



DATE: May 13, 2020

MEMO TO: Nels Leutwiler, Chair
Preservation Foundation Board

FROM: Jim Anderson
Director of Natural Resources

RECOMMENDATION: Recommend approval of a \$24,999 grant from unrestricted funds to support data collection for the first year of the project “Determining the Effects of Fire Return Interval on Understory Vegetation in Lake County”.

FINANCIAL DATA: The following table shows the anticipated expenses for the project.

PROJECT EXPENSES	ANNUAL EXPENSES	CHICAGO BOTANIC GARDEN MATCH	LCFPD MATCH	TOTAL PROJECT EXPENSES
Graduate Student Support 480 Hours @ 15.50/hour + 12% fringe	\$8,333			\$24,999
Mileage @ 0.575/mile * 2000 miles	\$1,150	\$575	\$575	\$3,450
LCFPD staff time 300 Hours/\$40			\$12,000	\$36,000
Subtotals	\$9,483	\$575	\$12,575	
Total Project Budget				\$70,678
This Request				\$24,999

We are requesting funds to support an incoming Master’s student in the Plant Biology and Conservation (PBC) department at Northwestern University, which is managed jointly with the Chicago Botanic Garden. Tiany Hernandez will begin her graduate studies in the fall of 2020 and will conduct data collection in our preserves in the summer and fall of 2020 through 2022. The requested funds would support her field data collection, data management and analysis for the duration of this three-year project. Tiany will apply for additional funding through The Graduate School at Northwestern University, the PBC program, as well as other funders such as The Garden Club of America. Tiany’s graduate advisor, Dr. Rebecca Barak, will provide funding for travel, and will further support this project by providing any additional field equipment required to complete data collection and analysis.

BACKGROUND: Fire has historically played an important role in determining the vegetation structure of woodlands and other habitats throughout the Midwestern United States. In the Chicago region, fire is a natural and essential ingredient of healthy native ecosystems. Oak woodlands and prairies are not just adapted to fire but depend on it to survive. Fire helps local habitats thrive by releasing nutrients from burned plant materials; stimulating seed germination by breaking their protective coats; opening the woodland floor to sunlight so that native wildflowers and plants can flourish; and reducing invasive woody vegetation cover.

Restoring a Natural Cycle

In an effort to restore the natural fire cycle, forest preserve districts and other agencies set fires that are carefully watched and kept under control. Trained ecologists burn parts of the woods, wetlands and prairies every few years to clear out weedy plants that choke out burr oaks and other native trees and wildflowers. The work is helping to bring back diverse communities of plants and animals, thus restoring dynamic, attractive and safe natural areas for people to enjoy. Each spring and fall, land managers conduct controlled burns, or prescribed burns, at sites throughout the Lake County Forest Preserve District. Following a controlled burn, native plants and wildflowers come back stronger than before. The improved natural areas provide habitat for wildlife and increase air and water quality in the region.

Prescribed Burning Intervals LCFPD

The intervals between prescribed burning events varies across and within preserves at LCFPD, based upon seasonal variation in weather patterns which are conducive to controlled fire, habitat types, as well as management priorities. Figure 1 provides an example of the variation in burning frequency that has historically occurred across the District. A 17-year burn frequency over a 29-year period indicates a fire return interval of 1.7 years. Where fire return intervals vary across a plant community, there is a continuum of burn treatments that may provide insight into the effects this variation has on the structure and composition of the plant community, and, subsequently, on the animal community as well.

The response of native plant species to differences in fire return intervals is not well known for many common species, however, it is well established that variation in fire return can affect population dynamics of plant species (e.g. Schafer et al. 2013). These population dynamics in turn affect plant community structure. In oak woodlands, for example, periodic burning can affect species composition, especially grasses, and forbs with seeds that form a soil seed bank (Hutchinson et al. 2005).

With the recent completion of the Burn Module in the Lake County Forest Preserve District’s mECO (Mobile Ecologist) data tracking system, the Natural Resources Division has an opportunity to investigate the effects of burning, particularly fire return interval, on the response of vegetation in our high quality preserves. We will collect data on the number of species present (Species Richness) across a continuum of fire return intervals at multiple preserves, and observe their abundance, from which we can determine the Relative Importance Value (RIV) of each species observed and if RIV or other metrics are correlated with Fire Return Interval. We will also use these data to undertake exploratory analysis to visualize the importance of fire return intervals, and to specifically address the question about the effects of burn interval on the prevalence of invasive species.

References Used

Hutchinson, T.F., Boerner, R.E., Sutherland, S., Sutherland, E.K., Ortt, M. and Iverson, L.R., 2005. Prescribed fire effects on the herbaceous layer of mixed-oak forests. *Canadian Journal of Forest Research*, 35(4), pp.877-890.

Schafer, J.L., Sullivan, L.L., Weekley, C.W. and Menges, E.S., 2013. Effects of habitat and time-since-fire on recruitment, survival, and reproduction of *Paronychia chartacea* ssp. *chartacea*, a short-lived Florida scrub endemic herb. *The Journal of the Torrey Botanical Society*, 140(2), pp.181-195.

REVIEW BY OTHERS: Foundation Board President.

PRESERVATION FOUNDATION BOARD:

Date: _____ Roll Call Vote: Ayes: _____ Nays: _____
 Voice Vote Majority Ayes; Nays: _____

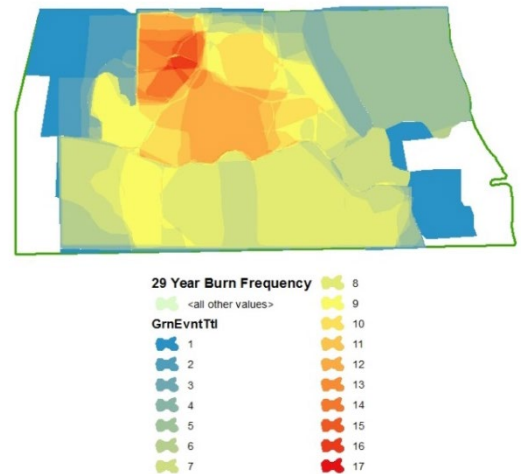


Figure 1. This map provides an example of a fire return interval, shown here at Gander Mountain Forest Preserve. The warm colors indicate greater frequency of burning.