Building Meadows

a Practitioner's Toolkit

NATIONAL FISH AND WILDLIFE FOUNDATION

NFWF

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pennsylvania environmental council

About Pennsylvania Environmental Council

The Pennsylvania Environmental Council (PEC) works to protect, restore, and enhance the Commonwealth's natural and built environments through innovation, collaboration, and strategic leadership. For more than half a century, PEC has brought together communities, land managers, scientists, and policymakers to advance practical, science-based solutions that strengthen Pennsylvania's landscapes and the people who depend on them. This meadow-building guide, commissioned by PEC and developed by ArcheWild®, reflects that commitment—providing clear, actionable guidance to help land stewards create resilient, biodiverse meadows that support wildlife, enrich public spaces, and contribute to a healthier ecological future for Pennsylvania.

About ArcheWild®

ArcheWild® is a leading ecological restoration firm known for its scientific rigor, authenticity, and deep practical experience across the landscapes of the Mid-Atlantic. Drawing on decades of fieldwork, applied research, and hands-on project delivery, ArcheWild® helps land stewards design, build, and sustain resilient native ecosystems that reflect both ecological integrity and real-world constraints. Their team brings a rare combination of technical expertise, horticultural precision, and operational pragmatism—ensuring that every meadow, woodland, and habitat they help create is grounded in sound science, shaped by place, and built to thrive.

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Introduction

Who is this document written for?

This document is written for land managers, park managers, natural resource managers, and anyone else that is responsible for large land parcels who wants more information and guidance on the meadow building process than what is currently available in the available literature, or online.

How does this document complement the existing literature?

Existing literature frequently focuses on "why" someone might want to build a meadow and on the steps that a person should follow to build one. The literature accurately describes the importance of selecting an appropriate site, but not how to select one. Most existing meadow guides describe the importance of controlling weeds and invasives, but few provide enough information for someone to confidently perform the work. Selecting species for a meadow is a critical step, but few guides describe the process for doing so, outside of buying a premade mix on the internet. Even fewer guides talk about how to choose a sowing method or the exact steps required to operate a seed drill, partly because there are so many models available.

This guide is designed to go behind the scenes and take a close look at how an experienced meadow building team performs their work step-by-step, to reveal key decision points, nuanced techniques, and the technology they use to deliver professional results.

Note: this tool kit is not a meadow "design" guidebook. There is no information in this document about individual species, there are no plant lists, and no seed mix recommendations. There are no tables of bloom time and color, leaf texture, height, or any other horticultural information.

How was this document written?

This document was written to mirror the thought processes, decisions, and actions that professional meadow builders follow every day; this document reveals their processes and their technology.

Links are provided to third-party information sources where a topic is well-covered elsewhere, such as obtaining your pesticide applicators' license.

Key Concepts

Before beginning to understand the work that goes into creating a meadow, it's important to understand key terms and ideas. This way, you will know why these ecosystems are so important and therefore why there is a push for more of them to be installed throughout Pennsylvania.

Definitions

A plant species that is 'Native' to a particular geographical area has evolved to the unique conditions present in that area over a period of hundreds or thousands of years. An example of a common native plant here in Pennsylvania is Common Milkweed, *Asclepias syriaca*. This species has thrived in much of the Eastern U.S. and Canada for millennia and in that time has become a vital host plant to Monarch Caterpillars, helping them to complete their life cycle. On the other hand, a popular plant in large nursery centers, Burning Bush, *Euonymous alatus*, is considered 'Invasive' in much of the U.S. because it is originally from Eurasia but unfortunately easily spreads into wild spaces here, creating a monoculture and pushing out important native species.

Just because a native plant grows in Pennsylvania, though, does not mean that it grows just anywhere. Remember, all plant species have evolved to survive under certain conditions, and these conditions are only found in certain 'Ecoregions,' or geographical areas defined by their physical characteristics including geology, soils, altitude, and climate. Within each ecoregion, different species, or varieties of the same species, have adapted to these unique characteristics and make up unique Plant Communities that are important for the other flora and fauna that have evolved alongside them.

And this state isn't called "Penn's Woods" just for fun. Thanks to the natural conditions found here, while plants differ across different ecoregions throughout the state, Pennsylvania is dominated by forest with very little room left for much else. For a 'Meadow,' an ecosystem dominated by grasses and forbs (flowering plants), to exist several underlying conditions need to be met. For one, meadows need a lot of sun, more than eight hours of direct sunlight every day. Secondly, they need fairly flat ground or gentle slopes. And thirdly, they need to be exposed to one of three extremes of soil moisture: very dry, very wet, or extreme variation in these two soil moistures throughout the year. Only under these conditions can a meadow survive without interference because larger species like trees and shrubs simply cannot handle these extremes.

Benefits of a Meadow

So, if they're so rare in Pennsylvania, why are we building meadows? Great question, reader! There is one other situation that could cause a meadow to form here historically: a natural disaster. As a hurricane or a fire or a flood ripped through an area, trees and shrubs could be toppled or destroyed in the process and leave behind large canopy gaps in their place. And the seeds of plants can be quite tenacious, lasting in the soil for decades

sometimes! Some even need fire to complete their life cycle. The moment that canopy gap would open, the seeds of herbaceous plants like grasses and forbs would begin to germinate, and in only a few short years there would be a thriving meadow. Of course, this meadow was short-lived as the seeds of trees and shrubs would also germinate and eventually shade out the shorter herbaceous plants. Nevertheless, in that short time, this would be an irreplaceable ecosystem.

Keep in mind that it was not only plants that evolved alongside each other in different ecosystems, but also a plethora of birds, insects, fungi, and so on. Some of these relationships became so specific that certain species relied on only one or two other species to survive (like Monarch Caterpillars relying on species of Milkweed). And the species that thrived in a meadow ecosystem did so because they had access to food in the forms of nectar, seeds, and other species, they had access to materials to provide shelter, and they had access to large amounts of these vital resources.

You can see where this is going… These days, meadow ecosystems are even more rare than they were historically, and those that persist are highly threatened because of habitat loss, invasive species encroachment, and climate change. This is leading to a loss in biodiversity (variety of life) on all sides, which in turn makes meadows less productive. Restoring high quality meadows, and other natural ecosystems throughout Pennsylvania can help to slow this loss or even reverse it. And these ecosystems come with many other benefits, for man and wildlife alike.

Before getting into additional benefits, it's also important to differentiate between a meadow and a garden at this stage using four main factors. First, meadows are larger than gardens, spanning a space of at least a ¼-acre. Meadows also appear 'naturalized,' whereas gardens tend to be manicured to achieve a cleaner aesthetic. It's important for meadows to be regionally authentic as well, only containing species that naturally occur in the area. And finally, the conditions of the site for a meadow are not altered in any way, while often garden creation includes tasks such as adding fertilizers or soil amendments to the area.

These four factors together increase all the benefits of these habitats. Aside from wildlife benefits, meadows help to meet important climate goals by sequestering carbon and other greenhouse gases and slowing down water runoff, leading to reduced downstream flooding and increased water filtration. They also reduce long-term maintenance costs associated with lawns such as the need for fertilization, aeration, or irrigation, the need for regular mowing, and large pesticide inputs. And of course, they also open areas for recreational opportunities like hiking/exploring, wildlife observation, and environmental education, among many others.

You will find at first that the creation of these ecosystems seems daunting as there are many factors to consider when choosing to do so. With some upfront understanding and thorough planning, the benefits of creating a new meadow far outweigh the risks and challenges.

Is This a Viable Meadow Opportunity? **A**

KEY QUESTIONS	OVERVIEW
○ Have you familiarized yourself with the definition of a meadow, and understand the differences between meadow and garden? ○ Does the site have the ecological factors to support a meadow? ○ Is there room for a continuing maintenance budget for the meadow? ○ Is there support from right people to build the meadow? ○ What are the goals behind creating a meadow?	Before deciding to install a meadow in a yard, field, or open parcel of township land, it is imperative to understand the steps involved in establishing a meadow by reading this and other supporting documents. First and foremost, in this decision there are the following factors: ecology, support, and goals. This is an iterative process to arrive at a conclusion.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLE	DATE
1	**Cultural Support**	Verbal consent from neighbors, staff, board members, and other relevant stakeholders. Written consent preferred.	
2	**Preliminary Research**	Reviewed enough literature or have enough experience to be able to describe multiple natural PA plant communities.	
3	**Ecological Conditions**	Evidence from multiple visits that the site can support a functional meadow system.	
4	**Environmental Goals**	Evaluate the environmental goals (wildlife, stormwater, etc.) for this project against ALL alternative projects (forests, basins, etc.).	
5	**Cultural Goals**	Receive consensus from stakeholders on cultural goals which align with the expected meadow conditions.	
6	**Financial Support**	Develop order of magnitude budgets and discuss with decision-makers. Identify sufficient sources of funding for all phases of the project.	
7	**Partner Support**	Spoke with at least three (3) professional organizations about your project and ways they can help, if needed.	
8	**Landowner Commitment**	Verbal commitment from the landowner to fulfill their obligation through the life of the project. Written commitment preferred.	
9	**Decide**	You have asked all stakeholders this questions: is this a viable meadow opportunity?	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You have conducted enough independent research to describe key differences between meadow types. A meadow professional, or similar, has reviewed and approved the baseline ecological conditions. You have verbal (minimum) commitments for financial, cultural, and partner support. You have consensus among stakeholders on the goals for the meadow that align with the ecological, financial, and cultural context.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE


STOP

DECISION POINT #1

You have worked through all relevant needs for support and understand the goals that your stakeholders have for the space. Ideally, you will have also read through this document to understand what goes into building a successful meadow from start to finish. This brings up the first important decision: do you have all the necessary support to properly build this meadow?

It is vital that you be perfectly honest in this decision as straying from what is outlined in this document can lead to eventual issues or even project failure. If you are unsure whether you will have the correct support at any stage throughout this process, holding off on the project until all the necessary support is in place can be the best decision for you in the long run.

As will be mentioned throughout this document, meadows can take up to seven years to establish, and this time is only exacerbated by pushing forward with a project without procuring the needed support.

Site Evaluations – Ecological Zones

A

KEY QUESTIONS	OVERVIEW
○ What major ecological zones or eco-tones does your new meadow site currently have? ○ Where is the soil drier, and where is it wetter? ○ Do I have any shady edges, or sections near a road? ○ What is the history of the site? Is it an old factory or oiling station? An old strip mine? Or a filled wetland? ○ What are the existing vegetation patterns, if any? Sometimes even park lawns will reveal their different zones when you look close enough. ○ Have you visited the prospective meadow multiple times during multiple seasons?	Meadows are usually heterogeneous. They have low spots, high spots, sunny spots, and shady spots. Large meadow sites can flow up and down large grades and hills. And even small meadows can cross multiple underlying soil types, each with their own limitations. Each combination of soil type, moisture pattern, and light availability should receive its own seed mix, which often improves performance while reducing costs. But you need to find and map each zone.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLE	DATE
1	**Light Map**	A project map that indicates, with shapes, the different number of hours of daylight in July.	
2	**Water Map**	A project map that indicates, with shapes, any observable moisture conditions.	
3	**Soil Map**	A copy of the USGS soil survey for the project. Pictures of shallow soil pits are helpful for each soil type.	
4	**Plant Map**	A project map that indicates, with shapes, where there are obvious differences in vegetation, including weeds.	
5	**Historical Map**	Notes of any prior uses (e.g., farm, parking lot, ball field, etc.).	
6	**Zone Map**	A combination map that weaves the light, water, soil, and plant map together in clearly marked ecological zones.	
7	**Zone Data**	Fill out a form to document each zone, and include at least one representative GPS coordinate for each zone.	
8	**Evaluate™**	Set up your project zones in Collector ™ or in Evaluate™. Alternatively, send your zone data sheets out for analysis.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You should have identified at least three (3) different ecological zones for any meadow project under 10 acres. Larger meadow projects can have many more. You will know that you have the right ecological zones when you can take someone on a tour through the meadow site and easily point out and explain zone to someone else not closely involved with the project.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Species Selection – Seed Mix Design

A

KEY QUESTIONS	OVERVIEW
○ Do I want a native meadow? What is the core set of species for each ecological zone in the new meadow? ○ Can I find nearby and naturally occurring meadows (not seeded meadows) that closely resemble my site conditions and use the species growing there as the basis for my seed mix design, by zone? ○ How much am I willing to spend on a per-acre basis to establish a new meadow? What are my budget constraints? ○ How much do I care about genetics? ○ Do I have a consultant that can help with design?	Studies show that native species mismatched to a site's conditions will be outcompeted by weeds sooner than later. Seasoned practitioners concur. Internet-sourced seed mixes with multiple dozens of species are designed to "mask" the site suitability problem by charging you for seed that will never be a part of your long-term meadow and can mislead landowners. Instead, the preferred method is to focus on choosing the 8-12 species known to survive each ecological zone.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLE	DATE
1	**Stakeholder Communication**	I have consulted with stakeholders and they understand the meadow will be of a type that the site can naturally support.	
2	**Literature Review**	I have reviewed relevant academic publications that describe local meadows in enough detail to be useful for seed mix design.	
3	**Reference Sites**	I have visited nearby natural meadows to find reasonable comparative examples to my site and ecological zones.	
4	**Genetics & Provenance**	I have agreement on the guiding principles for meadow genetics.	
5	**Setting a Budget**	I have established a seed budget based on my grant or on what my organization is willing to spend.	
6	**Recommendations**	I have solicited at least one recommendation from a meadow consultant or a local ecologist.	
7	**Seed Mix Design**	I have a distinct seed mix for each of my ecological zones.	
8	**Carrier Selection**	I have made a conscious decision about the use and selection of seed carriers.	
9	**Finalize Species List**	Finalize species list.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You are finished when you feel comfortable that you have an appropriate seed mix design for each of the major ecological zones that has, ideally, been validated by a third-party or by a decision-support software tool. Alternatively, you have selected a pre-designed seed mix based on the information provided on the vendors' website and have decided the number of pounds that you can buy that is within your budget.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Choose Vegetation Management Strategy **A**

KEY QUESTIONS	OVERVIEW
○ Which noxious species are present? If present, what's the age and scope of the infestation? ○ What's the size of the project area and site preparation budget? ○ What's the desired timeline for control? ○ Are there relevant environmental factors that would impact preparation strategies?	Comprehensive weed management and site preparation is a critical component to successful meadow building. Implementation strategies will differ by project, but the outcome should be a project area with adequate control of non-desirable species and supports the planting strategy. This section reveals the optimal vegetation management strategy for the site.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLE	DATE
1	**ID Noxious Weeds**	Re-evaluate site to ensure identification of all non-desirable vegetation at and/or near the site.	
2	**Financial Review**	Review high-level budgets with decision-makers prior to making planting decisions to establish guard rails.	
3	**Environmental Factors**	List the environmental factors that would impact control strategies.	
4	**Cultural Factors**	Consider the stakeholders and the potential implications for each vegetation management strategy.	
5	**Accessibility**	Assess the accessibility for equipment.	
6	**Build Vegetation Mgmt. Calendar**	Create a mgmt. plan based on the weeds present in the project site, considering phenology, taxonomy, and effective control methods.	
7	**Consider Alternative Approaches**	Evaluate the tradeoffs between chemical suppress and 'organic' methods. Remember to evaluate both short- and long-term costs.	
8	**Control Timelines**	Evaluate the preferred control mechanism against the realistic timeline to complete site preparation.	
9	**Control Tools**	Determine the most effective tool for eradicating noxious weeds.	
10	**Consider Planting Strategy Impact**	Review the project planting strategy sequence against the vegetation management strategy to identify potential conflict.	
11	**Validate the Plan**	Solicit feedback from other practitioners.	
12	**Select/Modify**	Choose a strategy and communicate to relevant stakeholders.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You are finished with this step once you are confident that you have identified all the invasives in and around your meadow and have confirmed that you have the time, budget, and community support to treat them all effectively. The best practice is to keep all your constituents informed of your activities to avoid concerns and complaints.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Preparing To Spray

A

KEY QUESTIONS	OVERVIEW
○ What kind of plants are being targeted? (forb, grass, woody) ○ What non-target species are present and what is the degree of mixing with invasives? ○ What is proximity to water? ○ How accessible is the site?	This section is for practitioners that have decided to implement a chemical approach; organic practitioners should review literature on appropriate timing/technique for their practice. Proper herbicide selection can be as easy and effective as applying glyphosate once at a single rate. More complicated scenarios may involve a collection of various herbicides tailored to different kinds of plants, applied together or separately, at various rates and times of year, and with multiple application methods. Thinking through the best approach is like preparing to wage war. You must know your enemies, when they are weakest, and how they can best be subdued while not causing undue destruction to the surrounding community.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Reassess Surrounding Native Species**	Identify desirable vegetation and their location on the landscape in relation to non-desirable vegetation.	
2	**Update Vegetation Management Calendar**	Update your Vegetation Management Calendar with new and/or relevant information.	
3	**Pesticide License**	Bring your license into compliance, if necessary.	
4	**Choose Products & Read Labels**	Select the product you will use for your first two (2) spray events (e.g., pre-emergent application of Prodiamine for stilt grass. If greater than 20' from stream, use grass-specific herbicide.)	
6	**Choose Adjuvants & Read Labels**	Select the product you will use for your first two (2) spray events (e.g., add non-ionic surfactant to aquatic glyphosate; add crop oil concentrate to Clethodim).	
7	**Confirm Application Method & Equipment**	Re-evaluate the equipment and/or tools necessary for the application.	
8	**Determine Application Rate**	Decide on desired application rate for first two (2) applications (e.g., Prodiamine at 1.5-3 pts/acre).	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You are finished with this step once you have determined which herbicides and adjuvants you will be using, how many times and when you will be using them, at what rates, and using what application method. This will be an iterative process of making best-practice decisions about the targeted species, evaluating year 1 success, and adjusting accordingly.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Choose a Planting Strategy

A

KEY QUESTIONS	OVERVIEW
○ What species dominate the list? Are these species commercially available? ○ What is the size of the project site? ○ What is the timeline for establishment? ○ What are the popular planting methods? ○ What is the budget for planting? ○ What are the site conditions?	The planting strategy aims to determine the optimal planting methodology and timeline for the site and chosen species. Planting strategy considers the requirements and availability of the desired species as well as the optimal timeline for establishment. Although budgets are a factor, they are secondary to effective and efficient seed installation. After completing this section, you will have determined the timing of planting and the methodology for installation.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Financial Review**	Review high-level budgets with decision-makers prior to making planting decisions to establish guard rails.	
2	**Timeline for Establishment**	Develop a project sequencing document that delivers the expected vision for the meadow on schedule. This informs future planting strategy decisions.	
3	**Research Seed Requirements**	'Write' down the germination requirements of every species on your list.	
4	**Site Conditions**	Identify site characteristics that would impede equipment access and/or efficacy on site.	
5	**Understand Seeding Strategies**	Research the relevant factors that determine seeding efficacy.	
6	**Consider Vegetation Mgmt. Strategy**	Review the project planting strategy sequence against the vegetation management strategy to identify potential conflict (i.e. you want to seed two months after applying pre-emergent).	
7	**Choose Your Strategy**	Determine the seeding strategy that delivers the seed at the appropriate depth during the appropriate season.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You have developed a planting strategy that considers ecological and cultural timelines using equipment suitable to the type and scale of project.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Socialize and Set Expectations

A

KEY QUESTIONS	OVERVIEW
○ Who is likely to notice or be affected by this work? (neighbors, park users, staff, volunteers, etc.) ○ Is there a risk of confusion, concern, pushback if work proceeds without explanation? ○ What aspects of the process will raise the most eyebrows? (herbicide, meadow height, access?) ○ Who is responsible for communicating, and when/how often should it occur?	Hopefully, by this point you have engaged with enough stakeholders that there are no major surprises with public perception and support for your meadow. Up until this point, however, there has not been a concrete plan for how creation of the meadow will proceed. Now armed with that implementation plan, it is up to you to decide how- and to what extent- to best communicate it. This can be a delicate balance, especially if there are people from many backgrounds involved. The goal at this stage is to set clear expectations, reduce confusion, and proactively address frequently raised issues.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Identify New Stakeholders and Concerns**	Create a list of all relevant stakeholders, including new stakeholders, and their expected reservations/concerns.	
2	**Select Communication Method**	Set up a meeting with stakeholders; send an email with an abridged version of the plan and ask for feedback.	
3	**Communicate Desired Project Outcome**	Remind stakeholders of the project goals (ex. will serve as habitat for meadowlarks, will be kept at a maximum of 4' tall)	
4	**Communicate Vegetation Mgmt. Approach**	Outline the planned vegetation management approach, discussing the number, timing, and types of points of entry.	
5	**Communicate Planting Approach**	Outline the planned planting approach, discussing the implementation strategy.	
6	**Communicate Establishment Timeline**	Outline the high-level timelines associated with prep, installation, and establishment.	
7	**Document Feedback & Confirm Readiness**	If necessary, re-evaluate vegetation management, planting approach, and timeline based on feedback. Otherwise, proceed.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
If no communication is required with outside stakeholders, this step may be completed immediately, and no further action is necessary. If communication is required to proceed, you are finished once you have relayed the implementation plan, addressed concerns, and set expectations for anyone whose objections could delay, alter, or otherwise derail the project.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE


STOP

DECISION POINT #2

You have now made many of the most important decisions: species selection, how to plant, how to manage undesired vegetation, and so on. And now you have presented all this information to the relevant stakeholders with your reasoning. But what was their feedback? Did they give a resounding approval or did major questions on your choices arrive? Did any issues arise and were they resolved?

Your stakeholders don't have to love the plan, but they do need to agree to it. Remember that the end goal is near-complete control of undesired vegetation and a thriving ecosystem composed of the right plants for your site. If there is fear that the only available options will lead to a less-than-ideal product, serious consideration should be given as to whether the project should continue.

Again, without proper preparation and planning, any meadow seeding will become overwhelmed with undesired species and ultimately fail as trying to manage those species after the fact becomes exorbitantly more difficult, and exorbitantly more costly.

Perform Vegetation Management

A

KEY QUESTIONS	OVERVIEW
○ Do you own or do you have to set up rental of the equipment you will be using? ○ Is your equipment properly calibrated and ready to use? ○ Do you have all the necessary protective equipment for the strategy you're using? ○ Have you communicated your timeline with the necessary parties? ○ Have you completed all necessary documentation?	Finally, the project start is close at hand. But there are a few more important tasks that need to be completed before work can begin. This page will discuss the decisions and plans that need to go into preparing to perform and then ultimately performing vegetation management.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Communicate Timeline (Far in Advance)**	Provide relevant stakeholders with notice at the beginning of the season and discuss relevant details.	
2	**Check Necessary Paperwork**	Ensure all documentation and paperwork is up-to-date (i.e. applicator's license, permits, etc.).	
3	**Procure Materials**	Procure necessary equipment and materials in advance of application (i.e. purchase products).	
4	**Communicate Timeline (Days in Advance)**	Provide relevant stakeholders with notice at the beginning of the week, if not earlier, and discuss relevant details.	
5	**Review Product Label and Instruction**	Re-familiarize yourself with the product/equipment label, if relevant.	
6	**Check Calibration**	Test equipment and ensure proper calibration.	
7	**Perform Strategy**	Apply the vegetation management strategy.	
8	**Document Everything**	Take photos, complete herbicide logs, send updates to client.	
9	**Check Efficacy**	Return to the site 2-4 weeks after first treatment and evaluate efficacy.	
10	**Plan your Next Treatment**	Develop the plan for the next point of entry and communicate the plan, if necessary.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You are finished with vegetation management once you have confirmed that you have reached the suppression goal (e.g. 90% vegetation suppression) that you've set for the project and all activities have been properly documented and communicated with all necessary parties. Remember that adequate time is needed to check efficacy of overall treatment. If there is any uncertainty, more time should be allowed to monitor efficacy.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Secure your Plants and Equipment

A

KEY QUESTIONS	OVERVIEW
○ Where are you sourcing your seed? ○ What types of seed are you using? ○ How are you seeding? Do you need a seed drill or a broadcast seeder? ○ What type of drill are you using? ○ Where is your drill? Are you subcontracting it? ○ Who is operating your drill? ○ Do you need a carrier? ○ Are you using a cover crop?	With a plan in hand, acquiring the seeds and equipment becomes the next step in creating a meadow. Navigating different types of seeding equipment and methods and purchasing from a seed vendor does not need to be a complex task but should consider some key elements promoted by the questions to the right.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Check Seed Availability**	Contacted at least three (3) seed vendors to solicit quotes for seed. Inquire about genetics.	
2	**Consider Ecological Factors**	Consider price, availability, genetics, and weeds when making your decision about seed procurement.	
3	**Choose Storage Strategy**	Identify and decide on the optimal location and type of seed storage.	
4	**Order and Store Seed**	Order seed as single species rather than mix and then store it according to storage strategy.	
5	**Secure Seeding Equipment**	Reserve the equipment necessary to implement your planting strategy (ex. tractor and seed drill).	
6	**Transport/Hauling**	Safely pick up the rented seed drill from the local conservation district and move it to your planting site.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You are finished with securing seed once you have figured out where seed will be stored, how it will be organized, and have then placed the order. You are finished with securing your seed drill once you have a seeder reserved, other necessary equipment reserved, and know how all equipment is getting to the site.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Plant your Meadow

A

KEY QUESTIONS	OVERVIEW
○ Have you verified that the site is in a condition suitable for seeding? ○ Do you have an experienced operator and/or enough support staff to complete the task? ○ Have you communicated the timeline? ○ Have you familiarized yourself with the necessary equipment/tools? ○ What type of seeds are you sowing?	The individual characteristics of each site and seed mix will affect how seed will be distributed. Calibration ensures that the mix is applied by the specific machine, at the specific site, at the specific rate intended. Uncalibrated sowing may result in poor coverage, time inefficiency, and increased costs. The result of this section is the distribution of the seed to the site.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Verification Visit**	Visit the site before seeding to re-confirm effective control has been achieved and that the soil conditions are suitable for seeding.	
2	**Communicate Implementation**	Communicate to stakeholders the plan for planting the meadow (ex. timeline, method).	
3	**Site Review**	Walk the site to check for debris, ditches, swales, or other impediments. Address as necessary.	
4	**Equipment Review**	Gather the team to review the plan and pertinent safety information. Check the equipment.	
5	**Calibration**	Perform calibration on the equipment, as necessary.	
6	**Seed Mixing and Loading**	Weigh (if needed), mix (if needed), and distribute seed into the equipment.	
7	**Install Meadow**	Use your equipment to install the meadow. Regularly check operations to ensure successful seed distribution.	
8	**Document**	Capture key moments with images (with permission).	
9	**Communicate**	Communicate the effective distribution of seed.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
The seed has been successfully distributed to the necessary zones and you have documented and subsequently communicated the effective completion of this step.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Re-educate your Stakeholders

A

KEY QUESTIONS	OVERVIEW
○ Have we sent a quarterly reminder to all stakeholders reinforcing the outcome that we collectively aspire to achieve (which takes seven years)? ○ What level of investment and specification was provided during the evaluation and planning process associated with timelines? ○ What elements of the growth stage predictably lead to negative feedback and how can we address those? ○ Was our planning, evaluation. site prep, and planting strategy implemented correctly, based on this guide?	Meadows are dynamic spaces that can shift and change from season-to-season, but they usually stabilize and mature into their near-terminal vegetation complex in about seven years. The meadow maturation process can be burdensome for many due to the early growth stages that commonly raise concerns. Proactive, consistent, accurate, and confident communication and expectation management alleviates these concerns and aid in the successful meadow maturation. Remind your stakeholders that the journey is just beginning.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Review Previous Protocols**	Evaluate your process and scan for potential gaps during the design and install.	
2	**Confirm Responsibilities**	Review establishment responsibilities and protocols.	
3	**Schedule & Deliver Annual Meeting**	Re-engage with all stakeholders at least once per year to zoom out and discuss outcomes and timelines.	
4	**Identify & Engage New Stakeholders**	Look for opportunities and always be prepared to engage and educate new stakeholders that could influence the project during establishment.	
5	**Develop Media Assets**	Create media assets that support the outcome and/or process you have described to stakeholders.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You have reviewed the timeline and approach for establishment and responsibilities have been assigned for establishment. You have created a folder for meadow assets and shared the best assets with stakeholders. Communication can be on-going. You know your communication is effective if the vast majority of communication is outbound.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Establishment (Years 1-7) **A**

KEY QUESTIONS	OVERVIEW
○ How successful was germination? ○ Is re-seeding necessary and if so, what should change? ○ What weeds are appearing and how pervasive? ○ How frequently should you mow?	Meadow management should decrease in intensity every year. In the first year, keeping it on track will feel like a full-time job: multiple mowings, weed surveys and control efforts, possible reseeding, and consistent evaluation of what worked and what didn't. Doing a thorough job in each of these areas the first couple of years will set you up for success. Gradually, intervention frequency should decrease and species will naturally find their niches within the meadow. Your job is to steward it along. Establishment protocols should be tailored to each specific meadow.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Meadow Documentation**	Photograph meadow regularly.	
2	**Monitor Project**	Periodically evaluate the project area for invasives and germination success. Monthly cadence in the first 1-2 years, quarterly or bi-annually in years 2-7.	
3	**Consider Mowing**	Consider the frequency and necessity of mowing to incorporate in the stewardship plan.	
4	**Write the Meadow Stewardship Plan**	Write out all anticipated steps to keep the meadow successful. This should be comprehensive. Monitoring will inform decisions about acting on the plan. Validate with a professional.	
5	**Announce Stewardship Plan**	This outreach effort should be explicit about responsibilities and outcomes for the stewardship plan. You don't intend to kill every weed, but rather steward the space to health.	
6	**Implement Stewardship Plan**	Act on the stewardship plan. Monitoring will inform the necessity for action.	
7	**Collect Seed**	Collect seed from valuable species to establish new meadows, share with the community, or grow into plugs.	
8	**Decide Next Year's Management Approach**	Use your periodic monitoring visits to make decisions about adjusting or modifying the stewardship plan on an annual basis.	
9	**Maintain Communication**	Regularly provide updates to stakeholders about the status of the meadow.	
10	**Remain Vigilant**	Continue this process until completion, defined below.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
Establishment is finished when the meadow can function with minimal human intervention. This means insignificant populations of invasive weeds that can be easily controlled and native herbaceous coverage that is self-seeding over >95% of the meadow area. Achieving this will likely take up to 7 years. Remember that everything should be documented.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Maintenance (Years 8+) **A**

KEY QUESTIONS	OVERVIEW
○ What weeds are present and at what level? ○ What is your early detection protocol? ○ Are your goals still clear? ○ Will a burn be helpful? ○ How are desirable species responding? Are they still present? ○ Was your species selection right?	Once you've reached a point where there are minimal invasives present and native plants are re-seeding roughly 95% of the meadow, your job does get easier, but it never stops. Remember, regular maintenance actions must be taken to preserve a meadow, except for extreme circumstances. Luckily, maintenance efforts are only establishment efforts done less frequently, so you should be comfortable with these tasks.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Meadow Documentation**	Perform annual visit to evaluate meadow and photo-document the status of the system.	
2	**Periodic Stakeholder Engagement**	Find opportunities to re-engage with existing stakeholders and develop new stakeholders.	
3	**Consider Educational Programs**	Teach others about the comprehensive process you followed.	
4	**Write Meadow Maintenance Plan**	Write out all anticipated steps to keep the meadow successful. This should be comprehensive. Monitoring will inform decisions about acting on the plan. Validate with a professional.	
5	**Meadow Intervention**	Act on the maintenance plan. Monitoring will inform the necessity for action.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You're never finished with maintenance! Tasks every year should include succession interruption (mowing/grazing), surveying, and refined management actions.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Keeping a Meadow, or Not...

A

KEY QUESTIONS	OVERVIEW
○ How does one that has a meadow keep it a meadow? ○ What does keeping a meadow as a meadow entail? ○ Can a meadow even be kept as a meadow? ○ Why doesn't my meadow look like it used to? ○ How do I get my meadow back to the point when it was full of flowers all year? ○ Why doesn't my meadow look like I thought it was going to look? ○ Weeds have taken over, especially Goldenrod; what do I do now? ○ How do I decide when to let the meadow go?	Meadows will become whatever they are meant to become; that's what nature does. Keeping a meadow as a meadow means that you will need to arrest natural processes, particularly the emergence of trees and shrubs. Keeping a meadow as a certain "type" of meadow is particularly challenging as doing so requires fighting against nature's processes, which can be expensive. Ultimately, you might decide you don't need a meadow any longer and just let it go.

CHECKLIST

STEP	TITLE	SUMMARY DELIVERABLES	DATE
1	**Meadow Retirement**	I have reviewed and documented my meadow, or had it reviewed and have the documentation in hand.	
2	**Transition to Shrubland**	Follow the guidebook for Transition to Shrubland.	
3	**Transition to Forest**	Follow the guidebook for Transition to Forest.	

SUMMARY AND SIGN-OFF

HOW TO KNOW WHEN YOU ARE FINISHED	MANAGER/CONSULTANT SIGNOFF	
You have made all your major decisions for the meadow, which you repeat annually. You know what your stewardship activities will always be for three years. You have consciously decided to intervene, reset, or retire the meadow each year, and socialized your decisions. You have secured extra budget and schedule for activities that require supplemental funding.		
	FIELD MANAGER SIGNATURE	DATE
	PROJECT MANAGER SIGNATURE	DATE

Summary

If you've made it through this entire document (go you) it should be plain to see that building a meadow is not something that happens over a few days with minimal effort. Indeed, the main point we'd like you t take away is that building an authentic, productive meadow, or any natural space for that matter, requires careful planning and decision-making to become a success. We harp on this because we've been there more times than we care to admit and don't want you to make the same mistakes. And we harp on this so much because we want to see nothing less than a thriving ecosystem where bees and birds, humans and fungi can all roam together.

Learn from our mistakes and you'll find yourself surrounded by bees buzzing and flowers blooming in only a couple of years. Ignore our mistakes and you'll find yourself doing exactly what we've done: pulling your hair out, crying in despair because you have to start all over. Okay, maybe that was just me. But seriously, skip the disappointment altogether by being thorough and methodical. Oh, and did we mention communicating and documenting everything?