

Lighting the Way: A Guide to Establishing Firefly Sanctuaries in the United States



Firefly viewers at New Canaan Firefly Sanctuary, CT (photo by Connor de Mayo).

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Introduction

What is a firefly sanctuary?

A **firefly sanctuary** is a protected area that is managed specifically to safeguard native wild fireflies and their habitats. Firefly sanctuaries can be important tools for conserving rare or endemic fireflies, although they also benefit more common or widespread species. They can be designated by local, state, or federal agencies, or private landowners, such as individuals, non-profits, and research institutions.

While the criteria for designating a site as a firefly sanctuary can vary, they typically include actions such as using firefly-friendly lighting, eliminating the use of pesticides, cutting back on mowing practices, and adopting sustainable tourism practices.

The term “sanctuary” has been used to describe a variety of other protected areas, animal hospitals, and commercial ventures including wildlife refuges, butterfly houses, honey bee apiaries, and wildlife rescue and rehabilitation centers. However, for the purposes of this guide, our definition of a firefly sanctuary does not include captive firefly breeding facilities or enterprises that display fireflies for profit.

Why establish a firefly sanctuary?

Firefly populations are in trouble. Of the more than 175 firefly species [currently described](#) from the U.S. and Canada, at least 18 are at risk of extinction. Researchers suspect many more may be imperiled due to threats including habitat loss and degradation, light pollution, climate change, and pesticide use, but we currently lack sufficient data to assess the extinction risk and conservation status for over half of the region’s firefly fauna.

Yet even with these knowledge gaps, we know enough that protecting habitat for these species is vitally important. One way to do so is to establish firefly sanctuaries in areas where fireflies are known to occur. This concept is not new—the use of sanctuaries as designated places of refuge for wildlife has been in practice since at least the late 19th century, although the concept really took off with the creation of the U.S. National Wildlife Refuge system in 1903. Over time, other types of sanctuaries have emerged, including bird sanctuaries, marine sanctuaries, and sanctuaries for at-risk species, such as the Monarch Grove Sanctuary in Pacific City, California. Today, wildlife sanctuaries are often managed by federal and state agencies or non-profit organizations dedicated not only to preservation of a species and its habitat, but also to habitat restoration, research, and education.

Beyond protecting habitat for fireflies, there are several other reasons someone may consider establishing a firefly sanctuary. For one, a sanctuary can act as a natural laboratory where scientists and other researchers can study fireflies and their natural history. There is still a lot we don’t know about the firefly species that have been described, and undoubtedly there are many more discoveries yet to be made, including previously undescribed species! People also tend to appreciate fireflies more than most insects, and they enjoy watching their light shows. By providing a safe space for visitors to experience fireflies and learn more about them, sanctuaries give people the chance to connect with nature and their own sense of wonder, hopefully inspiring new conservationists. Firefly sanctuaries may act as refugia for not only fireflies but other plant and animal species that may be disappearing from the broader landscape, due to habitat loss or degradation. These refugia could even help repopulate nearby

habitats, should they become suitable in the future—for example, after restoration efforts or recovery from a wildfire.

Why develop this guide?

Despite the history of wildlife sanctuaries in the United States, the concept of a firefly sanctuary is still quite new. To our knowledge, only a handful of firefly sanctuaries currently exist in the country. These are paving the way for future sanctuaries, each pursuing their own goals and testing out different ways of operating and engaging with their communities. This guide represents our effort to clarify the process and offer some direction, with the hope that more people will be inspired to create firefly sanctuaries across the country. In these pages, you will learn more about what fireflies need and what steps you can take to start your own firefly sanctuary. The case studies at the end of the guide may be particularly insightful, offering structural ideas, lessons learned, and other tips from four firefly sanctuaries already established in the U.S.

Who is this guide for?

This guide is for anyone who wants to set aside and manage some land with the primary goal of protecting fireflies and their habitats. This might include not only public park managers, but also land trusts, groups of individuals working with local parks, and private landowners.

What fireflies need

Before we dive into the steps for establishing a firefly sanctuary, it is helpful to outline what fireflies need to thrive. In general, fireflies need food, shelter, moisture, dark nights, and protection from pesticides. Careful consideration of each life stage (egg, larva, pupa, and adult) as well as the different types of fireflies (flashing, glow-worm, and daytime dark) active at your site will help ensure that you design your sanctuary and associated management strategies with the needs of fireflies in mind.

Fireflies are best known for their bioluminescent courtship displays, yet while the larvae of all firefly species are bioluminescent, not all adults are capable of producing light. Fireflies can be organized into three different groups depending on their courtship style: flashing fireflies (a.k.a. lightningbugs), which are probably the best-known fireflies due to the quick, bright flashes they produce; glow-worm fireflies, whose flightless females glow to attract mostly non-luminescent males flying overhead; and daytime dark fireflies, which are active during the day and use pheromones to attract potential mates, rather than producing light.

Depending on the species and your location, the complete life cycle can take anywhere from a couple of months to two years or more. Fireflies spend most of their lives in the larval stage, hunting for soft-bodied invertebrates such as snails, slugs, and earthworms. While the larvae are predators and sometimes scavengers, the adults of many species do not feed. Practices that affect firefly prey—such as using pesticides to eliminate slugs—may diminish firefly food sources and harm their populations. Insecticides can also directly kill fireflies and herbicides can damage their habitat. Diverse natural habitats that are safe from pesticides are important for fireflies. Leaf litter, native vegetation, and rotting logs can provide shelter for fireflies at all life stages. Vegetation can also help block out light pollution while maintaining soil moisture, which is critically important to both fireflies and their prey. For flashing and glow-worm species that are active at dusk or after dark, dark skies are especially important—artificial light can interfere with their courtship displays and reduce their ability to mate.

successfully. Other considerations, such as dispersal ability, are also important; for example, larvae and flightless glow-worm females are unable to fly or move very quickly, which makes them especially vulnerable to ground disturbances such as trampling or mowing.



Figure 1. Fireflies need dark nights, moisture, food, and shelter—all of which can be found in the diverse native habitats at this nature preserve in Texas (photos by Candace Fallon/Xerces Society).

Steps to establishing a firefly sanctuary

Establishing a firefly sanctuary is a worthwhile endeavor for protecting fireflies and their habitats. This step-by-step guide will walk you through some of the main considerations for establishing a firefly sanctuary. In the section following this one, we provide case studies of existing firefly sanctuaries, illustrating how others have put some of these steps into action.

1: Select your location

The first step will be identifying the location for your firefly sanctuary. Do you already have land that you own or manage? If so, consider the areas where fireflies are known to occur. Is it possible to set aside some or even all of these areas as a firefly sanctuary? Are there particular firefly species or habitat types that are especially in need of protection? Even if you don't own or manage land, there are still opportunities to work with others who do. For example, could you work with a local park, preserve, or

nature center to designate an area as a firefly sanctuary? Is it possible to integrate the designation of a firefly sanctuary into an existing wildlife sanctuary?

2: Identify the resident firefly species

If you are not yet sure which firefly species occur on the land you would like to designate as a sanctuary, spend some time getting to know the local fauna. Conduct an inventory of your site over the course of one or more seasons and collect baseline data on firefly populations. Remember that different species have different life histories, activity periods, and habitat associations. To get a sense for the species that might occur in your area, download a checklist for your state from the [Firefly Atlas](#) and use the resources on this website to learn more about particular species. Several field guides are also available, which can help you learn more about your local species and their natural history. Check out the **Resources** section for suggestions. You can use the survey data sheets and online Firefly Atlas data portal to help guide your surveys and collect information that will help you track the species at your site while contributing to ongoing research efforts.

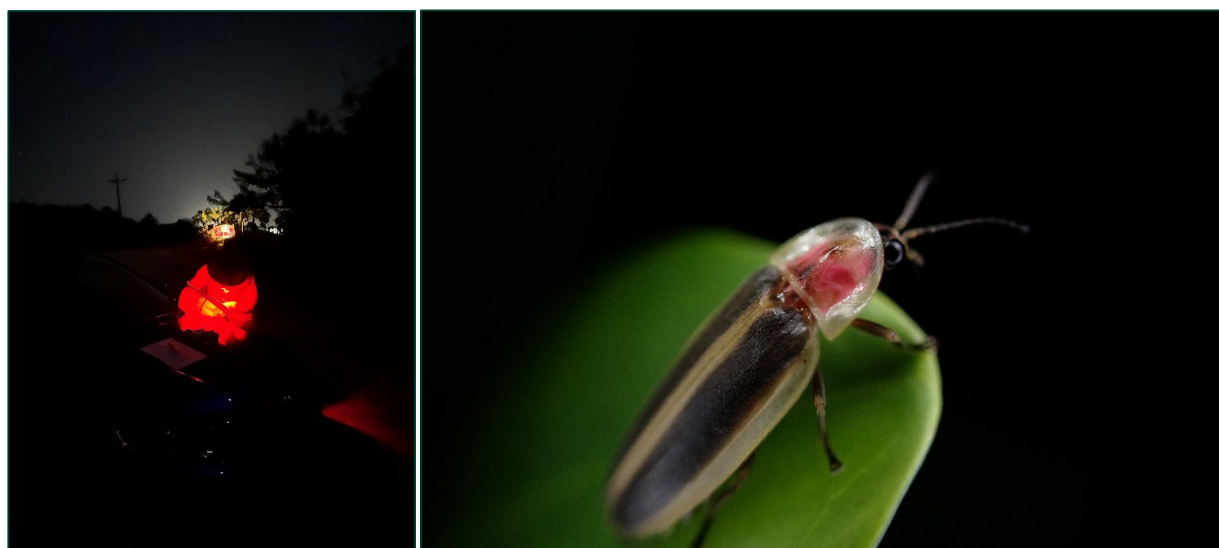


Figure 2. Conducting firefly surveys throughout the season can be helpful for determining which species are present at your firefly sanctuary (photos by Richard Joyce/Xerces Society).

3: Identify your goals

You know that you want your sanctuary to protect fireflies, but what are the specific goals of your sanctuary? Do you want to focus on habitat preservation? Education and outreach? Community engagement? Promotion of sustainable and ethical firefly tourism? Will your sanctuary be open to the public or specific groups of people (e.g., student groups, researchers), or will it be fully set aside for protection? Are you focused on protecting habitat for one or more rare, threatened, or endemic species, or is your focus broader, perhaps on an area that supports high firefly abundance or diversity? Identifying these goals from the outset will help you determine subsequent actions for your sanctuary. Be sure to consider your location as you think through your goals as well. Are you located near an urban area, or are you further out? If education is a goal of your sanctuary, proximity to people may be an important element.

4: Develop a site management plan

A site management plan is a helpful tool that outlines detailed actions to be taken at a particular location to effectively manage and conserve wildlife species. In the context of a firefly sanctuary, such a document provides a roadmap for targeted conservation efforts based on the unique needs of resident firefly species, including where and when to implement management activities like habitat restoration, population monitoring, or invasive plant removal. Site management plans can also be helpful for determining the best path forward when it comes to sustainable firefly tourism and other public access considerations. These plans are developed to meet the stated goals of the sanctuary, and should include considerations of the specific characteristics of the sanctuary site itself, including habitat features, potential threats to fireflies, and existing management practices, if any. Keep in mind that site management plans are most successful when they include mechanisms to monitor the effectiveness of management actions and adjust strategies as needed over time.

5: Secure funding

Regardless of your sanctuary's structure, size, or goals, you will likely need funding to ensure its long term success. Once you've found your location, identified your goals, and have your site management plan developed, estimate the costs involved to operate the sanctuary. Do you already have the land or at least access to it, or will it need to be purchased? What habitat restoration or maintenance is needed? Will you need staff to carry out management activities, conduct inventories, provide educational programming, or coordinate volunteers? Are new facilities such as an office or restrooms needed? Will you be building new trails or improving existing ones?

Depending on your needs, funding can be a challenge. Brainstorm different funding sources, such as grants, donations, crowdfunding, and partnerships with local organizations or businesses. Consider phasing the creation of your firefly sanctuary, so that costs are not prohibitive from the start. Experiment with different structures. Anticipate that your needs and vision may change over time, and plan accordingly.

6: Implement the site management plan

Once you have secured any necessary funding to support your site management plan and infrastructure needs, put your plan into action. How will you address light pollution or pesticide use in or near the sanctuary? Does the site need to be restored with native plants? Can you reduce mowing and allow grasses and other forbs to grow naturally? What types of interpretive signs or educational programs will you offer, if any? What kinds of infrastructure do you need to build out? Keep in mind that infrastructure can include things like public access (such as creating or improving trails and access points for visitors that minimize impacts on vulnerable firefly habitats) as well as personnel (bringing on staff or trained volunteers who will help manage the sanctuary, advocate for fireflies, and engage with the local community). For example, if your site will be open to the public, can you use boardwalks, ropes, or signage to keep people on designated trails? If you plan to host firefly viewing events, can you designate specific areas for this?



Figure 3. Bleachers and dim red rope lighting are used to keep viewers in one area while guiding them with minimal light pollution during an event with the Pennsylvania Firefly Festival (left, photo by Peggy Butler). Boardwalks, such as these seen in Congaree National Park, SC, help to keep visitors on designated trails (photo by Ken Lund/Flickr).

7: Engage the local community

Firefly sanctuaries provide ideal opportunities for engaging with the local community about fireflies, conservation, and ecology. Consider developing educational programs to raise awareness about firefly conservation, local species, and the importance of the sanctuary. There are many examples of firefly programming to get you inspired, including evening firefly walks or viewing events, lectures and webinars, firefly festivals, and interpretive materials. Another way to engage the community in sanctuary activities is to provide volunteer opportunities. This could include invasive plant removal parties, trail maintenance days, Firefly Atlas surveys, docent programs for firefly viewing events, or even long term firefly population monitoring. If you are located in an urban area, go door-to-door or send out flyers letting neighbors know about the sanctuary and any upcoming events or opportunities. Ideally, this step would be considered even earlier in the process, when you are first planning and developing the sanctuary. What does a firefly sanctuary mean to local residents? How would they like to engage, and what resources or events would be meaningful to them?



Figure 4. Get creative with your engagement! Firefly walk programming can include props and even costumes, like this event at the Coler Firefly Sanctuary, AR, featuring the four life stages of fireflies (left and middle photo by Amy Long; photo on right by Pam Morgan).

8: Establish a monitoring program

Establishing baseline abundance estimates and monitoring trends in firefly populations is important for understanding the extinction risk of species, identifying high priority species for conservation actions, and determining the impacts of threats or different management actions—including habitat restoration, artificial light mitigation, invasive species control, and prescribed fire. However, monitoring can be difficult for some sanctuaries to implement due to limitations on capacity and other resources. Before implementing a monitoring program, it is helpful to identify the goal of the program. For example, are you interested in long-term trends or is the focus more on understanding how various management actions affect the local firefly population? Once the goal is identified, sanctuary managers can decide on a monitoring program that fits their needs and available resources. How feasible is it that you can run a monitoring program over the long term? What partnerships (e.g., with researchers at a local university) might you develop to help support such an effort? These monitoring programs can be incorporated into the site management plan and adapted as needed over time. For some ideas on the various types of monitoring programs you can implement, check out the **Resources** section.

9: Promote awareness

By raising awareness about fireflies and their needs, sanctuaries can help ensure their survival while promoting healthier ecosystems for myriad species. There are numerous benefits to raising awareness. For example, firefly festivals and events can foster community involvement in conservation efforts and increase appreciation for local biodiversity. A better understanding of the threats fireflies face—such as light pollution and habitat degradation—can encourage communities to adopt measures to reduce light pollution and pesticide use and engage in more sustainable gardening and farming practices. Fireflies can be effective ambassadors for the conservation of nature—they are well-loved by many people, and can open the doors to larger conversations around protecting the environment. By offering workshops, tours, and volunteer days, you can educate the public while involving them in local conservation efforts. You can also promote your sanctuary via social media, local events, and partnerships with schools and other groups. If working with schools, use the opportunity to inspire the next generation and educate them on firefly life cycles and ecology. Habitat certification and display of informational signage can also help to educate and inspire visitors or passersby. If certification is of interest, there are a number of programs to choose from, including:

- [Firefly Habitat Certification](#) with Firefly Conservation and Research
- [Wildlife Habitat Certification](#) with National Wildlife Federation
- [Dark Sky Places Certification](#) with International Dark-Sky Association



Figure 5. Installing signage like this Certified Firefly Habitat sign can help engage visitors to learn more about fireflies and their needs (photo by Pam Morgan).

10: Evaluate and adapt over time

Regular assessment of your sanctuary and resident firefly population is crucial for ensuring its success over time. Periodically evaluate the sanctuary's progress against its goals and adapt management practices and other approaches as needed. Use long-term firefly population monitoring results to better understand how different threats, management activities, or tourism practices are impacting fireflies, and adapt management strategies accordingly. Poll your volunteers and ask what is working and what needs adjusting. Regularly engage the community and anyone involved with the sanctuary to troubleshoot challenges and brainstorm new ideas. Reach out to other firefly sanctuaries to compare notes and get inspired. Consider partnering with universities or conservation organizations to conduct research that supports firefly conservation, and use the findings from these projects to inform your management strategies moving forward.

11: Plan for long-term sustainability

Long-term sustainability is crucial for firefly sanctuaries because it ensures the continued protection and preservation of fireflies and their habitats over time, allowing their populations to thrive, rather than just offering a temporary refuge. Long-term sustainability can be approached in a variety of ways, but at its core it means managing resources responsibly, minimizing human impact, and considering the needs of both the fireflies and their surrounding environment to maintain ecological balance.

One way to plan for long-term sustainability is to place the sanctuary in a land trust. Don Lewis' Firefly Forest in Cleveland, South Carolina, is a good example of this. This private site, known for its blue ghost fireflies (*Phausis reticulata*), was protected in 2006 by an easement held by the land trust Upstate Forever. State funding through the South Carolina Conservation Bank helped establish the easement. Another option is to look into an endowment. Endowments are funds that are invested to provide support for nonprofits or charitable causes into perpetuity. These can further ensure long-term financial stability of the site. If your firefly sanctuary is nested within a larger landscape that already has an existing long-term management plan, consider how you might incorporate the sanctuary into that plan to ensure its management into the future. At a minimum, do not discount the power of continuous engagement with the community. By offering regular and ongoing events, updates, and volunteer opportunities, you can foster a culture of conservation and long term relationships that will help support the sanctuary for years to come.



Figure 6. Blue ghost fireflies are just one of many species that could benefit from firefly sanctuaries (photo by Radim Schreiber, fireflyexperience.org).

12: Share your experience with others

Firefly sanctuaries are a relatively new idea in the United States, so sharing your process—both the challenges and successes—along the way can be helpful for those just starting out. Whether you track your progress on a blog, share highlights on social media, host periodic virtual meetings with other sanctuaries, or simply share insights with others who reach out hoping to follow in your footsteps, any reflections you can offer along the way will help light the way for others.

Firefly sanctuary case studies

Firefly sanctuaries can take many forms. The following case studies highlight four of the first sanctuaries known to be established in the United States. Each case study provides an overview of the sanctuary's overall structure, goals, outreach and education efforts, and management strategies, in addition to some lessons learned and tips for others. It is our hope that these case studies will inspire you to start your own sanctuary, building upon the experiences and advice of others who have led the way.

Kellettville Firefly Farm and Cabins, Tionesta, PA



Figure 7. Fireflies and the Milky Way light up the skies at Kellettville Firefly Farm and Cabins, PA (photo by Peggy Butler).

While not technically named a firefly sanctuary, the old-growth forest surrounding Peggy and Ken Butler's mini-farm certainly fits the bill. What started as a bed and breakfast with a hayfield full of fireflies quickly grew to be one of the most popular firefly attractions in the country, particularly once the Butlers founded the nonprofit [Pennsylvania Firefly Festival](#) (PAFF) in 2013. The festival was so successful that the organization had to limit visitors to protect the fireflies. Now, after over 10 years in operation, the sanctuary has taught thousands of people about fireflies, and it continues to protect the many species that call the site home. Their story underscores just how much people love fireflies—and how that excitement can lead to unsustainable growth if it is not carefully managed.

The Butlers' main goal with the Firefly Farm is to monitor, manage, and protect the farm's landscapes and wild habitats so that they can preserve the fireflies for future generations. Located on 15 acres along Tionesta Creek in northwest Pennsylvania, this private sanctuary is home to a wide variety of firefly species. Synchronous fireflies (*Photinus carolinus*) tend to steal the show, but the site also hosts Chinese lantern fireflies (*Photuris versicolor*-complex) and 12 other species, including diurnal fireflies.

One of the biggest lessons PAFF has learned over the years is how important it is to keep checking in and adapting as you go. Managing a firefly sanctuary alongside an annual festival requires balance and continual reassessment to ensure that the needs of the fireflies are weighed against the importance of sharing the message of firefly conservation with a large audience. For folks just starting out, they offer this advice: don't underestimate the potential popularity of your site or events! When PAFF first launched, visitors were allowed to attend without prior reservations. PAFF only asked for donations and did not restrict the parking or numbers of attendees. After a few years, the numbers of visitors were much too high, and expenses exceeded revenue. The Butlers started to impose more restrictions through online registration and parking fees, yet still it was not enough. The COVID-19 pandemic in 2020, which halted many large gatherings, offered a chance to reassess. The festival was scaled back to a small firefly event for just 30 paying visitors.

Now, the festival takes place over three days at the end of June, focusing on education. Experts and naturalists from agencies and like-minded groups are invited to display and talk with guests. One musician entertains the group for an hour during check-in, followed by a guest speaker who presents on fireflies and prepares guests for what they will do and see. Trained volunteer guides provide firefly etiquette and safety talks for small groups before venturing into the forest. PAFF restricts the audience size to 50 people per night, requires them to complete a free lottery entry, and charges a registration fee for the adults who are selected from a random drawing. Not only is this more sustainable for the organizers, it also helps keep the fireflies safe. To further protect the fireflies and their habitat, PAFF will change its structure once more in 2025, moving the festival to the nearby Kellettville Campground and conducting all programs and tours on the campground property. PAFF will continue to provide private tours on the Firefly Farm, but will restrict use of the lodge and cabin to festival volunteers, researchers, and exhibitors only.

In addition to the annual festival, PAFF provides year-round firefly-themed educational programs to Pennsylvania K-12 schools, state parks, special interest groups, and community firefly events. More recently, they have established a memorandum of understanding (MOU) with the Tionesta Lake U.S. Army Corps of Engineers (USACE), which manages the adjacent waterways, reservoir, and local campgrounds. This partnership affords PAFF the ability to monitor and protect these additional areas near the farm, as well as operate tours and educational programs on USACE properties.

The Butlers use a variety of management strategies to ensure their fireflies thrive, including:

- Eliminating and/or restricting the use of artificial light at night (ALAN), especially during spring/summer months when adults are active,
- Limiting mowing, leaf removal, and soil disturbances during sensitive seasons when fireflies are most active (i.e., late spring through late fall),

- Eliminating invasive species, hybrids, and monocultures, and replacing them with a variety of indigenous plants in order to restore habitat,
- Restricting the use of pesticides and herbicides, opting instead to find more natural means of control, or just letting nature take its course,
- Restricting access to the sanctuary through limited audiences and lottery for registration,
- Providing educational programs, materials, and signage in order to raise awareness,
- And promoting Leave No Trace tenets to audiences and visitors.

When asked if they had any other tips for people hoping to establish firefly sanctuaries, the Butlers shared the following:

- Don't forget that the fireflies are at your site all the time, not just in the summer. What you do affects them no matter the season, so be mindful.
- The first and easiest thing a property owner or site manager can do is eliminate, restrict, or limit lights at night. This is also a cost saving measure. Next, limit mowing and allow some areas to grow wild and undisturbed. After that, the next steps, like eliminating use of pesticides and/or restoring monoculture lawns to natural landscapes, won't be such a big leap.
- Consider registering your site with the National Wildlife Federation as a Certified Wildlife Habitat and as a Certified Firefly Habitat with [Firefly.org](https://www.firefly.org). Anyone can get these designations with a commitment to following the above precepts.

They end with this reminder: The firefly is an indicator species, meaning that its presence indicates that its habitat is healthy and well balanced. If you have fireflies, then you must be doing something right. If you do not have fireflies (and you live in an area that should), then you should be concerned. Fireflies are also umbrella species—any actions you take to protect or improve firefly habitat will also likely have a positive impact on other species, from the smallest of creatures all the way up to us—human beings.

New Canaan Land Trust Firefly Sanctuary, CT



Figure 8. The firefly meadow at New Canaan Land Trust Firefly Sanctuary (photo by Connor de Mayo).

Located in the heavily-populated Northeast Corridor between New York City and Boston, the [New Canaan Land Trust \(NCLT\) Firefly Sanctuary](#) serves the important role of bringing the message of firefly conservation to a largely urban audience. Light pollution and habitat loss are big threats for firefly species in this area, and this sanctuary not only protects 6.5 acres of valuable land for fireflies, it ensures that future generations will want to protect them as well.

The nonprofit NCLT Firefly Sanctuary is the first dedicated firefly sanctuary in the United States. The site was acquired in two phases: 2.5 acres were initially gifted to the Trust by David and Marion Marvin in 1983, and then four additional adjoining acres were purchased from Anthony and Marie Massarella in 2015. The Firefly Sanctuary, also known as the firefly field or meadow, was established after the purchase of these additional acres.

The foremost goal of the sanctuary is to preserve the land as firefly habitat, but a close second goal is to share the experience of fireflies with the community, giving them the opportunity to witness the magical critical mating season of the fireflies. During the peak firefly season from late June through early July, volunteers lead guided group walks to the firefly meadow. Pre-registration is required for these events, and they are capped at 30 participants per night. Guests are provided with red-beam flashlights to aid in returning to the parking lot after dark within minimal disturbance to the fireflies, and they are asked to refrain from applying bug spray once the group has started the walk to the firefly field. The most abundant firefly at the sanctuary is the big dipper (*Photinus pyralis*), which emerges at dusk. But several

other species can be found here as well, including heebie-jeebies (*Photuris hebes*), July comets (*Photuris lucicrescens*), versicolor *Photuris* fireflies, and, earlier in the season, the spring treetop flasher (*Pyractomena borealis*).

The NCLT Firefly Sanctuary has implemented several different management strategies to help protect the fireflies and their habitat, including:

- Eliminating any use of pesticides and limiting their possible spread from neighboring properties,
- Mowing the site only once annually (typically in December or January after a hard frost) to maintain a grassy/brushy meadow habitat, while preventing it from returning to forest,
- Leaving fallen trees and branches to serve as breeding/egg-laying sites for the fireflies and their prey,
- Asking adjacent neighbors to reduce landscape lighting during peak adult courtship periods,
- And employing a registration system for visitors during peak viewing season.

When asked about lessons learned, New Canaan Land Trust's Events and Outreach Coordinator Elle Smith reflected on the fact that you can't create a firefly sanctuary from scratch—you need to build on what is ready there. She recommends focusing on preserving the habitat where fireflies naturally gather—leave leaf cover and tall grass, avoid pesticides, and avoid landscaping. Over time, you'll see the population start to flourish. Similar to the Butlers, Smith also emphasized the importance of having a good registration system if you plan to invite people to visit. Ensuring that guests understand that firefly showings are at the mercy of the weather, limiting visitors to keep the habitat safe, and providing red-light flashlights are all essential elements of firefly events.

Firefly Sanctuary at Stream Valley Park, Greenbelt, MD



Figure 9. Greenbelt Firefly Sanctuary (photo by Vlad Tchompalov).

The [Firefly Sanctuary at Stream Valley Park](#) shows that it can be relatively easy to protect fireflies. All it takes is a little motivation, communication, and cooperation. Ordinary residents have the power to make a difference in their community, and with just a little education and a few changes, cities can set aside safe places for fireflies. It's a win-win for fireflies and their human neighbors!

Maryland's first firefly sanctuary was established in response to growing concerns about firefly declines and potential development of existing firefly habitat in Greenbelt's Stream Valley Park. Mary Ann Canter, a local resident who had enjoyed the fireflies in this area for decades, formed a Firefly Sanctuary Committee with her neighbors in 2020 and submitted a proposal to the Greenbelt City Council to designate part of the city park as a firefly sanctuary. It was officially approved in March of that year.

Today, approximately three acres are set aside as a sanctuary with the goal of preserving and enhancing the environment so that fireflies will continue to thrive. While the park is open to visitors year-round, the primary firefly viewing season is in June and July. The big dipper firefly (*Photinus pyralis*) is the main entertainment here, but it is likely other firefly species call the park home as well. When the sanctuary was first designated, volunteers associated with the Firefly Sanctuary Committee spread the word via door-to-door outreach to adjacent residences. Since then, volunteer-led viewings have been held in June and July during the peak season. The City of Greenbelt is planning to move forward with more programming in the future. Two interpretive signs, one at each entrance to the sanctuary, have been

installed describing firefly biology, their place in the environment, and what homeowners can do to enhance their own yards with fireflies in mind.

The City of Greenbelt has committed to several management strategies to meet their goal of preserving and enhancing the environment for fireflies, including:

- Maintaining the boundaries of the sanctuary,
- Prohibiting the use of herbicides and other pesticides throughout the sanctuary,
- Prohibiting the installation of lighting within the sanctuary,
- Allowing the vegetative buffer bordering the streams along the northeastern and eastern edges of the sanctuary to grow taller grass and brush (for example, by mowing only at the end of winter), while keeping the central grassy area as is,
- Working with volunteer groups to remove invasive plants and establish native species,
- And maintaining current water flow and the existing water channels.

When asked to share a lesson learned from this process, the City of Greenbelt's Environmental Coordinator Kevin Driscoll emphasized the importance of communication. As a local neighborhood park, residents have a strong sense of ownership of the space. Effective communication is critical to maintain these relationships and the balance of stewardship and preservation. Driscoll noted that working closely with the community and local institutions (including university extensions, master naturalists, biota groups, and others) is a great way to generate support and help identify suitable sites for a sanctuary. He further highlighted how invaluable dedicated volunteers are when establishing and maintaining a firefly sanctuary.

Coler Firefly Sanctuary, Bentonville, AR



Figure 10. Coler Firefly Sanctuary (photo by Pam Morgan).

Established in 2024, the [Coler Firefly Sanctuary](#) is the youngest in our case study series, but is already off to a great start. Located in northwest Arkansas, which has seen incredible growth over the last decade, the sanctuary provides a refuge for fireflies in an area where habitat loss is a growing concern. This sanctuary came together as a partnership between a local nonprofit—the Peel Compton Foundation—and the Northwest Arkansas (NWA) Master Naturalists. The Foundation manages several properties in the area with an eye towards conservation, so when master naturalists approached them to designate a portion of the Coler Mountain Bike Preserve as a firefly sanctuary, it made sense. Coupled with guided firefly walks and activities, the sanctuary was an easy way to get people excited about fireflies and ways they can help them.

The Coler Firefly Sanctuary is the first firefly sanctuary in Arkansas and the first west of the Mississippi River. Its goal is to share the magic of fireflies with others and ensure the magic lives on for future generations. Roughly one acre in size, the sanctuary is open to the public year-round, although the main firefly viewing season is in June. Visitors can expect to see several species, from the common big dipper (*Photinus pyralis*) to sidewinders (*Photinus brimleyi*), July comets (*Photuris lucicrescens*), and other *Photuris* fireflies. Earlier in the season, in March and April, spring treetop flashers (*Pyractomena borealis*) put on a show. In addition to leading Firefly Educational Walks for the public in June, volunteer NWA Master Naturalists also conduct firefly surveys at the sanctuary, following [Firefly Atlas](#) survey

protocols. More species will no doubt get added to their inventory list as they get another season or two under their belts.

NWA Master Naturalists have worked with preserve managers to implement the following management strategies, both at the sanctuary itself and within the larger preserve:

- Preserving tall grass, native plants, and leaf litter,
- Managing the area without pesticides,
- Eliminating artificial lights except at the parking lot and camping area,
- Leaving the leaves,
- And ensuring minimal disturbance in wooded areas.

Pam Morgan, a master naturalist who has helped lead the charge on designating the firefly sanctuary, providing outreach opportunities, and conducting firefly surveys, shared some lessons learned from their first year as a sanctuary. For one, because it was their first year, site naturalists weren't sure when the best firefly displays would happen, making it difficult to plan scheduled walks. Although each walk still had fireflies, the timing could have been better for seeing more impressive displays. This is something they will be able to improve upon as they get to know the site and its resident fauna more intimately. The firefly walks were also labor intensive, and finding enough volunteers each night could be a challenge. There was also the issue of different species flashing at different times of night. Each firefly event started with activity tables and information at the preserve's pavilion at 8:30 pm, just before it started to get dark. Participants were then led down to the sanctuary, where some big dipper fireflies were present. However, *Photuris* displays did not begin until after 9:00 pm, and most folks left after a few minutes, missing the bulk of the show.

Reflecting on these challenges and lessons learned, Morgan shared these tips for others hoping to establish their own sanctuaries:

- Have a dress rehearsal or soft opening with friends, associates, or family before kicking off public events. This can help identify any changes that might be needed in speaking scripts, activities, or other elements of the event.
- Set expectations for participants. Emphasize education and the fact that firefly displays are seasonal, species-dependent, and tend to fluctuate. Encourage people to stick around for later displays if focal species don't start displaying until later in the evening.
- Don't open registration for events too early, cap your registration (they can fill quickly!) and don't forget to send out reminders closer to the event.
- If the main goal of your firefly sanctuary is to protect the fireflies with safe habitat, then the location depends mainly on the presence of fireflies, the habitat, and the partner/landowner. However, if the main goal is to educate the public about fireflies and their need for conservation, the location should also be close to a town or city so it will be seen by more people. If you're going to have educational programs, there should be plenty of parking and a walking trail or observation area.
- Developing a good relationship with the partner/landowner is important.
- Make sure you have committed volunteers before you plan firefly walks or other educational programming.

- Having a sign is important. This can include a Firefly Habitat certification sign and/or interpretative signage relevant to your area.
- Assign a person who can talk to the press. That person should be very familiar with talking points around the importance of a firefly sanctuary, the status of fireflies and their threats, and other relevant topics.

Resources

Species checklists

- [Firefly Species Checklist of the USA and Canada](#) on the Firefly Atlas

Firefly identification guides

- *Fireflies, Glow-worms, and Lightning Bugs: Identification and Natural History of the Fireflies of the Eastern and Central United States and Canada*, by Lynn Faust
- [Guide to Fireflies of the Southwest](#), by Anna Walker
- [North American Firefly ID Course](#), by Oliver Keller

Firefly inventory and monitoring

- [Firefly Atlas](#) survey protocols and data sheets
- [Protocols and Guidelines for Measuring Indices of Abundance in Firefly Populations](#)

Habitat restoration and conservation

- [Conserving the Jewels of the Night: Guidelines for Protecting Fireflies in the United States and Canada](#)
- [Conserving the Jewels of the Night: Firefly-Friendly Lighting Practices](#) (also available in Spanish)
- [Firefly Habitat Certification](#) through Firefly Conservation and Research

Sustainable firefly tourism

- [Sustainable US Firefly Tourism: A Guide for Site Managers](#)
- [Visitor Etiquette for Sustainable Firefly Tourism](#) (available in multiple languages)