



ENVIRONMENTAL STEWARDSHIP GUIDE



“In terms of Ecology, of using the land in a natural way, he was ahead of his time; Ultra ahead.”

Pete Dye, on Radrick benefactor Frederick C. Matthaei

CONTENTS

Introduction	1
Natural Features Map	2-3
Wildlife Habitat and Management	4
Wildlife Inventory	4-5
Water Quality and Conservation	6
Environmental Best Management Practices	7
Honeybee Apiary	8
Golf Course Environmental Signage	9
Outreach and Education	10
USGA Deacon Tool	11
University of Michigan Golf Course	12
Environmental Programs	13
U-M Partners and Programs	14-15

All photographs provided by Radrick and UMGC Team Members.

ENVIRONMENTAL STEWARDSHIP IS A GUIDING PRINCIPAL

Golf courses have a massive influence and impact on the communities and landscapes they reside in. With the average 18-hole golf course being 150 acres in size, golf courses occupy large amounts of land and can require high amounts of inputs to maintain (money, labor, resources).

Understanding this impact, the golf industry is currently in a state of transition with golf courses taking action to work alongside nature, limiting their overall impact on the local environment (GCSAA Golf Course Environmental Profile Reports, 2022). With new technology, resources, and Best Management Practices (BMPs), golf courses now have the opportunity to deviate from outdated unsustainable practices to manage their facilities in a way that is environmentally, socially, and economically sustainable. Environmental stewardship is a win-win practice for the golf industry and the environment. It helps the bottom line, reflects positively on the golf industry, and offers the public the chance to experience nature.

At the University of Michigan's Radrick Farms Golf Course, environmental stewardship has been rewarding on many levels. From its inception, Radrick Farms has been at the forefront of environmental stewardship, ecological enhancement, and community support. Even prior to the establishment of the golf course, Frederick Matthaei, Sr., a loyal alumnus and former regent who donated the property to the University of Michigan in 1960, was already implementing environmental stewardship practices in the 1930's when he purchased the property and converted it from a gravel mine into a farm. He practiced the innovative science of arboriculture while growing at least one of every tree indigenous to the state, many of which still stand on the course today. With Matthaei's encouragement, Pete and Alice Dye used the land in a natural way, shaping holes that fit within the natural landscape of the beautiful, rolling terrain.

The Radrick Farms team continues to embrace Mr. Matthaei's pioneering environmental stewardship vision. Environmental stewardship helps us accomplish our mission of creating an exceptionally valuable golf experience for the University of Michigan community while preserving the resources and wildlife that reside on site.



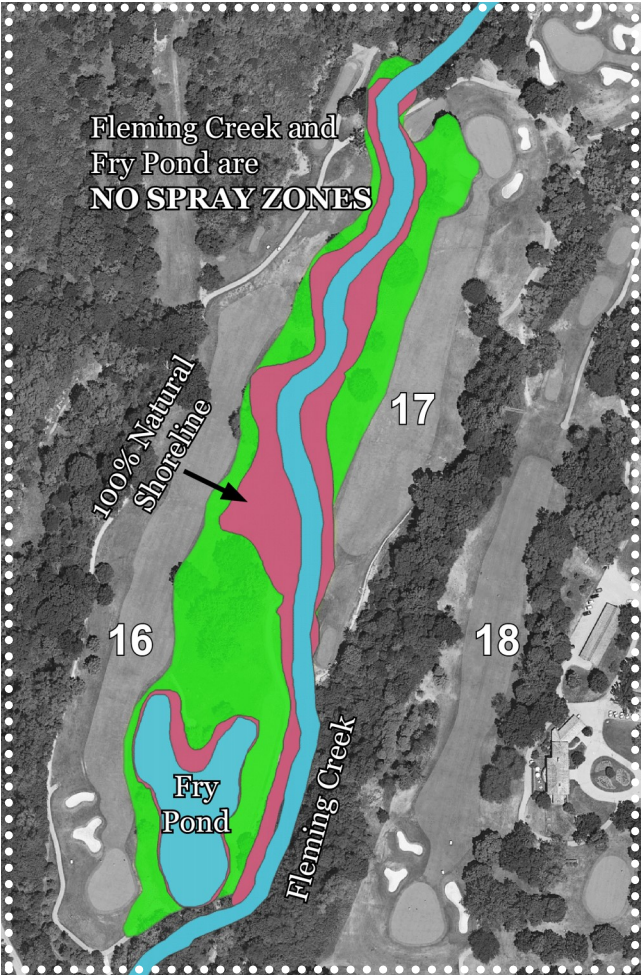
Frederick Matthaei, Sr.

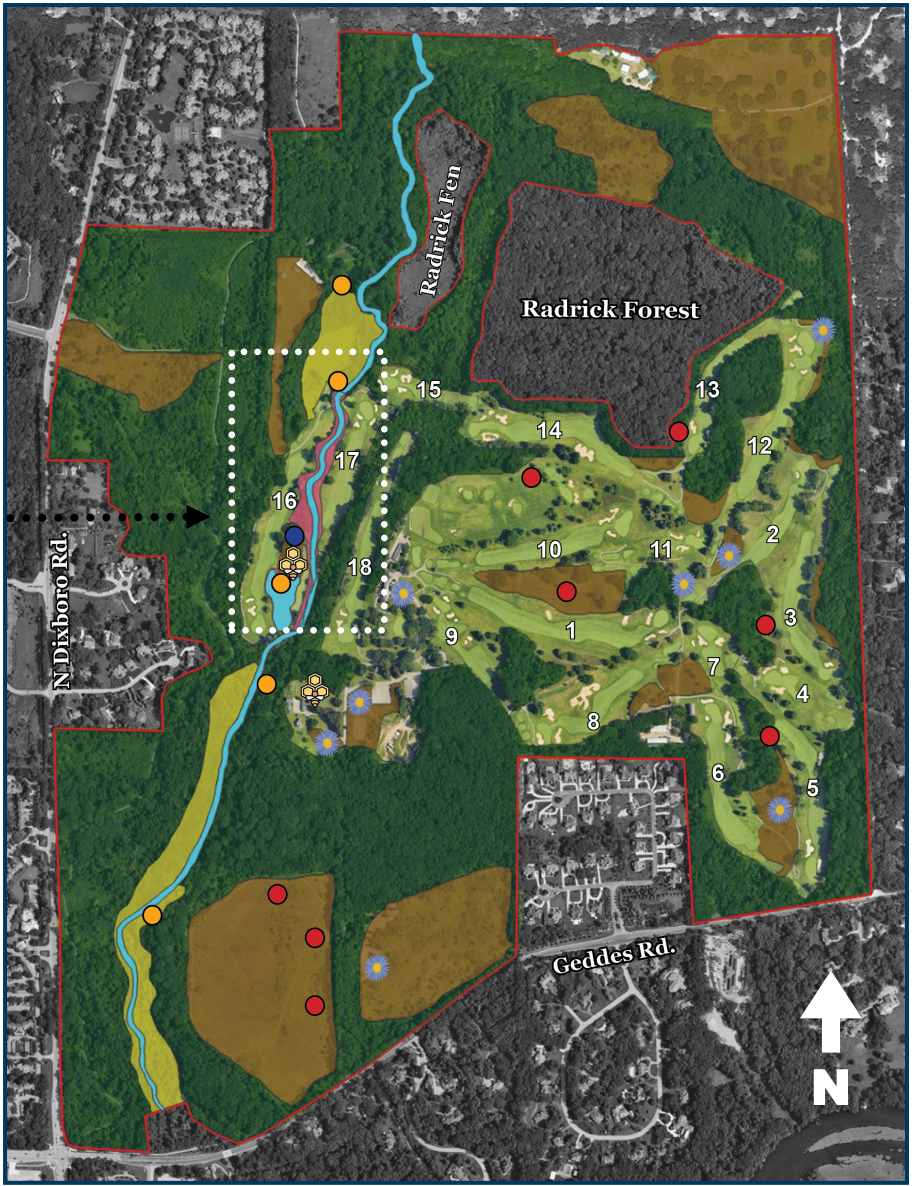
NATURAL FEATURES MAP

Radrick Farms Acreage:

















Total Property: 544.4
Irrigated Turf: 82.24
Woodland: 304.27
Grassland: 90.90

Freshwater Wetland: 16.64
Fry Pond & Fleming Creek: 5.18
Vegetative Buffer Zone: 2.12
Impervious Surface: 8.23





LEGEND

- | | | | | | |
|---|---------------|---|------------------------|---|---|
|  | Property Line |  | Vegetative Buffer Zone |  |  |
|  | Woodland |  | No Spray Zone |  |  |
|  | Grassland |  | Hole Number |  |  |
|  | Wetland |  | Wildflower Area |  | Honeybee Apirary |
|  | Water Body | | | | |
- Bird images sourced from birds.audubon.org

WILDLIFE AND HABITAT MANAGEMENT

Radrack Farms provides approximately 417 acres of wildlife habitat in out-of-play portions of the golf course which constitutes nearly 77% of the entire Radrack Farms property. The four main habitat types found within these out-of-play areas include old-growth Oak-Hickory forests, grasslands/prairies, wetlands, and water bodies (Fleming Creek and Fry Pond).

To help protect and enhance the native habitats and wildlife present on site, Radrack Farms staff have carried out numerous ecological stewardship projects which include:

- Creating native pollinator gardens.
- Building bluebird, purple martin, and wood duck nesting boxes.
- Establishing informal wildflower meadows in no-mow areas.
- Establishing and maintaining a honeybee apiary on-site.
- Naturalizing 100% of all shorelines with native wetland plants.
- Installing a solar-powered aerator in the Fry Pond.
- Installing J-hooks within Fleming Creek.
- Invasive species removal.



WILDLIFE INVENTORY

AS IDENTIFIED BY STAFF AND GOLFERS SINCE 2012

MAMMALS

- | | |
|-------------------------|----------------------|
| • Whitetail deer | • Raccoon |
| • Groundhog | • Skunk |
| • Eastern Chipmunk | • Muskrat |
| • Field Mouse | • Possum |
| • Eastern Grey Squirrel | • Red Fox |
| • Northern Red Squirrel | • Eastern Red Bat |
| • Star-nosed mole | • Mink |
| • Coyote | • Eastern Cottontail |



BIRDS

- Wild Turkey
- American Robin
- Red-Winged Blackbird
- Purple Martin
- Baltimore Oriole
- Northern Cardinal
- Barn Swallow
- Ruby-throated Hummingbird
- Great Blue Heron
- Great White Heron
- Blue Jay
- Bluebird
- European Starling
- Northern Flicker
- Mourning Dove
- Brown-headed Cowbird
- Great Crested Flycatcher
- Bald Eagle
- Ring-Necked Pheasant
- Mallard Duck
- Turkey Vulture
- Wood Duck
- Great Horned Owl
- Coopers Hawk
- Downy Woodpecker
- Red-Bellied Woodpecker
- Hairy Woodpecker
- Red Tailed Hawk
- Peregrine Falcon
- American Kestrel
- Northern Goshawk
- Red Shouldered Hawk
- Eastern Screech Owl
- Northern Saw-whet Owl
- Short Eared Owl



REPTILES

- Box Turtle
- Painted Turtle
- Snapping Turtle
- Eastern Massasauga Rattlesnake



OTHER SPECIES

- Smallmouth Bass
- Bluegill
- Minnow Species
- Crayfish
- Various Amphibian Species
- Various Insect Species

WATER QUALITY AND CONSERVATION

Water Quality

The quality of water used for golf course irrigation is an essential element of growing healthy turf. The Fry Pond and Fleming Creek are used as the water source for the golf course's irrigation system. These waters are tested three times a year for nitrates, pH, temperature and salinity. We utilize key management techniques that help protect water quality on-site such as:

- Maintaining vegetative buffer zones around 100% of freshwater shorelines.
- Designating “no spray” zones located around all water bodies to prevent potential chemical runoff.
- Using slow-release foliar fertilizers, limiting the amount of chemical applications needed throughout the season and minimizing runoff potential.



Water Conservation

Evapotranspiration (ET) rates are used as a guide to determine the turf's water needs. The ET rate is entered into a computerized irrigation system to calculate the amount of water to be applied to the course.

Moisture Meters are used throughout the day during the golf season to detect moisture levels in the soil. They help determine the precise amount of water needed for targeted, sight-specific applications.

Radrick also utilizes Variable Frequency Drive (VFD) pumps which increases the efficiency of the irrigation system and reduces overall electricity consumption.

ENVIRONMENTAL BEST MANAGEMENT PRACTICES

Integrating environmental best management practices (BMP's) into our maintenance schedule allows us to manage our facility in an efficient and environmentally sustainable manner. We use suitable techniques and resources including:

- Computerized irrigation
- Hand watering
- Topdressing
- Aerating
- Vertical mowing
- Precise pesticide application
- Brushing
- Rolling
- Scouting
- Fertility testing

Environmental BMP's allows Radrick Farms to maximize golfer experience on the course and minimize the negative environmental impact from maintenance practices.



A HIVE OF ACTIVITY: RADRICK'S HONEYBEE APIARY

Established in 2012 by the student organization "UM Bees", the Radrick Farms' Apiary has played a key factor in promoting healthy pollinator habitat in and around the golf course. Since its initial installment, the Radrick Farms apiary has grown to over 20 colonies!



What are the benefits of maintaining an apiary at Radrick?



Honeybees are "indicator species" meaning that their health indirectly reflects the overall health of the ecosystem around them. By measuring the health of all of the hives, we can gain insight into the health of the habitats located in Radrick Farms.



Apiaries serve as a safe out-of-play home base for bees which reduces dangerous human-bee interactions.



Honey! Radrick Farms harvests and jars honey on-site where it can then be distributed and consumed.



Harvested honey from
Radrick Farms

GOLF COURSE SIGNAGE



Caution Wildlife

The first sign on the property informs our customers and visitors that a variety of wildlife that live on our property. Use caution while driving along our half-mile private drive and in our golf carts on the course. We never know what animal life may be present.

Eastern Massasauga Rattlesnake

Holes 15 through 17 are a great habitat for the Eastern Massasauga Rattlesnake, a threatened species that will defend itself. Please use extra caution in tall grass areas and along the shoreline of Fleming Creek.

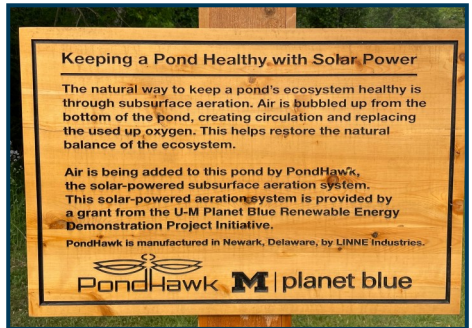


Naturally Buffered Shoreline

We want our visitors to be aware of our efforts to keep the waters of Radrick Farms clean and create natural habitat for wildlife. This signage increases knowledge of our environmental management practices.

Solar Powered Pond Aeration

Through solar powered aeration, we are able to keep the ecosystem of the Fry pond healthy for wildlife, creating subsurface circulation and replacing the dissolved oxygen within the water.



Pollinator and Butterfly Habitats

Radrick Farms actively manages pollinator patches across the golf course. These spaces include native wildflowers which provide food for a variety of pollinator species.

OUTREACH AND EDUCATION

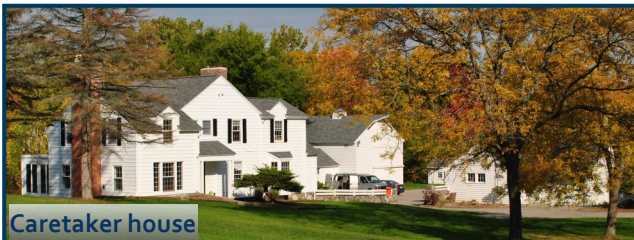
BEYOND THE GOLF COURSE: EARTHFEST

To ensure ongoing support for stewardship initiatives, strengthen local community connections, and showcase our ongoing environmental stewardship projects, Radrick Farms participates in Earthfest. This is an annual University of Michigan event that celebrates sustainability initiatives across U-M and the surrounding communities.



During Earthfest, our goal is to communicate Radrick's environmental goals, promote our stewardship projects, and present job and internship opportunities to the student body and other university organizations.

GRADUATE STUDENT CARETAKER PROGRAM



- In 2012, we began the Graduate Student Caretaker Program which gives three U-M graduate students an opportunity to live on-site in the Radrick Farms caretaker house.
- Students selected for the program work around the property, caring for the course and natural areas during the academic school year.
- Interested students can apply by contacting General Manager, Paul Scott: plscott@umich.edu

In September of 2023, Radrick Farms utilized the USGA DEACON tool to gain valuable insights into golfer traffic patterns and pace of play around the course. Attaching GPS loggers to golfers during their round, Radrick Farms was able to capture golfer generated data that will be used in three major ways:

1. Resource Consumption

- Improve operational efficiency by prioritizing our maintenance resources towards the areas that come into play most for golfers.
- Cut back resource use (water, fertilizer, pesticides) in areas that do not come into play for most golfers.

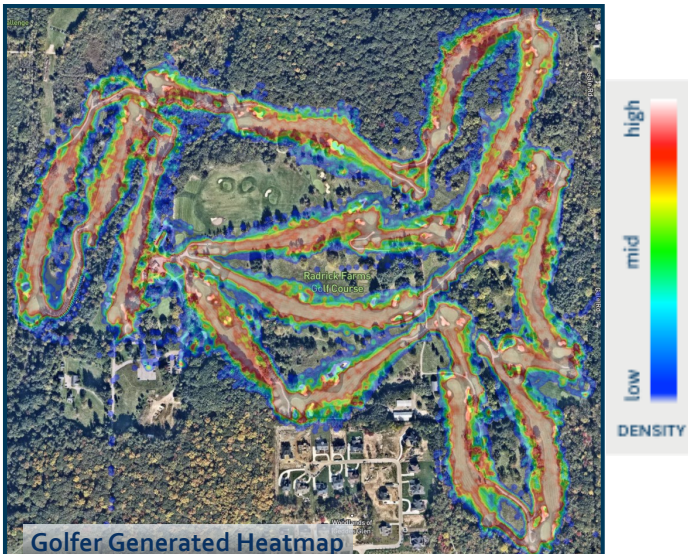


2. Golfer Satisfaction

- Utilizing the GPS generated heatmap of where golfers hit the most, Radrick can tailor its maintenance schedules towards high-use areas, improving the playability of the course.
- GPS data also helps identify delays and bottlenecks around the course which can be used to smooth out pace of play for a better golfing experience.

3. Continuous Improvement Impact

- GPS data can provide insights that maximize return on investment for future projects such as converting low-use turfgrass areas into low-maintenance wildlife habitat or making sure tees are friendly and appropriate for Radrick golfers.



THE UNIVERSITY OF MICHIGAN GOLF COURSE



UMGC's 6th Hole Green complex

The University of Michigan Golf Course (UMGC) is another U-M owned golf course that works hard to incorporate sustainability into their maintenance plans. UMGC has also accomplished numerous environmental stewardship projects such as:

- Earned Clean Corporate Citizens Certification through the Michigan Department of EGLE in 2015.
- Platinum Certified Workplace by the Office of Campus Sustainability in 2013.
- MTESP Certified in 2012.
- Partner in the Washtenaw County Community Partners for Clean Streams Program.
- Use of moisture meters and variable frequency drive pump station.
- For more information on UMGC's sustainable practices, visit: <https://umgolcourse.umich.edu/>, scan the QR code or call (734) 615-4653.



A red tail hawk feasts on a squirrel at UMGC



ENVIRONMENTAL PROGRAMS

Audubon Cooperative Sanctuary Program for Golf Courses

ACSP for golf courses is an award winning education and certification program that helps golf courses protect our environment and preserve the natural heritage of the game of golf. The ACSP for golf courses covers six key environmental areas that are relevant to golf course management. www.auduboninternational.org/acspgolf



GROUNDWATER GUARDIAN GREEN SITE

Groundwater Guardian Green Site

The Groundwater Guardian Green Site program was developed to recognize good stewards of groundwater by encouraging managers and superintendents of highly-managed green spaces to implement, measure, and document their groundwater-friendly practices. www.groundwater.org/action/community/green-sites.html

Michigan Turfgrass Environmental Stewardship Program

The MTESP is intended to organize efforts of the turfgrass industry, state agencies, Michigan State University (MSU), and environmental advocacy groups to advance the environmental stewardship of the turfgrass industry and to recognize environmental achievements. www.mtesp.org



Community Partners for Clean Streams

The (CPCS) is a voluntary, cooperative effort between the Washtenaw County Water Resources Commissioner's Office and Washtenaw County businesses, institutional landowners and multi-family residential complexes. The goal of the program is to help identify practical, cost effective ways to protect Washtenaw County waterways through pollution prevention. www.ewashtenaw.org/cpcs



Clean Corporate Citizen Program

Radrick Farms is the first golf course in Michigan to receive the Michigan Department of Environmental Quality's Clean Corporate Citizen (C3) program designation. This honor is given to facilities that have demonstrated outstanding performance and commitment to environmental stewardship.



U OF M PARTNERSHIPS AND PROGRAMS

Planet Blue

The University of Michigan Planet Blue initiative established a campus-wide waste reduction goal that focuses on pursuing purchasing, reuse, recycling and composting strategies toward long-term waste eradication. According to the Department of Waste Management, Radrick Farms currently diverts 57.36% of their waste from landfills by recycling or composting, a 46% increase from 2013.

This initiative also established a program for individual University community members to become Planet Blue Ambassadors. During our on-boarding process for new employees, we encourage and offer them the opportunity to participate in the training found online: <http://sustainability.umich.edu/pba>

Office of Campus Sustainability

Radrick earned Certification as a Platinum Sustainable Workplace from the Office of Campus Sustainability in 2012. The program encourages the efficient use of power, reduced use of office/kitchen supplies, and sustainability awareness. Our team explores ways to improve all of our environmental practices. To learn more about certification, please visit: <https://ocs.umich.edu/programs/workplace-initiatives/sustainable-workplaces/>

School For Environment and Sustainability (SEAS)

Radrick Farms continues to encourage high quality research that looks at the sustainability of the golfing industry as a whole. We have partnered with two graduate student projects through the University of Michigan School for Environment and Sustainability that looked to explore and quantify the ecological, social, and economic benefits of integrating sustainability practices into the maintenance schedules of golf courses. For more information on these two studies, refer to their citations on the following page:

Bates, C., Gerst, R., Schafer, C., Vreeken, K., (2023). Bees & Golf: An Unlikely Yet Impactful Partnership. University of Michigan. <https://seas.umich.edu/research-impact/student-research/masters-projects/bees-golf-unlikely-yet-impactful-partnership>



Anderson, P., Chalat, R., Gehle, E., Mackowski, I., Martin, K., (2015). Greener Golf: An Ecological, Behavioral, and Communal Study of the University of Michigan Golf Courses. University of Michigan. <https://seas.umich.edu/research-impact/student-research/masters-projects/greener-golf-ecological-behavioral-and-communal>



To learn more about Radrick Farms Golf Course, please scan the QR code or go to: <http://radrick.umich.edu>





Radrick Farms Mission:

Create exceptionally valuable golf experiences for the University of Michigan community.



Radrick Farms Golf Course

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