CF 4/5/23

https://www.youtube.com/watch?v=bfwL_2inbpY

Where does the water go? Stormwater management in the solar energy future

Fresh Energy
369 subscribers
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383 views Sep 28, 2022
Are solar farms a threat to water quality, or a community asset? How can we create a solar-friendly permitting process that also enhances water and ecosystem services for the host community? Thanks to the PV-SMaRT project funded by the U.S. Department of Energy's (DOE) Solar Energy Technology Office, we are excited to debut the first solar-specific national study on stormwater dynamics and modeling. Project members include Great Plains Institute (GPI), DOE's National Renewable Energy Laboratory (NREL), Fresh Energy, and the University of Minnesota. The team used field research on five existing ground-mounted photovoltaic (PV) solar sites across the United States, three-dimensional hydrologic modeling, and feedback from solar developers, site managers, state and local regulators, and other stakeholders to assess the opportunities. And results are flooding in! Based on the project's findings, researchers have now developed a stormwater runoff calculator tool and best practices recommendations for local and state permit officials and solar industry practitioners. Tune in to this webinar, recorded on September 28, 2022, for more details from hosts Fresh Energy, GPI, and NREL and special guests for the inside scoop on how the tool has worked so far. Meet the speakers: Brian Ross, GPI Dr. David Mulla, University of Minnesota James McCall, NREL Todd Smith, Minnesota Pollution Control Agency Robert L. Goo, U.S. Environmental Protection Agency, Office of Water Lee Strait, EOR Moderator: Briana Kerber, Fresh Energy
Show less

Two of the findings that the PB consultant touched on in his comments

1:11:28 Depth to bedrock or fragipan or any restrictive layer is a major component in their calculations that no one takes into account. Shallow soil depth means there is less capacity to infiltrate water and it saturates more quickly leading to more runoff.

Developers should choose sites with greater soil depth.

1:21:30 Orientation of the panels is an important factor. They found that there is a 40% increase in runoff from panels that run perpendicular to the slopes relative to panels that run parallel to the slope.

Table 5. Recommended Buffers Based on Proposed Activity and Site Conditions to Prevent Disturbance

Activity	Restriction Period	Condition/Season	Distance Recommendation *
New building, roadway or utility construction	Year-round	Nest with visual buffer	No closer than 660' from nest
		Nest without visual buffer	No closer than ¼ mile ** from nest
Boat ramp and/or marina construction	Year-round	With or without visual buffer	No closer than ¼ mile from important foraging areas
Logging	Varies seasonally	During breeding season (Jan 01-Sept 30)	No harvest within 660' from nest
		During wintering period (Dec 01-March 31)	No harvest within ¼ mile from important deep winter roosts
	Year-round		Avoid removal of overstory trees within 330' from nest
Motorized recreation	Varies seasonally	During breeding season (Jan 01-Sept 30)	No closer than 660' from nest
		During wintering period(Dec 01-March 31)	No closer than 660' from communal roosts
Non-motorized recreation	Varies seasonally	During breeding season (Jan 01-Sept 30)	No closer than 330'from nest with visual buffer or 660' without visual buffer
		During wintering period(Dec 01-March 31)	No closer than 330' from communal roosts with visual buffer or 660' feet without visual buffer
Airboats	Varies seasonally	During breeding season (Jan 01-Sept 30)	No closer than ¼ mile from nests
		During wintering period(Dec 01-March 31)	No closer than ¼ mile from important deep winter roost sites
Aircraft, Unmanned Aerial Vehicles (drones)	Varies seasonally	During breeding season (Jan 1-Sept 30)	¼ mi or 1500' above ground level at nest
		During wintering period(Dec 01-March 31)	¼ mi or 1500' above ground level at communal roost sites
Blasting, Fireworks and other loud noises	Varies seasonally	During breeding season (Jan 01-Sept 30) With visual buffer	No closer than ½ mile from nest
		W/out visual buffer	No closer than 1 mile from nest
		During wintering period (Dec 1-March 31) With buffer	No closer than ½ mile from communal roost and foraging sites
		W/out visual buffer	No closer than 1 mile from communal roost and foraging sites

*may vary based on landscape characteristics and type of activity
**¼ mile = 1320'

Published: March 1993

Importance of small wetlands for the persistence of local populations of wetland-associated animals

James P. Gibbs

Wetlands **13**, 25–31 (1993) | Cite this article

1936 Accesses | **235** Citations | **6** Altmetric | Metrics

Abstract

I simulated loss of small, legally unprotected freshwater wetlands in a 600 km^2 area of Maine, USA to examine how loss of small wetlands altered the geometry of the wetland mosaic and thereby might affect the dynamics of metapopulations of wetland-associated organisms. Loss of small wetlands resulted in total wetland area declining by 19% (from 2032 to 1655 ha), total wetland number declining by 62% (from 354 to 136 wetlands), and average inter-wetland distance increasing by 67% (from 0.6 to 1.0 km). Also, average upland-wetland proximity decreased by 50% (0.5 to 1.0 km), such that just 54% of the landscape was within the maximum migration distance (1000m) of terrestrial-dwelling and aquatic-breeding amphibians after loss of small wetlands, versus 90% before loss. A spatially-structured demographic model revealed that local populations of turtles, small birds, and small mammals, stable under conditions of no wetland loss, faced a significant risk of extinction ($P >$ 5%) after loss of small wetlands. No change in metapopulation extinction risk was evident for salamanders or frogs, largely because high rates of population increase buffered these taxa against local extinction. These results suggest that small wetlands play a greater role in the metapopulation dynamics of certain taxa of wetland animals than the modest area comprised by small wetlands might imply.

[illegible]

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AMPHIBIAN UPLAND HABITAT USE AND ITS CONSEQUENCES FOR POPULATION VIABILITY

PETER C. TRENHAM[1] AND H. BRADLEY SHAFFER

Section of Evolution and Ecology and Center for Population Biology, 1 Shields Avenue, University of California, Davis, California 95616 USA

Abstract. To predict the effects of habitat alteration on population size and viability, data describing the landscape-scale distribution of individuals are needed. Many amphibians breed in wetland habitats and spend the vast majority of their lives in nearby upland habitats. However, for most species, the spatial distribution of individuals in upland habitats is poorly understood. To estimate the upland distribution of subadult and adult California tiger salamanders (*Ambystoma californiense*), we used a novel trapping approach that allowed us to model the spatial variation in capture rates in the landscape surrounding an isolated breeding pond. As expected, we found that captures of adults declined with distance from the breeding pond. However, captures of subadults increased steadily from 10 to 400 m from the breeding site, but there were no captures at 800 m. A negative exponential function fit to the adult capture data suggested that 50%, 90%, and 95% were within 150, 490, and 620 m of the pond, respectively. For subadults, the quadratic function fit to the data similarly suggested that 95% were within 630 m of the pond, but that 85% of this life stage was concentrated between 200 and 600 m from the pond. To investigate the population-level consequences of reducing the amount of suitable upland habitat around breeding ponds, we used a stage-based stochastic population model with subadult and adult survival parameters modified according to our empirical observations of upland distribution. Model simulations suggested that substantial reductions in population size are less likely if upland habitats extending at least 600 m from the pond edge are maintained. Model elasticities indicated that quasi-extinction probabilities are more sensitive to reductions in subadult and adult survivorship than reproductive parameters. These results indicate that understanding the upland ecology of pond-breeding amphibians, especially the distribution and survivorship of subadults, may be critical for designing protective reserves and land use plans.

Key words: Ambystoma californiense; *California tiger salamander; declining amphibian; drift fence; matrix simulation model; pitfall trap; population viability analysis; reserve design; terrestrial; upland spatial distribution.*

INTRODUCTION

In the United States, wetland habitats are protected against draining and filling by state and federal regulations. A few states further require maintenance of a 30–60 m wide upland buffer of undeveloped habitat around some or all wetlands. These buffers capture silt and chemical pollutants before they reach the wetlands, and are generally recognized as effective in protecting water resources (e.g., Phillips 1989, Brosofske et al. 1997). An additional benefit of upland buffers is that they provide essential habitat for a variety of wildlife species. While the contribution of buffers towards the maintenance of viable populations is intuitively obvious, there has been relatively little quantitative evaluation of exactly how buffers may enhance the value of wetlands for wildlife. Recently there have been attempts to estimate the amount of "core upland habitat" needed to accommodate populations of semi-aquatic wetland-breeding amphibians (Semlitsch 1998, Semlitsch and Bodie 2003). Summarizing across 32 species, Semlitsch and Bodie (2003) estimated that the core upland habitat used by amphibians extends 159 to 290 m from the wetland edge, revealing that buffers designed to protect water quality encompass only a small fraction of the habitat used by most amphibians. While the Semitsch and Bodie (2003) review provides strong rationale for greater protection of upland habitat around wetlands to enhance habitat values for amphibians, it also emphasizes our rudimentary understanding of amphibian upland ecology.

Losses of wetland and upland habitats are recognized as key contributors to the widespread decline of amphibian populations (Semlitsch 2002, Collins and Storfer 2003). However, experimental research on amphibian declines has continued to focus on the aquatic embryonic and larval stages, while the equally important terrestrial stages are rarely studied (Storfer 2003). This research inequity between aquatic and upland amphibian ecology is not a new phenomenon, and is probably

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Effects of Timber Harvest on Amphibian Populations: Understanding Mechanisms from Forest Experiments

RAYMOND D. SEMLITSCH, BRIAN D. TODD, SEAN M. BLOMQUIST, ARAM J. K. CALHOUN, J. WHITFIELD GIBBONS, JAMES P. GIBBS, GABRIELLE J. GRAETER, ELIZABETH B. HARPER, DANIEL J. HOCKING, MALCOLM L. HUNTER JR., DAVID A. PATRICK, TRACY A. G. RITTENHOUSE, AND BETSIE B. ROTHERMEL

Harvesting timber is a common form of land use that has the potential to cause declines in amphibian populations. It is essential to understand the behavior and fate of individuals and the resulting consequences for vital rates (birth, death, immigration, emigration) under different forest management conditions. We report on experimental studies conducted in three regions of the United States to identify mechanisms of responses by pond-breeding amphibians to timber harvest treatments. Our studies demonstrate that life stages related to oviposition and larval performance in the aquatic stage are sometimes affected positively by clearcutting, whereas effects on juvenile and adult terrestrial stages are mostly negative. Partial harvest treatments produced both positive and weaker negative responses than clearcut treatments. Mitigating the detrimental effects of canopy removal, higher surface temperature, and loss of soil-litter moisture in terrestrial habitats surrounding breeding ponds is critical to maintaining viable amphibian populations in managed forested landscapes.

Keywords: amphibian, clearcut, forest management, land use, vital rate

The extraction of natural resources, such as timber, is strongly associated with the loss and modification of forested habitat in most regions of the world (Putz et al. 2008). Deforestation may be long term (e.g., DeFries 2002, Biggs et al. 2008, Putz et al. 2008) or part of a sustainable forest management system (e.g., Hunter 1999). There is general agreement that timber harvest in temperate regions can have numerous negative effects on species richness and abundance of forest-dependent species, including amphibians (e.g., Bury 1983, Petranka et al. 1994, deMaynadier and Hunter 1995, Grialou et al. 2000, Ross et al. 2000, DeGraaf and Yamasaki 2002, Knapp et al. 2003). Yet, few data exist for species with differing life histories (Ross et al. 2000), and there are conflicting views concerning the mechanisms of population decline across regions, especially among lungless woodland salamanders (e.g., Ash and Bruce 1994, Ash 1997, Petranka 1999). This lack of data is of great concern because recent estimates indicate that 1896 species of amphibians worldwide, about one-third, are currently threatened with extinction (Stuart et al. 2004), and 89% of all threatened species are affected by habitat loss (Young et al. 2004). Despite recognition of habitat loss and alteration as major contributors to amphibian declines, the effects of structural habitat change have not been well studied for amphibians (Gardner et al. 2007, deMaynadier and Houlahan 2008).

We initiated a collaborative research project with a primary goal of understanding the mechanisms by which timber harvest affects pond-breeding amphibian populations. Although past studies of timber harvest effects have focused on species richness or abundance or both (reviewed in deMaynadier and Hunter 1995, Gardner et al. 2007), we believe that the response of individual amphibians to timber harvest and the subsequent effects on population demography are critical to understanding the effects of timber harvest on these animals (Armstrong 2005, Todd and Rothermel 2006). Studies of effects on vital rates (birth, death, immigration, emigration) are essential in mitigating population declines or losses. Understanding the mechanisms of decline from timber harvest may also

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WETLANDS, Vol. 26, No. 2, June 2006, pp. 298–306

LIMITATIONS OF REGULATED "BUFFER ZONES" FOR THE CONSERVATION OF MARBLED SALAMANDERS

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Abstract: Most amphibians that breed in seasonal wetlands are predominantly terrestrial animals that require "upland" habitats for the majority of their life cycles. However, wetland regulations aimed partially at protecting wildlife values are often limited to the wetland basins and small terrestrial "buffer zones" that typically extend 30 m or less from the wetland edge. In this study, we assessed whether a common buffer zone (i.e., 30 m) is sufficient for the conservation of marbled salamanders (*Ambystoma opacum*). We installed and monitored two concentric and continuous drift fence arrays (3 m and 30 m from the pond margin) around each of three seasonal ponds in western Massachusetts, USA. We quantified the numbers and percentages of breeding adults and emerging juvenile salamanders that immigrated from and/or emigrated beyond the 30-m fences. In addition, we recorded incidental year-of-emergence captures of juveniles at more distant drift fences that were in place for a broader study. Of the breeding adults captured immigrating to the basins at 3-m fences, 84–96% were first captured at 30-m fences, and corrections for capture probabilities suggested that nearly 100% of these individuals originated beyond 30 m from their breeding sites. Of the newly emerging juveniles captured emigrating from the basins at 3-m fences, 58–85% were subsequently captured at 30-m fences and 284 juvenile captures were recorded at distances between 111 and 1,230 m (median = 269.2 m) from natal ponds. Our findings highlight the dramatic limitations of existing wetland regulations with regard to upland habitat use by mole salamanders (family Ambystomatidae) and the need to approach conservation of these animals both at broader scales and with more comprehensive and innovative strategies.

Key Words: amphibian, marbled salamander, *Ambystoma*, seasonal wetland, ephemeral wetland, vernal pool, buffer zone, wetland regulation, terrestrial habitat, dispersal

INTRODUCTION

Seasonal wetlands and the terrestrial communities surrounding them provide critical habitats for many amphibians (Dodd 1992, Semlitsch 1998, Snodgrass et al. 2000, Comer et al. 2005). In the northeastern USA, five species of ambystomatid salamanders and two anurans are known to rely almost exclusively on seasonal wetlands for breeding, and numerous other amphibians use them facultatively (Hunter et al. 1999, Colburn 2004). As many as 27 amphibian species were associated with a Carolina bay wetland in the southeastern USA (Semlitsch et al. 1996), of which at least 10 may be considered seasonal wetland obligates. Seasonal wetlands may also play vital roles for amphibians in a broader landscape context, acting as "stepping stones" between otherwise isolated breeding sites and/or contributing to broad-scale population dynamics (e.g., Gill 1978, Sjogren 1991, Skelly et al. 1999).

Despite much research documenting the extensive use of terrestrial habitats (Semlitsch 1998, Semlitsch and Bodie 2003), many pond-breeding amphibians are still widely perceived as being primarily aquatic. This is reflected in state and federal wetland regulations that offer little or no protection to terrestrial (i.e., "upland") communities adjacent to wetlands (Calhoun and Klemens 2002, Burne and Griffin 2005). For example, in the state of New York, no regulatory protection is afforded to non-wetland areas surrounding vernal pools except under endangered species legislation (Calhoun and Klemens 2002). In Massachusetts, United States Department of Agriculture

Monarch Butterfly Conservation Strategy for the Eastern Region of the USDA Forest Service

Kari Kirschbaum, Susan Trull, Janet Kudell-Ekstrum

Marjory Brzeskiewicz, Matt Lechner

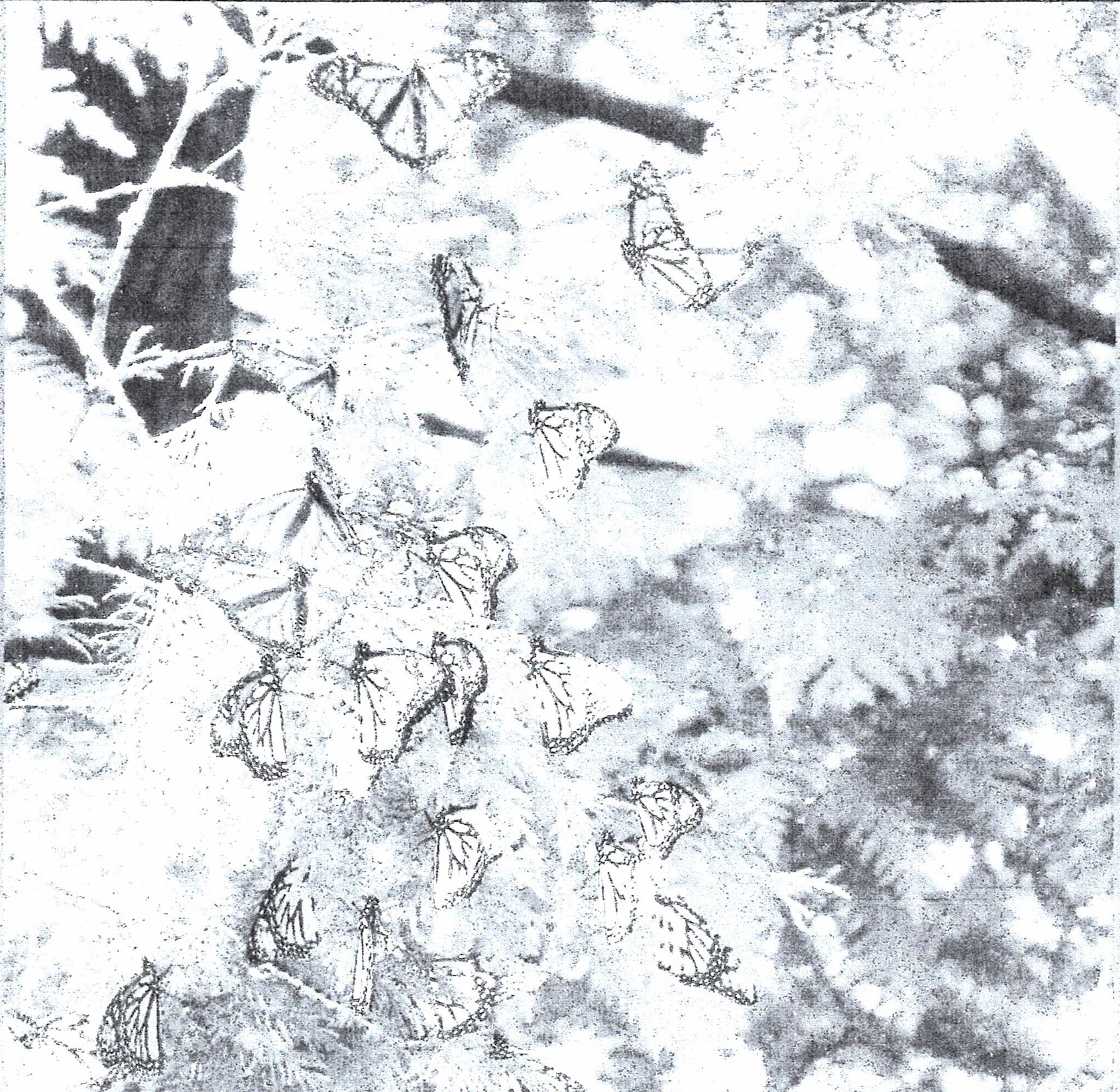


Photo: Janet Kudell-Ekstrum, USDA Forest Service

Forest Service

reached a new low of approximately 33.5 million individuals, covering just 0.67 hectares (1.66 acres). The population has rebounded modestly since then, to approximately 200 million monarchs (4.01 ha, 9.9 ac) during the winter of 2015-2016.

A recent analysis found that the risk of quasi-extinction of monarchs over the next 20 years was between 11% and 57% (Semmens et al. 2016). In this study, quasi-extinction was defined as loss of a viable migratory population of monarchs in eastern North America. The same study estimated that in order to halve this risk, the monarch population would need to increase approximately 5-fold (relative to the winter of 2014–15). The U.S. Fish and Wildlife Service has recommended monarch conservation work focusing on geographic priorities, opportunity areas, and threats to be avoided (Figure 6).

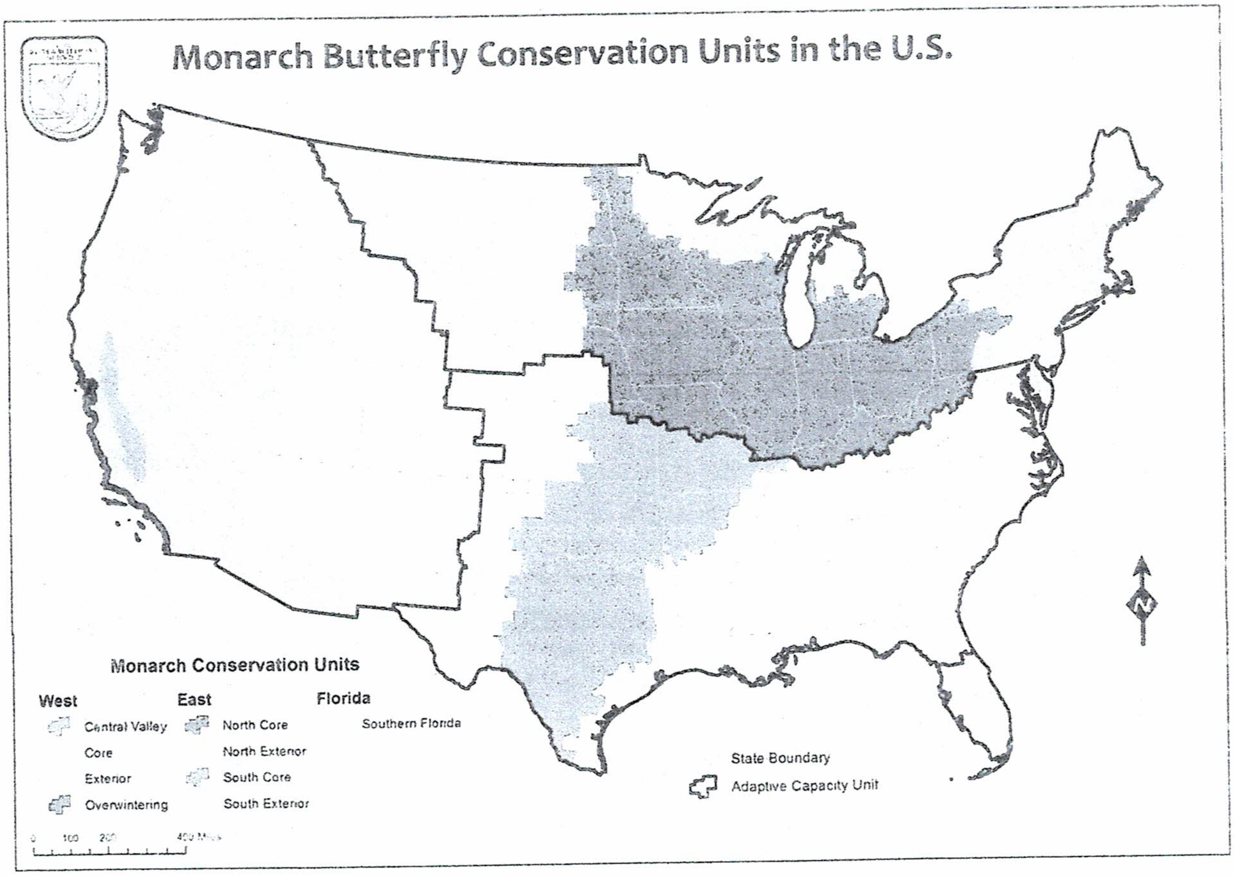


Figure 6. Monarch butterfly conservation units as defined by the U.S. Fish & Wildlife Service. The dark purple "North Core" unit constitutes the primary breeding range of monarchs in the eastern U.S., with secondary breeding habitat found in the "North Exterior" unit. The "South Core" represents the core of the migratory corridor for monarchs.

The Role of Lands within the Eastern Region of the Forest Service

The national forests/prairie of the Eastern Region all lie within the breeding range of monarch butterflies, and all provide migratory habitat during spring and fall migration (Figure 3). Tagging and isotope studies of the overwintering butterflies indicate that 18-58% (depending on the year) of the monarchs wintering in Mexico were born in the midwestern United States (Wassenaar and Hobson 1998; Flockhart et al. 2013; Flockhart et al. 2017). These studies indicate that there is annual variation in the productivity and importance of portions of the monarch breeding range, but the studies agree that the midwestern (mean annual 38%), north central (mean annual 17%), and northeastern United States (mean annual 15%; Flockhart et al. 2017), areas encompassed by the Eastern Region, provide critical breeding habitat for monarch butterflies. As such, the Forests within the Eastern Region can play an important role in the conservation of monarchs.

The following map (Figure 7) shows the national forests/prairie within the Eastern Region, overlaid with the breeding range of monarchs in the United States. Based on previous isotope analysis, approximately 50% of all monarchs at the overwintering sites were found to originate from the area in blue, an additional 45% from the area in yellow, and an additional 5% from the area in green. (The yellow and green areas extend into Canada, although this is not displayed on the map.) More recent analyses have demonstrated that this is a simplified model, and there is substantial annual variability in the productivity of sub-regions within the monarch breeding range (Flockhart et al. 2017). Nonetheless, this map suggests that monarch breeding is occurring throughout the Eastern Region, and forests in the heart of the breeding range, including the Mark Twain, Shawnee, Hoosier, Wayne, Monongahela and Allegheny, may have higher densities of breeding monarchs. Northern Eastern Region forests in the yellow area may have increasingly important roles to play as climate change forces shifts in monarch and milkweed ranges. Lemoine (2015) found that the range of milkweed is likely to expand northward into Canada with the southern U.S. becoming less suitable. Note that, other than for Peninsula Point, Forest-specific data on monarch occurrence is very limited, and was not included in the mapping.

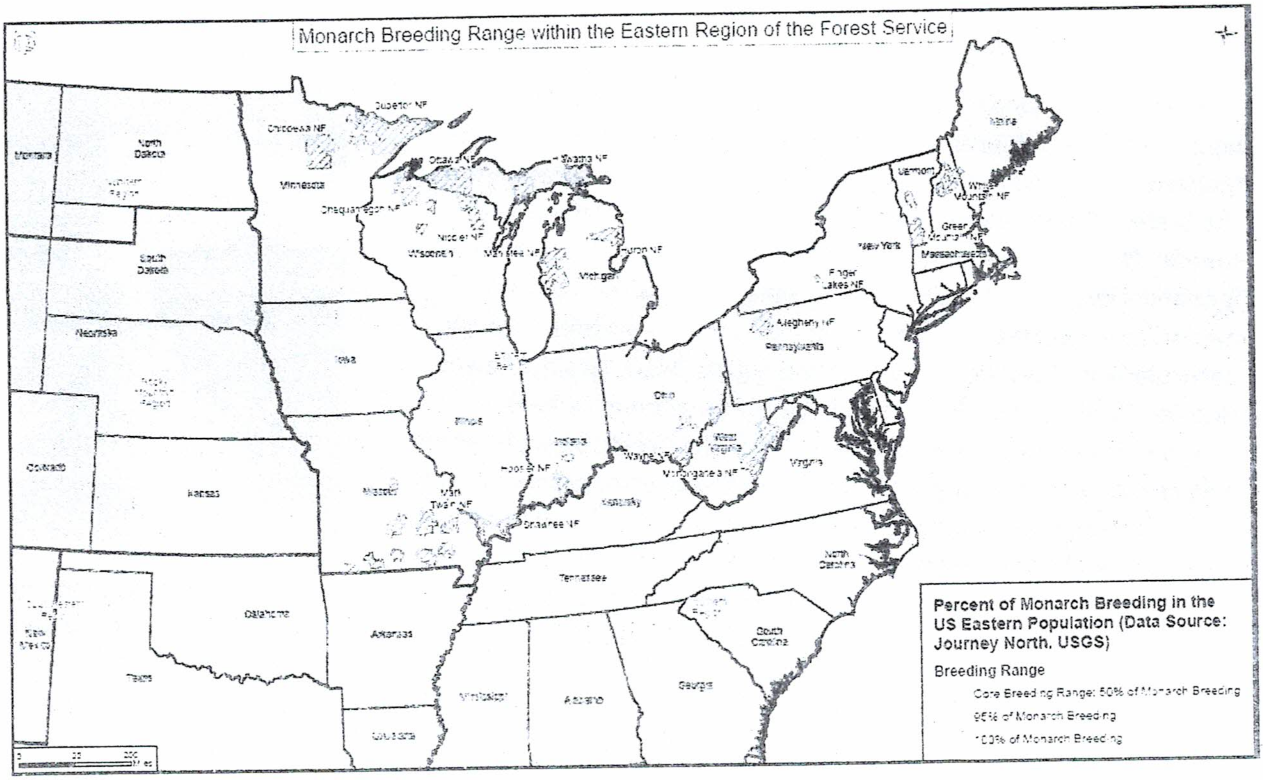


Figure 7. Forests within the Eastern Region of the Forest Service overlaid with the breeding range of the monarch butterfly in eastern North America. The blue area represents the breeding range within which 50% of the wintering monarchs in Mexico are produced. The yellow area represents the area within which an additional 45% of wintering monarchs are produced. The green area represents the range within which an additional 5% of monarchs are produced. The yellow and green areas extend into

Canada, though this is not shown on the map. A full-size version of this map can be found on the R9 Renewable Resources Sharepoint site here.

Historically, milkweed in agricultural areas served as an important source for monarch production (Pleasants and Oberhauser 2012). However, non-agricultural areas such as roadsides, rights-of-way, gardens, old fields, and forest openings also provide important monarch breeding habitat, especially where other habitat is scarce and if wildlife-friendly management practices are employed (Kasten et al. 2016). While most units in the Eastern Region are dominated by forest, all units also manage suitable or potential monarch habitat in the form of openings, open woodlands, riparian areas, wet meadows, prairies, grasslands, rights-of-way, roadsides, and administrative sites. Collectively our greatest opportunity to improve habitat for monarchs may be in those areas not traditionally managed for wildlife habitat, such as roadsides and rights-of way.

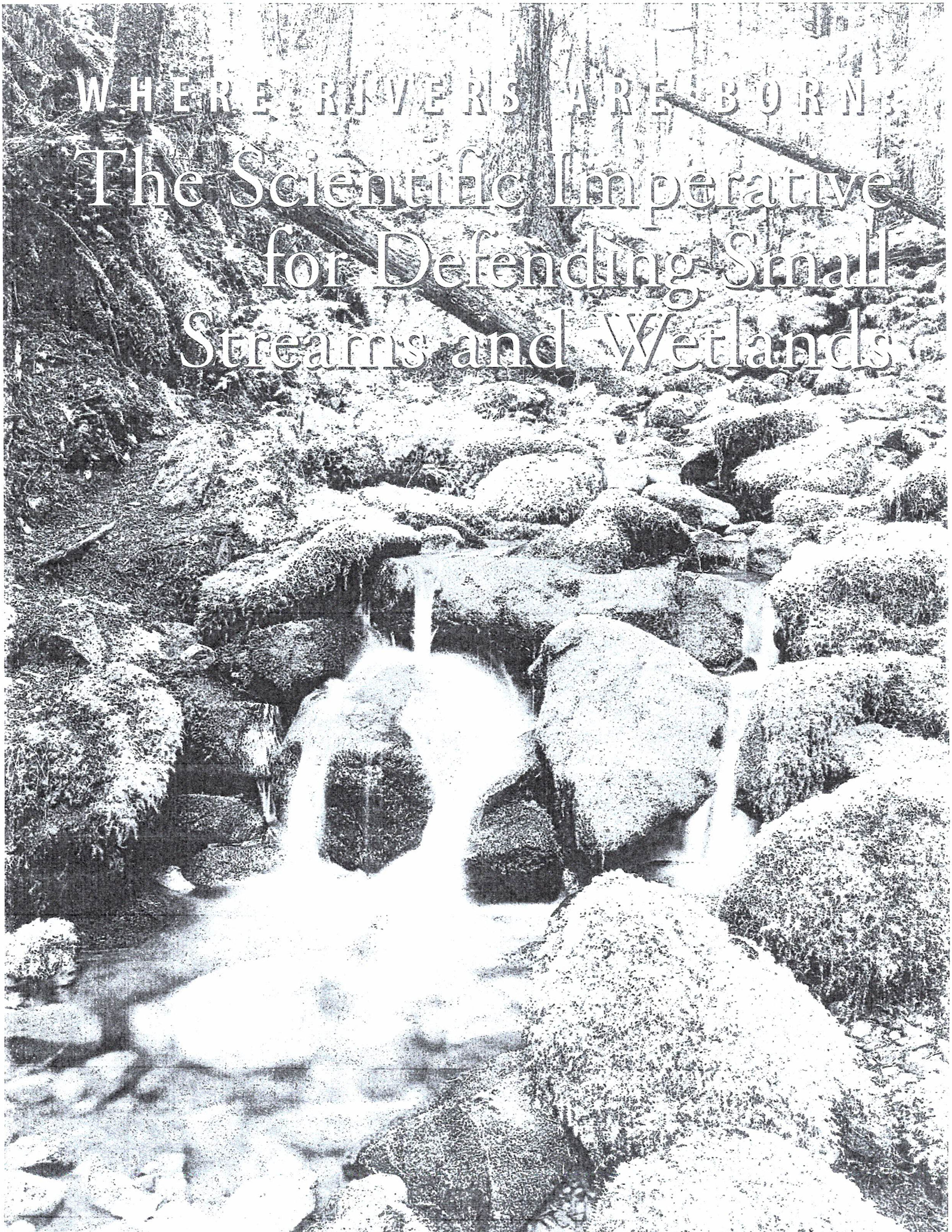
The contribution of non-agricultural monarch habitat will be more important as agricultural fields are increasingly planted to genetically-modified crops that can be sprayed with pesticides, thereby eliminating milkweeds; as neonicotinoid use on agricultural lands increases; and as suitable habitat is made unsuitable due to development (see Threats section, below). From 1999 to 2012, there has been an estimated 64% decline in overall milkweed abundance, which has primarily occurred on croplands (Pleasants 2015). Milkweed in agricultural fields produces nearly four times as many monarchs as milkweeds elsewhere (Pleasants and Oberhauser 2012), suggesting there is a strong need to provide abundant replacement milkweed plants on other landscapes such as national forests.

The vegetation managed by National Forest System lands also supports nectar plants which provide the essential lipid stores as fuel for the monarchs' long migration. The following maps show migration through the Eastern Region as documented by the citizen science program Journey North. Eastern Region Forests/Prairie can support migrating monarchs by providing early- and late-blooming nectar plants for monarchs during the time migrating monarchs are passing through, particularly in the southern part of the region (Mark Twain, Shawnee, Hoosier, Wayne, and Monongahela). Because monarchs follow geographic features, national forests along the Great Lakes shorelines may also be part of important migratory pathways for monarchs. The spring and fall migration maps below (Figures 9 and 10) show the earliest dates monarchs are observed during spring migration, and the peak of fall migration. These dates can help guide plant species selection for supplemental planting, to ensure nectar plant availability during migration.

Figure 8. Chrysalis emerging as caterpillar skin splits. (Photo credit: Sue Trull, USDA Forest Service)

WHERE RIVERS ARE BORN:

The Scientific Imperative for Defending Small Streams and Wetlands



Conclusion

Headwater streams and wetlands abound on the American landscape, providing key linkages between stream networks and surrounding land. Although often unnamed, unrecorded, and underappreciated, small headwater streams and wetlands-including those that are dry for parts of the year-are an integral part of our nation's river networks. Small wetlands, even those without visible surface connections, are joined to stream systems by groundwater, subsurface flows of water, and periodic surface flows. Current databases and maps do not adequately reflect the extent of headwater streams and associated wetlands. The resulting underestimate of the occurrence of such ecosystems hampers our ability to protect the key roles headwater systems play in maintaining quality of surface waters and diversity of life.

> "THE PHYSICAL, CHEMICAL, AND BIOTIC INTEGRITY OF OUR NATION'S WATERS IS SUSTAINED BY SERVICES PROVIDED BY WETLANDS AND HEADWATER STREAMS."

Essential ecosystem services provided by headwater systems include attenuating floods, maintaining water supplies, preventing siltation of downstream streams and rivers, maintaining water quality, and supporting biodiversity. These small ecosystems also provide a steady supply of food resources to downstream ecosystems by recycling organic matter.

Photo courtesy of Raymond Eubanks.

Small streams and wetlands provide a rich diversity of habitats that supports unique, diverse, and increasingly endangered plants and animals. Headwater systems, used by many animal species at different stages in their life history, provide shelter, food, protection from predators, spawning sites and nursery areas, and travel corridors between terrestrial and aquatic habitats.

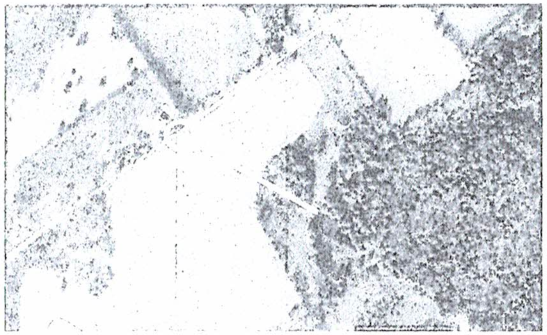
Since the 1970s, the federal Clean Water Act has played a key role in protecting streams and wetlands from destruction and pollution. We have made progress toward cleaner water, in part because the law has historically recognized the need to protect all waters of the United States. The health of downstream waters depends on continuing protection for even seemingly geographically-isolated wetlands and small streams that flow only part of the year.

These small streams and wetlands are being degraded and even eliminated by ongoing human activities. Among the earliest and most visible indicators of degradation is the loss of plant diversity in headwater wetlands. The physical, chemical, and biotic integrity of our nation's waters is sustained by services provided by wetlands and headwater streams.

Today's scientists understand the importance of small streams and wetlands even better than they did when Congress passed the Clean Water Act. If we are to continue to make progress toward clean water goals, we must continue to protect these small but crucial waters. The goal of protecting water quality, plant and animal habitat, navigable waterways, and other downstream resources is not achievable without careful protection of headwater stream systems.

Existing

Proposed



CF
4/25/23

Bruce Hill Road Solar

1. As part of the Building Permit application, the Applicant will provide the following documentation:
   * a. Stormwater Pollution Prevent Plan (SWPPP) approved by the New York State Department of Environment Conservation.
   b. Driveway/Access permit from the Town Highway Department.
   c. Interservice agreement with New York State Electrical and Gas Corporation.
2. Prior to the start of construction, the applicant will submit financial assurance, in the form of a performance bond, surety bond, irrevocable letter of credit or other form of financial assurance in the amount of $158,725, for review and approval by Town of Harpersfield Code Enforcement Officer. In this submission, the applicant will commit to updating the financial assurance at 15 years after approval of the plan and no less frequently than every 5 years thereafter.
3. During construction and operation, the applicant will adhere to their submitted Operations and Maintenance Plan. If this document needs to be revised, the applicant will seek approval from the Code Enforcement Officer.
4. The applicant will install knox boxes at the entrance to allow for access by emergency services.

*5

Bruce Hill Road B Solar

1. As part of the Building Permit application, the Applicant will provide the following documentation:
   * a. Stormwater Pollution Prevent Plan (SWPPP) approved by the New York State Department of Environment Conservation.
   b. Driveway/Access permit from the Town Highway Department.
   c. Interservice agreement with New York State Electrical and Gas Corporation.
2. Prior to the start of construction, the applicant will submit financial assurance, in the form of a performance bond, surety bond, irrevocable letter of credit or other form of financial assurance in the amount of $96,175, for review and approval by Town of Harpersfield Code Enforcement Officer. In this submission, the applicant will commit to updating the financial assurance at 15 years after approval of the plan and no less frequently than every 5 years thereafter.
3. During construction and operation, the applicant will adhere to their submitted Operations and Maintenance Plan. If this document needs to be revised, the applicant will seek approval from the Code Enforcement Officer.
4. The applicant will install knox boxes at the entrance to allow for access by emergency services.

*5

TOWN OF HARPERSFIELD PLANNING BOARD
AGENDA FOR REGULAR MONTHLY MEETING
APRIL 26, 2023

MEETING WILL BE AT THE TOWN HALL

I) OPENING OF REGULAR MEETING.

II) Read and approve minutes of last meeting (March, 2023).

NEW BUSINESS

III) Public Hearing----Ted Dziewit Subdivision—Colonel Harper Drive

IV) Boundary Line Adjustment application---Melendez///Eklund
Peters Road

V) Boundary Line Adjustment application---Bertolini///Eklund
Odell Lake Road

OLD BUSINESS

VI) Update on Mountaintop Airfield LLC application
+++++ No Public Hearing scheduled++++++

VII) Continuation of Public Hearing and discussion of Blue Wave Solar
project----Bruce Hill Road

VII) Continuation of Public Hearing and discussion ofDelaware River Solar
project---Weaver Road

Other Business as it developes

Next Meeting----May 31, 2023