

Appendix C

Criteria used to identify Legacy Places

As mentioned in the report, this study was conducted in two phases. First, criteria were developed based on the opinions and perspectives of the public and Department staff regarding the types of resources and recreation opportunities most in need of addressing over the next fifty years. Second, the criteria were applied using a variety of data sources and the professional expertise of Department staff. At a series of public meetings held around the state the public reviewed and commented on the list of 195 places generated in this analysis. The overwhelming response to the Legacy Places was strong support that they, collectively, captured what citizens wanted to see protected. During this review, the public suggested the removal of two places and the addition of slightly more than 600 places.

This Appendix describes the criteria used, how they were developed, and how they were applied. Because the study's original charge was to identify those places most appropriate for the state to attempt to purchase in its efforts to meet conservation and recreation needs, early work on criteria focused on public land ownership needs and goals. As the task of applying the criteria progressed it became increasingly apparent to staff and the Natural Resources Board that the study should shift its focus and concentrate on identifying places critical to meet future conservation needs and not attempt to address how these places should be protected. How, when, and who should be involved in the protection of a place is much more appropriately left to a locally-focused, detailed evaluation involving landowners, local governments, and a variety of land use, conservation, and recreation organizations. As a result, the criteria have been slightly modified to reflect the study's evolution.

Developing the criteria

One of the first steps in building criteria was to determine what the public and DNR staff believed were the most important goals and needs that public land ownership should address and why. In addition, opinions and perspectives were gathered regarding what the DNR should consider when proposing to purchase land for conservation and recreation. Input was sought from the public and staff through three means: a series of small group discussions, a questionnaire, and letters and e-mails.

Eight public and 12 DNR staff meetings were held in January and February 2000 in the following cities: Green Bay, Rhinelander, Spooner, Eau Claire, La Crosse, Stevens Point, Madison, and Milwaukee. Two hundred forty-eight members of the public and 192 DNR staff attended the meetings. A wide array of local and state conservation and recreation organizations were represented. When signing in at the meetings, the public was offered the opportunity to list an affiliation. Although attendees were not necessarily formally representing these organizations, some of the groups listed included: county conservation alliances, horse riding groups, off road biking groups, snowmobile clubs, Audubon societies, lake associations, sportsman groups, University of Wisconsin students and faculty, regional planning commissions, local land conservancies and trusts, 1000 Friends of Wisconsin, Consolidated Paper, The Nature Conservancy, the Farm Bureau, Conservation Congress, National Park Service, Natural Resources Conservation Service, Sierra Club, and the Izaak Walton League.

In addition four middle and high schools were visited (in Rosholt, Milwaukee, Hayward, and Westby) to hear the ideas and perspectives of younger residents. One hundred eleven students participated in these discussions.

These meetings were designed to elicit a wide range of ideas and visions on resources and needs that future public land purchases should address. Small groups of people (typically 7 to 12 people per group) were questioned about what they believed to be the most important conservation and recreational needs in Wisconsin now, what these needs are likely to be in the future, and what the DNR should consider when deciding whether or not to purchase land.

A short questionnaire that asked the same type of questions was also developed. These questionnaires were handed out at the public meetings as well as posted on the Department's web page. One hundred forty-five questionnaires were returned. Finally, the Study received 16 e-mails and 15 letters from the public voicing their perspective on public land ownership needs to address conservation and recreation.

Collectively, almost 2,000 individual comments were collected from the public and staff meetings, questionnaires, letters and e-mails. These comments were analyzed to determine general themes and trends. Within each meeting, participants expressed a range of perspectives on public land needs, what the future might be like, and how the state should use public land ownership to accomplish conservation and recreation goals. Overall, however, there were significant similarities in the input received, including between the perspectives of DNR staff and the public as well as between residents in the northern and the southern parts of the state.

The nine major themes or goals that emerged (not in any priority order) are:

- 1. Protect the pearls**
(Protect the last remaining high quality and unique natural areas).
- 2. Protect functioning ecosystems in each part of the state**
(Protect representative, functional natural landscapes that help keep common species common).
- 3. Maintain accessibility and usability of public lands**
(Protect land close to where people live and establish buffers that ensure these lands remain useable and enjoyable).
- 4. Think big**
(Protect large blocks of land).
- 5. Ensure abundant recreation opportunities**
(Provide a wide range of outdoor recreation opportunities).
- 6. Connect the dots**
(Link public and private conservation lands through a network of corridors).
- 7. Protect water resources**
(Protect undeveloped or lightly developed shorelands, protect water quality and quantity, and protect wetlands).
- 8. Promote partnerships**
(Leverage state money and effort through partnerships with other agencies and organizations).
- 9. Diversify protection strategies**
(Where feasible, utilize options other than outright purchase to accomplish conservation and recreation goals).

Criteria were developed for the first seven of these major themes, but not for "Promote Partnerships" or "Diversify Protection Strategies" since these are both process-oriented goals and are part of how, rather than where, the Department should approach land protection.

Applying the criteria

To apply these criteria, Department staff first compiled several existing databases pertaining to a variety of environmental and recreation issues. Some of these data sets are represented in the maps seen in Part I of this report. However, for many of the criteria, statewide data are not available or could not be readily collected and represented. For example, the Department's Natural Heritage Inventory database contains substantial information on where populations of endangered, threatened, and special concern species occur (or have occurred) in Wisconsin. However, the database is not designed to identify the habitat most critical for maintaining these populations. As such, the database (which is the most comprehensive collection of information on rare species and natural communities in the state) cannot be easily applied to identifying and delineating the boundaries of places most important in "supporting high quality natural areas, important populations of rare species, or regionally significant biological or geological resources" (see criteria). Similarly, although plat books show ownership parcels, no spatially-referenced, statewide database exists depicting the distribution of parcel size and how parcel sizes have changed over time. As a result, there is no simple way to represent which parts of the state offer the best opportunities to protect large, minimally fragmented landscapes.

In response to this lack of comprehensive, easily accessible information, Department staff were asked to identify places that best fit the criteria, based on their professional knowledge of Wisconsin. Through a series of workshops, Department experts—in wildlife, forestry, fisheries, water resource management, natural areas, and other fields—from each part of the state identified the places that they believed most effectively addressed the criteria. The focus of this analysis was on places that were predominantly unprotected through any formal means. Out of this process emerged 195 places that staff believed were critical to meet future conservation and recreation needs.

Public Reaction

These places were then presented to the public at a series of eight open house meetings held around the state in early 2001. The open houses were designed to solicit overall reaction to the places as well as specific comments about specific places. Comment cards, each addressing a different topic, were distributed. In particular, the public was asked for their opinions on the suitability of the places identified, how adequately the places (as a group) address future conservation and recreation needs, the geographic distribution of the places, and relative priorities. The public was also provided with the opportunity to identify additional important places that they believe staff missed or to suggest the removal of places that they believed did not adequately meet the criteria.

The public response was overwhelmingly in support of the places identified. The primary recommendation from the public was to add a number of places to the list. Many of the places suggested for inclusion either were already largely protected (these were intentionally not included in the public meetings because the intent of the study at this point was to identify important places that were unprotected) or locally popular places that serve a variety of conservation or recreation purposes. Most of these locally popular places occur within 50 miles of the city where the public meeting was held in which they were identified.

A notable issue during these public open house meetings was the tension between different recreation users. In particular, the tension between those who enjoy motorized vehicles (e.g., ATV, snowmobile, personal watercraft, and off-road trucks) and those who enjoy "silent sport" activities (e.g., hikers, cross country skiers, horse riders, and paddlers). For people who prefer "quiet" activities, their recreation experience is dramatically diminished by the nearby use of motorized vehicles. Even when on separate trails within an area, it appears difficult (if not impossible) for people seeking a quiet experience to find the solitude they desire. For them, the typical "multiple use"

area or trail is of little value. Most motorized vehicle users recognized that they are not compatible with areas of high conservation value. However, they feel their needs are not currently being met—too few places and those that do exist are in remote locations typically distant from where users live. Many snowmobile and ATV users noted a concern of losing existing access to properties (e.g., trails on industrial, county, and national forest lands). As a group, motorized vehicle users believe that there should be increased access to some public properties, both existing and future. For them, multiple recreation uses on some public areas makes considerable sense.

Little has changed over the years in what hunters and anglers (the traditional recreation users of many public properties) seek: quiet, scenic areas with good quality habitat and few signs of humanity. There appears to be little support among many of these users for newer forms of recreation (e.g., off road biking, ATV, personal watercraft) on public properties, particularly those that were acquired using license funds and taxes on hunting and fishing gear.

Criteria used to identify Legacy Places

General theme: Protect the pearls

Specific goal (A): *Protect Wisconsin's remaining high quality natural areas, habitat for Wisconsin's rare species, and regionally significant or unique natural resources.*

Some places in Wisconsin remain relatively wild and undisturbed from human influence. The most valuable of these areas include those that: support a full complement of native species (both aquatic and terrestrial), exhibit minimal human disturbance or adverse impacts from exotic species, are likely to contain their special features and attributes over time, and are primarily influenced by natural ecological processes. Since these natural areas represent the sole means by which to evaluate changes to the more human-dominated landscape, their protection is of considerable importance.

Although many of these high quality natural areas support rare species, in some cases important populations of rare species occur in areas that are more disturbed. Thus, there is a need to also protect lands that support critical rare species habitat, even though the lands may be more influenced by human factors.

In addition to high quality areas, Wisconsin also supports many regionally significant natural resources. For example, our northern forests (along with those of Minnesota and Michigan) harbor the highest diversity of breeding birds on the North American continent. Similarly, Wisconsin plays a critical role in the water quality and aquatic diversity of the Great Lakes and the Mississippi River. Wisconsin also plays a regionally, if not globally, important role in the conservation of biological and geological resources such as: Great Lakes shoreland (especially dunes, wetlands and estuaries), Mississippi River bluffs, oak and pine barrens, prairies, the Niagara Escarpment, large clusters of high quality lakes, drumlin fields, and calcareous fens.

Although some regionally significant resources may be somewhat degraded, their importance lies less in their existing quality than in the rarity or uniqueness of their habitats and features from a regional perspective.

Criterion: *Lands and their adjacent waters supporting high quality natural areas, important populations of rare species, or regionally significant biological and geological resources.*

Specific goal (B): *Protect lands and waters of exceptional natural scenic beauty.*

The Wisconsin landscape is unquestionably scenic. The influx of tourists that come to see and enjoy the state's lakes, woods, farmlands, streams, and grasslands is testament to this fact. Many of the state's most scenic places have already been identified and are in some form of protective ownership. In fact, early conservation and recreation plans tended to focus on protecting places of exceptional beauty, like waterfalls and interesting geological features, as well as sites that provide exceptional scenic views, such as high points or lands along large open water. Nearly all of the state's first parks and forests were identified in part because they contained a significant scenic feature or because they provided exceptional vistas.

Although many of the state's most scenic places are already protected, some significant sites remain unprotected and are a protection priority. In addition, there is growing concern that various types of developments threaten many treasured views. Clearly, the state cannot protect all of the rural scenery that "makes Wisconsin Wisconsin." However, over the next fifty years, it may be appropriate to protect some of these views through the acquisition of some land rights. For example, possibly purchasing development rights in the area immediately visible from the bluffs at Devil's Lake, or purchasing land management rights in the "viewshed" along some rivers extensively used by boaters.

As with many of the goals listed in this document, protecting scenic places, places that provide scenic views, and some portions of the actual views can also help accomplish many other conservation and recreation goals.

Criterion: *Lands containing unique or exceptional natural scenic beauty or lands that provide outstanding scenic views.*

General theme:
Protect functioning ecosystems—
Keep common species common

Specific goal (C): *Protect habitat for common species to ensure their long-term viability and to provide abundant hunting, fishing, wildlife watching and nature study opportunities within each ecologically distinct part of the state.*

In addition to protecting the highest quality areas in Wisconsin, there is a need to simply protect and sustain functioning natural ecosystems in each part of the state. That is, we need to conserve the full spectrum of native species and their habitats and to prevent common species from becoming rare. Although there are many ecological, social, and economic advantages to preventing species from becoming endangered, a more compelling reason to “keep common species common” may be to pass on to future generations the beautiful and bountiful natural resource base that we have “inherited.”

Wisconsin has long been a leader in managing and enjoying our lands and waters. As a result, we have strong traditions of environmental protection and resource management. In one of the clearest examples of the quality of our fish and wildlife resources, more than 600,000 non-residents hunted or fished in Wisconsin last year. One of the most popular outdoor activities in the state is simply walking outdoors and enjoying the sights, smells, and sounds of wildlife and their habitats.

Soils, topography, water quantity and quality, climate, and other factors influence the distribution and abundance of plants and animals around the state. Based on these different characteristics, scientists have divided the state into different units. As more information has become available and as our understanding of the natural world has grown, scientists have developed classification systems to meet a variety of purposes. Wisconsin’s portfolio of protected places should include lands within each ecologically similar area that protect and sustain the area’s representative and characteristic natural communities, species, and ecological processes.

Criterion: *Lands in each ecologically distinct part of the state that support and sustain the area’s representative species, habitats, and ecological systems.*

General theme:
Maintain accessibility and usability
of public lands and waters

Specific goal (D): *Keep people connected to the natural world by protecting land close to population centers.*

It is important for our population to understand natural resource management and protection needs, and how these needs fit into society’s use of land for agricultural production, tourism, forest products, development, and other purposes. As Wisconsin’s population becomes more urbanized and more removed from its agricultural and forestry roots, there is an increased need to facilitate the understanding and appreciation of the natural world. Public and private conservation lands have a role to play in providing easily accessible opportunities for people to experience areas containing native plants and animals and natural ecological processes. To maximize their effectiveness, these lands should be close to where people live, and to the degree practical, connected to population centers through a system of travel corridors.

Because of their close proximity to large concentrations of people, some lands important to reaching this goal currently do not, and likely never will, have high biological value. In many cases, native species and their habitats will need to be restored. Although these lands may never qualify as high quality lands from an biological perspective, these lands will serve important conservation functions by “growing” a conservation ethic.

To the degree practicable, these areas should offer a variety of educational and recreational opportunities. Because most of the state’s population centers are near or adjacent to lakes and rivers, undeveloped shorelands and riparian corridors could be important in providing multiple conservation and recreation benefits.

Criterion: *Lands and adjacent waters near population centers that support, or could reasonably be restored to support, native plants and animals and their habitats.*

Specific goal (E): *Buffer public lands and waters most threatened with incompatible uses.*

Many public and private conservation lands are becoming surrounded by low- to high-density developments. Adjacent developments can have a negative effect on people’s use and enjoyment of these lands and waters by affecting the scenic qualities of the area, by restricting the useable acreage, and by increasing safety concerns. For example, several wildlife areas in the southern part of the state now have a considerable number of residential developments near or adjacent to their property boundaries. These lands, and a growing number of other public properties, can no longer be safely hunted near their perimeter. Similarly, most lakes in the southern part of the state have extensive housing developments along their shore.

In addition to altering the rural, undeveloped setting of most conservation properties, adjacent developments can limit a property’s useable land area for many species. The “hard” edge that intensive developments creates also restricts some species from moving to other nearby habitat areas or can make the public land unsuitable itself. Of course, many of the same problems exist with developments along lakes, rivers and streams. Open space surrounding public and private conservation lands and waters, especially in the form of active or fallow agricultural lands or forest production lands, can increase the “useable space” for many species.

To prevent or reduce these adverse impacts, many conservation lands (particularly in regions experiencing significant development pressures) would benefit from open-space buffers. Determining adequate buffer widths will need to reflect specific circumstances regarding predominant uses of the property and the surrounding land uses, opportunities for connecting conservation lands with open space, habitat needs of important species in the area, quality of the land to support agriculture or forestry, and other factors. Effective buffers do not necessarily require fee title acquisition and may be created through the use of landowner agreements, easements, or purchasing particular land rights, particularly development rights.

Criterion: *Lands that ensure public lands and waters can support their desired recreational uses and biological components over time.*

Specific goal (F): *Provide adequate and appropriate access to public lands and waters.*

Navigable waters are public property for the use of all citizens. Although the state maintains many boat launches on lakes and large rivers, there is a growing need to provide additional shoreland access throughout the state. Many people do not own boats or do not want to be restricted to their boat while enjoying the state’s lakes, rivers and streams. People need the opportunity to walk along riparian corridors as well as along the shores and upland areas surrounding lakes. Providing public access along shorelands will be integral in developing a successful “water trails” network.

In addition to public waters, there is a need to provide better access to some public properties. In some cases, existing properties are not bordered by many roads and have only a limited number of access sites. Expanding boundaries to adjacent roads could help resolve access problems as well as address many management and buffering issues.

An issue related to improved access is the need to accommodate people with limited mobility. Although an issue that is primarily dealt with in planning the uses of a property, how the state approaches these access needs is an issue that will likely become of increasing importance as the state’s population ages.

The general need for improved access must be balanced with some people’s desire to enjoy remote, wild places visited by few others. By definition, these areas are difficult to access and making it easier for people to get to these areas could significantly detract from the unique experience they offer.

Criterion: *Lands that improve access to, or use of, existing public lands and waters where recreational demands warrant.*

General theme: Ensure abundant
recreation opportunities

Specific goal (G): *Provide a wide range of outdoor recreation opportunities.*

Wisconsin currently supports a healthy and diverse recreation industry. Not only are our residents some of the nation’s most active outdoor recreationists, but many people from surrounding states come to enjoy our bountiful recreation opportunities. Clearly, our existing public lands (Federal, State, and County) provide an excellent foundation and meet many current recreation demands. However, recreation demands and opportunities will evolve over time with changes to population size and demographics, recreation techniques, transportation methods, individual preferences, and other factors. Future efforts to provide adequate public access to lands and waters will need to reflect these changes and “fill gaps” as necessary.

To the degree practicable, recreation opportunities should be made available throughout the state, not concentrated in just a few areas. Of course, it is not possible to provide all types of recreation in all parts of the state, nor is it possible to provide all recreation uses on any given property. In some cases, conflicts develop due to the incompatible nature of certain types of recreation (e.g., motorized and non-motorized users and consumptive and non-consumptive users). Some of these conflicts can be addressed in a property’s management plan to separate certain types of recreation or to permit particular uses on only certain properties. However, restricting recreation activities does not cause the demand to go away. Often it only shifts the activities to different areas. In some cases, concentrating certain types of recreation may be appropriate; in others it can compound problems.

Parts of the state are not well suited for some recreation pursuits. For example, soil types and topography limit the suitability of some areas for off-road vehicles. Similarly, if climate change results in warmer winters with less snowfall, there may be a reduced demand for snowmobile and cross-country skiing trails in the southern part of the state.

Some of Wisconsin’s outdoor recreation needs are currently met by the private sector. Privately owned campgrounds, canoe rentals, hunting clubs, and other operations will continue to play an important and possibly expanding role to meet recreation needs in the future. However, there are many recreation needs that, for a variety of reasons, are not appropriate, practicable, or cost-effective for the private sector to provide. Public lands will need to continue to provide places for people to camp, hike, hunt, bike, fish, canoe, watch wildlife, ride horses, kayak, or simply relax in the shade of a large tree and enjoy solitude.

Criterion: *Lands that address high priority gaps or unfilled needs in outdoor recreation activities.*

Criterion: *Lands that provide significant opportunities for fishing, hunting, and other outdoor activities.*

General theme: Think big

Specific goal (H): *Protect big tracts of land when feasible.*

Big blocks of conservation land have many advantages over smaller ones. Large conservation areas are more likely to contain all the habitat needs of a greater number of species than smaller ones and are better able to support larger and more complete ecosystems. Large tracts of relatively wild land are necessary for certain species such as forest interior birds and wolves. Bigger areas are able to provide a greater diversity of recreational uses with fewer user conflicts, and can provide a greater sense of remoteness and tranquility. Large tracts can also help ease conflicts among recreationists and can help minimize impacts to sensitive resource areas. Finally, large areas can be easier and more cost effective to manage.

Depending upon the area of the state, “thinking big” has different contexts. In the northern part of the state, large public and private ownership parcels exist. Protecting large blocks of land (several thousand or tens of thousands of acres) is feasible. In the rapidly developing areas of the state, such large blocks do not exist. In these areas parcels are increasingly fragmented and opportunities to protect single tracts (especially uplands) in excess of 500 or 1,000 acres are limited, if not non-existent.

Creating large protected areas does not require that the entire area be publicly owned. It is possible, and in many cases advantageous, to protect different types of lands throughout a large area using a variety of different protection tools. For example, protecting a large grassland or savanna ecosystem could incorporate significant agricultural lands within and around a set of core conservation lands. Keeping these important agricultural lands in farming through easements or the purchase of development rights would benefit both the conservation areas and could help keep agriculture as an important component of the local community.

Criterion: *Lands that allow the protection of large, minimally-fragmented, ecological functional landscapes.*

General theme: Connect the dots—create a network of corridors

Specific goal (I): *Create a statewide recreational trail network with connections to population centers.*

Trail-based recreation includes many popular outdoor activities. Hiking, biking, snowmobiling, cross-country skiing, ATV riding, backpacking and horseback riding are all popular trail-based pursuits. According to the latest SCORP report, walking is the most popular form of outdoor recreation in the state. Wisconsin currently has many trails that serve a variety of users. Some of the most popular trails, particularly for biking and snowmobiling, are those that have been converted from abandoned railroad lines. Although some are owned and managed by the state, most are managed locally.

The recently completed State Trails Network Plan proposes an integrated system of trails to serve a variety of users. Ideally, this network will consist of a set of “backbone” trails that link existing and future trails. This trail system should accommodate both multiple-day trips as well as connect shorter trails and thus provide a greater diversity of one-day trips. Feeding into this network should be a variety of trail types that serve the specific needs of different trail users. The rails-to-trails effort and the Ice Age Trail provide an excellent foundation on which to build a network.

To ensure the greatest number of people have access to this trail network, urban-link trails should be developed. Urban-link trails will allow people in our population centers to access the trail network without the need for an automobile. In particular, they provide conduits for some urban youth to gain access to public lands.

In addition to a land-based trail network, a water-based network should also be developed to serve the needs of a growing number of boaters and paddlers. This network will need to provide strategically placed access points, portage routes, picnic/day use areas, and camping sites along aesthetically-pleasing waterbodies. As with a land-based system, the water trail network should be designed to provide both day trips and longer, multi-days trips.

Because many population centers and public properties are centered on or are located near rivers and streams, riparian corridors will play an important role in the state land and water trails network. In addition to providing connections, riparian corridors also contribute many biological and water quality functions.

Criterion: *Lands that complete a statewide network of land and water-based recreational trails and provide linkages to population centers.*

Specific goal (J): *Link conservation lands to each other and to the state trail network with corridors that satisfy a variety of ecological goals.*

In addition to recreation benefits, connecting conservation lands through a network of corridors can provide many ecological benefits. Corridors of sufficient width can facilitate the movement of species from one area to another. This is often beneficial because it allows plant and animal populations that would otherwise be isolated to exchange genetic material. Particularly in the southern part of the state where public and private conservation lands are smaller and more isolated, a network of corridors would help make these places “greater than the sum of their parts.” If wide enough, corridors themselves can provide useable habitat for many species. Over longer periods of time, corridors can also allow some plant and animal populations to shift their ranges in response to environmental changes. To be most effective, Wisconsin’s network of corridors should connect with conservation lands in surrounding states.

Establishing corridors, both those serving ecological and recreational needs, will likely be most successful if existing land use patterns and regulations are capitalized upon. For example, environmental corridors identified in sewer service area plans, shorelands, utility corridors, and areas zoned as conservation lands in local land use plans may offer excellent opportunities, particularly near urban areas, to start building a network of corridors.

Criterion: *Lands that establish an interconnected network of corridors (incorporating existing conservation lands and a variety of landscape features) that maximizes ecological benefits.*

General theme: Protect water resources

Specific goal (K): *Improve the quality of water used by municipal drinking water systems.*

In much of the eastern third of the state, municipalities rely on Lakes Michigan and Winnebago as a source of drinking water. Elsewhere, most municipalities rely on groundwater, often very close to the surface, to provide drinking water. Although Wisconsin’s municipal water systems each gather water locally, where this water originates—where it falls as rain or snow—can be nearby or many miles away and across municipal boundaries. As such, maintaining, improving, and protecting the quality of drinking water is both a local and state responsibility.

Our understanding of which lands are most important in terms of their contribution to the quality and quantity of drinking water is currently incomplete. The locations of critical groundwater recharge areas, as well as lands that most effectively improve water quality in those surface waters that are sources of drinking water, is partially known at this time. The Department is currently identifying recharge areas as part of its Source Water Assessment Program. As additional information becomes available over time, we will be able to more precisely identify lands important to reaching this goal.

Fortunately, many land uses are compatible with maintaining and improving good drinking water, particularly land uses related to conservation and recreation. As a result, there is an opportunity to combine many drinking water protection needs with other conservation and recreation goals listed in this document.

Criterion: *Lands that most effectively contribute to the protection and improvement of the quality of water used by municipal drinking water systems.*

Specific goal (L): *Protect the quality and quantity of surface waters.*

From tiny headwater streams to the Great Lakes, from the tannin-stained waters of the north to the biologically-rich waters of the southeast, from countless spring ponds to the “muddy” Mississippi, Wisconsin contains some of the most diverse, high quality surface waters in the Midwest. Many of the state’s surface waters have their origins, at least in part, in the springs and seeps where groundwater emerges. As small creeks flow downstream they pick up more and more water from surface drainage and groundwater sources. Thus, maintaining and improving the quality and quantity of most surface waters requires a coordinated effort to protect groundwater (and the associated recharge areas) and drainage sources.

In nearly all cases, the quality and quantity of groundwater and surface waters are connected and dependent upon each other. Water flows through the ground and emerges to form springs and seeps that feed creeks and lakes. The converse is equally true; water flows into underground aquifers both when precipitation falls on the ground and directly from our lakes and rivers. The relationship between surface water and groundwater can be illustrated through the growth in impervious surfaces in many urban environments. As more acres are covered with roads, parking lots, rooftops, and other hard surfaces, precipitation is quickly shunted into ditches, curbs and gutters, and discharge pipes. As a result, nearby lakes, streams, and rivers receive huge flushes of water over relatively short time periods, which can have adverse impacts to the ecology of these systems as well as create substantial flooding. Equally problematic is the reduction in precipitation that can seep into groundwater aquifers. Without replenishment, less groundwater emerges as the cool springs and seeps that provide the base flows for many streams and rivers.

Clearly, the state can actively protect only a small percentage of lands that contribute to surface water quality and quantity. Yet, the quality and quantity of many surface waters is often significantly affected by a relatively small percentage of land. For example, strips of natural vegetation along waterbodies can provide significant benefits to water quality by filtering out sediments and nutrients. Wetlands, whether adjacent to surface waters or not, are critical in protecting and maintaining water quality and quantity in many surface water systems. Groundwater recharge areas appear to be relatively small in many cases. Thus, the strategic protection of land can have a large impact on surface waters.

Criterion: *Lands that most significantly contribute to the quality and quantity of surface waters.*