

Commonwealth of Virginia

Natural Area Preserve Management Guidelines

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**Virginia Department of Conservation and Recreation
Division of Natural Heritage**

Natural Area Preserve Management Guidelines

Overview

Natural area preserves in Virginia are acquired and managed for the primary objectives of providing suitable habitat conditions for rare or declining species of plants and animals and for protecting outstanding examples of both common and rare natural community types. Natural area preserves also provide opportunities for field research, outdoor education, and an array of outdoor recreation activities. Active management actions are needed to meet these objectives. For example, natural areas managers: (1) plan, construct, and operate public access facilities in a manner that allows visitors to experience the beauty of these special places while protecting the habitats of rare species; (2) reinstate the natural process of fire through the use of prescribed burning to restore and maintain habitat conditions required by fire-adapted species of plants and animals; (3) restore altered water flows and natural hydrological conditions by blocking ditches or removing fill; (4) remove non-native, invasive species that displace native plants and animals, eliminate rare species, and destroy natural communities.

These management guidelines explain the reasons and methods for managing rare species habitats and natural communities, describe how public use can be balanced with resource protection, and state principles and ideas that guide management of natural area preserves with the goal that they will perpetually sustain their valuable and vulnerable resources.

Introduction

The Virginia Natural Area Preserve System was established by law in 1989 to protect and conserve *natural heritage resources* (habitats of rare plants and animals; exemplary natural communities; other rare natural features) throughout the state. This system of protected lands is administered by the Virginia Department of Conservation and Recreation (DCR) and managed by the Division of Natural Heritage (DNH). Natural Area Preserve Dedication, in accordance with the Code of Virginia sections 10.1-209 - 217 (Virginia Natural Area Preserves Act), offers strong levels of protection by placing privately and publicly held natural areas into a legally established statewide preserve system with statutory protection against most forms of condemnation and conversion to other land uses.

These guidelines were developed to provide management direction for dedicated natural area preserves in Virginia. Natural area preserves in most cases are discrete areas of land under the ownership of the Commonwealth and managed by DCR-DNH. However, some preserves comprise a portion of larger conservation areas such as state parks, state forests, municipal watersheds, county parks, and privately-owned open spaces. These may have recreation and/or commodity and income production as parallel management objectives; thus, some natural area preserves may have a somewhat broader set of compatible uses – and management challenges – than is found for natural area preserves owned and managed by DCR. Still, all preserves in the state system have one unifying and primary purpose, which is to permanently protect the natural heritage resources found on the site.

Natural area preserves often support fragile habitats that have the potential to be damaged or destroyed by inappropriate public use or other human activities. Virginia's long post-settlement history has resulted in most natural areas having been modified to varying degrees by past and on-going land-use, as well as by introductions of non-native species of plants and animals. As a result, natural processes such as fire and floods have been suppressed or eliminated. These and other agents of disturbance are required to maintain successional stages that provide habitat for certain species or that result in the formation of distinct communities. On-going introductions and proliferation of non-native, invasive plants and animals also pose a threat to native species and natural community integrity. Certain physical settings, e.g. beaches, mountain peaks, cliffs, and wetlands can attract heavy visitation due to their popularity for various types of outdoor recreation; hence, such sites are frequently heavily impacted if such use is not monitored and managed. For these reasons, a "hands-off" or passive management approach seldom meets the objectives of natural areas stewardship. Managers must identify which processes are needed to maintain natural communities and habitats of rare species in order to develop successful management strategies and prescriptions.

The primary objective of natural areas stewardship in Virginia is to provide for the continued presence of natural heritage resources. Attaining this objective may require management actions that result in perpetuation of a particular successional vegetative stage (habitat condition) required by a rare species or characterizing a natural community. Actions are taken that

maintain, restore, or mimic natural processes and result in a particular vegetative structural and compositional condition. Thus, natural area stewards often attempt control of unnatural, harmful disturbances, such as invasion by invasive plants such as kudzu or Phragmites. They may also promote natural disturbance by fire to maintain a rare grassland or wet prairie community in the Shenandoah Valley. By taking such actions, the natural processes and conditions that allowed the rare species or community to historically occur at the site are restored, to the extent possible.

Natural Area Preserve (NAP) Management Plans are written for all dedicated natural area preserves in Virginia. Plans are comprehensive and contain specific site and resource information plus management objectives and action recommendations that guide preserve stewardship and allow for management continuity over time. With assistance from various sources and organizations, DCR-DNH natural areas managers assemble information and develop strategies designed to enhance, maintain, and/or restore the natural heritage resources for which a site was dedicated as a state natural area preserve.

Public Uses

Natural area preserves are managed for the primary purpose of protecting the long-term quality, condition, and viability of natural heritage resources within their boundaries. Most preserves are managed to meet this resource protection objective while at the same time accommodating some level of public use. Compatible and appropriate types of public use are identified for individual preserves through the management planning process. Some preserves support resilient habitats and may be capable of sustaining relatively high levels of public use. Others may contain fragile habitats such as seepage bogs, wet prairies, and outcrop barrens where plant and animal species can be damaged even by low levels of visitation. Natural areas managers need to monitor public use in order to ensure a balance between resource protection and public use objectives.

Monitoring of use levels provides data needed to justify changes to public use patterns and refine resource protection strategies. Some preserves may be closed seasonally but open for visitor use at specific times of year. Others may have closed areas but remain open along a designated trail or boardwalk.

The term “public use” includes such activities as hiking, camping, biking, fishing, hunting, swimming, research, and education. Uses that harm or have potential to harm resources are considered *inappropriate* and incompatible with natural area preserve objectives. The degree of damage or potential damage can vary with the frequency, intensity, and location of visitor activity. Whenever public use causes or has potential to cause harm to natural heritage resources, there is a conflict with the primary protection objective mandated by the Virginia Natural Area Preserves Act. Additionally, the scarcity of funds to support natural areas management often translates to an inability on the part of DCR to monitor, manage, and/or mitigate the impacts of public use, thereby making them incompatible with resource protection.

Guidelines relating to specific types of public uses in the context of natural areas management follow. These are organized into three use categories, based on their appropriateness under normal circumstances and management situations.

1. Normally Appropriate Uses

Birding, wildlife-watching, native plant observation, photography.

These uses by the public are normally appropriate and compatible with natural areas management. These are non-consumptive uses whereby populations of plants and animals are simply being observed, often at a distance, with no collection, disturbance, or resultant change in population or habitat conditions. At some fragile sites such as rock outcrops or wetlands, boardwalks and/or observation platforms may be constructed to reduce impacts of large groups at any one time, or to make it possible to accommodate increased numbers of visitors over time. In some cases, visitation may be limited to specific seasons or seasonally closed, such as with preserves supporting shorelines with populations of colonial water birds where the presence of humans can result in nesting failure.

Hiking. Trails and old roads are often present as a result of land use prior to the establishment of a natural area preserve. Such trails may or may not be appropriate for public use by hikers, depending on factors such as proximity to occurrences of natural heritage resources, slope, active erosion, wetland crossings, and other terrain features. Proposals for new trails in natural area preserves are reviewed by the DCR-DNH Division Director and Natural Areas Stewardship Manager. Maps showing existing and proposed trails are included in natural area preserve management plans. On DCR-owned preserves, trail maintenance and use monitoring is conducted by Natural Area Operations Stewards to assess 1) the number of trail users, 2) the extent to which users stay on designated trail routes, 3) trail maintenance needs, and 4) whether or not occurrences of natural heritage resources are being degraded by trail use. “Unofficial trails” or those created by users off or away from planned trails, can damage resources. Actions for reducing use of unofficial trails may include barricading with bollards, cable, or rocks, constructing planned trails to less sensitive locations in the preserve, and installing interpretive signs explaining the reasons for access restrictions.

Research. Excellent opportunities for scientific research exist on natural area preserves. Baseline inventory work is often needed to inform preserve management, such as floral, faunal, and community surveys, and studies on local microclimates, soils, geology, and hydrology. To the extent possible, DCR-DNH will permit scientific studies that show promise to fill knowledge gaps in natural area preserve and natural heritage resource management. Studies to be conducted on preserves will require prior submission of a DCR Research and Collecting permit application, review and approval by DNH staff, and issuance of a written permit. Research methods will be used that minimize adverse effects on natural heritage resources and physical features at the preserve. At project conclusion, researchers are required to 1) remove evidence of their work such as residue from destructive sampling techniques (clipped plots), temporary shelters for instrumentation, plastic flagging, and visual plot locators such as stakes, wire flags, or sampling station monuments and 2) submit a written summary report of their project results.

Teaching and education. The use of natural area preserves for educational uses is highly appropriate. Natural areas present an opportunity to observe many rare forms of life as well as the natural processes that maintain their habitats. The preserves provide ideal locations for introducing people of all ages to the idea and value of biodiversity protection and for education about a broad set of natural resource management approaches. As with other uses, teaching activities should be managed to prevent adverse impacts on natural heritage resources. DNH staff and/or responsible volunteer instructors should accompany group field trips to natural area preserves.

2. Conditionally Appropriate Uses

Fishing, picnicking, canoeing/kayaking. Whether or not these activities constitute appropriate public uses depends on (1) the site-specific characteristics of a particular natural area and (2) the observed and documented consequences of such uses. For example, circumstances may allow low numbers of surf fishermen to use a beach that also supports rare beach nesting birds. At some preserves, however, there may be sound reasons to prohibit this use because it is known or

expected to cause negative impacts. When and where allowed, the effects of such uses that are considered to have potential to cause negative effects on natural heritage resources will be monitored. If negative impacts to resources are observed, the public use(s) causing the impact may be discontinued.

Swimming. Swimming is not authorized on DCR-owned natural area preserves due primarily to the issue of public safety. With no lifeguards or patrols in place on preserve shorelines or waterways, DCR cannot officially sanction swimming. Rather, in nearly all cases, this use is either prohibited or actively discouraged. On privately-owned natural area preserves, decisions to allow swimming or to prohibit it are the responsibility of the landowner. In cases where beach uses such as sunbathing and beach-walking result in direct damage to fragile beach and dune habitats that support rare species, such impacts should be documented and the specific causative use(s) discontinued.

Hunting. As with fishing, hunting may or may not be compatible with natural area preserve management. Hunting is sometimes necessary for the purpose of managing population size of animals such as white-tailed deer, nutria, snow geese, or resident Canada geese. However, hunting can result in conflicts between user groups. For example, public use by birdwatchers visiting a preserve to view migratory waterfowl is not compatible with concurrent waterfowl hunting. Likewise, use by wildlife photographers or students on a class field trip is not compatible with managed hunting to reduce a preserve's deer population. In most instances, hunting on natural area preserves will be limited temporally and conducted specifically to meet the management objective of controlling animal populations that, if left unchecked, present a threat to natural heritage resources at the site or that are causing economic harm to adjacent or nearby farm lands.

Caving. Caves are fragile habitats and support some of the rarest occurrences of natural heritage resources in the state. Overuse of caves has been documented to cause habitat degradation and, if prolonged or chronic, is well-known to cause damage or extirpation of rare species of animals and alteration of pristine cave features. For this reason, access to most caves on natural area preserves will be restricted to visitation during an organized field trip, or following issuance of a written Research and Collection or Special Use permit from DCR-DNH.

Geocaching. This “high-tech treasure hunt” activity is increasingly popular on public lands nationwide as GPS technology and devices make it easier for the public to search for and find “geocaches”. Natural areas managers should monitor the amount of such activity on individual preserves and, to the extent practical, stay aware of the locations of all geocaches in order to document and prevent damage to fragile sites. Caches placed too close to habitats that have potential to be impacted should be removed or relocated.

3. Inappropriate and Incompatible Uses

Camping. Camping activities result in repeated localized intensive use and long-term degraded site effects. Even “leave-no-trace” camping causes some adverse impacts and would require

monitoring. Additionally, if “no-trace” camping were allowed on state-owned preserves, increasing numbers of campers would likely request access and many would not abide by “no trace” practices. Thus, camping can reasonably be expected to cause habitat degradation and negative impacts on rare species and natural communities. For these reasons, camping is incompatible with the primary resource protection objective of the Virginia Natural Area Preserve Act and is a prohibited activity.

Mountain biking. Except for use on vehicular access roads and established parking areas designed for automobiles, the use of bicycles within state natural area preserves is prohibited. Mountain biking has become a popular outdoor activity that exerts increasing pressure on sensitive natural areas. If bicycle use has occurred in a preserve or if ready access exists, management actions will be taken to inform riders that bike riding is not permitted. If feasible or needed, access will be blocked with signs and/or barricades placed in strategic locations. Given that bike riding patterns are difficult to change once established, it is important to quickly develop strategies to protect natural heritage resources once such use is detected.

Horseback riding. Equestrian uses are inappropriate on state natural area preserves due to the well-documented negative impacts to soils and vegetation of concentrated and frequent passage of horses. Additionally, the introduction of invasive weeds from both manure and hoof-borne vectors is a documented negative aspect of horseback riding in areas managed for natural heritage resources. While infrequent use may cause small impacts, increased levels of use over time are inevitable on public lands. Thus, as with bicycles, horseback riding is an inappropriate and incompatible use on lands dedicated as natural area preserves.

Rock climbing. Rock outcrops and cliffs are among the most fragile of habitats and support some of the rarest occurrences of natural heritage resources in the state. Repeated use by climbers at these sensitive places is known to cause habitat degradation and, if prolonged or chronic, can cause direct population damage or extirpation of rare species of plants and animals. For this reason, access to cliffs and outcrops by rock climbers is prohibited on natural area preserves.

Off-road vehicles. Motorized all-terrain-vehicles including “four-wheelers,” motorcycles/dirt bikes, and sport utility vehicles are prohibited within natural area preserves except for licensed vehicles on preserve access roads and established parking areas. Off-road use by these vehicles damages hiking trails and causes severe erosion requiring expensive repairs. Noise from vehicle engines also reduces the quality of the outdoor experience for other authorized user groups and is a harassment of wildlife. The use of off-road vehicles is perhaps the most incompatible of all public use categories on state natural area preserves.

Unleashed pets. Visitors may bring pets with them when visiting natural area preserves. However, pets must at all times remain under leash restraint while on DCR-owned lands. Unleashed dogs pose a particular threat to natural heritage resources and to various species of wildlife. Free-roaming dogs are known to cause nest abandonment in shore nesting bird colonies and to harm or destroy ground nesting bird eggs and young. Digging activity by dogs also

causes habitat degradation on beaches protected for rare animals such as northeastern beach tiger beetles. For these reasons, all dogs or other domestic animals accompanying human visitors to natural areas preserves must be kept on leash at all times.

Collection of plants, animals, minerals, or artifacts. In order to protect occurrences of rare species, the collection and removal of plant material, animals, minerals (rocks), or artifacts is prohibited. The one exception to this guideline is the non-commercial, incidental gathering of common species (e.g., blackberries, blueberries, strawberries) for personal consumption. However, some rare species that produce an edible berry are native to Virginia and should not be picked. In such instances and locations, signs will be posted to inform the public in order to prevent negative effects to rare species from incidental collection. For legitimate research and education purposes, collection of specimens may be approved by DNH following submission and review of an application for a natural area preserve Research and Collection permit.

Site Operations Management

Roads and Trails

Many preserves have existing roads from previous land uses. Building new roads is nearly always inappropriate in natural area preserves and seldom will there be sufficient justification to do so. Even roads outside of preserves, especially along boundaries, may adversely affect resources within the preserve due to impacts such as introduction of invasive species, noise pollution, and alteration of local hydrology. Existing woods roads, trails, or historic traces will be mapped and described in Natural Area Preserve (NAP) Management Plans. Roads within preserves will be considered for closure if they have no specific utility or function for preserve stewardship, or if such closure would reduce negative impacts to natural heritage resources or cause a decrease in vandalism to preserve facilities and infrastructure.

Old roads may or may not provide acceptable locations for hiking trails on preserves. New trail systems will be designed using a balanced approach that considers both resource protection and quality of the hiking experience for visitors. An emphasis will be placed on interpretation using appropriate signs in order to provide information to visitors about natural heritage resources and the state natural area preserve system.

Rights-of-way

Utility corridors such as powerline rights-of-way can and do exist in natural area preserves. Siting of new corridors within preserve boundaries is highly inappropriate. Rights-of-way agreements or easements particular to a preserve will be appended to the NAP Management Plan along with a list of contacts regarding agreements and corridor maintenance. All non-DCR entities (rights-of-way maintenance contractors, utilities, municipalities, etc.) should be informed of the presence of natural heritage resources in the preserve. Frequency and methods for rights-of-way maintenance will be used that have the fewest negative effects on natural heritage resources. Such coordination will decrease adverse impacts to rare species and increase DCR inclusion in planning for expansion or improvement to utility corridors near or within natural area preserves.

Public Access Facilities

Public access facilities at preserves will be designed to meet the primary objective of protecting natural heritage resources while also providing high quality visitor experiences. Access designs will function to constrain visitor activity in ways that protect fragile habitats. Determining and mapping the location of sensitive areas within the preserve is essential so that threats can be abated and vulnerable resources protected. All proposed and existing structures and signs at preserve entrances will be described in NAP Management Plans. Plans for new or improved parking, interpretive signs, and trails will be discussed and approved by the Natural Heritage Division Director and Natural Areas Stewardship Manager prior to project implementation.

Other Infrastructure

Guard rails, bollards, signs, fences, gates, trail steps, bridges, boardwalks, observation decks, and other structures or measures may be installed as necessary for resource protection, site security

and visitor safety. Such infrastructure should be described and justified in each NAP Management Plan. Potentially dangerous conditions such as dead trees, branches, abandoned wells or pits, and similar hazards on trails or in authorized public use areas may be removed, cleared, filled in, or otherwise remedied. When in accordance with the NAP Management Plan, evidence of past human use such as fences, fence rows, culverts, trash dumps, and abandoned vehicles or structures (having no historic or scientific value) may be removed from the preserve, following standard procedures administered by DGS and other agencies.

Boundary Lines

Preserve boundary lines are marked according to standard procedures as outlined in the DCR Natural Area Preserve Sign Manual for the purpose of establishing and maintaining the visual physical extent of preserve lands. Well-marked boundaries are essential for preventing trespass and deterring illegal and/or harmful activities, thus providing for resource protection. In general, preserve boundaries should be maintained (painted, re-signed) every 5 to 10 years, or as needed.

Law Enforcement

DCR Natural Areas Operations Stewards are commissioned Conservation Police Officers with law enforcement authority and jurisdiction on all state natural area preserves, whether or not owned/managed by DCR. Virginia State Park regulations are applicable to all DCR lands, including state natural area preserves. Operations Stewards, in addition to their responsibilities for primarily non-biological management issues on preserves, conduct law enforcement patrols, respond to reports of violations, collect evidence, conduct investigations, and work with local law enforcement officials to deter and prosecute criminal activity.

Biological Resource Management

Prescribed Burning

Prescribed (or *controlled*) burns are conducted on NAPs in accordance with the DCR Prescribed Fire Management Manual (2010) for the objectives of 1) restoring, enhancing, and maintaining fire-adapted natural communities, 2) controlling invasive species, and 3) accomplishing various other objectives – such as fuels reduction – as identified in NAP Management Plans and/or in accordance with guidance from DNH fire managers and fire ecologists. DNH stewardship staff with training and experience in fire management that hold Virginia Prescribed Burn Manager Certification will, in conjunction with reviews and approval by DCR Fire Leaders, prepare written burn plans for each prescribed burn project. All required permits and approvals shall be obtained for each project. Burning shall not be attempted under conditions more hazardous than those specified in the prescribed burn plan. The use of equipment and motorized vehicles, size and roles of the burn crew, identity of the fire leader, time of year for the burn, frequency of burning, size of the area to be burned, and other detailed information pertinent for conducting a burn shall be specified in prescribed burn plans.

Prescribed burn plans shall be reviewed and approved by a DCR Fire Leader. The implementation of prescribed burn plans will require the concurrence of the Director of the Department of Conservation and Recreation, or his/her designee, and the Director of the Division of Natural Heritage. Monitoring of animal, plant, or community responses will be accomplished in order to determine efficacy of burn projects. Copies of unit burn prescriptions and monitoring reports will be completed and archived in the Natural Heritage NAP management files.

Restoration of Natural Hydrology

Hydrologic conditions altered by human activities such as drainage or fill placement may be restored when needed to create soil moisture regimes necessary for the benefit and enhancement of rare species and natural community occurrences. Stewardship actions that affect hydrology will be conducted for the purpose of meeting habitat maintenance and restoration objectives for which the preserve was established. Specific actions will be described in NAP Management Plans and be in accordance with local, state, and federal laws and regulations.

Erosion Control and Conservation Plantings

Control of erosion in natural area preserves that result from human disturbance may be accomplished through conservation plantings or by other means in order to meet natural heritage resource stewardship goals, protect water quality, and abate man-induced soil loss arising from previous land surface alterations. Species native to Virginia (and if possible, native to the specific region) will be used for conservation plantings to achieve soil stabilization. Planting non-native and/or invasive alien species is inappropriate on natural area preserves as well as in other natural settings. Such plantings are widely discouraged for most natural resource conservation projects. In addition, erosion problems on adjacent or nearby lands that impinge on preserve resources may be addressed in cooperation with DCR's Division of Soil and Water Conservation and the landowner. Erosion mitigation plans will be developed as needed in cooperation with appropriate agencies, partners, and stakeholders.

Invasive Species Control

Measures to control invasive plants and animals will be taken using accepted methods consistent with objectives stated in NAP Management Plans. Specific actions recommended for the control of any plant or animal species will be described in NAP Management Plans.

Insect and Disease Control

Insect or disease control programs will be undertaken on NAPs only if the infestation or outbreak (1) threatens adjacent natural areas, (2) will drastically alter natural ecological processes within the natural area preserve or cause adverse economic impacts on adjacent property, or (3) constitutes a public health emergency provided that such control programs are approved by the managing agency or are provided for by law.

Pesticide Use

The use of certain pesticides is one means by which natural area preserve stewards may accomplish specific management objectives. NAP Management Plans describe those situations under which pest management, such as invasive plant control programs, will be undertaken. Pesticide use in the context of natural area stewardship is mostly limited to herbicide applications for controlling (1) invasions of exotic vegetation that threaten on-site occurrence of rare species or natural communities or (2) weedy growth in public access facilities such as parking areas.

DCR natural area managers conducting herbicide work in proximity to natural heritage resources follow the principle that listed species not be harmed as a result of treatment actions. For all listed species in proximity (i.e. immediately adjacent) to a proposed herbicide treatment site:

- 1) Check the herbicide label for restrictions based on listed species (i.e. may state distance restrictions with aquatic habitat or state that only ground spraying can be done, etc.);
- 2) Consult the EPA's Endangered Species Protection Program's website for any chemical and time of year restrictions, listed by county and downloadable from:
<http://www.epa.gov/espp/bulletins.htm>.
- 3) make sure that all related requirements from the product label are met: e.g. loading, mixing and cleaning of equipment off site.

Other than the standard guidelines for licensed commercial applicators, there are no specific VDACS or federal guidelines for working in proximity to rare species with herbicides, other than taking all precautions to assure that listed species will not be harmed. Applying herbicides immediately adjacent to known locations of natural heritage resources should be avoided or minimized whenever possible. When necessary, and on a case by case basis, precise application methods should be used to avoid non-target spraying. Be mindful of underground flashback potential of the chemical used. For example, use wicking wands to treat individual Phragmites stems within a rare sea level fen community on the Eastern Shore.

Harvesting Trees

Natural area preserves are not “working forests” managed for sustainable production of wood products. However, it may be necessary in specific instances to cut trees in order to accomplish specific objectives, such as 1) removing invasive plants (trees) such as Ailanthus, Paulownia, and Eleagnus; (2) removing existing forest cover in order to accomplish a restoration objective such as establishing longleaf pine savannas or American chestnut forests; 3) thinning a forest – often in combination with prescribed fire – in order to encourage diverse groundcover development and improve habitat conditions for light-demanding species such as smooth coneflower. Practices such as harvesting, deadening, or felling trees may be compatible with natural areas goals as habitat restoration for a targeted rare species or natural community. For example, harvesting loblolly pine by clearcutting may be needed to restore a longleaf pine savanna.

When alterations to existing structure and composition of forest vegetation are appropriate and necessary to benefit natural heritage resources, natural area preserve stewards may make use of practices that closely resemble those of silviculture. Management plans for natural area preserves should clearly designate what vegetation management practices are to be used and for what objectives.

Wildlife and Fisheries Management

Natural area preserves are not acquired or managed for the primary objective of providing recreational fishing, hunting, or trapping opportunities for the general public. However, certain types of consumptive wildlife-dependant activities may, at times, be compatible with preserve management goals. For example, deer hunting may be appropriate on some preserves under circumstances such as conditions of sale or to meet population management objectives. Hunting, fishing, and trapping activities intended to accomplish the objective of protecting natural heritage resources will be recommended in site-specific preserve management plans.

Rare Species Recovery

Natural areas managers sometimes conduct practices to restore or enhance habitat for species that have declined under historic land management regimes. Rare, threatened, and endangered species of plants and animals will receive special attention from natural area managers. Habitat improvement practices targeting a particular species will be undertaken as specified in NAP Management Plans. Monitoring of the target species will assess effectiveness of management actions in furthering population recovery.

Species Introductions

Reintroduction as a means for rare species recovery will be considered only as a last resort and only when it is clear that reinstating natural processes and/or threat and stress mitigation will not result in population recovery. Intentional introductions of plant material of any type or kind of propagule (plant, cutting, seed, shoot, rhizome, rootstock, bulb, corm, etc.) or of any animal will be made only with review and approval on a species by species and site by site basis by the DNH Division Director, Stewardship Manager, and Chief Biologist.

Livestock Grazing and Crop Production

Domestic livestock grazing is generally incompatible with the objectives of natural area preserve management. Concentrated grazing by cattle, horses, sheep, or other stock does not mimic a natural process; e.g., to simulate the effects once produced by native grazing animals such as bison or elk. Negative grazing effects commonly include degradation of stream banks and reduction of downstream water quality.

However, certain exceptions are noteworthy of mention. Some natural area managers have experimented with and seen positive results from grazing of goats in mountain bald communities to control invading woody species. Specialized circumstances may exist, such as retained rights or conditions of a preserve acquisition sale where grazing is continued for a specified time period after state purchase. In such cases, monitoring may be conducted to evaluate the effects of grazing. Management options for reducing negative grazing impacts to natural heritage resources should be developed under the guidance of a NAP Management Plan. Options may include shifting the season of grazing, providing resting periods, changing stocking levels, appropriately locating water, shelter, and mineral supplements, and rehabilitating soil.

As with grazing of stock, crop production for agricultural production purposes is not typically compatible with natural area preserve management. With a few exceptions, as in the cases of retained rights or short-term leases for specialized circumstances, the use of natural areas for producing crops including forages, grains, leaf, vegetables, or fruits is not consistent with the purpose and objectives for establishing and managing natural area preserves.

Cultural Resources

Archeological and historic resources on natural area preserves will be protected. Inventories for archeological and historic resources will be conducted and recommendations for conservation will be included in NAP Management Plans. Resources may be considered for interpretive and/or research value as identified and prescribed in the Plan. The collection of artifacts will be permitted only for legitimate scholarly research purposes approved by the Department of Historic Resources and the DCR.

Eligible historic structures will be surveyed and nominated for placement on the Virginia Landmarks Register. Archeological research may vary, from recordation surveys where no collection or excavation is performed, to intensive excavations usually focused in a confined area. Consequently, compatibility of archaeological research and natural area preserve stewardship may vary and each proposed action should be assessed on an individual basis.

Certain resources are protected by established statutes, regulations, and guidelines. Activities which would in some way affect significant historic resources may require review and/or permitting by the Department of Historic Resources. Pertinent statutes to consider include the Virginia Antiquities Act, Virginia Cave Protection Act, Appropriations Act, and the National Historic Preservation Act.

Minerals

Mineral exploration and extraction are incompatible and inappropriate uses and are prohibited on state natural area preserves. Soil disturbance, especially at the scale necessary to remove mineral resources, is clearly at odds to the purposes and objectives of natural area preserve protection and stewardship. Collection of surface mineral specimens for research or educational purposes requires the prior issuance of a Research and Collection permit by the DCR.

Cave and Karst Stewardship

Cave Classification

All caves (or sections thereof) on DCR-managed natural area preserves will be ranked according to their biological sensitivity and speleological significance. Though subjective, these criteria will guide the determination of appropriate levels of visitor use, the prioritization of site operations, and the direction of biological resource stewardship, all of which are described in greater detail, below.

Biological sensitivity. In ranking biological sensitivity, DCR-DNH staff will consider the presence of or potential for natural heritage resources, other cave-obligate fauna, and the presence or absence of naturally occurring flood events that periodically supercede anthropogenic disturbance. DCR-DNH staff will also consider the significance of the cave relative to the rest of the natural area preserve. (For example, a cave that represents the sole basis for dedication of the natural area preserve will always receive a high biological sensitivity ranking; other caves may have less biological significance relative to the rest of the natural area preserve).

High biological sensitivity – Any combinations of the following may apply. The cave is the sole basis for the dedication of a natural area preserve. The cave (or section thereof) has one or more documented natural heritage resources, or future surveys are likely to document natural heritage resources. Absent natural heritage resources, the cave has outstanding diversity and numbers of cave-obligate fauna. The cave ecosystem is fragile to the point that anthropogenic disturbance is significantly greater than any naturally occurring flood or other disturbance events.

Medium biological sensitivity – Any combinations of the following may apply. The cave (or section thereof) does not have documented natural heritage resources, and future surveys are unlikely to document natural heritage resources. The cave has diversity and numbers of cave-obligate fauna, but not outstanding examples, relatively. The cave ecosystem is sensitive, but anthropogenic disturbance is not greater than any naturally occurring flood or other disturbance events. Caves that are considered biologically significant by the Virginia Cave Board but do not qualify for a high biological sensitivity rating.

Low biological sensitivity – Any combinations of the following may apply. The cave (or section thereof) has had a thorough biological inventory and does not have documented natural heritage resources, has few, if any cave-obligate species. The cave ecosystem is robust, and anthropogenic disturbance is negligible compared to naturally occurring flood or other disturbance events.

Undetermined biological sensitivity – A thorough biological inventory of the cave has not been performed.

Speleological significance. While biological sensitivity is the foremost impetus for NAP cave stewardship, DCR-DNH staff will consider other categories of speleological significance. The

Virginia Cave Board considers 11 additional categories in evaluation of the significance status of a cave. The complete list of categories, including biological, is:

- 1.) Archaeological
- 2.) Biological
- 3.) Depth
- 4.) Economic
- 5.) Esthetic
- 6.) Geological
- 7.) Historical
- 8.) Hydrological
- 9.) Paleontological
- 10.) Length
- 11.) Recreational
- 12.) Atmospheric

Stewardship of some of these categories of speleological significance (for example, hydrology, geology, archeology, paleontology, and atmospheric) is concomitant with, and thus addressed by, biological resource stewardship. Other categories of speleological significance (such as recreation, economics, history, aesthetics, length and depth) will be addressed once biological resource stewardship has been addressed in full.

High speleological significance – A cave is considered to be of high speleological significance if it is designated as significant by the Virginia Cave Board under the provisions of the Virginia Cave Protection Act.

Low speleological significance – A well-documented cave not listed as significant by the Virginia Cave Board is considered for purposed on stewardship to be of low speleological significance.

Undetermined speleological significance – Some caves on natural area preserves may not be thoroughly documented, and thus their speleological significance is unknown. Stewardship staff will work with the Virginia Cave Board and other Division of Natural Heritage staff to document such caves and assign them to one of the other speleological significance categories. If significance is determined in one or more categories, stewardship staff will work with the Virginia Cave Board to determine if addition of the cave to the Significant Cave List is warranted. Criteria establishing "thorough documentation" include 1 - complete exploration and survey of cave passages and 2 - assessment of the cave for potential significance in the 11 non-biological significance categories.

Visitor Use

Cave systems are inherently fragile; caving trips of a purely recreational nature are an incompatible and inappropriate use. Visitors' use of caves (and the attendant disturbance) must be balanced with an opportunity to educate, or gain information central to the management of the

cave. Visitor access to most caves on natural area preserves will be restricted to designated trails or observation points *only*, or to visitation during an organized field trip, or following issuance of a written Research and Collection or Special Use Permit from DCR-DNH and the Virginia Cave Board. DCR-DNH staff (including members from inventory, protection, and stewardship) will develop appropriate visitor use specifications for each cave in the Natural Area Preserve System based on the cave's biological sensitivity and speleological significance.

Every cave's visitor use specifications will specify: the maximum number of visitors per cave trip (group number), the maximum numbers of cave trips per month, the maximum numbers of cave trips per year, and the maximum number of cave visitors per year. Visitor use specifications will also address seasonal closures based on habitat requirements of species present in the caves (e.g. - winter closures of bat hibernacula). Every cave's visitor use specifications will also address possible visitor use conflicts, specify the requisite training and experience for cave visitors, and provide detailed emergency response procedures. Where applicable, DCR-DNH will establish relationships (in the form of Memoranda of Understanding and renewable Special Use Permits) with local speleological clubs who will assist with the administration of these visitor use specifications.

Site Operations Management

Gates. Restricting visitor access may require physically restricting the cave entrance with a cave gate. The decision to gate a cave on a natural area preserve will consider biological sensitivity and speleological significance, described above. Caves will not be gated unless a DCR-DNH oversight committee (consisting of the Division Director, Stewardship Manager, Karst Program Manager, and Chief Biologist) demonstrates that physically restricting access is essential to the cave's biological and speleological resource stewardship.

Cave mapping and exploration. The extent of any cave may be unknown. As new passages are discovered, or as new passages become accessible due to changes in hydrology, they will be explored, surveyed, and mapped. Decisions to dig, blast, or otherwise expand an opening to permit additional exploration will be addressed by a DCR-DNH oversight committee (consisting of the Division Director, Stewardship Manager, Karst Program Manager, and Chief Biologist). As a general rule, altering cave passage to permit exploration will not be allowed.

Outreach. Cave stewardship requires effective outreach. Information on cave and karst resources should be provided either on site (in the form of signs, kiosks, and regularly scheduled field trips) or off site (printed materials for distribution, displays, and presentations) to demonstrate to the public the importance of cave and karst resources.

Biological Resource Management

Below ground protection. Unnecessary and / or excessive visitor use can threaten a cave's biological and speleological resources. DCR-DNH staff will periodically assess baseline populations of natural heritage and other cave resources, and use these data and other qualitative assessments of cave conditions, to evaluate the appropriateness of visitor use levels. Additional

research and monitoring will highlight naturally occurring (vs. human caused) variability in natural heritage resource populations.

Above ground protection. Monitoring visitor use is not the only way to protect the cave's biological and speleological resources. Harmful pollutants from above can and do enter the cave system through recharge points such as fissures or sinkholes. A familiarity with the recharge / discharge points of a cave system is crucial to mitigating above ground threats. DCR-DNH staff will compile information on the hydrologic systems of caves (conducting additional dye tracing research where applicable) and identify critical recharge areas. Once threats to the biological resources have been identified, outreach (including the promotion of appropriate land use, conservation easements, and sinkhole cleanouts) and property acquisition will be used to minimize above ground threats.

Modifications

The Natural Area Preserve Management Guidelines were first approved by DCR Director David Brickley on December 8, 2000 and by the Board of Conservation and Recreation on December 12, 2000. Guideline revisions were made in early 2010 and approved by DCR Director David Johnson and by the Board of Conservation and Recreation on June 15, 2010. Modifications to these Guidelines shall require the approval of the DCR Director, or his/her designee.