

Beyond the Primary: A Guide for Lower Maintenance and Naturalized Roughs

Low-maintenance and naturalized roughs can be a darling, the devil, or a little of both depending on their use, placement, and management.

BY JIM SKORULSKI

Mention the words “naturalized” or “low maintenance” when referring to the rough areas on a golf course and you will receive a wide range of responses from both managers and golfers. On the surface, the concept of naturalizing low-traffic rough areas seems to make good economic and environmental sense by providing a means to reduce management inputs, conserve water, and establish beneficial wildlife habitat. Like many well-intentioned ideas, the devil is often in the details, as is sometimes realized when programs are implemented to establish naturalized or low-maintenance roughs. Unfortunately, there is no universal strategy for developing or maintaining naturalized roughs. Even the term “low maintenance” can be misleading. The intention of this article is to examine areas outside primary roughs to see how they can be established and maintained to conserve resources while providing ecological benefits and enhancing the golf experience.

ROUGH CLASSIFICATION

For the sake of this article, areas outside the primary rough will be termed transitional and naturalized roughs. These terms are meant to be descriptive for the purpose of this article, but roughs can be classified in other ways as well. Transitional rough will be defined as areas outside the primary rough that are not routinely mowed and where the use of irrigation and other resources is minimal. Transitional

rough can be composed of turfgrass and native grasses or may contain blends of grasses and forbs similar to a meadow. Generally, transitional roughs are maintained at a higher mowing height than primary roughs but are managed to be more playable than naturalized areas, offering a practical option for areas that are more likely to receive play. Often, transitional roughs are established where site conditions or golfers do not support more naturalized habitats.

In this article, naturalized roughs will be defined as areas that receive the least amount of maintenance and where there is little emphasis on playing conditions. Naturalized areas with dense vegetation usually are established farther from play areas. However, practices like mowing, weeding, thinning, grazing, burning, and scarification may be used to eliminate unwanted plants, reduce vegetative material, and maintain habitat conditions in naturalized areas. Golfers often associate grassland habitat with naturalized rough, but there is great variation in the appearance and biology of naturalized areas at golf courses across the country. Naturalized roughs also can be other important habitat types, including forests, shrubland, savanna, desert, and wetlands. Both transitional and naturalized roughs lie outside primary roughs and can provide beneficial habitat for plants and wildlife. Furthermore, lower-maintenance roughs can be integral to course design, bringing increased interest and

beauty to a golf course while providing definition and contrast to playing areas.

GETTING STARTED

There are several misconceptions about creating transitional or naturalized roughs. One of the most commonly heard misconceptions is, “All we should have to do is stop mowing and turn off the water.” However, creating transitional or naturalized roughs simply by eliminating mowing and irrigation only succeeds if the site provides ideal growing conditions and the right plant material. Long-term success requires a well-conceived plan based on a clear set of objectives and knowledge of existing site conditions. Plans for creating transitional or naturalized roughs should be developed with input from golfers and other facility stakeholders. Furthermore, input from a golf course or landscape architect can be helpful during planning. Keep in mind that initial plans should not be too large or overly complex. If possible, begin planning where to implement transitional and naturalized roughs by targeting small, inconspicuous areas. In some cases (e.g., turf-reduction programs resulting from water-conservation mandates), incorporating transitional and naturalized roughs may be dictated out of necessity. Other times, naturalized and transitional roughs are created in hopes of attracting wildlife or to add features like wildflower gardens. No matter the reason, a formal plan is essential to make sure the objectives

of creating transitional or naturalized roughs are achieved.

A thorough site evaluation should be completed early in the planning process. A site evaluation should determine two key elements, soil type and drainage. Both soil type and drainage factor heavily in determining plant selection, rough type, and the conditions that can be expected from transitional and naturalized roughs. Soil evaluations can be completed in the field or by accessing online soil-classification maps at the National Resource Conservation Service's (NRCS) [Web Soil Survey](#). Other important site factors to inventory include existing plant communities, surface contours, wetland habitats, irrigation coverage, and traffic patterns. A map of the golf course will be useful when completing the site inventory. Also, the expertise of a naturalist or plant ecologist may be required to identify plant species and habitat type. A thorough site evaluation provides the information needed to formulate realistic goals and develop establishment and maintenance strategies for transitional and naturalized roughs.

Close scrutiny should be given to areas that are most likely to impact play (e.g., rough areas that create forced carries or are near fairway landing zones). A golf course architect can help identify sites that are most

likely to come into play. GPS data loggers, relatively new technology to the golf industry, offer another option to identify traffic patterns and areas that seldom come into play. GPS data loggers can be given to golfers to track their location as they play a golf course. The tracking data help identify general traffic patterns and areas that receive minimal play. Determining areas that receive minimal play can help identify areas for lower-maintenance or naturalized roughs that will have minimal impact on pace of play. Be conservative when initially selecting areas to convert to transitional or naturalized rough. It is easiest to start small and let the program evolve.

A map of the areas that will be turned into transitional or naturalized roughs is a helpful planning and communication tool. Maps should delineate different types of rough or habitat areas and the level of maintenance each area will receive. Maps can be a rudimentary hand drawing created with an existing golf course map or a more sophisticated digital map created using aerial satellite images. Google Earth Pro and other software applications offer measuring tools that can be useful for planning purposes.

PLANT SELECTION

At most golf facilities, open grassland communities are the desired habitat

in transitional and naturalized rough areas. The grasses used in grassland areas may be naturalized or native warm- or cool-season species, depending on the location of the golf course. Drought-tolerant grasses that can be maintained with periodic mowing work well in transitional roughs that occasionally come into play. While the playability and appearance of grassland grasses may be less uniform than turf-type grasses, they remain more playable than naturalized roughs and, when the correct species is selected, can require little or no supplemental irrigation.

Wildflowers, forbs, shrubs, and trees may be larger components of transitional or naturalized roughs in areas farther from play. Fine fescue and native bunch grasses are especially desirable in naturalized areas. When established in the correct environment, fine fescues and native bunch grasses are durable and require very little maintenance. Grasses with the least vertical growth rate are favored where play is anticipated. Blends of hard, blue, and sheep fescue — although not native — are popular “short grass” seeding choices for northern golf courses and also can be blended with lower-growing native grasses. Some of the more commonly used grasses and their regions of adaptation are listed in Table 1.

Table 1
Native and Naturalized Grass Species

Cool-season grasslands	Tallgrass prairie	Shortgrass prairie	Sub-tropical
Alkali grass	Big bluestem	Alkaligrass	Bahagrass
Autumn bentgrass	Blue lovegrass	Blue grama	Eastern gamagrass
Blue lyme grass	Broom sedge	Buffalograss	(Fakahatchee grass)
California melic grass	Coastal bluestem	Idaho fescue	Gulf bluestem
California oatgrass	Elliott's lovegrass	Inland saltgrass	Muhly grass
Canada wild rye	Indiangrass	Needle-and-thread grass	Saltgrass
Dune wild rye	Little bluestem	Sandberg bluegrass	Sand cordgrass
Hard fescue	Muhly grass	(Canby's bluegrass)	Marsh cordgrass
Poverty grass	Prairie cordgrass	Sideoats grama	
Red top bentgrass	Prairie dropseed	Silver bluestem	
Purple needlegrass	Purple lovegrass	Western wheatgrass	
Riverbank wild rye	Rough dropseed		
Sheep fescue	Sand dropseed		
Tufted hairgrass	Switchgrass		
Virginia wild rye	Weeping lovegrass		
Wavy hairgrass	Wiregrass		



Native lupines can also benefit pollinating insects while adding a splash of color to non-irrigated naturalized roughs.

Survey your rough areas to determine what plant communities are already adapted to your site. Visit other local golf facilities and conservation areas to observe mature plant communities and determine how they might be used on your golf course. Touring your site with a USGA Green Section agronomist or plant specialist who can help identify existing plants also can be an invaluable experience.

A wealth of information regarding plant selection and seed sources for native grasses and forbs can be obtained from state natural resource agencies, the NRCS, Audubon International, and various native plant societies. Seed companies specializing in native grasses and forbs also

provide helpful plant lists, and many offer compatible seed mixtures to meet specific growing conditions or planting objectives.

Selecting grasses and other plants for establishing roughs does not have to be intimidating. Plants should be well adapted to the growing conditions, climate, and, most important, match the intended use of the area. Naturalized rough areas also can be established to wildflowers or mixes of grasses, native shrubs, ground covers, or trees that best meet the objectives for the site.

ESTABLISHMENT OPTIONS

Establishment techniques for transitional and naturalized roughs vary

widely depending on site conditions and plant selection. Areas that already contain many of the desired plants may require little more than adjusting mowing practices, modifying the irrigation system, or selectively removing unwanted plants. Some sites may require seeding or planting desirable plants, while others may need more complete renovation. Sometimes interseeding programs are used to augment existing plant stands. Complete renovation is more effective when it is necessary to remove dense turfgrass or persistent perennial plants.

Seed mixes for transitional or naturalized rough areas can be expensive, so it is important to select species that are adapted to your region

and growing conditions and develop a strategy to produce an effective seedbed. The general process is similar to seeding playing areas, but the equipment and techniques can differ on more demanding sites.

Seed placement dictates the success or failure of any seeding program. A firm seedbed and good seed-to-soil contact are absolutely necessary. Preparing an adequate seedbed may require aggressive mowing and scarification followed by raking, sweeping, or burning the surface litter to expose bare soil. If necessary, glyphosate or glyphosate combined with fluazifop can be used to kill existing vegetation. Depending on field conditions, commercial aeration equipment, scarifying machines, disc cultivators, or rangeland drill seeders may be used to effectively prepare a seedbed. Seed can be broadcast by hand, spread with a drop spreader, planted with a drill seeder, or hydro-seeded. Light seeding rates often are recommended when establishing grassland areas to keep plant density low. Also, it is commonly recommended to target seeding depths of 0.5 inch for loamy soils or 0.75 inch for sandy soils. Late summer is a common time to seed transitional and naturalized roughs in northern regions, but some warm-season native grasses establish more effectively when seeded during early spring. Keep in mind seeding rates depend on the grasses or plants being seeded. Irrigation also is critical during initial establishment. Information regarding effective seed rates, planting dates, and irrigation schedules can be obtained from seed suppliers and local county extension agents.

Vegetative planting is another effective technique for establishing plants. Native grass plugs, shrubs, and trees are available from commercial nurseries or may be transplanted in desired areas from onsite locations. Establishing native grasses through interseeding or renovation can take several growing seasons, and initial results may be disappointing, especially if immediate results are anticipated. Some seed blends provide faster-establishing species that persist until



A mixture of native trees and shrubs combined with native and ornamental grasses was used in place of turf at Cypress Lake Country Club in Ft. Myers, Fla. The native planting was a practical choice for non-irrigated sites and requires limited maintenance while providing light screening and additional interest to the golf course.

the slower-growing native plants take hold. Patience, perseverance, and strong communication skills often are necessary during the establishment of transitional and naturalized grassland roughs.

course official expectations and site conditions.

Sadly, there is no one maintenance recipe for naturalized or transitional roughs. Maintenance programs are specific to habitat type and site condi-

tion. Density can be maintained with cultural practices such as mowing, hand weeding, selective grazing, and controlled burning where permitted. Herbicides also are an important tool for managing unwanted or invasive plants. Herbi-



A mix of native shortgrass prairie grasses hard fescue, sagebrush, juniper, and ponderosa pine provides excellent contrast to the irrigated playing areas at the Stockfarm Club in Hamilton, Mont.

MANAGEMENT

All rough areas will require some management because nature is dynamic. Allow temperate grasslands or meadows to lie fallow and they will evolve into a forest or become dominated by a few plant species. Sites that receive abundant rainfall and have more fertile soils require more maintenance if expectations call for playable, open grassland. The level of management required for transitional and naturalized roughs ultimately depends on the relationship between golfer and

tions and often are dictated, in the short term, by weather. Furthermore, maintenance programs must evolve as the plant communities in naturalized and transitional roughs mature.

An annual management plan should be developed for all areas of rough, which should be categorized by their location, habitat type, purpose, and maintenance needs. Often the primary goals of rough-management programs are eliminating unwanted plants and invasive weeds while controlling vegetation density. Plant species and

cide programs can be complex or simple, depending on the plants that need to be controlled.

Contra-agronomy is a descriptive term for managing mature naturalized and transition roughs that dovetails with the goals of reducing maintenance inputs. Contra-agronomy commonly implements practices that reduce plant vigor and growth rates — such as eliminating or reducing irrigation, periodic mowing, and practices that decrease plant-available nutrients — to keep roughs playable. Annually mowing

grassland and meadow areas is a common practice to help suppress woody and some herbaceous vegetation. Annually mowing and removing the cut vegetation also slowly mines soil fertility to reduce plant growth and vigor. Traditionally, large rotary or flail mowers are used to cut naturalized roughs to a 6- to 8-inch height once during late summer or fall. Transitional rough areas are mowed more frequently than naturalized roughs.

Mowing during the spring may also be necessary to control vigorous growth. Spring mowing removes some of the initial plant growth and can slow plant development, and it should be scheduled after the turf resumes growth but before it enters reproductive phases. Mowing fine fescues after they have initiated seed development can shock the plant and significantly reduce its vertical growth and ability to produce seedheads. In trials conducted by Don Woodall, president of Colonial Seed Company, mowing fine fescue

soon after seed development was initiated — i.e., boot stage — resulted in a 40- to 80-percent reduction in plant height. However, timing mowing to occur during boot stage may be a viable strategy to reduce vertical growth in transitional roughs where seedheads are not a concern. A similar response to mowing is anticipated with warm-season grasses.

Mowing also can be used to manipulate plant communities in roughs. Mowing mixed stands of grasses can be timed to favor either cool- or warm-season species. Furthermore, more frequent mowing favors grasses over forbs and lower mowing heights favor turfgrasses over native bunch grasses.

Where controlled burning is allowed, fire also can be a valuable management tool. Controlled burns usually are practiced on a rotational basis during early spring to maintain plant composition and reduce vegetative litter. Burning can rejuvenate older fields and savanna habitats, stimulating robust

growth and greater flowering. Deep-rooted, warm-season, native grasses and fire-resistant trees respond especially well to controlled burns. Controlled burns typically are planned and executed by trained specialists who evaluate each site to determine what burning strategies will most effectively meet the objectives established by the golf course superintendent and course officials.

Some courses are using grazing animals — such as sheep and goats — to manage naturalized roughs. Goats are especially fond of shrubs and can be used to slow the spread of multiflora rose, briar, poison ivy, and other difficult-to-manage plants. Grazing animals are especially useful when managing severely contoured and rocky sites that cannot be easily maintained with traditional equipment. Innovative farmers now are contracting their animals for vegetation-control purposes. Of course there are some unique challenges associated with using animals on golf courses and in urban settings.

Maintaining plant communities in naturalized roughs is extremely challenging when there is little tolerance for species diversity. Sometimes one person's plant is another person's weed. Cultural and mechanical practices — e.g., mowing, hand weeding, etc. — are important parts of managing plant communities, but herbicides also may be necessary to manage unwanted plants in naturalized and transitional roughs, especially when expectations call for uniform, weed-free roughs. Weed management programs should integrate a variety of strategies, and those for transitional areas located near play are likely to be more intensive and more reliant on herbicides than selective weed management programs often used in areas farther out of play. Selective weed management allows for greater diversity of grasses, sedges, and forbs in naturalized roughs.

Invasive plants — especially exotic grasses, forbs, and trees that are well adapted to the climate and growing conditions — can be major nuisances in naturalized roughs. Many invasive plants pose a threat to native plant



Annual mowing helps maintain grassland habitats by removing woody plants.

communities because they are highly competitive, typically aggressive, and often difficult to control. Information and images of invasive plants in North America can be found at the USDA's [National Invasive Species Information Center](#). Many states also provide websites dedicated to identifying and managing invasive plants. Managing invasive weeds should be considered a priority and may be required by law in some states.

Herbicide programs for transitional and naturalized roughs can become complex, depending on expectations and the plants that have to be managed. Applications of non-selective herbicides — e.g., glyphosate — can be made selectively to control most perennial weeds. Glyphosate and picloram also can be applied to cut stems or stumps to prevent regrowth of woody plants. There are several selective, pre- and post-emergence herbicides available for controlling annual and perennial grasses and forbs. However, herbicide programs are very site specific, and state regulations and herbicide availability make generalizations difficult at best.

Although weed management information is becoming more easily accessible, managers still need to conduct site assessments to identify desirable and target plant species in order to select the most effective and safest herbicides and application techniques. Trial applications are always recommended when using an unfamiliar herbicide for the first time. Contacting your local turfgrass extension specialist or USGA Green Section agronomist is a good starting point for more information about herbicides and specific weed-control strategies to best meet your objectives. Representatives from herbi-

cide companies also can provide specific information about their products.

FINAL THOUGHTS

It can be difficult to take the time to monitor and document successes and failures when establishing and managing transitional and naturalized roughs. Yet assessing successes and failures is an important part of determining if a plan's objectives have been met and helps document what has been achieved or determine where programs need to be modified. Whether the goals of establishing transitional or naturalized roughs involve water conservation, mowing and pesticide reduction, habitat creation, course beautification, or invasive plant eradication, commit to monitoring your progress through sampling and good record keeping.

GCSAA-sponsored surveys have shown that low- or weed-management areas make up as much as 25-50 percent of the total acreage of many golf facilities. More golf facilities are reevaluating how low- or non-play areas are perceived, how they are managed — especially from a cost perspective, and the alternative benefits they might provide. Modifying rough maintenance may involve developing lower-maintenance transitional roughs, naturalized habitats, wildflower plantings, or allocating out-of-play areas to vegetable, herb, and cut-flower gardens or small orchards. There are many options to utilize in out-of-play areas with the ultimate goal of creating a more sustainable operation. And just think what new meaning and appreciation the sight of native grasses and plants, fresh picked fruit, vegetables, or cut flowers could bring to those areas "Beyond the Primary."

CASE STUDIES

[Paradise Valley Aims to be a Responsible Desert Citizen](#)

[The No-Mow Experiment at Hidden Falls](#)

[Sustainability Case Study: The Moorings Yacht and Country Club](#)

OTHER HELPFUL LINKS

[Managing Small Grasslands for Grassland Birds](#)

[USDA Plant Fact Sheets](#)

REFERENCES

Brown, Lauren. Grasses: An Identification Guide. 1979. Houghton Mifflin Company, New York, N.Y.

Darke, Rick. The Encyclopedia of Grasses for Livable Landscapes. 2007. Timber Press, Portland, Ore.

Dodson, Ronald. Managing Wildlife Habitat on Golf Courses. 2000. Ann Arbor Press, Michigan.

Nelson, Matt. Natural Areas. Green Section Record. N/D 1997. 35(6), pp. 7-11. <http://turf.lib.msu.edu/1990s/1997/971107.pdf>

Packard, Steve, and Cornelia Mutel, eds. The Tallgrass Restoration Handbook for Prairies, Savannas, and Woodlands. 1997. Island Press, Washington.

Skorulski, J., and J. Foy. Naturalized Areas: Beauty and the Beast, Green Section Record, M/J 2009. 47/3, pp 28-30. <http://turf.lib.msu.edu/2000s/2009/090528.pdf>

[JIM SKORULSKI](#) is an agronomist who enjoys working with golf courses across New England and Eastern Canada.

SUBSCRIBE TO THE USGA GREEN SECTION RECORD

TEXT "GREENSECTION" TO "22828" OR CLICK HERE

Offering the latest information on golf course management, turfgrass culture, environmental issues, research and economic sustainability.