivalent (SWE) is projected to decline by 65–80%, and snow residence time (SRT) by 40–50%, by 2090 under the RCP 8.5 scenario—relative to average conditions from 1975 to 2005.

2024 OTHER POWER-DRIVEN MOBILITY DEVICES (OPDMD) MANAGEMENT PLAN

The OPDMD Management Plan looks at trail conditions in the Pitkin County system and designates them as either open, closed, or restricted for OPDMD use. Open Space and Trails takes pride in providing excellent recreational opportunities and works to make these opportunities accessible when possible.

4. MANAGEMENT

Extensive data has been collected and has informed the adaptive management strategies implemented over the 47 years that Pitkin County has owned North Star Nature Preserve. Over this time, the landscape and ecological conditions have continued to improve, supporting important ecosystem services and robust wildlife activity. Within the designated recreation locations, visitor-use management over the past 10 years has adapted to new technologies and increased use, resulting in improved visitor behavior while mitigating safety concerns and addressing congestion at river access points. Each year continues to improve on the next.

The 2025 North Star Nature Preserve Management Plan provides guidance for continued adaptive management to address both near- and long-term ecological and community needs as new issues, opportunities, information, or strategies emerge. The plan is grounded in best practices, multi-year research and monitoring, and extensive public participation.

The following points summarize key findings from Sections 1-3, including current conditions, relevant studies, best practices, and public input, and how they helped inform management direction.

Ecological restoration and support for natural geomorphological processes continues

This plan allows the river to remain dynamic through a passive management approach that supports natural geomorphological processes to maximize ecological function. This maintains floodplain connectivity, fosters the development of robust riparian communities, and ensures that beaver complexes can drive ecological change. Action items, primarily focused on habitat enhancement, intend to improve the quality and resilience of North Star's ecosystem by prioritizing efforts and allocating resources to areas such as riparian corridors, wetlands, and other biodiversity hotspots, where ecological benefits may be greatest.

Comprehensive ecological indicators are used to monitor broad ecosystem components and conditions

Adaptive management relies on several ecological indicators, such as specific Management Indicator Species (MIS), habitat condition, hydrological function, vegetation community health, and overall wildlife use to guide management to minimize undesirable changes or impacts to the ecosystem. Given that wildlife activity is influenced by a combination of environmental conditions and human activity, monitoring a diverse set of ecological indicators provides a reliable understanding of ecosystem health and its ability to meet the needs of local wildlife. This approach reflects both scientific best practices and the practical realities of long-term stewardship and efficient use of resources.

"The property possesses natural, scenic, habitat, wildlife, recreational and open space values…It is anticipated that the conservation values may change as the property is enhanced and restored, and that such changes will be reflected in amendments to the Management Plan."

2002 Deed of Conservation Easement for North Star Preserve

Remains an accessible nature experience that offers meaningful connections to the landscape

Providing limited public access to North Star is essential to cultivating a community that values, understands, and protects its environment. When people experience wetlands, wildlife, and open spaces firsthand, they develop a deeper appreciation for the significance of these landscapes. This personal connection fosters a sense of stewardship, encouraging visitors and residents alike to support conservation efforts, respect habitat needs, and engage in the long-term protection of the area. Managed recreational access helps ensure that North Star continues to inspire understanding, responsibility, and care for the natural world in current and future generations.

Recreational use is concentrated spatially and temporally to benefit wildlife

Visitor management is intentionally structured to concentrate use within designated recreation locations and during consistent timeframes, rather than dispersing use throughout the day or extending the use seasons. Visitor use and wildlife studies show that current river use occurs on approximately five percent of North Star's total area, within a three-month window, and during times of the day that are not critical to wildlife's seasonal or daily needs. Predictable patterns of human activity create benefits for wildlife through known timeframes and areas of reduced disturbance. The public closure of the west side of the river for the benefit of wildlife, plants, and ecosystem function has been and continues to be one of the most critical management strategies carried forward with each plan update. Alongside the dusk-to-dawn closure, the plan incorporates additional protections to ensure wildlife continues to thrive at North Star.

Emphasis on respectful user behavior continues with proactive peak use strategies

Current daily river-use counts indicate that overall river use is within acceptable limits, and monitoring data indicate that wildlife presence and use of North Star are stable. The biggest challenge isn't everyday or annual use; it's managing a handful of peak days. Congestion, parking overflow, crowding at the put-in and take-out, and conflicts with neighboring properties spike during these short windows. Management direction, therefore, focuses on monitoring crowding and parking relative to capacity, and proactively implementing peak-use protocols and response actions.

This plan seeks to maintain consistency over time in the extent of recreational use areas to minimize impacts on the natural environment. Although they require more active management to ensure safety and maintain vehicular flow, deliberately constrained parking and loading areas are a visitor-use management strategy that helps meter river use to levels that are publicly acceptable.

Establishes safeguards and adaptive management through an indicator and threshold approach

This plan acknowledges that, while current use is generally acceptable, future conditions may change, whether due to increased visitation, longer seasonal use, ecological shifts, or evolving community expectations. The management direction, therefore, establishes:

- Indicators and thresholds for both ecological and visitor-use conditions.
- Clear response actions when thresholds are exceeded.
- A continued commitment to annual partner meetings to review conditions and update management responses.

These safeguards ensure that North Star's management continues to advance the desired conditions.

4.1 MANAGEMENT FRAMEWORK

At the core of this plan are conservation values - the resources that define what makes North Star worth protecting. For North Star, these values are represented by the following categories: the river system, riparian areas, wetlands and beaver habitat, wildlife and habitats, biodiversity and ecosystem integrity, and community.

Building from these conservation values, the management direction begins with a desired conditions statement. This aspirational vision describes the long-term ecological and social outcomes that OST seeks to achieve. To promote accountability and adaptability, this statement is monitored through a suite of indicators. These measurable attributes are used to monitor changes over time, such as vegetation, wildlife activity, and visitor use levels. Thresholds define the acceptable range of change for these indicators and serve as guideposts for adaptive management, alerting staff when conditions approach or exceed thresholds of acceptability.

This desired conditions statement is aligned with conservation values, informs broad management goals, and is supported by specific actions. Each action is guided by best practices in ecosystem and visitor-use management and incorporates public and technical feedback. Actions also include corresponding steps and response options if, or when, indicators show thresholds are being approached or exceeded. When thresholds are crossed, managers evaluate causes and implement applicable response options to improve conditions, ensuring North Star remains on track toward its desired conditions.

This management framework is summarized in Figure X. Figure X illustrates how conservation values inform management direction, which in turn shapes the regulations, policies, and actions that guide implementation. Finally, through monitoring and adaptation, managers assess progress and adjust strategies as needed. This approach ensures that decisions at North Star remain data-driven, transparent, and responsive to changing environmental conditions and community expectations.

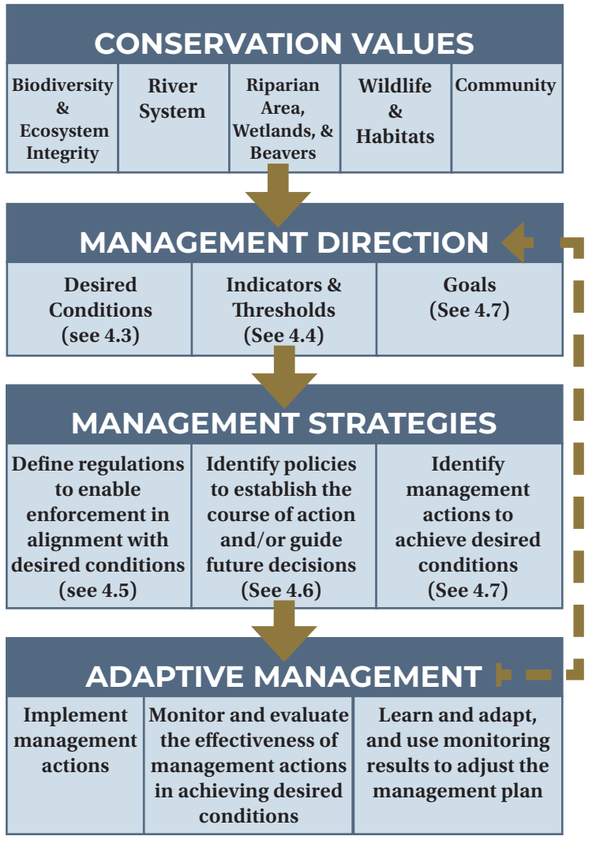
By following this structured and adaptive process, OST and its partners can prioritize actions, allocate resources efficiently, and ensure that management decisions continue to protect the values that define the North Star Nature Preserve.

Figure 15.
ADAPTIVE MANAGEMENT

The conservation values of the 2025 North Star Preserve Management Plan form the foundation for management at North Star. These values inform the development of desired future conditions, goals, and measurable indicators, which are translated into policies, regulations, and management actions. Staff can return to this framework annually and at each five-year plan update to understand:

- **Why an action was included.**
- **What conditions it is meant to address.**
- **What threshold triggers a response.**
- **How to learn and adapt.**

This creates a durable, transparent plan update process that maintains continuity.



4.2 CONSERVATION VALUES

The intent of the acquisition, as stated in a 1984 letter from The Nature Conservancy, was to manage North Star as a natural area for scientific and educational purposes, while still encouraging and allowing some passive recreation. The conservation values outlined in the 2002 Conservation Easement include the natural, scenic, habitat, wildlife, recreational, and open space values that continue to guide property management. The original acquisition intent and early conservation values have been refined based on expert input and feedback a working group. These values serve as the organizational framework for updating the North Star Nature Preserve Management Plan.

Biodiversity and Ecosystem Integrity

- Ecological function
- Overall biodiversity
- Fire and flood resilience
- Landscape permeability and connectivity

River System

- Floodplain Connectivity
- In-stream Habitats
- Water Quality & Quantity
- Aquatic Life

Riparian Zone, Wetlands, and Beavers

- Biodiversity hot spot
- Beaver influence
- Functional wetlands

Wildlife and Habitats

- Diverse habitat types
- Mammals
- Reptiles/amphibians
- Birds (e.g., songbirds, raptors, owls, wading birds, waterfowl)
- Invertebrates (e.g., pollinators)

Community

- Environmental education
- Scientific research
- Access to nature
- Respectful recreation
- Responsible behavior and stewardship
- Minimal impact to nature
- Safety

4.3 DESIRED CONDITIONS

North Star Nature Preserve provides long-term protection of biodiversity, natural ecosystem processes, landscape connectivity, and opportunities to connect with nature. Management efforts restore natural processes and promote ecological resilience in the face of challenges, including climate change, upstream water diversions, and agricultural land use legacies. Habitat complexity exists across the property to benefit diverse wildlife species as well as the continued provision of ecosystem services for the Roaring Fork Watershed, including flood protection, hydrological function, wildfire fuel break, and air and water quality. North Star in its entirety is managed first and foremost for ecological integrity and resilience, while allowing human presence in limited areas for environmental education, research, respectful recreation, and access to nature.

WILDLIFE ZONE

Closed to public access, the area west of the main river channel, otherwise know as the “Wildlife Zone”, is managed for the benefit of native flora and fauna. Meadow, wetland, riparian, forest, open water, and shrubland habitats are protected and enhanced to provide food, water, and shelter, and support species richness and diversity for invertebrates, amphibians, mammals, and birds. Off-channel wetlands and water resources serve the best possible hydrological and ecological function given water availability and climatic conditions.

Types of Visitor Activities, Facilities, & Services

- Research
- Maintenance/restoration
- Limited educational tours

RIVER ZONE

The dynamic river corridor supports floodplain connectivity and development of robust riparian communities to accommodate variability in flows. Beavers continue to inhabit the area, acting as ecosystem engineers to support ecological resilience. The river accommodates recreational use and river access, providing a peaceful, nature-based experience that is compatible with ecological values. River users arrive informed about the area’s values and regulations through accessible pre-visit and onsite information. While on the river, users exhibit behaviors that reflect environmental awareness, community connection, and responsible recreation.

Types of Visitor Activities, Facilities, & Services

- River use (non-motorized river crafts, including kayaking, canoeing, paddle boarding, etc.)
- South Gate Put-in, Pedestrian Bridge Take-out
- The Beach
- Educational programs

LIMITED ACCESS ZONE

The Limited Access Zone prioritizes wildlife habitat while accommodating low-impact recreation in defined areas. Allowed, low-impact recreation refers to human-powered activities that have minimal impacts on the natural environment and other users. Human presence is restricted to specific areas to minimize disturbance and maintain ecological integrity. Access points, parking, and trails are managed to promote safety and education, address congestion, and foster a sense of respect and stewardship among users.

Types of Visitor Activities, Facilities, & Services

- Parking areas
- Visitor amenities (e.g., bike racks, paddle racks, informational kiosks, interpretive signage)
- East of Aspen Trail (biking, running, walking, wildlife viewing, birding, etc.)
- James H. Smith Nature Trail
- Wildlife Viewing Blind and North Viewing Deck
- Groomed winter trails
- Paraglider landing area

DESIRED CONDITIONS

“Changing desired conditions statements based on changes in visitor use or experience should be approached with caution and consideration, but updates may be warranted. Awareness of new trends related to user groups (such as different age or income groups, or more families visiting), use types (for example, more water-based activities such as standup paddleboarding), or changes in policy or access (such as the use of e-bikes on unit roads) that ultimately change types of use, access or accommodations, and experiences for which the area is being managed would likely require updated desired conditions statements.”[1]

The 2000 management plan established key ecological and recreation concepts. The Desired Conditions Statements in this plan update build on, rather than replace, these early concepts.

KEY ECOLOGICAL CONCEPTS (2000)

- **North Star is a vital link in the Roaring Fork Watershed ecosystem. Plans for the preservation of the health of natural systems in North Star will not be effective unless they are supported throughout the system.**
- **North Star represents a high-quality remnant of minimally disturbed riparian/ montane wildlife habitat surrounded by human development that serves to connect landscape elements required by many wildlife species for different life history stages.**

KEY RECREATION CONCEPTS (2000)

- **Chemical and physical filtering of surface runoff results in a cleaner, more productive river for both wildlife and people**
- **Opportunity for solitude immediately adjacent to a population center**
- **Opportunity to observe wildlife in a natural setting immediately adjacent to the population center**
- **Opportunity for quiet recreational activities**
- **Opportunity to serve as a living classroom for environmental education and research**

1 The Desired Conditions Guidebook. The Heart of Visitor Use Management, Edition One (2023)

4.4 INDICATORS AND THRESHOLDS

Indicators translate the aspirational nature of the desired conditions into measurable attributes that can be tracked over time to evaluate changes in conditions. Defining indicators provides a transparent way to track changes to specific resources or experiential attributes and supports management accountability by listing monitoring efforts for each indicator. Thresholds ensure that conditions remain acceptable for the selected indicators. Some change is inevitable. The acceptable amount of change is established by defining the point at which impact to a resource or experience requires a change in management to improve the condition. In other words, thresholds serve as a "stop sign," letting managers know that corrective actions must be taken.

Indicators and thresholds are a new addition to the 2025 North Star Nature Preserve Management Plan because they formalize the framework that OST has been using for decades for adaptive management, and to catalog the many elements that have been tracked for years into a clearer monitoring program, alongside new ones. The addition of thresholds and indicators to this plan enables the partners and the public to assess change and progress toward achieving the stated desired conditions.

The selected indicators and thresholds are listed in Table 9 with the corresponding monitoring details.

Table 9. North Star Nature Preserve Monitoring Table

INDICATOR TOPIC	INDICATOR *Specific resource or experiential attributes that can be assessed and tracked over time to evaluate change in condition.*	THRESHOLD *The minimum acceptable condition for each indicator that takes into consideration the qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, staff management experience, and public preferences.*	Frequency of monitoring *When / how often?*	Monitoring Approach *How to assess the indicator*	Partners
Biodiversity and Ecosystem Integrity					
Biodiversity	Floristic Quality Index (e.g. Mean Coefficient of Conservatism for all plants and for native plants)	Floristic Quality score is stable or upward trending	Approx. every 10 years Since 2018	Comprehensive Vegetation Monitoring by botanist/ecologist	Ecological consultants
Biodiversity	Shannon Diversity index (for mammals and birds)	Diversity Index score is stable or upward trending	Approx. every 10 years Since 2017	Wildlife surveys by wildlife biologist and camera monitoring data	Ecological consultants
Invasive species	Noxious weed species, extent of infestations.	No increase in extent or number due to management activity.	Annually	-Field crew surveys. See North Star Weed Monitoring Protocol -Vegetation Monitoring by a botanist	City of Aspen, Ecological consultants
Invasive species	Aquatic Nuisance Species (ANS) presence	No uncontrolled presence of ANS.	As needed New in 2025	-Annual observations -coordination with regional river organizations	CPW
Landscape permeability	Annual Wildlife/vehicle collisions adjacent to North Star property	Number of wildlife/vehicle collisions that pose safety concerns by CDOT and/or Pitkin County Sheriff	Every 5 years New in 2025	CDOT and/or Sheriff records along Highway 82 adjacent to North Star property	CDOT, Pitkin County Sheriff
River System					
Floodplain connectivity; River system dynamism	Channel form and early succession vegetation	Channel form is dynamic, meandering laterally within the floodplain. Point bar development is occurring and no progressive widening occurs. Vegetation recruitment occurs on point bars.	Approx. every 10 years, or after a significant channel-changing event Since 2018	Geomorphological assessment of channel incision and channel meander Photo documentation of point bar vegetation recruitment	Ecological consultants
Floodplain connectivity; Aquifer function; Hydrologic conditions	Groundwater levels	Groundwater well levels that historically track with streamflows continue to do so.	Growing Season (~May-Oct); data compiled prior to Plan update (every 5 years)	Seasonal groundwater well monitoring (depth to groundwater) per North Star Groundwater Monitoring Program/protocols	Ecological consultants
Water quality	Macroinvertebrate multimetric index (MMI)	MMI scores do not exceed the State of Colorado CDPHE standards for a stream of this type.	Approx. every 3 years Since 2017	Follow Colorado River Watch and/or CDPHE protocols for macroinvertebrate sampling.	RFC, Ecological consultants
Water quality	Standard Water Quality Parameters, e.g., pH, dissolved oxygen, temperature, heavy metals	Parameters tested do not chronically exceed State of Colorado Water Quality Standards	Approx. every 3 years Since 2023	Follow Colorado River Watch and/or CDPHE protocols for water quality sampling. Regional analysis approx every 10 years, or as warranted by acute conditions	Ecological consultants, RFC, City of Aspen
Riparian Area, Wetlands, Beavers					
Beavers	Beaver presence and activity levels	Beaver presence and activity areas do not decline in extent for more than 2 consecutive surveys.	Approx. every 2-4 years Since 2018	Pedestrian surveys by wildlife biologist	Ecological consultants
Riparian condition	Riparian vegetation presence and condition	Diverse riparian plant species are present and in various successional stages.	Approx. every 10 years Since 2018	Comprehensive Vegetation Monitoring by botanist/ecologist	Ecological consultants
Wetland integrity and function	Wetland health, via vegetation health and habitat condition/utilization	There is no chronic or preventable decline in overall proportion of wetland habitat at North Star. No significant decline in wetland vegetation health (e.g. riparian species dieoffs, significant shifts in species composition, etc.) Wetland habitats continue to see appropriate levels of use by area wildlife.	Approx. every 10 years New in 2025	Wetland Health Assessment: - Photopoint documentation - External Stressor evaluation - Ecosystem function evaluation via integrated analysis of other data (groundwater, water quality, macroinvertebrates, riparian vegetation, beavers, etc.) Wildlife use of wetland habitats	Ecological consultants
Wetland integrity and function	Saturated extent of fen	Saturation extent and vegetation condition do not decline below pre-project levels.	Approx. every 3-5 years for first decade post-project, then increasing interval Since 2019	Saturation extent and vegetative cover (Per methods described in Fen Vegetation & Hydrology Monitoring - Post-Restoration Year 2022)	Ecological consultants
Wildlife and Habitat					
Bird diversity	Avian species present, Sensitive species ratios	Ratio of human-sensitive avian species to synanthropes (avian species not sensitive to human activity) continues to favor sensitive species	Approx. every 3 years Statistical analysis approx. every 10-15 years Since 2000/2017	Per OST avian monitoring methods. (Include quantitative measures such as the ratio and densities of synanthropes to sensitive species.)	Ecological consultants
Habitat condition	Indicator Species: Warbling Vireo, Elk, Lincoln's Sparrow, Song Sparrow, Yellow warbler, Great Blue Heron, Beaver	No statistically significant decline in indicator species	Include Management Indicator Species assessments during general wildlife surveys.	Per OST wildlife monitoring methods, Integrate mammal and avian indicator species into the same analysis.	Ecological consultants
Habitat condition	Habitat elements (forage, cover, reproduction areas and access to water) for large and small animals	Biodiversity-supporting habitat elements are present in effective quantities, locations and conditions	Approx. every 10 years New in 2025	Wetland and river health synthesis	Ecological consultants
Habitat condition; Plant communities	Aspen forest, transitional grassland, sagebrush shrubland, willow riparian and cottonwood riparian areas	Vegetative cover and plant communities persist in appropriate locations.	Approx. every 3-5 years Since 2018 Approx. every 10 years Since 2018	Monitor five permanent sampling locations approximately every 3 to 5 years. Conduct comprehensive vegetation mapping in accordance with the U.S. National Vegetation Classification System and OST monitoring protocols every 10 years	Ecological consultants
Terrestrial wildlife diversity	Wildlife species present, detections, and habitat utilization	Wildlife species detections and habitat utilization do not trend downward over two consecutive sampling periods	Approx. every 3-5 years Since 2014	Per OST wildlife monitoring methods	Ecological consultants

INDICATOR TOPIC	INDICATOR	THRESHOLD	Frequency of monitoring	Monitoring Approach	Partners
Community					
Commercial use	Number of commercial users and percentage of commercial use relative to total annual use	*None at this time*	Annual Since 2015/2018	Annual commercial use reports and User counts through seasonal cameras installed at James H.* and below South Gate after low flow closure	Commercial Permittees
Compliance	Number of commercial permit violations	Trend toward fewer over time	Annual Since 2016	Annual Ranger report	
Compliance	Number of river use regulation violations	Trend toward the fewer violations as a percen	Annual Since 2018	Camera counts or other technology and ranger observations	
Compliance	Number and type of Ranger citations	*None at this time*	Annual Since 2014	Ranger report-out	City of Aspen, USFS
Congestion	Vehicles At One Time (VAOT) in parking lots and adjacent overflow areas.	Average parking lot occupancy remains at, or below, 100% of capacity. Number of parked cars over design capacity (# of days/hourly duration)	Every 5 years New in 2025	Hourly parked vehicle counts for a 1-month period conducted mid-June to mid-July	ACES Naturalists
Education	Number of educational programs offered to youth	*None at this time*	Annual	Annual partner reports	RFC, ACES
Education	Number of youth participants in interpretive or educational programming	*None at this time*	Annual	Annual partner reports	RFC, ACES
Education	Number of educational programs or guided tours offered	*None at this time*	Annual	Annual partner reports	RFC, ACES
Education	Number of participants in interpretive or educational programming	*None at this time*	Annual	Annual partner reports	RFC, ACES
Enforcement	Number of ranger hours	*None at this time*	Annual	Ranger report-out	City of Aspen, USFS
Overall river use	Total number of annual river users	Trend toward stable year-to-year overall use	Annual	User counts through seasonal cameras installed at James H.* and below South Gate after low flow closure	
Overall river use	River use season duration (# of months)	Stable year-to-year annual season length.	Annual New for 2026	User counts through seasonal cameras installed at James H.* and below South Gate after low flow closure	
Peak use	Peak use (total days, hourly duration)	Maintain daily duration of peak use, ensuring the hourly duration of peak use does not expand and the number of peak use days remains stable.	Annual New in 2026	User counts through seasonal cameras installed at James H.* and below South Gate after low flow closure	
Recreation Disturbance	Spatial extent of all recreation use, including designated access locations and extent of social trails	Minimum disturbed area required to provide safe and reasonable summer and winter recreation.	Every 5 years New for 2025	ESRI Field Map	
Recreation Disturbance	Width of vegetation compaction and area of soil disturbance in designated access corridors	Minimum disturbed area required to provide safe and reasonable river access and prevent trail widening. No social trail development.	Every 5 years New for 2025	ESRI Field Map	
Recreation Disturbance	Grooming season length relative to wildlife needs/use	Remains in compliance with seasonal limits	Every 5 years Since 2021	Annual Nordic report	City of Aspen
Recreational Use	East of Aspen Trail User Counts	*None at this time*	Annual Since 2015	Trail counter	
Recreational Use	Commercial and Non-Commercial Paragliding Use	Remains in compliance with daily weekday and weekend limits	Annual Since 2014	Landing area log book	Commercial Permittees
Recreational Use	Number of Nordic users	*None at this time*	Annual Since 2021	Trail counter	City of Aspen
River Experience	Visitor experience satisfaction	25% or fewer surveyed indicate feeling crowded while floating on the river 80% or more surveyed rating "good" or "excellent"	Every 5 years	Community feedback/surveys	
River Experience	People per viewscape (PPV)	Manage public river use such that 30 minutes or less of the overall river use day have fewer than 6 people per viewscape. Recreational river users indicate a sensitivity to crowds when PPV conditions increase beyond 6 PPV. In 2024, river PPV exceeded 6 PPV 3% of the time (see 2025 Visitor Use Study).	Every 5 years New for 2025	Methodology from the 2025 VUM Study, with user counts collected through a camera installed below South Gate.	
Safety	Number of reported incidents / medical calls	<0 safety incidents	Annual	Ranger report-out	City of Aspen, USFS

** Trail counters or other methods may be considered in the future if they meet acceptable levels of accuracy. Additional locations may be added; however, the James H. location should continue to be used to facilitate comparisons over time.*

4.5 REGULATIONS

North Star Nature Preserve is in unincorporated Pitkin County, and Pitkin County Title 12 Regulations of the Pitkin County Code apply to the property. Specific regulations governing North Star aim to protect ecological resources and public safety.

Both the City of Aspen and OST rangers are authorized to enforce these regulations. In addition to education and enforcement of property regulations, rangers also assist the Sheriff's Office, U.S. Forest Service Protection Officers, other law enforcement agencies, and emergency personnel in responding to public safety-related activity.

Title 12 Regulations

Title 12, Section-04-030 covers the "Rules Regarding Public Use of Open Space and Trails Program." This section of the Pitkin County Code captures OST regulations such as no camping, no hunting, no campfires, no entry into closed areas, no discharging of firearms, no littering, and no harassment of wildlife. These rules apply to all OST assets unless otherwise superseded by easement language, management plans, or other OST Board of Trustees direction.

North Star Nature Preserve Regulations

The following regulations are applicable to North Star Nature Preserve, in addition to regulations found in Title 12:[1]

- No glass (included in WRNF-2023-07 Occupancy and Use Restrictions for the Wildwood Area).
- No dogs; except on leash on East of Aspen Trail (included in WRNF-2023-07 Occupancy and Use Restrictions for the Wildwood Area).
- No horses.
- No playing music audible to other people or wildlife, or loud noise (included in WRNF-2023-07 Occupancy and Use Restrictions for the Wildwood Area).
- No bikes or commercial uses allowed on the James H. Smith Loop.
- Closed from dusk to dawn (included in WRNF-2023-07 Occupancy and Use Restrictions for the Wildwood Area).
- Access in designated corridors only. No leaving the trail (included in the Designated Recreation Locations Policy).
- Float-through only, no beaching of watercraft on beaches or gravel bars, except at designated access corridors.
- No anchoring, including for fishing purposes. Fishing from watercraft only; no fishing from banks of the river. Colorado regulations for the Roaring Fork River in the North Star reach

1 "No launching or taking out at the Beach access point," a regulation from 2000-2020, has been removed from this update to alleviate pressure at the Stillwater Bridge Take-out.

allow artificial flies and lures only, and all trout must be returned to the river immediately.
- The Beach and South Gate River access corridors are closed during the Nordic season, when the trail is groomed. River access from the Stillwater Bridge is permitted year-round.
- Parking is only allowed in designated parking lots or pull-offs (included in WRNF-2023-07 Occupancy and Use Restrictions for the Wildwood Area).
- No motorized watercraft (including electrically powered devices).

In addition to the other powers, rules, and regulations provided by the Pitkin County Home Rule Charter, Title 12 of the Pitkin County Code, and this 2025 North Star Nature Preserve Management Plan, Pitkin County may take any other action, including closure of the property and/or temporary administrative closure, necessary for the preservation of its open space values or the health, safety, and welfare of members of the public or wildlife.

4.6 POLICIES

West Side Public Access Closure (Wildlife Zone)

The property on the west side of the Roaring Fork River is closed to public access. The closure is for the benefit of wildlife, plants, and a functioning ecosystem and represents approximately 188 acres or 77% of the property. The access restrictions include prohibitions on hunting, removal of game, and backcountry ski access. Exceptions to the closure include monitoring and maintenance, scientific research, and limited educational programs.

Designated Recreation Locations

Within the portion of the property between the river and the East of Aspen Trail/Highway 82, public access is limited to designated locations. Educational tours and research can occur outside of these areas on a case-by-case basis, subject to a special-use permit.

Designated recreation locations with public access include:

- River and Beach Access Corridors: The three public access corridors include South Gate, The Beach, and the Stillwater Bridge Take-out.
- Roaring Fork River: Boaters and paddlers are allowed to float the river; however, they are not allowed to exit their vessels except at designated river and beach access corridors.
- East of Aspen Trail and Wildlife Viewing Platform: The multi-use trail follows the eastern edge of the preserve adjacent to Highway 82.
- James H. Smith Interpretive Loop: Pedestrian and Nordic uses are permitted as well as access to the Heather Hopton Bird Blind.
- North Star Landing Zone: Paragliders and hang gliders are allowed to land in the designated landing zone only.
- Nordic Loop/Winter Use Areas: In the winter, Nordic use is allowed on the North Star Loop, on the James H. Smith Loop, and along the East of Aspen Trail.

Designated Parking and Staging Areas:

- South Gate Parking Area
- The Beach Parking Area
- North Lot Parking Area
- Stillwater Bridge Take-out and 10-minute loading zone

Regulations Strictly Enforced

Rangers patrol both the North Star Nature Preserve and the Wildwood Put-in in accordance with seasonal and daily use patterns and flow levels. The ranger's first priority is to educate users about the area's importance and how to respect and care for it. Violations that impact ecological values (such as the prohibition on audible music and dogs and the west side public access closure) will be strictly enforced. Strict enforcement may necessitate issuing written warnings or tickets for first-time offenses, depending on the nature of the violation and the circumstances. Partnerships with USFS and the City of Aspen are in place to augment OST ranger staff during busy periods.

Wildlife Closures

Wildlife closures are used as needed to protect wildlife and other ecological values, and to minimize wildlife conflicts for the health and safety of both humans and wildlife. When warranted, public access is adjusted promptly to protect wildlife or habitat needs or human safety through the use of temporary signage, educational efforts, enforcement, and other appropriate strategies. Land access points are closed when warranted. These restrictions may extend to Wildwood as voluntary closures in partnership with the USFS. Closures may go into effect if:

- Heron nesting or elk calving activity is observed in areas where human activity may interfere with reproductive success. OST monitors wildlife, including moose, elk, deer, great blue heron and bear activity, as well as tracks seasonal occurrences and changes in nesting/calving. OST coordinates with CPW on appropriate closures and other warranted strategies to protect these important phases of an animals' lifecycle.
- Moose are identified in the area. Moose-triggered closures are coordinated with CPW, as these large animals pose significant risks to humans. A tiered response, ranging from voluntary to mandatory closures, is implemented, alerting users to the presence of moose in the area and triggering voluntary or mandatory closures when a moose exhibits aggressive behavior.

Flow Level & River Temperature Closures

Low river flows and water temperatures can require closing the river corridor to protect ecological values and prevent trespassing (i.e., scraping the river bottom). At identified flow levels, a voluntary public closure of the launch areas is established through signage and other outreach efforts, including communication with rental shops. Closures are mandatory for commercial operators pursuant to their annual permit and can be mandatory for the public at the North Star access points where OST has the authority to restrict access. These closures can also extend to the Wildwood Put-in either as voluntary closures or in partnership with the USFS.

Closures or restrictions can go into effect if:

- Water levels reach the established low-flow threshold. OST monitors low flows and reviews the threshold for low-flow closures. Set at 60 cfs at the Upper Roaring Fork Gauge in 2021, this threshold can be adjusted in response to changes in river morphology and the levels at which floating the river becomes challenging for novice visitors without scraping the bottom. If warranted, low-flow closures of South Gate, The Beach, and Stillwater Bridge Put-ins or Take-outs can be implemented, depending on changes in river morphology, reductions in flow levels, and/or climate changes over time.
- Public safety is jeopardized. Rangers can institute a mandatory or voluntary closure if warranted by conditions or situations (ex., When flow levels are unnavigable due high water, bridge clearances, or other hazards).
- High water temperatures are reached. OST coordinates with recommendations from CPW.

North Star Quiet Zone

To help minimize disturbance to wildlife from river users, North Star is designated as a "Quiet Zone" for floaters and paddlers passing through. This reinforces messaging that North Star is a place "where the Roaring Fork whispers" and is first and foremost a nature preserve. This policy amplifies actions to improve messaging and enforcement about the regulations regarding "no playing music audible to other people or wildlife or loud noise." Signs along the boundary of North Star and the river shall be placed and maintained to alert people that they are entering the nature preserve and a quiet zone.

Voluntary River Use Group Size Limits

To mitigate ecological and social impacts of large groups, there is a voluntary group size limit of six people, which aligns with the size limits for commercial groups. According to the 2024 river user surveys, the typical group size of river users is three. Larger groups are less frequent but tend to have a greater impact on noise levels and crowding at the river's put-in and take-out points.

Peak River Use

OST relies on evaluation of current river use, trends, conditions, prior experience, and best judgment to determine which action(s), if any, to implement to manage river use volume on peak days. This flexible process enables OST to manage for public safety and nature-based experiences on anticipated peak river use days.

The following criteria are used to predict peak use days:

- Weather and temperatures
- River flows
- Day of the week (i.e., weekends and holidays)

- Water quality and/or other environmental factors
- Use trends and seasonal fluctuations
- Anticipated river use reaches, or exceeds, 370 downstream river users per day (see page 52 for more information on river use crowding-related capacity estimates).

There are various interventions available to OST to manage visitor use on anticipated peak use days. The following represents some of the steps that may be taken:

- Install signage at South Gate to inform visitors that Wildwood parking is full.
- Utilize established communication platforms to notify visitors of anticipated crowds.
- Enlist additional staff support to manage crowds.
- Implement additional measures to safeguard natural systems, mitigate the risk of a party atmosphere, and enhance the overall user experience.

The primary launch point for river users, Wildwood Put-in, has limited parking capacity for put-in staging, and congestion occurs there long before river use crowding becomes an issue. The listed peak use interventions focus on mitigating the crowding felt on the river. However, rangers retain the discretion to deploy any listed interventions as warranted due to operational constraints related to parking congestion (see page 52 for more information on Wildwood parking-related capacity estimates).

Downed Trees

Downed trees and other woody debris contribute to a healthy, evolving river system. They may also present obstacles for river users. Keeping these considerations in mind:

- Woody debris may only be removed in consultation with OST staff.
- Staff determine if and how the woody debris may be removed or stabilized to maximize ecological health and river user safety. OST staff take a conservative approach to interrupt the natural river ecology as little as possible; this may mean removing only a portion of a downed tree.

Beaver Dams

In general, the presence of beavers enhances the habitat complexity of waterways, wetlands, and the riparian system. Beaver dams are particularly important for the local ecosystem as they improve water quality, increase riparian area and open water habitat, and provide water storage in spring that supports higher streamflows in late summer.

- Beaver dams are monitored. Typically, OST utilizes a game camera to track dam development and observations such as at what river flows the dams wash out in certain sections.
- Beaver dams are not dismantled or removed, unless required to protect infrastructure (i.e. Highway 82/East of Aspen Trail).
- If a beaver dam presents a major obstacle for river users, an ecological evaluation is conducted, and OST prescribes river user behavior to minimize ecological harm for beaver dam encounters on a case-by-case basis. Where appropriate, portage around beaver dams may be allowed, preferably on the east side. However, this is considered based on feasibility and ecological impact, and can include vegetation trimming and/or the addition of ground protection to prevent trampling of vegetation. OST disseminates information on how to navigate the obstacle at the river access corridors and through other outreach channels.

Memorials

All memorials placed on OST properties and trails are addressed in the adopted Stewardship Policies, which allow individual management plans to determine the memorial policy for each property. For all parcels included in this plan, no additional memorials are permitted.

Public Paragliding Use

Public, non-commercial paragliding landings are limited to 30 per weekday and 50 on Saturdays and Sundays. The maximum number of recreational hang glider landings per day at North Star is five (refer to the Commercial Use Regulations for commercial landings).

- Landings are allowed year-round between 7 a.m. and 5 p.m. Outside of this time, the landing zone is closed. There is a no-fly zone in the airspace within 200 meters (650 feet) of any great blue heron colony.
- Every user is required to enter the time, date, single/tandem, and commercial/public classification for their trip into the logbook at the landing zone.

Nordic Use and Grooming

- Grooming operations on the North Star Nature Preserve parcel for Nordic skiing are allowed between November 16 and April 14.
- On James H. Smith, grooming operations are limited to January 1 through March 14 for the added protection of ungulates in the early winter and nesting birds like great blue herons in the early spring.
- All grooming must be set back 10 feet from the banks of the Roaring Fork River.
- No mowing of the Nordic trail corridor is permitted.
- The Beach and South Gate river access corridors are closed during the Nordic season, when the trail is groomed.
- Snowshoeing is permitted on the groomed trail. Walking on the groomed surface is prohibited.
- No dogs are allowed on Nordic trails.
- According to the 2015 Intergovernmental Agreement (IGA), Nordic trails at North Star are operated and maintained by the City of Aspen.

Commercial Use

Commercial uses are limited to river outfitters (guiding/instruction and/or shuttle operations) and paragliding, and are approved through a permit system. All other commercial uses are prohibited, including hang gliding, commercial filming, commercial photography, and commercial use of The Beach. An exception to the ban on commercial photography is made for commercial photography conducted by the permitted commercial operator. Operators should be careful to minimize commercialization of the preserve and ensure that all marketing or promotion is consistent with the nature preserve's management values.

Commercial uses are subject to OST's Title 12 Section 12.04.080: COMMERCIAL USE OF OPEN SPACE AND TRAILS. Commercial operators are responsible for ensuring their clients comply with the property's regulations and conditions outlined in their permit.

Any permitted commercial use of North Star must take place within the designated recreation locations and parking lots.

Commercial River Outfitters (Guiding/Instruction & Shuttle Operations)

Working with permitted outfitters, including river guides, instructors, and shuttle services, is a visitor-use management strategy aimed at reducing parking congestion and enhancing safety at river access points. It also helps educate new visitors to North Star about the preserve's ecological importance and the regulations and etiquette for floating the river.

Commercial river outfitter permits are issued in accordance with the following guidelines, which aim to advance the desired conditions and management goals of North Star and to provide a transparent and objective process for allocating permits.

1. Any commercial outfitters seeking to utilize North Star Nature Preserve and/or the parking areas are required to obtain one of five commercial-use permits. Permits are allocated through a merit-based, competitive selection process via a Request for Applications (RFA) procedure. River outfitters and shuttle services must have both an OST permit and authorization (Letter of Nominal Effects) from the USFS to operate at the Wildwood Lane launch site.
2. Permits are valid for three seasons for permittees in good standing, which is evaluated through an annual review process. Permittees must be up to date on payment of annual permit and use fees, comply with permit conditions, meet reporting deadlines, and agree to any updated permit conditions if changes are implemented.
3. A permit can be revoked if the operator or its designees violate the permit's terms, established regulations and policies, or act in a manner that conflicts with, or circumvents, North Star regulations. If a permit is revoked, the slot is offered to the next eligible applicant, or replaced through an RFA released at the end of the year.

4. The scoring criteria for permits are adaptable and are part of the RFA process. They consider and weigh the following:
    - Strong compliance with the regulations, permit terms, and positive interactions with other outfitters, public visitors, clients, rangers, naturalists, and other OST staff.
    - Operating plan, including shuttle/transportation services, vehicle and vessel types, guided experiences or other services, guide qualifications and training, client education and stewardship, and climate-friendly/environmental practices.
    - Knowledge of and commitment to advancing the management goals and desired conditions for North Star. It is the responsibility of commercial operators to be knowledgeable of the unique North Star environment, respect the balance between the property's status as a nature preserve and its recreational use, and educate and share this respect with their clients.
    - Agreement to require all commercial guides and shuttle drivers to complete OST's annual training and relay information to their clients.
5. OST seeks to permit a diversity of operators who are positioned to alleviate parking demand and congestion through the provision of shuttle services, offer unique and/or educational/instructional experiences that are consistent with the area's Community Management Goals, and provide high-quality and respectful nature-based experiences.
6. The commercial-use permit establishes group size limits (currently set at six people, including the guide), the number of groups per day, and launch timing. Any changes are part of the annual renewal process and shall be agreed to prior to permit renewal.

Commercial Use of the North Star Landing Zone

Commercial use of the North Star landing zone is limited to 98 paraglider landings per week, with no more than 20 landings allowed on a single day. Paragliders are allowed to land in the designated landing zone only. All users must observe the no-fly zone in the airspace within 200 meters (650 feet) of any great blue heron colony. An exception to the ban on commercial photography is made for commercial photography in conjunction with the permitted commercial paragliding operation. Photography may only be conducted by the operator at the landing zone, and only during commercial flights. Commercial operators maintain a logbook at the landing zone, in which each user must enter the date, time, single/tandem, and commercial/public classification for their trip. This information is provided to OST in accordance with the permit requirements.

Special-Use

Special uses conducted in partnership or with permission from OST must be related to ecological studies, such as educational tours, scientific research, or biological studies, provided such uses are compatible with the conservation values.

Any special or organized use or event at North Star (inclusive of its parking areas and the East of Aspen Trail) that is not conducted under the auspices of OST must apply for a special-use permit. Failure to comply with the Pitkin County permit process can result in the loss of the ability to use North Star. Special-use permits can accommodate an activity that may occur outside of the designated recreation locations (See Designated Recreation Locations Policy). It is the responsibility of the permit holder to be knowledgeable about the unique North Star environment, to respect the balance between the property's status as a nature preserve and its recreational use, and to educate and share this respect with their group. The group size is capped at ten people, excluding guides and instructors. Special exceptions to group size may be made for educational purposes, such as school programs, on a case-by-case basis and with approval from OST.

Special uses specifically prohibited on North Star include weddings, concerts, catered events, or other special events. All users must be respectful of the tranquility of the nature preserve and the experience of others.

Maintenance

The following are maintenance details specific to North Star. The notes below do not cover all of the maintenance activities that take place on the property:

Mowing

Mow the North Star landing zone up to two times per year. Mow the sides of the East of Aspen Trail as needed. No mowing for Nordic operations.

Plowing

Plow the North and South Gate Parking Lots as needed through the winter. Designated access corridors are not plowed. The East of Aspen Trail is open year-round, but does not receive winter maintenance outside of periodic packing by snowmobile.

Parking Lot and Road Maintenance

Maintain North Star parking lots as needed, including resurfacing, dust control, weed control, seeding, maintenance/repairs of fences, parking stops, and signage. Install roadway delineators at the Stillwater Bridge around Memorial Day and remove them in September or as warranted based on visitor use trends.

Waste Facilities

There are no trash receptacles, dog pots, or bathroom facilities anywhere on the North Star property or parking areas. North Star is a pack-in/pack-out area. OST does install a seasonal port-a-potty at the Wildwood Put-in in coordination with the USFS.

Amenities

Paddleboard racks are installed at access points to prevent vegetation from being trampled. Additional racks are not recommended.

East of Aspen Trail

Maintenance consists of corridor and sight line trimming, trail surface repair, and trail resurfacing, all of which are done on a as needed basis.

Mosquito Control

Mosquito control is permitted to occur at the North Star Nature Preserve under the direction of the East of Aspen Mosquito Control District Board of Directors, in consultation with OST.

Mosquito control practices may be modified for ecological benefits if warranted.

4.7 MANAGEMENT GOALS AND ACTIONS

The selected goals and actions, aligned with the conservation values, are listed in Table 11 with the corresponding tactics and response options, to be used as warranted as the thresholds of applicable indicators are met. All actions include an estimated timeframe and budget in addition to partners. Refer to Table 10 for the key, which helps to identify new actions in 2025 as well as actions either updated or continued from prior plan.

Table 10. North Star Nature Preserve Goals and Actions Key

Actions	Estimated Budget 2025 - 2030	Timeframe
New (2025)	$ < $10	Long Term = 5-20 years
Updated / Amended	$$ = $10-75k	Short Term - less than 5 years
Carried Forward from Prior Plan	$$$ > $75k	Ongoing

Table 11. North Star Nature Preserve Goals and Actions

	Conservation Values, Goals, and Actions	Relevant Indicator Topics *See Monitoring Table*	Tactics and Response Options *Specific, actionable, and adaptable steps/tactics taken to implement the action and the response options when thresholds are exceeded and additional steps are warranted. They are the daily/weekly/seasonal actions that individuals or teams perform.*	Timeframe and Estimated Budget 2025 - 2030	Partners
Value: Biodiversity and Ecosystem Integrity					
Goal 1: Provide ecosystem services for public benefit, such as flood protection, fire protection, and clean air and water. *See aligned actions in Riparian Areas, Wetlands and Beavers*					
1.1	**Cultivate and participate in landscape-level conservation and wildfire resilience partnerships.**	*Habitat condition*	· Work with partners (e.g. USFS) if, in the future, they determine habitat improvement or fuel reduction projects are deemed necessary on the eastern slope of Richmond Ridge, along the boundary of North Star.	Long-Term TBD	COA, CPW, RFC, AFPD, USFS, RFVWC, RFOC
Goal 2. Control invasive species to the greatest extent possible with the least environmental impact.					
2.1	**Control noxious vegetation.**	*Invasive Species*	· Follow North Star Noxious Weed Monitoring Protocol to track noxious weeds and inform control efforts. · Noxious weeds are controlled per the State of Colorado Noxious Weed Act. · Implement integrated weed management techniques on site (mechanical, biological, chemical and/or cultural methods) to control noxious weeds. · Prioritize noxious weed control efforts in areas of intact native plant communities. · Stay informed about current best practices and scientific knowledge **Response Options:** · *Adapt integrated control methods for better results* · *Increase staff/contractor capacity to improve control* · *Address the source of noxious vegetation encroachment/expansion if off-site for coordinated control efforts*	Ongoing $	COA with internal and contractor support
2.2	**Monitor/manage Aquatic Nuisance Species (ANS) if concern of presence in the Upper Roaring Fork arises.**	*Invasive Species*	**Response Options:** · *Include ANS surveys in river monitoring.* · *Conduct targeted surveys as appropriate.* · *Investigate upstream and downstream conditions with regional water partners to identify and implement actions to control, contain and eradicate these species as possible.*	Long-Term TBD	CPW, RFC, City of Aspen, etc.
Goal 3: Protect and support the overall biodiversity of plants and animals.					
3.1	**Monitor overall native plant biodiversity.**	*Biodiversity; Habitat condition; Plant communities*	· Evaluate the overall conservation value of flora at North Star by resampling permanent vegetation transects/plots using established protocols. Calculate the mean Coefficient of Conservatism for all plants and for native plants or other suitable Floristic Quality Index to track changes over time. · Maintain and update vegetation mapping during comprehensive surveys to be consistent with current classification standards and track changes to vegetation communities. · Protect any rare plant species. **Response Options:** · *Consider experimental management actions to address imminent threats to plant biodiversity, such as controlled burns, flooding, or other integrated vegetation management techniques as informed by best available science, depending on the cause and nature of floristic quality decline.*	Ongoing $$	COA (with contractor support)
3.2	**Monitor avian and mammalian species diversity.**	*Biodiversity; Bird diversity; Terrestrial wildlife diversity*	· Conduct comprehensive wildlife monitoring (including avian, mammal, reptile, and amphibian species), according to OST protocols and monitoring plan. · Monitor Management Indicator Species. **Response Options:** · *Engage a wildlife biologist or ecologist to investigate and report on potential contributing factors to observed downward trends in management indicator species and/or diversity scores.* · *Evaluate and implement habitat and/or visitor use recommendations from relevant reports.*	Ongoing $$$	COA (with contractor support)
3.3	**Prioritize habitat protection and enhancement activities in known biodiversity hotspots.**	*Biodiversity; Habitat condition; Plant communities*	· Implement actions in wetland, riparian and aspen habitats over habitats with less known biodiversity (meadow). · Conduct maintenance and monitoring of restoration projects and adaptively manage for best outcomes. · *See also Control Noxious Vegetation.*	Ongoing TBD	COA (with contractor support)
Goal 4: Maintain and enhance landscape permeability to allow animals of all sizes to move through and across North Star Nature Preserve. Preserve and improve the migratory corridors for elk and deer.					
4.1	**Address and prevent impediments to animal movement to the greatest extent possible.**	*Landscape permeability*	· Find and remove obsolete fencing. · Participate in an awareness campaign promoting best practices (e.g., seasonal migrations, Living with Wildlife, dog behavior, etc.). **Response Options:** · *If notable increases in wildlife-vehicle collisions are observed, OST will work with highway corridor partners (CPW, CDOT) to evaluate mitigation options, such as:* · *Explore the use of seasonal highway signage alerting drivers to the migration corridor.* · *Use of a portable variable message panel during times of peak ungulate activity along Highway 82 in collaboration with CDOT/Sheriff's Office.*	Ongoing / Long-Term $	COA, CPW, WBI
4.2	**Use the Pitkin County land-use referral process (for both redevelopment and new projects) to minimize impacts on migration and movement corridors.**	*Landscape permeability; Invasive species; Floodplain connectivity; River system dynamism*	· Include OST in all land use referrals for parcels adjacent to North Star, along the flanks of Smuggler Mountain, and along the river and highway corridor between Wildwood and North Star. **Consideration should be given for strategies to minimize and mitigate impacts to wildlife movement, including:** · Avoid construction during peak wildlife periods; · Do not build in the floodplain; · Restrict type, height, and extent of fencing to ensure minimal impacts to wildlife movement; · Preserve the riparian zone and river; · Minimize activity envelope and preserve existing natural vegetation; · Removal and control of noxious weeds and planting of native plant species; · Protect land west of the Roaring Fork River to the maximum extent possible. · Development on the slopes of Smuggler Mountain on the east side of Highway 82 should allow a 1/4-mile-wide elk migration corridor. · Minimize development drainage and erosion impact on the wetlands and river. · Locate development in areas that are visually screened from North Star by natural landforms or vegetation. · Set development back to the maximum extent possible from North Star's boundaries and/or the river.	Ongoing N/A	Community Development
Conservation Value: River System					
Goal 5: Instream habitat contributes to the overall health and resilience of the stream ecosystem, meeting the needs of diverse aquatic and terrestrial species.					
5.1	**Encourage instream and near-channel habitat complexity.**	*Floodplain connectivity; River system dynamism; Beavers*	· Implement and enforce Beaver Dam and Downed Tree policies (See Section X). · Protect and enhance riparian tree and shrub regeneration and maturation.	Ongoing $	COA, CPW
5.2	**Conduct macroinvertebrate monitoring to track overall, long-term river health.**	*Water quality*	· Sample macroinvertebrates in the river following Colorado River Watch protocols and assess MMI scores. **Response Options:** · *Coordinate with upstream/downstream partners and analyze regional sampling results to determine the spatial scale and possible factors driving observed changes.* · *Additional investigation into driving cause(s) may be pursued if management changes within North Star have the potential to improve aquatic ecology conditions.*	Ongoing $	COA, RFC, CPW
Goal 6: Maintain floodplain connectivity as natural channel meander occurs via streambank erosion and sediment deposition processes, allowing the river system to operate in a dynamic state.					
6.1	**Monitor groundwater and streamflow.**	*Floodplain connectivity; Aquifer function; Hydrologic conditions*	· Collect field data on seasonal groundwater levels · Track streamflow data from the USGS stream gauge below North Star **Response Options:** · *Assess for possible loss of floodplain connectivity.*	Ongoing Staff Time	

	Conservation Values, Goals, and Actions	Relevant Indicator Topics	Tactics and Response Options	Timeframe and Estimated Budget 2025 - 2030	Partners
6.2	**Monitor channel form and change through time.**	*Floodplain connectivity; River system dynamism*	· Monitor channel meander and channel incision · Stay apprised of best practices for river and riparian area management. **Response Options:** · *Natural and engineered interventions will be considered to reconnect the floodplain and improve ecosystem function.*	Long-Term / Ongoing $$	
Goal 7: Maintain good water quality and continue efforts to maintain and/or increase water quantity, ensuring this stretch of the Roaring Fork River has adequate flow, temperature, pH, and oxygen levels, and limited harmful pollutants to support native aquatic life.					
7.1	**Monitor water quality. Coordinate with regional partners to address acute and chronic water quality concerns in the upper Roaring Fork River.**	*Water quality*	· Conduct water sampling, following Colorado River Watch protocols. Coordinate efforts with other water quality sampling efforts. **Response Options:** · *Increase sampling frequency to better understand exceedances.* · *Coordinate and conduct an investigation into upstream and downstream conditions with regional water partners to identify actions at North Star that may improve acute or chronic water quality impairments in the upper Roaring Fork River.* · *Implement projects as identified above to bolster water quality.*	Ongoing / Long-Term $	COA, RFC Lincoln Creek Work Group
7.2	**Keep water quantity in the Roaring Fork River as close to natural, undiverted levels as possible. Seek a hydrograph (seasonal streamflow) which mimics natural stream systems, with a late spring/early summer peak and a slow decline toward late summer baseflow levels.**	*Water quality; Wetland integrity and function*	• Work with the Pitkin County Attorney and Healthy Rivers Board on operational agreements and/or water rights negotiations to increase streamflows through North Star. • Participate in Upper Roaring Fork watershed conversations regarding water supply and water quality, including the optimization and tracking of diversion and bypass flows.	Long-Term Staff Time	COA, RFC, Healthy Rivers and Streams Board
Conservation Value: Riparian Area, Wetlands, Beavers					
Goal 8: Promote riparian area recovery toward a more naturalized state, with increasing habitat complexity, and protect beaver complexes across North Star as effective ecosystem engineers.					
8.1	**Encourage natural geomorphological and ecological succession processes, primarily through a passive rewilding management approach.**	*Wetland integrity and function; Compliance; Habitat condition; Plant communities*	· Maintain and enforce 'no beaching' to ensure young plants can establish on developing point bars. · Allow bank erosion process and incorporate its benefits (providing a sediment supply) into educational messaging · Add tree fence protection as needed to ensure diverse age classes and diverse species can establish in the riparian areas. · Nature-based or process-based ecological restoration activities are preferred over engineered or heavy-handed interventions. · Any projects involving heavy machinery and/or engineered design are reviewed with partners prior to inception. **Response Options:** · *OST will investigate factors limiting riparian plant establishment, growth and/or expansion and implement strategies to improve.* · *OST may consider more intensive interventions to achieve the desired conditions, informed by the best available science and practices.*	Ongoing Staff Time	
8.2	**Encourage beaver presence as effective ecosystem engineers, influencing the river channel, hydrology, wetlands, and vegetation in a natural, dynamic way.**	*Beavers; Floodplain connectivity; River system dynamism; Compliance*	· Allow the river to be dynamic. · Enforce Dusk to Dawn closure (protects nocturnal beavers) · Survey Beaver activity areas · Monitor beaver dams and enforce the Beaver Dam Policy. · Support beaver co-existence practices. · No expansion of pedestrian access routes, such as the James H. Smith trail, to maintain a 50-foot terrestrial buffer around areas of beaver activity where possible. · Active lodges within designated use corridors will be assessed for any additional protection measures needed. **Response Options:** · *If beaver activity declines, OST will investigate and address driving factors.* · *Conduct a study of the direct impacts and/or probable causes (e.g., human activity during beaver activity periods, limiting environmental conditions, trapping, or other detrimental actions in the broader area)*	Ongoing $	COA

	Conservation Values, Goals, and Actions	Relevant Indicator Topics	Tactics and Response Options	Timeframe and Estimated Budget 2025 - 2030	Partners
Goal 9: Preserve wetlands to ensure the provision of ecosystem services and habitat for diverse flora and fauna.					
9.1	**Maintain and/or increase wetland extent and function, as feasible within climatic and hydrologic constraints.**	*Wetland integrity and function*	· Conduct a wetland and river health synthesis, integrating relevant data to evaluate ecosystem function and overall wetland health. Data sources may include groundwater levels, soil saturation within the fen, photo-point documentation, assessment of adjacent land use, qualitative or quantitative observations of river geomorphology, water quality sampling, documentation of wildlife presence and use, habitat improvement project efficacy, etc. · Review vegetation mapping and transect data for shifts in wetland vegetation composition. · Support wetland extent and function through rewilding actions such as: increasing infiltration via soil health and vegetative diversity, adding willow/shrubs for shading, and addressing wetland drainage. **Response:** · *Collect quantitative data in area of concern, as needed.* · *Identify potential drivers of change and opportunities for intervention.*	Long-Term $$$	
9.2	**Monitor the fen wetland restoration area to ensure functionality is maintained.**	*Wetland integrity and function*	· Monitor the extent of saturation and native vegetation. Monitoring approach may change over time as stability of fen function is confirmed (e.g. quantitative field analysis, aerial analysis, photo documentation) **Response:** · *Contain reed canarygrass encroachment.* · *Additional native wetland plantings.* · *Fix or adapt plug structure.* · *Investigate drivers of change and identify intervention options.*	Short-Term $	
Conservation Value: Wildlife and Habitat					
Goal 10: Maintain diverse habitat types (aspen forests, riparian areas, wetlands, open water, meadows, and shrublands) in good condition across the Preserve, hosting native plant communities and local fauna.					
10.1	**Continue long-term plant community monitoring.**	*Habitat condition; Plant communities; Invasive species;*	· Monitor five permanent sampling locations · Conduct comprehensive vegetation mapping in accordance with the U.S. National Vegetation Classification System and OST monitoring protocols. **Response Options:** · *Review data with native plant ecologist/botanist in context of regional conditions and management activities to understand drivers of change.* · *Identify, consider and implement adaptive management actions as needed.*	Ongoing $$	
10.2	**Promote persistence and integrity of native plant communities to provide forage and habitat for pollinators and all animals**	*Habitat condition; Plant communities; Invasive species;*	· Conduct native reseeding in bare ground areas. · Foster shrubs and sagebrush regeneration via local seed collection and seeding/planting. · Investigate opportunities and methods to integrate other vegetation into meadows dominated by non-native grasses to improve ecological value. · Contain invasive vegetation that may be outcompeting native plants.	Ongoing $	
10.3	**Promote recruitment in all forest types for long-term viability.**	*Habitat condition; Plant communities; Invasive species;*	· Assess age-class diversity during vegetation and habitat surveys. · Stimulate vegetative reproduction like suckering and/or protect natural recruitment of native tree species. **Response Options:** · *Fence small areas of young trees to prevent overbrowsing and support growth to mid-size.* · *Plant native trees, shrubs and understory vegetation.* · *Stimulate aspen or cottonwood regeneration via cutting and or rootstock stimulation.* · *Continue willow expansion efforts via staking, etc.*	Ongoing Staff-Time	

Conservation Values, Goals, and Actions		Relevant Indicator Topics	Tactics and Response Options	Timeframe and Estimated Budget 2025 - 2030	Partners
10.4	**Protect and enhance bird breeding habitat.**	*Habitat condition; Plant communities; Bird diversity*	· Protect potential cavity nest trees from beaver and management activities (unless a significant safety hazard requires otherwise). · Protect ground nesting birds via designated access corridors, West side closure and no beaching policy. · Encourage willow growth and expansion. · Protect potential heron and raptor nesting trees from beavers via adequate basal fencing. · Voluntary or mandatory closures will be utilized during sensitive nesting periods if great blue herons are observed nesting within North Star Nature Preserve.	Ongoing Staff-Time	Roaring Fork Audubon
Goal 11: Provide habitats for diverse wildlife species, including songbirds, raptors, waterfowl, wading birds, herpetofauna, and large and small mammals, to use, live, and thrive.					
11.1	**Monitor terrestrial wildlife species.**	*Terrestrial wildlife diversity*	· Monitor terrestrial wildlife species approximately following established protocols. · Conduct surveys for evidence of elk production activity as needed by wildlife biologists or CPW to inform the development of additional protections. · Evaluate the potential reintroduction of the Wyoming Ground Squirrel. (Conduct thorough research, evaluate the potential benefits and concerns, a reintroduction proposal may be considered if warranted, etc.) **Response Options:** · *Identify and investigate potential drivers of observed changes at North Star, engaging a topical expert.* · *Implement additional protections around areas known to be occupied by sensitive species at critical times of their life cycle, including elk calving. Consider additional study of direct river user impacts on wildlife to inform management, such as elk calving activity.*	Ongoing $$	COA (with contractor support)
11.2	**Monitor avian species.**	*Bird diversity*	· Monitor avifauna at regular intervals according to the avian monitoring schedule and methods. · Include quantitative measures such as the ratio and densities of synanthropes to sensitive species. **Response Options:** · *Identify potential human-caused disturbances.* · *Investigate external factors that may contribute to observed conditions at North Star.* · *Implement additional protections around areas known to be occupied by sensitive species.*	Ongoing $$	COA (with contractor support)
11.3	**Monitor indicator species to assess functionality of key habitat types for wildlife.**	*Biodiversity; Habitat condition*	· Include Management Indicator Species assessments during general wildlife surveys. · Integrate mammal and avian indicator species into the same analysis. **Response Options:** · *If downward trends are observed, OST will investigate potential driving factors.* · *If a significant decline is observed, OST will engage a topical expert to evaluate the habitat condition that the indicator species represents to inform adaptive management actions.*	Ongoing $	COA (with contractor support)
11.4	**Conduct habitat condition evaluation and utilization in conjunction with wildlife surveys.**	*Habitat condition; Plant communities; Terrestrial wildlife diversity*	· Inventory critical habitat elements such as water, cover for reproduction and critical forage for key species (e.g. elk, beaver, birds, small mammals, pollinators) · Identify and implement habitat enhancement opportunities. · Supplement potentially lacking habitat elements, such as forbs and dead wood for pollinators, berry-producing shrubs for birds, bears and rodents, rodents for avian predators, cover for ungulate production/rearing, etc.	Ongoing $	COA (with contractor support)
Conservation Value: Community					
Goal 12: Serve as a living classroom, fostering and facilitating scientific research, community connection, and environmental education.					
12.1	**With our educational partners, provide a naturalist presence at Wildwood and North Star to engage visitors and educate them on the ecological importance of the area.**	*Education; Compliance*	· Educate the public about the importance of the preserve's natural resources and encourage responsible behaviors. · Explore expansion of outreach efforts, such as offering naturalist programs more frequently and across different areas of the preserve.	Ongoing $$ (Annual)	ACES
12.2	**Facilitate and support educational programming and volunteer opportunities to build a following, maintain relationships, and foster environmental and stewardship education.**	*Education*	*See Special Use Policy* · Support guided, seasonally focused programming led by educational partners with Ranger staffing as appropriate. · Schedule annual report-outs with partners to review programs and participation. · Limit educational opportunities in the Wildlife Zone. · Facilitate and support partnerships that provide educational opportunities for youth and students, including fall and spring school field trip programming and science projects like wildlife counts, vegetation monitoring, or stream health assessments. · Coordinate volunteer stewardship days focused on efforts such as invasive plant removal or habitat restoration.	Ongoing $$ (Annual)	COA, RFC, ACES
12.3	**Develop, implement, and update education and communication initiatives.**	*Education; Compliance*	· Develop and track-communications and outreach to address messaging needs, identify priority topics of concern, and identify effective tactics/strategies for identified audiences. · Research and implement as feasible the development of education and incentive programs to provide understanding of etiquette and compliance with regulations, and encourage behavioral shifts to meet those standards. · Strategies to reach visitors to the Preserve prior to their trip, as well as when they arrive, will be explored and implemented while also minimizing promotion of the Preserve. · Work with area stakeholders to encourage behavior and practices that align with and advance the conservation values of North Star.	Ongoing $$ (Annual)	ACRA, USFS, COA, RFC, ACES, Local Businesses and Nonprofits
Goal 13: Ensure the volume, type, and distribution of recreational and river use remain within a manageable and predictable range, allowing wildlife to adapt and thrive and utilize the river corridor during times with minimal (recreational) disturbance by tracking key indicators and adjusting management strategies as conditions change.					
13.1	**Concentrate and regulate visitor use so that activity stays within designated areas and predictable timeframes.**	*Terrestrial wildlife diversity; Overall river use; Peak use; Congestion; River experience; Safety*	*See Peak Use Policy, Voluntary Closures* · Monitor river use, including river use season duration, peak season, daily river use, and commercial use using cameras or other technologies as appropriate to monitor daily river use counts · Track daily hourly duration of peak river use (through PPV, VOAT, and/or river use counts) and compare to peak wildlife activity (through wildlife monitoring). · Monitor crowding on the river and the visitors' perception of crowding, and minimize unsafe or overly crowded conditions. · Track the number of peak-use days and the annual duration of the river use season. · Inventory the total area used to accommodate summer and winter recreation. Monitor the area required to accommodate the amount and types of recreation use permitted and track changes over time. · Monitor the area of vegetation and soil disturbance for increased width, disturbance, or social trails at access points and potentially trafficked areas: Wildwood put-in, South Gate put-in, Beach access, James H. Smith Trail, and the Pedestrian Bridge take-out. · Monitor beaver-dam areas for potential ground disturbance on the streambank associated with river users going around the dams. **Response Options:** · *Increase public awareness of wildlife activity periods.* · *Adapt user education or ground-protection measures around beaver dams.* · *Utilize site hardening strategies such as boardwalks if needed.* · *Utilize signage/fencing/gates to limit encroachment outside of established access areas/corridors/times.* · *Utilize strategies to close/restore areas of unauthorized use or social trails if/when observed.* · *If peak-use hours of the day increase, institute a timeframe for public use at all river put-ins, including Wildwood, based on wildlife needs and use, and jointly enforce it. Recommend river use occur between 10am and 6pm (requires coordination with the USFS).* · *Implement shoulder-season closures, if necessary, to benefit wildlife.* · *Any new infrastructure improvements will be considered through an update to the management plan and should be evaluated in response to resource protection needs.* · *See Wildwood and Takeout related actions for response options to minimize unsafe or overly crowded conditions.*	Ongoing Staff Time	COA

	Conservation Values, Goals, and Actions	Relevant Indicator Topics	Tactics and Response Options	Timeframe and Estimated Budget 2025 - 2030	Partners
13.2	**Coordinate commercial river use as a management tool to provide controlled public access that supports informed, respectful experiences, reduces parking pressure/congestion at access points, reduces private-use impacts, and enhances safety through structured scheduling, group size limits, and required education.**	*Commercial use; Overall river use; Peak use; Congestion; River experience; Safety*	*See Commercial Use Policy* · Monitor and evaluate commercial use and its role in supporting informed, respectful experiences, reducing parking pressure/congestion at access points, reducing private-use impacts, and enhancing safety through structured scheduling, group size limits, and required education. · Compare congestion indicators between commercial-use and private-use periods. **Response Options:** · *Test commercial use changes / permit requirements and evaluate the impacts of changes. Potential strategies to consider include:* · *Limiting or eliminating commercial use on peak days, such as holidays and weekends.* · *Coordinating/restricting commercial drop-offs during Wildwood School bus needs.*	Ongoing Staff Time	COA, USFS, Operators
13.3	**Explore the potential expansion of the Nordic loop on James H. Smith.**	*Recreational use*	· Work with City of Aspen and Nordic operators on the limited expansion of the Nordic trail system on James H. Smith in response to changes to the area's climate and the micro-climate. · Implement protections for elk migration and heron nesting activity, including no/limited grooming on James H. Smith before January 1 or after March 15. · Limit track expansion to the non-winter human-use zones and avoid impacting the wetlands. · Work with the Aspen Nordic Council to ensure consistency between the North Star Management Plan and the Nordic Trails Plan.	Short-term, Ongoing $	COA, Nordic Council
13.4	**Explore and implement strategies to address trail safety on the East of Aspen Trail.**	*Recreational use; Safety*	· Establish and sign a 10 MPH speed limit. · Install signs to increase awareness of speed. · Maintain the East of Aspen Trail to meet ADA standards. · Identify priority areas in the high-use portion of the trail between the end of the pavement north of the Preserve and the James H. Smith property to widen the trail. · Address additional trail segments in the lower-use sections of the trail between James H. Smith and Difficult Campground where the platform is constrained by Highway 82 and private properties.	Short-term $$$	COA, CDOT
13.5	**Improve accessibility of river access points for people with mobility challenges.**	*River experience*	· Evaluate and implement options to improve or provide alternative river access at the Pedestrian Bridge Take-out. · Evaluate whether path hardening, boardwalks, and grade changes are needed at other access points to facilitate access for people with mobility devices.	Short-term $	COA, RFC
Goal 14: Ensure user behavior supports the desired conditions, reflecting environmental awareness and respect for wildlife, by maintaining a seamless system of clear, consistent, and enforceable rules with strong compliance.					
14.1	**Coordinate regulations across jurisdictional boundaries to limit the issues created by inconsistency.**	*Congestion; Compliance; Enforcement*	*See Regulations and Policies.* · Continue to work with the USFS, Sheriff's Department, and City of Aspen on coordinated regulations and enforcement. · Enforce the "Strictly Enforced" policy. · Strengthen the policy language to escalate penalties for repeat offenders. · Work with neighboring properties that share river access to reinforce North Star's regulations where appropriate. · Coordinate with Pitkin County Sheriff's Office and CDOT to address illegal parking within the highway right-of-way and below and above North Star. · Patrol and enforce parking in designated spaces only with citations. · Work with CDOT to install additional “No Parking Signs”. · Work with the Sheriff’s Office to enforce parking violations and increase fines for parking offenses outside open space and trails. *See Wildwood Land Exchange Action.*	Ongoing Staff Time	COA, USFS, CPW, CDOT
14.2	**Ensure ranger and enforcement staffing can effectively communicate, and enforce regulations and policies (see Policy Section), Title 12 and the additional regulations specific to North Star have been established to ensure that visitor use impacts on wildlife are minimized and to facilitate predictable and non-threatening behaviors.**	*Peak use; Compliance; Enforcement*	· Ensure North Star access points and river corridor are adequately staffed by OST rangers during summer months. Prioritize patrols on peak days (Saturdays, Sundays, and holidays). **Response Options:** · *Increase Ranger patrols, as necessary.* · *Explore additional reporting technology.*	Ongoing Staff Time	COA
14.3	**Fund enforcement positions to help manage the parking and access at Wildwood and encourage user behavior shifts.**	*Congestion; Compliance; Enforcement*	Fund positions, such as: · OST Rangers · USFS Forest Protection Officer(s) · Other related positions or contractors	Ongoing $$$ (Annual)	COA, USFS
14.4	**Update and install consistent regulatory, wayfinding, education, and interpretive signage to educate and inform the public about the ecological value of the area, regulations, and management efforts.**	*Compliance; Education; Enforcement*	· Inventory, update and improve signs for consistency, visibility, and clarity, utilizing the 2014 Sign Guidelines. · Install and maintain wayfinding signage and kiosks communicating responsible recreation at river access points. · Streamline 'float-through only' signage, alerting river users of the wildlife closure through consistent messaging.	Ongoing $	CDOT
Goal 15: Maintain limited, functional, and safe access points, parking, and trails, while minimizing ecological impacts, reducing congestion, and promoting respectful use.					
15.1	**Use limited, available parking as a tool to manage visitor use and congestion and continue to explore and implement strategies to facilitate alternative modes of transportation.**	*Congestion; Compliance; Enforcement; Safety*	· Do not expand parking infrastructure beyond what was implemented with the 2023 improvements. · Additional amenities or facility improvements limited to safety and/or resource protection requirements may be considered. · Patrol and enforce parking within designated parking lots with parking citations at a higher enforceable level. · Enforce regulations around storing gear, loading, and/or unloading in parking spaces or travel lanes. **Response Options:** · *Docked and dockless bike fleet at North Star* · *Shared gear wagons* · *Temporary safety closures to parking areas as needed* · *Parking duration limits* · *Paid parking*	Ongoing $ & Staff Time	CDOT; WeCycle
15.2	**Manage congestion at the Stillwater bridge take-out.**	*Congestion; Compliance; Enforcement; Peak use; Safety*	· Patrol to ensure loading and unloading are taking place in designated zones. · Allow river use put-in and takeout at the Beach to reduce congestion; alert with on-site signage. · Coordinate with CDOT on vehicle travel delineators or other strategies to facilitate safe vehicle movements and prevent U-turns. · Identify strategies to prevent idling on nearby roads and driveways.	Short-Term Staff Time	CDOT
15.3	**Manage congestion and vehicle flow at the Wildwood put-in.**	*Congestion; Compliance; Enforcement; Peak use; Safety*	· Install temporary signs at the Wildwood parking lot on peak-use days (Saturdays, Sundays, and holidays in July) to alert river users when Wildwood parking is full. **Response Options:** · *Explore a vehicle turnaround with designated vehicle staging spaces at the Wildwood put-in.* · *Coordinate with the USFS to close the Wildwood put-in to public parking on peak-use days (Saturdays, Sundays, and holidays in July); monitor impacts.* · *Explore closing the Wildwood put-in to public parking (requires coordination with the USFS).* · *Consider paid parking at Wildwood put-in (requires ownership of the Wildwood put-in).* · *Consider a timed-entry or a permit system for public use (requires ownership of the Wildwood put-in).*	Short- and Long-term TBD	USFS, Wildwood School
15.4	**Complete the land exchange to transfer ownership of the Wildwood area from the USFS to Pitkin County Open Space and Trails.**	*Congestion; Compliance; Enforcement; Peak use; Safety*	· Fund the USFS's consultant to pursue the exchange. *County ownership of the Wildwood parcel is required prior to pursuing future adaptive management strategies to control public river use, vehicle flow, and congestion at the Wildwood put-in.*	Short / Long-Term TBD	USFS