Pollinator Habitat: Planning & Contracting

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Webinar | October 27, 2020

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Photo: Kelly Gill / Xerces Society

Pollinator Habitat Implementation: Planning and Contracting

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EQIP contracted farm photo: Brooks Bolyard, East Sparta, Ohio

Audience Poll Question #1

Please select which categories best fit your role or interest in pollinator habitat conservation and planning? (select all that apply)

- ❑ NRCS conservation planner
- ❑ NRCS science and technology support
- ❑ SWCD conservation planner
- ❑ Farmer
- ❑ Rancher
- ❑ Forester
- ❑ Gardener / Master Gardener
- ❑ Interested Citizen
- ❑ Lion tamer

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Webinar Outline

Recap of August's webinar Part 1: Habitat Opportunities

Overview of planning process and requirements

Go through an example NRCS Implementation Requirement (IR) form

- Plant selection criteria, seed mix specifications
- Site preparation – seedbed creation and weed control
- Seeding and planting methods
- Management during establishment

Long-term maintenance and operations

Establishment case study, what to expect

Other important planning considerations for contracting

Resources and Questions

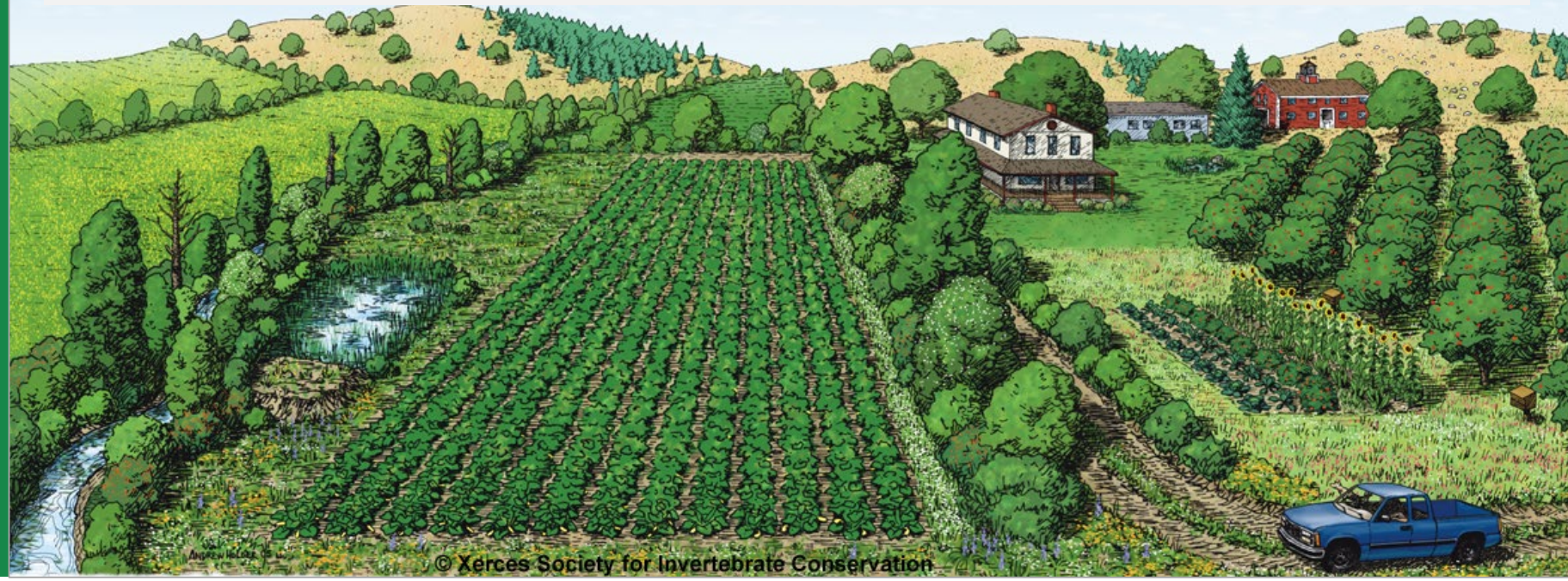
Photo: Sarah Foltz Jordan / Xerces Society

Pollinator Habitat Opportunities in the Farmscape

- Native wildflower meadows
- Flowering field borders
- Forest edges
- Hedgerows
- Riparian areas
- Ponds/reservoirs
- Insectary strips
- Beetle banks
- Cover crops
- Pesticide protection, spray set-baks, drift buffers

Part 1 of this series: *Pollinator Inventory and Design*

http://www.conservationwebinars.net/webinars/inventory-and-design-opportunities-for-pollinator-habitat-on-working-lands



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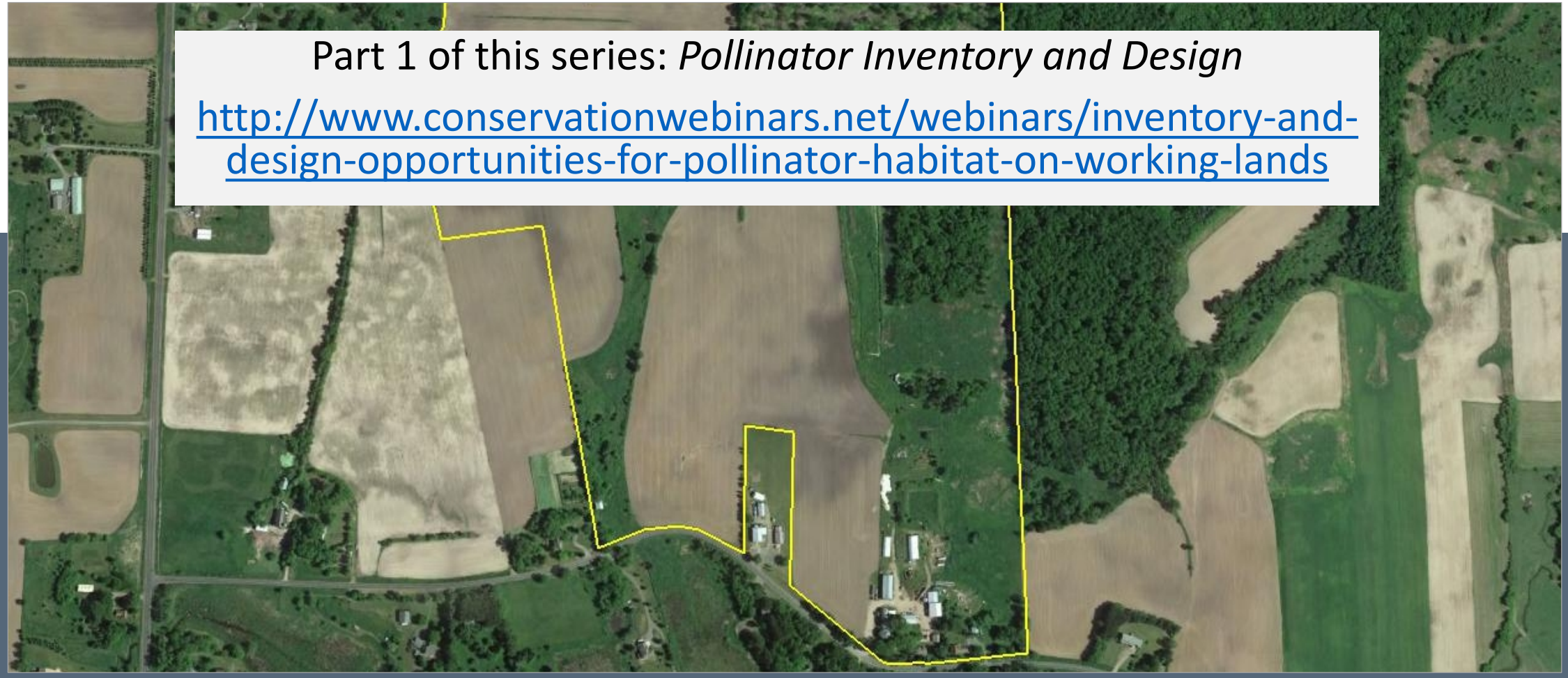
Artwork: Andrew Holder, Xerces Society

Pollinator Habitat Opportunities in the Farmscape



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Pollinator Habitat

When thinking about contracting new pollinator habitat, you can choose from many conservation practices.

For this webinar, we will use the new EQIP Wildlife Habitat Planting (420) practice as a framework

Photo: Nancy Lee Adamson (Xerces Society)

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Audience Poll Question #2

For those of you who work with Farm Bill conservation programs, what conservation practices standards have you used for planning and contracting permanent pollinator habitat? (select all that apply)

- ❑ N/A for me
- ❑ 420 - Wildlife Habitat Planting
- ❑ 327 - Conservation Cover
- ❑ 386 - Field Border
- ❑ 315 - Herbaceous Weed Treatment
- ❑ 314 - Brush Mgmt.
- ❑ 647 - Early Successional Habitat Development/Management
- ❑ 643 - Restoration of Rare or Declining Natural Communities
- ❑ 612 - Tree/shrub Establishment
- ❑ 645 - Upland Wildlife Habitat Mgmt.
- ❑ 422 - Hedgerow Planting
- ❑ 595 - Pest Management Conservation System
- ❑ Other

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Audience Poll Question #3

In your experience, what is the hardest part of the habitat restoration process in your work with landowners? (select only one)

- ❑ Site preparation
- ❑ Effective planting
- ❑ Follow up management during establishment
- ❑ Ongoing habitat management

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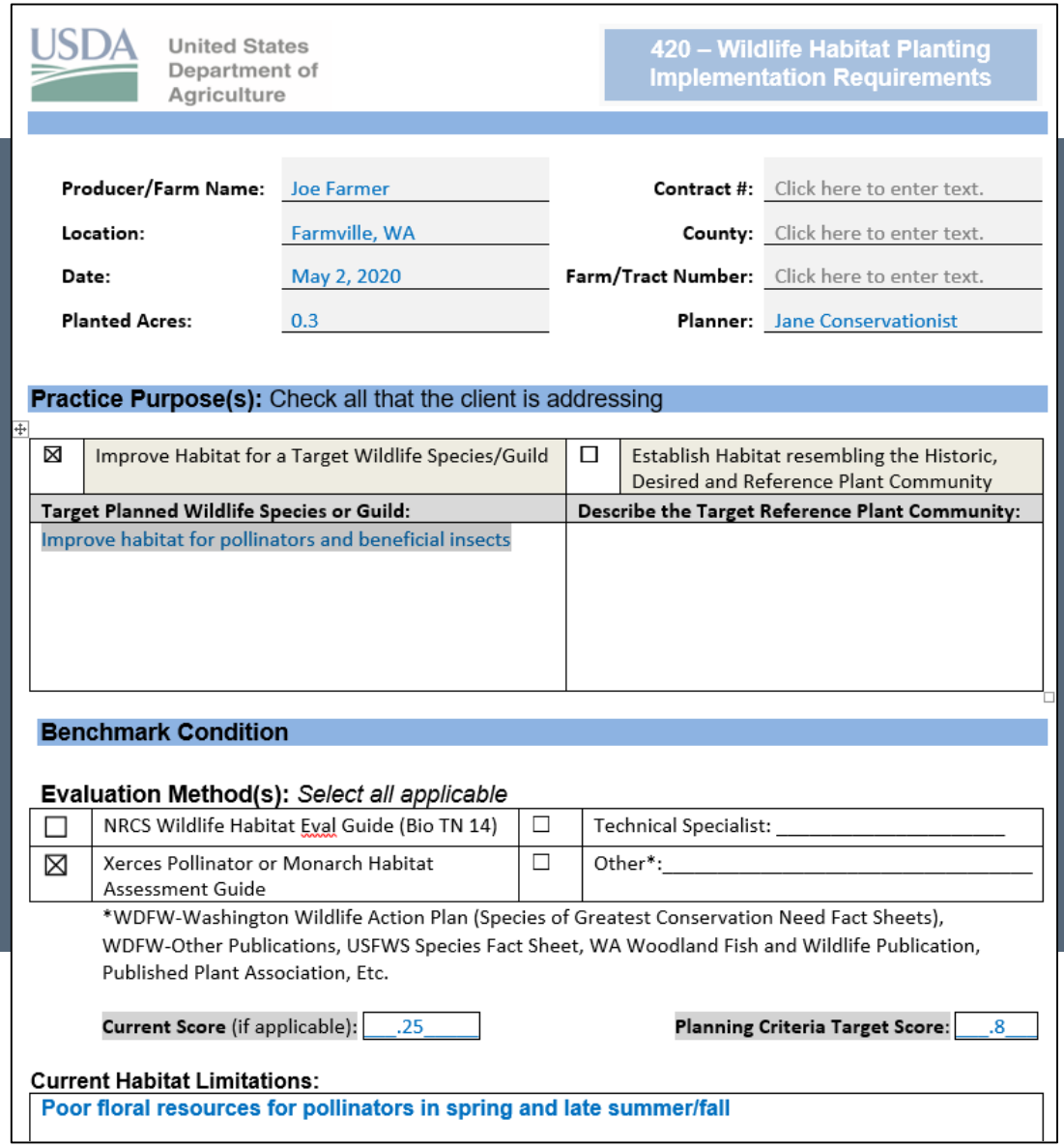
420 Implementation Requirement (Job Sheet)

Wildlife Habitat Planting (420)

- Used when *terrestrial habitat for wildlife and invertebrates* is the identified resource concern
- Multiple payment scenarios for creating diverse perennial (permanent) habitat rich in wildflowers
- Conservation Cover (327) is also often used for pollinator habitat



USDA United States Department of Agriculture

420 – Wildlife Habitat Planting Implementation Requirements

Producer/Farm Name:	Joe Farmer	**Contract #:**	Click here to enter text.
Location:	Farmville, WA	**County:**	Click here to enter text.
Date:	May 2, 2020	**Farm/Tract Number:**	Click here to enter text.
Planted Acres:	0.3	**Planner:**	Jane Conservationist

Practice Purpose(s): Check all that the client is addressing

☒	Improve Habitat for a Target Wildlife Species/Guild	☐	Establish Habitat resembling the Historic, Desired and Reference Plant Community

Target Planned Wildlife Species or Guild:	**Describe the Target Reference Plant Community:**
Improve habitat for pollinators and beneficial insects	

Benchmark Condition

Evaluation Method(s): *Select all applicable*

☐	NRCS Wildlife Habitat Eval Guide (Bio TN 14)	☐	Technical Specialist: _____
☒	Xerces Pollinator or Monarch Habitat Assessment Guide	☐	Other*: _____

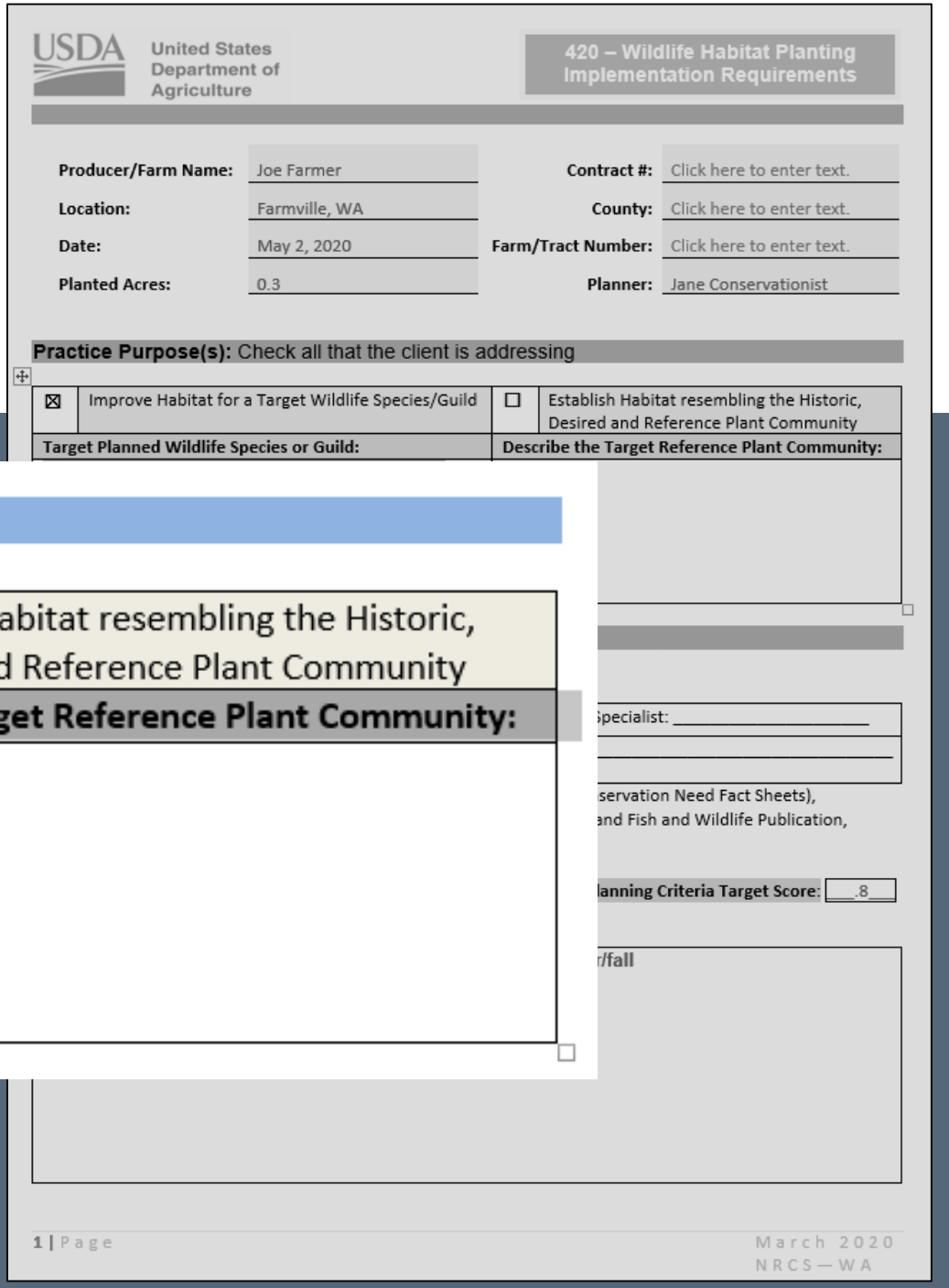
*WDFW-Washington Wildlife Action Plan (Species of Greatest Conservation Need Fact Sheets), WDFW-Other Publications, USFWS Species Fact Sheet, WA Woodland Fish and Wildlife Publication, Published Plant Association, Etc.

Current Score (if applicable): .25 **Planning Criteria Target Score:** .8

Current Habitat Limitations:

Poor floral resources for pollinators in spring and late summer/fall

420 IR (Job Sheet)



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Specialist: _____

servation Need Fact Sheets),
and Fish and Wildlife Publication,

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r/fall

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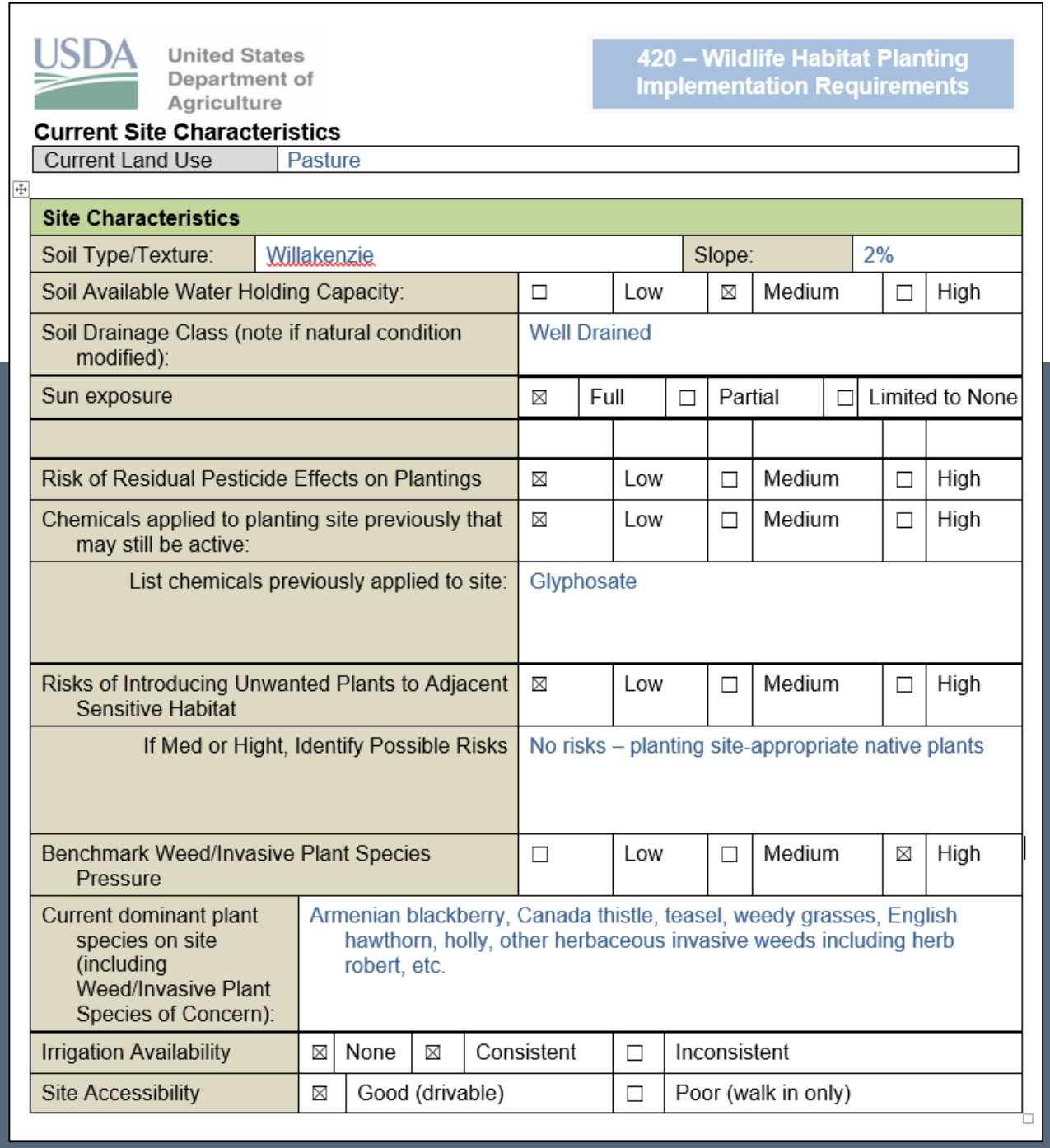
March 2020
NRCS—WA

420 IR (Job Sheet)

Planning: Document Existing Conditions

- Soil type, moisture, drainage
- Light exposure
- Pesticide risk and mitigation (direct exposure, drift, carryover/residual activity, persistence, etc.
- Risk of introducing unwanted plants, especially in or adjacent to sensitive habitat
- Weed/pervasive species pressure
- Dominant plant community
- Access to irrigation when needed
- Site accessibility



USDA United States Department of Agriculture

420 – Wildlife Habitat Planting Implementation Requirements

Current Site Characteristics

Current Land Use	Pasture

Site Characteristics						
Soil Type/Texture:	Willakenzie			Slope:	2%	
Soil Available Water Holding Capacity:	☐	Low	☒	Medium	☐	High
Soil Drainage Class (note if natural condition modified):	Well Drained					
Sun exposure	☒	Full	☐	Partial	☐	Limited to None
Risk of Residual Pesticide Effects on Plantings	☒	Low	☐	Medium	☐	High
Chemicals applied to planting site previously that may still be active:	☒	Low	☐	Medium	☐	High
List chemicals previously applied to site:	Glyphosate					
Risks of Introducing Unwanted Plants to Adjacent Sensitive Habitat	☒	Low	☐	Medium	☐	High
If Med or Hight, Identify Possible Risks	No risks – planting site-appropriate native plants					
Benchmark Weed/Invasive Plant Species Pressure	☐	Low	☐	Medium	☒	High
Current dominant plant species on site (including Weed/Invasive Plant Species of Concern):	Armenian blackberry, Canada thistle, teasel, weedy grasses, English hawthorn, holly, other herbaceous invasive weeds including herb robert, etc.					
Irrigation Availability	☒	None	☒	Consistent	☐	Inconsistent
Site Accessibility	☒	Good (drivable)			☐	Poor (walk in only)

Photo: John Wolchesk

Plant Selection

Requirements and considerations

- Meeting species' needs throughout their life cycle
- Focus on native perennial plants
- Species with high pollinator value (nectar, pollen, nesting)
- Butterfly host plants
- Succession of bloom periods
- Pesticide-free seed or plants
- Site appropriate characteristics
- Ease of establishment
- Availability and cost

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Photo: The Xerces Society/Kelly Gill

Plant Selection

Other priorities and benefits

- Create resilient plant communities
- Support other wildlife
  - Native trees support 4x herbivorous biomass of nonnatives, and 15x species of caterpillars
  - Seeds and berries for birds
- Multiple conservation goals
  - Reduce water use, fertilization
  - Erosion control
  - Privacy screen
- Harvestable products (edible berries, floriculture products)

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Season-Long Bloom

Select species that have overlapping bloom times from spring to fall

Photos: Bryan E. Reynolds (2); Matthew Shepherd (3); Jennifer Hopwood (2); Nancy Lee Adamson

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Native Seed Mixes for Pollinators

- Relatively high forb:grass ratio
- Total of 30-60 seeds per foot
- lb/ac – There is NOT a standard seeding rate b weight (varies by species in mix)
- Certified seed, PLS
- **Do not use unlabeled/untagged seed**
- Local ecotypes
- Seed inventory and cost vary
- GET QUOTES, CHECK SPECS AND SUBSTITUTIONS!!!!!!!

NY Pollinator Seed Mix: Dry-Mesic Sites

Common Name	Scientific Name	Percent of mix by seed	Target seed/ft2	Total lb	Bloom Period
Eastern Columbine	*Aquilegia canadensis*	3.0%	1.50	0.13	Early

NY Pollinator Seed Mix: Wet-Mesic Sites (2017)

Common Name	Scientific Name	Percent of mix by seed	Target seed/ft2	Total lb	Bloom Period
Ohio Spiderwort	*Tradescantia ohiensis*	1.0%	0.50	0.11	Early

NY Monarch GMAR Mix - Mesic-Wet Sites - 6.18.18

Species	Common Name	Percent of Mix by Seed	Target Seeds/ft2	DRILLED Seeding Rate lbs PLS/ac	BROADCAST Seeding Rate lbs PLS/ac	Bloom period
Monarda fistulosa	wild bergamot	6.0%	3.00	0.10	0.12	Early
Polygonum pensylvanicum	Pennsylvania smartweed	5.0%	2.50	0.86	1.04	Early
Verbena hastata	blue verbena	7.0%	3.50	0.10	0.12	Early
Rudbeckia hirta	blackeyed susan	10.0%	5.00	0.15	0.17	Early-Mid
Asclepias incarnata	swamp milkweed	1.0%	0.50	0.31	0.37	Mid
Asclepias syriaca	common milkweed	1.0%	0.50	0.31	0.37	Mid

NY Monarch GMAR Mix - Dry-Mesic Sites - 6.18.18

Species	Common Name	Percent of Mix by Seed	Target Seeds/ft2	DRILLED Seeding Rate lbs PLS/ac	BROADCAST Seeding Rate lbs PLS/ac	Bloom Period
Penstemon digitalis	tall white beardtongue	8.0%	4.00	0.09	0.10	Early-Mid
Coreopsis lancelata	lanceleaf coreopsis	5.0%	2.50	0.49	0.59	Early-Mid
Chamaecrista fasciculata	partridge pea	2.0%	1.00	0.67	0.80	Early-Mid
Rudbeckia hirta	black-eyed Susan	10.0%	5.00	0.14	0.17	Early-Mid
Asclepias syriaca	common milkweed	1.0%	0.50	0.31	0.37	Mid
Asclepias tuberosa	butterfly milkweed	1.0%	0.50	0.31	0.37	Mid
Heliopsis helianthoides	smooth oxeye	0.8%	0.40	0.17	0.20	Mid
Liatris aspera	tall blazing star	2.0%	1.00	0.18	0.22	Mid
Monarda fistulosa	wild bergamot	6.0%	3.00	0.10	0.12	Mid
Pycnanthemum muticum	clustered mountainmint	5.0%	2.50	0.03	0.04	Mid
Silphium trifoliatum	whorled rosinweed	0.2%	0.10	0.16	0.19	Mid
Verbena stricta	hoary verbena	6.0%	3.00	0.25	0.30	Mid
Veronicastrum virginicum	Culver's root	8.0%	4.00	0.02	0.03	Mid
Conoclinium coelestinum	blue mistflower	7.0%	3.50	0.10	0.12	Mid-Late
Echinacea purpurea	purple coneflower	7.0%	3.50	1.31	1.58	Mid-Late
Helenium flexuosum	purple sneeze weed	4.0%	2.00	0.04	0.05	Mid-Late
Euthamia graminifolia	flat-top goldentop	4.0%	2.00	0.02	0.02	Late
Solidago juncea	early goldenrod	2.0%	1.00	0.02	0.02	Late
Symphyotrichum laeve	smooth blue aster	5.0%	2.50	0.11	0.13	Late
Symphyotrichum lateriflorum	calico aster	4.0%	2.00	0.11	0.13	Late
Elymus canadensis	Canada wildrye	12.0%	6.00	2.29	2.75	Grass
	Totals	100%	50	6.93	8.31	

Seeding rate
Drilled = 7 PLS lb/ac
Broadcast = 8.5-9 PLS lb/ac (20% increase)
Percentages indiacte % of each species by seed/ft^2 (not %weight)
Pounds of seed/ac is based on target seeding of 50 seeds/ft2/ac

LAST UDATED June 18, 2018 SS

Native Seed Mixes for Pollinators

Photos: Kelly Gill / Xerces Society

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Audience Poll Question #4

What techniques have you used when working with landowners or on your own property to eliminate weeds or competing vegetation prior to planting habitat? (select all that apply)

- ❑ Herbicides / chemical fallow
- ❑ Smother cropping
- ❑ Flame weeding
- ❑ Repeated tillage
- ❑ Solarization
- ❑ Sheet mulching
- ❑ Other

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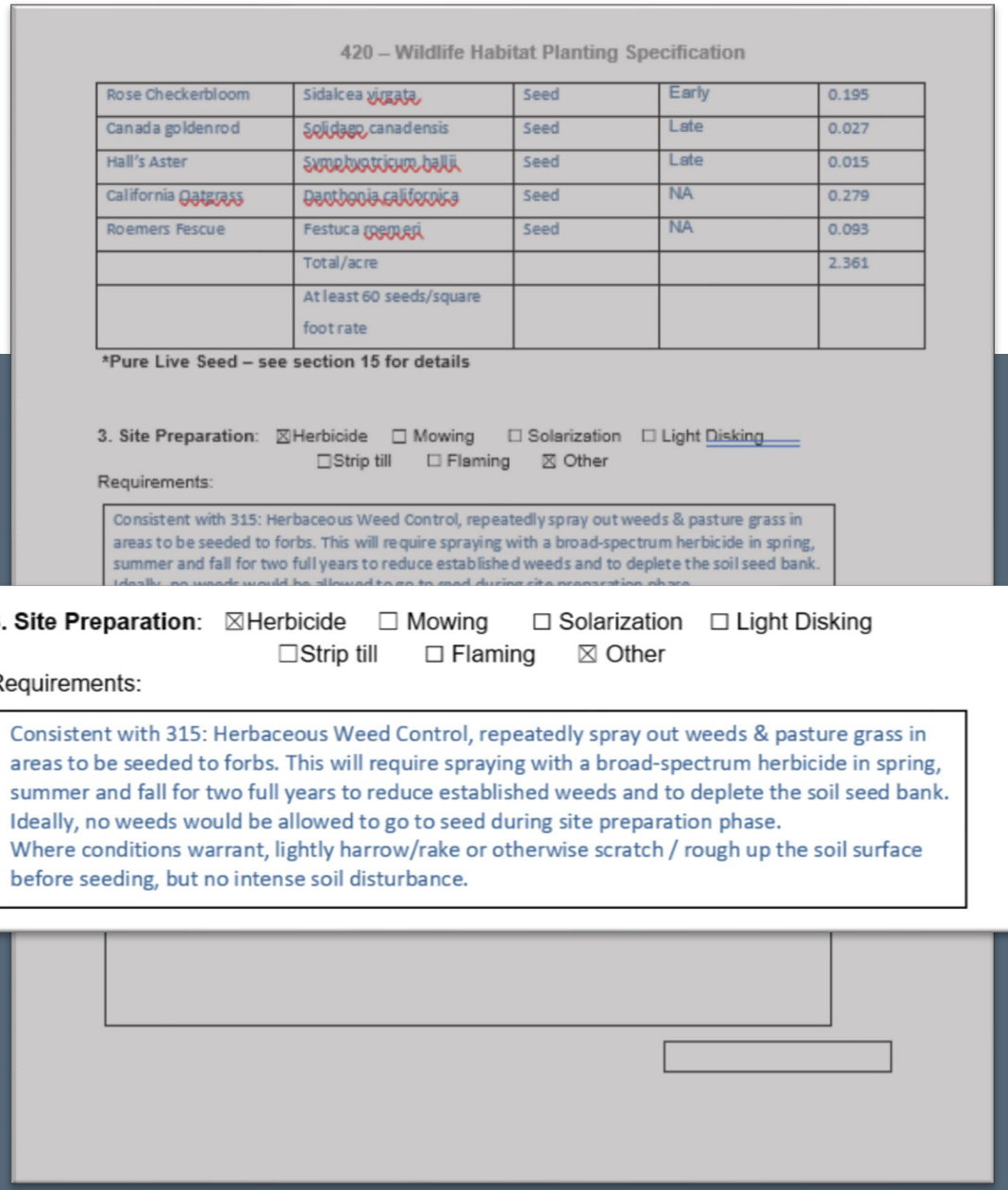
420 IR (Job Sheet)

EXCELLENT WEED CONTROL BEFORE PREPARING A SEED BED IS CRITICAL!!

- Site prep using 315 or 314 (to bring competing weed pressure below 5% cover) on non-cropland
- Does not apply to cropland being converted to habitat or scenarios with existing low weed pressure



420 – Wildlife Habitat Planting Specification

Rose Checkerbloom	Sidalcea virgata	Seed	Early	0.195
Canada goldenrod	Solidago canadensis	Seed	Late	0.027
Hall's Aster	Symphyotrichum hallii	Seed	Late	0.015
California Oatgrass	Danthonia californica	Seed	NA	0.279
Roemers Fescue	Festuca roemeri	Seed	NA	0.093
	Total/acre			2.361
	At least 60 seeds/square foot rate			

*Pure Live Seed – see section 15 for details

3. Site Preparation: ☒Herbicide ☐ Mowing ☐ Solarization ☐ Light Disking ☐Strip till ☐ Flaming ☒ Other

Requirements:

Consistent with 315: Herbaceous Weed Control, repeatedly spray out weeds & pasture grass in areas to be seeded to forbs. This will require spraying with a broad-spectrum herbicide in spring, summer and fall for two full years to reduce established weeds and to deplete the soil seed bank. Ideally, no weeds would be allowed to go to seed during site preparation phase.

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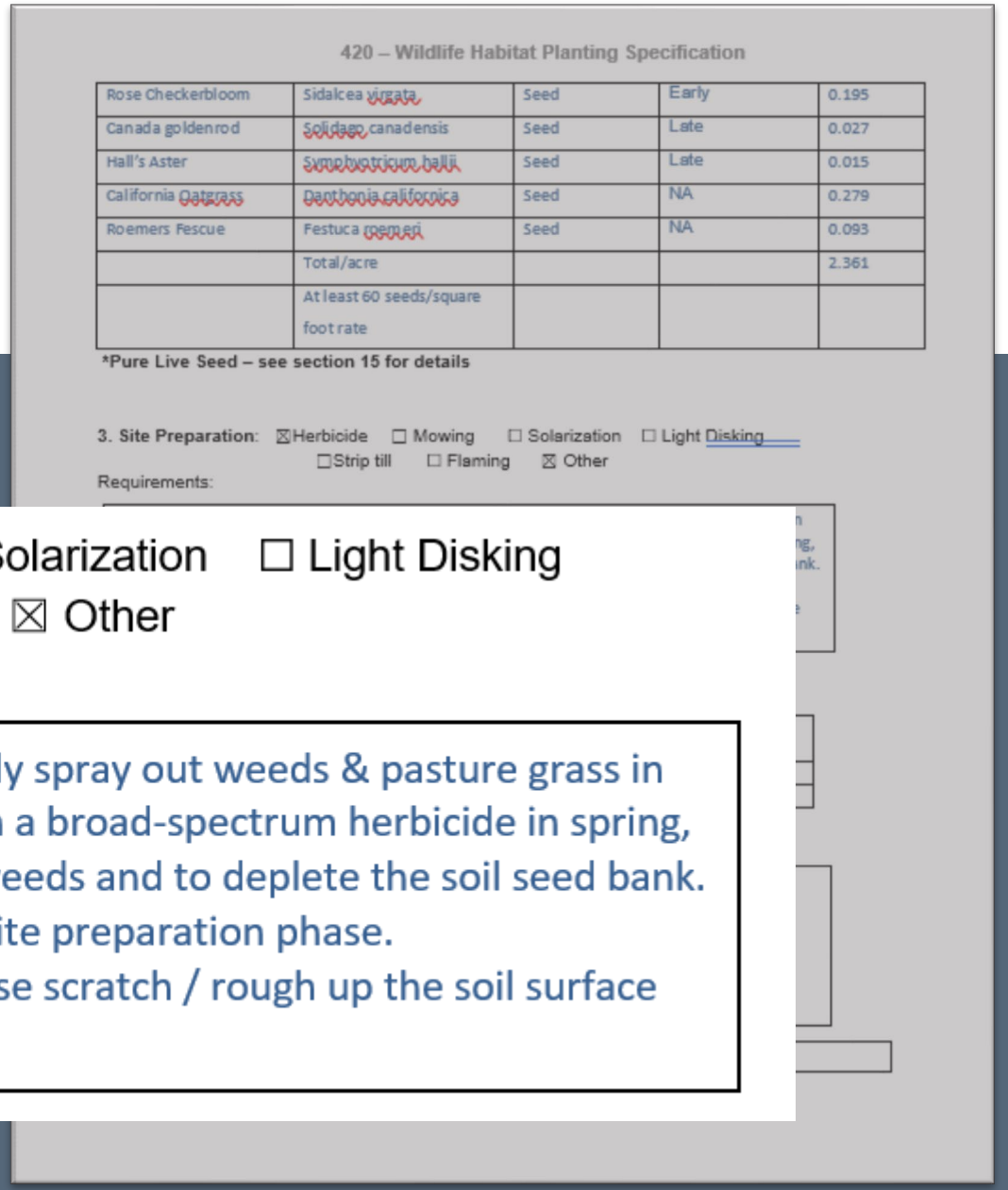
Where conditions warrant, lightly harrow/rake or otherwise scratch / rough up the soil surface before seeding, but no intense soil disturbance.

420 IR (Job Sheet)



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Site Preparation

Assess Existing Weed Pressure

High Weed Pressure vs. Low Weed Pressure

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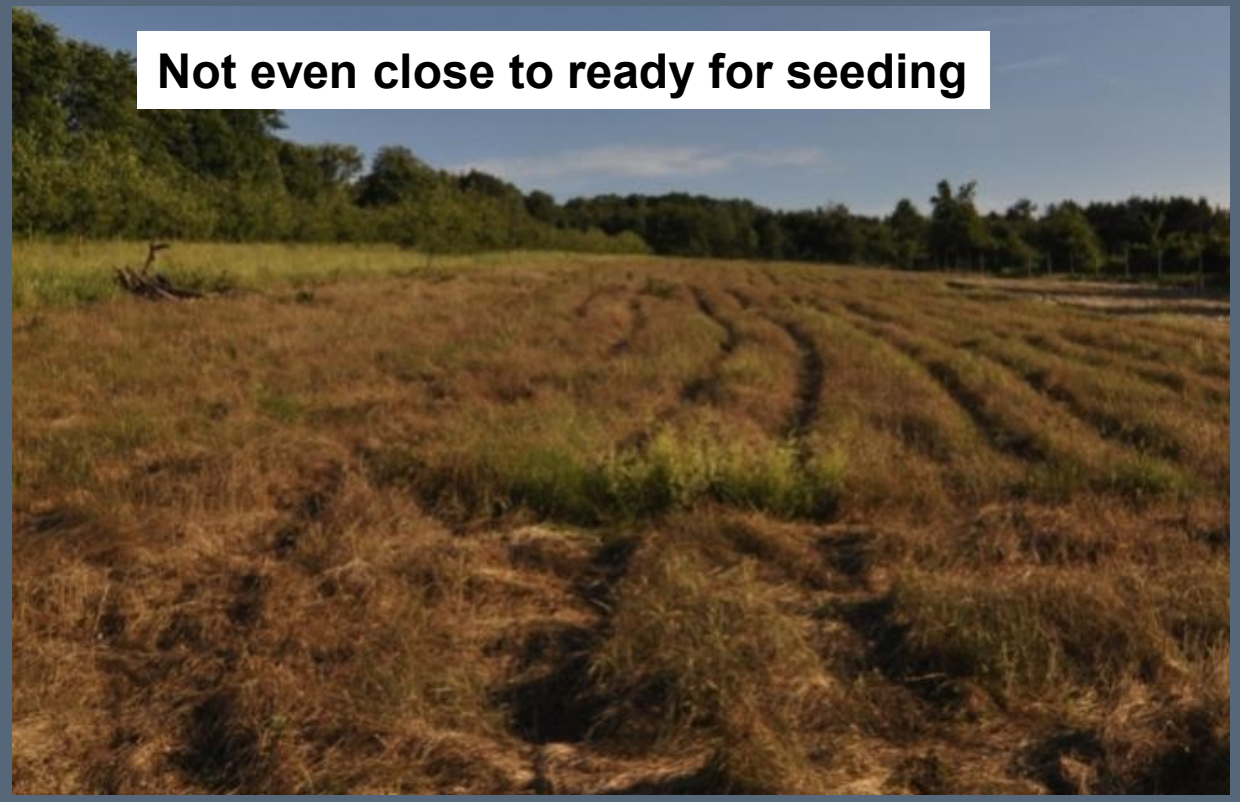
Photos: Kelly Gill / Xerces Society

Site Preparation:
Eliminate Competing Vegetation

Think ahead about the existing and desired future condition of the planting bed and the requirements for your planting technique.



Photos: Kelly Gill (top), Don Keirstead (bottom)

Site Preparation: Weed Abatement

Methods can include:

- Herbicides
- Flaming
- Solarization
- Smother-cropping
- Repeated mowing or *shallow* cultivation

Photos: Kelly Gill (ll), Linda Rinta (ur), Jessa Cruz (lr)

Site Preparation: Weed Abatement

Herbicide: Chemical Fallow

- Use non-selective and non-persistent herbicide
- Prepare the area with *light* tillage or close mow
- Start applications in early spring and continue for 6 to 9 months (longer if weed pressure is high)
- Repeat when weeds reach 4-6 inches
- **Avoid additional tillage**

Photos: Brianna Borders (ll); Jessa Kay Cruz (ur); Brianna Borders (lr)

Site Preparation: Weed Abatement

Mechanical: Repeated Shallow Cultivation

- Common method on organic sites
- Use implements that can be set to shallow depth
- Repeat mechanical weed removal throughout the season
- Use where erosion is not a concern
- Avoid use on wet sites or wet seasonal conditions
- Avoid deep tillage / plowing (some exceptions)
- Integrated approach (e.g., combine with smother crop)

Photos: Xerces Society / Kelly Gill

Site Preparation: Weed Abatement

Soil Solarization

Method of heating up the soil to kill weeds (and weed seeds).

- Full sun
- Prepare seed bed
- UV-stabilized plastic
- Soil must be moist
- Edges must be sealed off completely

Photo: Jessa Kay Cruz (Xerces Society)

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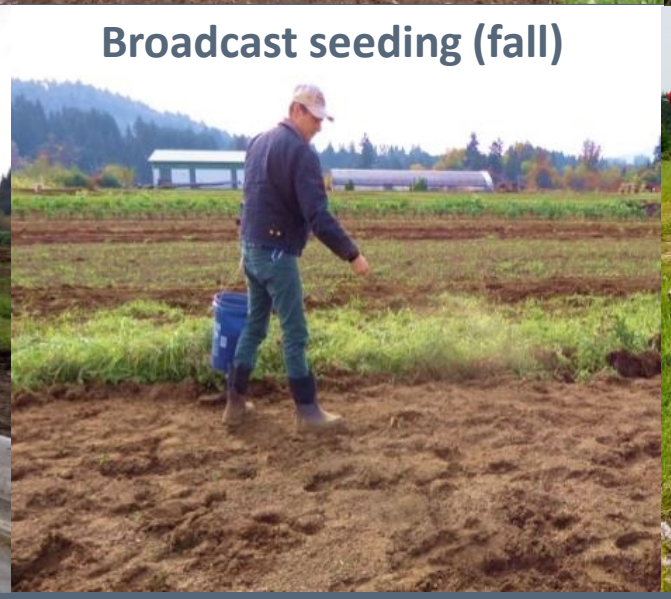
Site Preparation: Weed Abatement

Cultivating to create a seed bed (spring)

Solarization plastic (summer)

Removing the plastic (fall)

Broadcast seeding (fall)



Flowering habitat (next spring!)

Photos: Eric Lee-Mäder, Xerces Society

Audience Poll Question #5

What techniques have you used when working with landowners or on your own property to eliminate weeds or competing vegetation prior to planting? (select all that apply)

- ❑ Broadcast seeding
- ❑ Drop seeding
- ❑ Drill seeding
- ❑ Drill seeding with a native seed drill
- ❑ Planting live herbaceous plants
- ❑ Planting live herbaceous plants with a water wheel or other vegetable planter
- ❑ Planting live shrubs/trees

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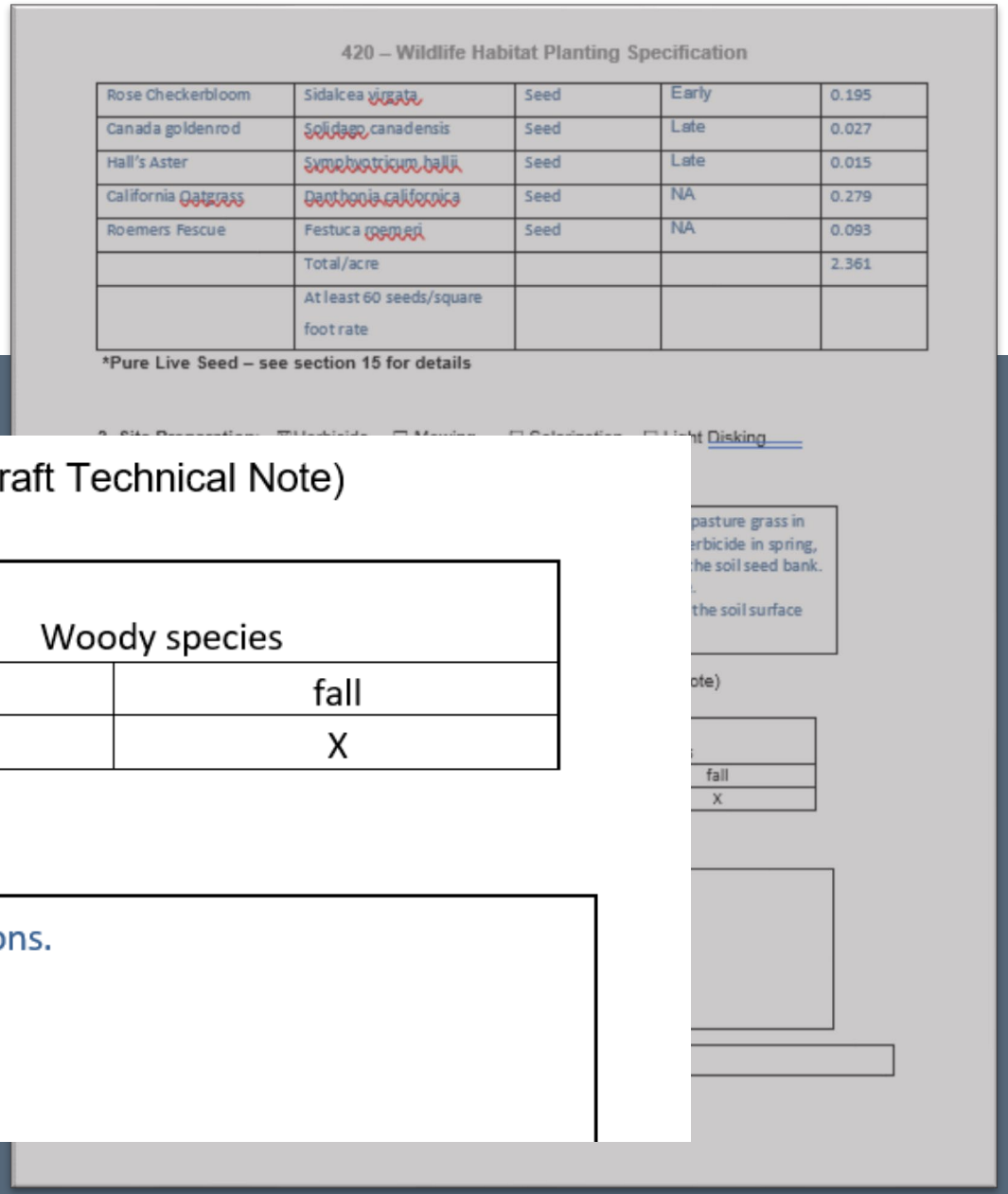
420 IR (Job Sheet)



420 – Wildlife Habitat Planting Specification

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	Total/acre			2.361
	At least 60 seeds/square foot rate			

*Pure Live Seed – see section 15 for details

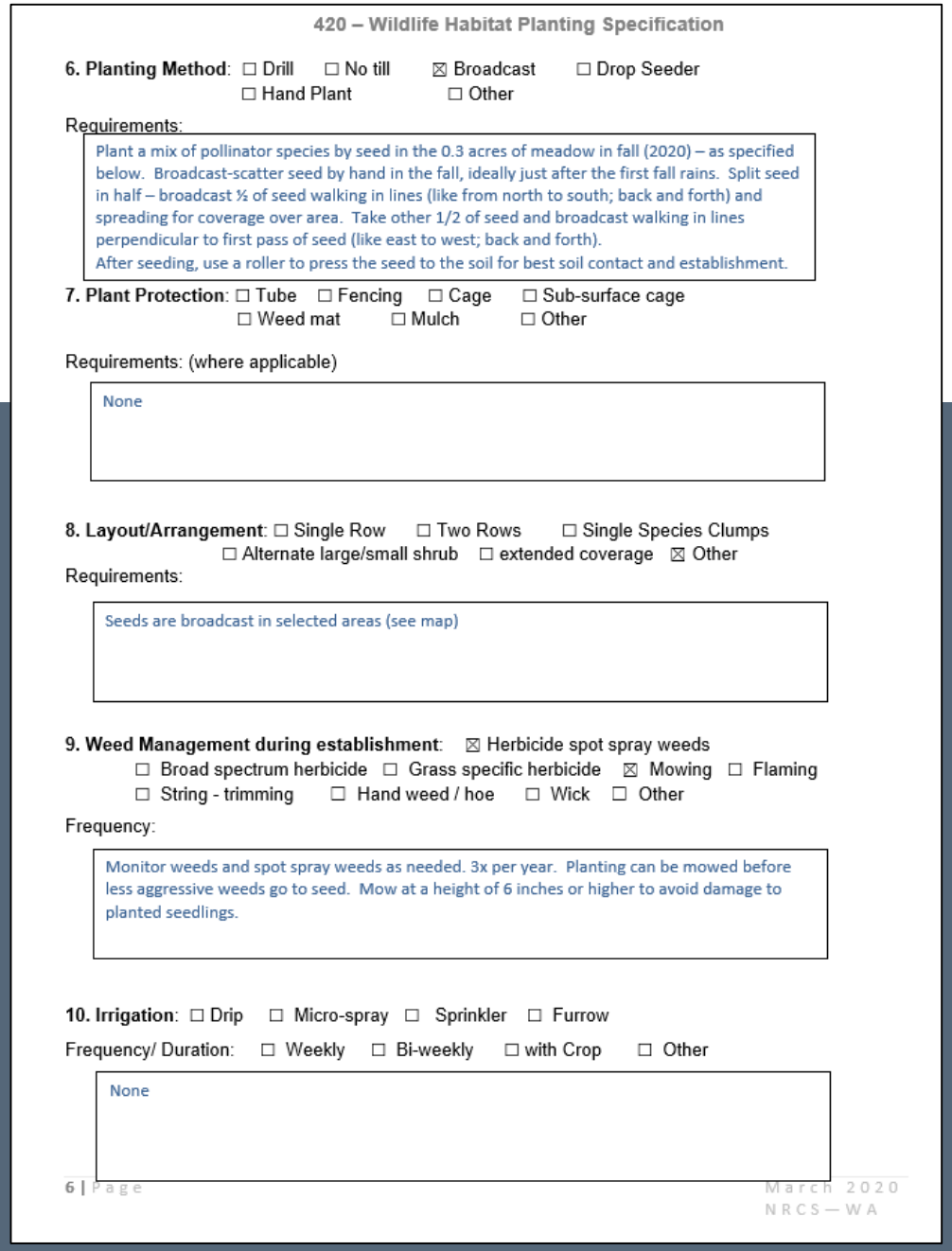
4. Planting Period Dates: (from table in Planting Design draft Technical Note)

Herbaceous species (perennial grasses & forbs)		Woody species	
spring	fall	spring	fall
	X		X

Requirements:

Broadcast seed before fall rains prior to wet and cold conditions.

420 IR (Job Sheet)



420 – Wildlife Habitat Planting Specification

6. Planting Method: ☐ Drill ☐ No till ☒ Broadcast ☐ Drop Seeder ☐ Hand Plant ☐ Other

Requirements:

Plant a mix of pollinator species by seed in the 0.3 acres of meadow in fall (2020) – as specified below. Broadcast-scatter seed by hand in the fall, ideally just after the first fall rains. Split seed in half – broadcast ½ of seed walking in lines (like from north to south; back and forth) and spreading for coverage over area. Take other 1/2 of seed and broadcast walking in lines perpendicular to first pass of seed (like east to west; back and forth).
After seeding, use a roller to press the seed to the soil for best soil contact and establishment.

7. Plant Protection: ☐ Tube ☐ Fencing ☐ Cage ☐ Sub-surface cage ☐ Weed mat ☐ Mulch ☐ Other

Requirements: (where applicable)

None

8. Layout/Arrangement: ☐ Single Row ☐ Two Rows ☐ Single Species Clumps ☐ Alternate large/small shrub ☐ extended coverage ☒ Other

Requirements:

Seeds are broadcast in selected areas (see map)

9. Weed Management during establishment: ☒ Herbicide spot spray weeds ☐ Broad spectrum herbicide ☐ Grass specific herbicide ☒ Mowing ☐ Flaming ☐ String - trimming ☐ Hand weed / hoe ☐ Wick ☐ Other

Frequency:

Monitor weeds and spot spray weeds as needed. 3x per year. Planting can be mowed before less aggressive weeds go to seed. Mow at a height of 6 inches or higher to avoid damage to planted seedlings.

10. Irrigation: ☐ Drip ☐ Micro-spray ☐ Sprinkler ☐ Furrow

Frequency/ Duration: ☐ Weekly ☐ Bi-weekly ☐ with Crop ☐ Other

None

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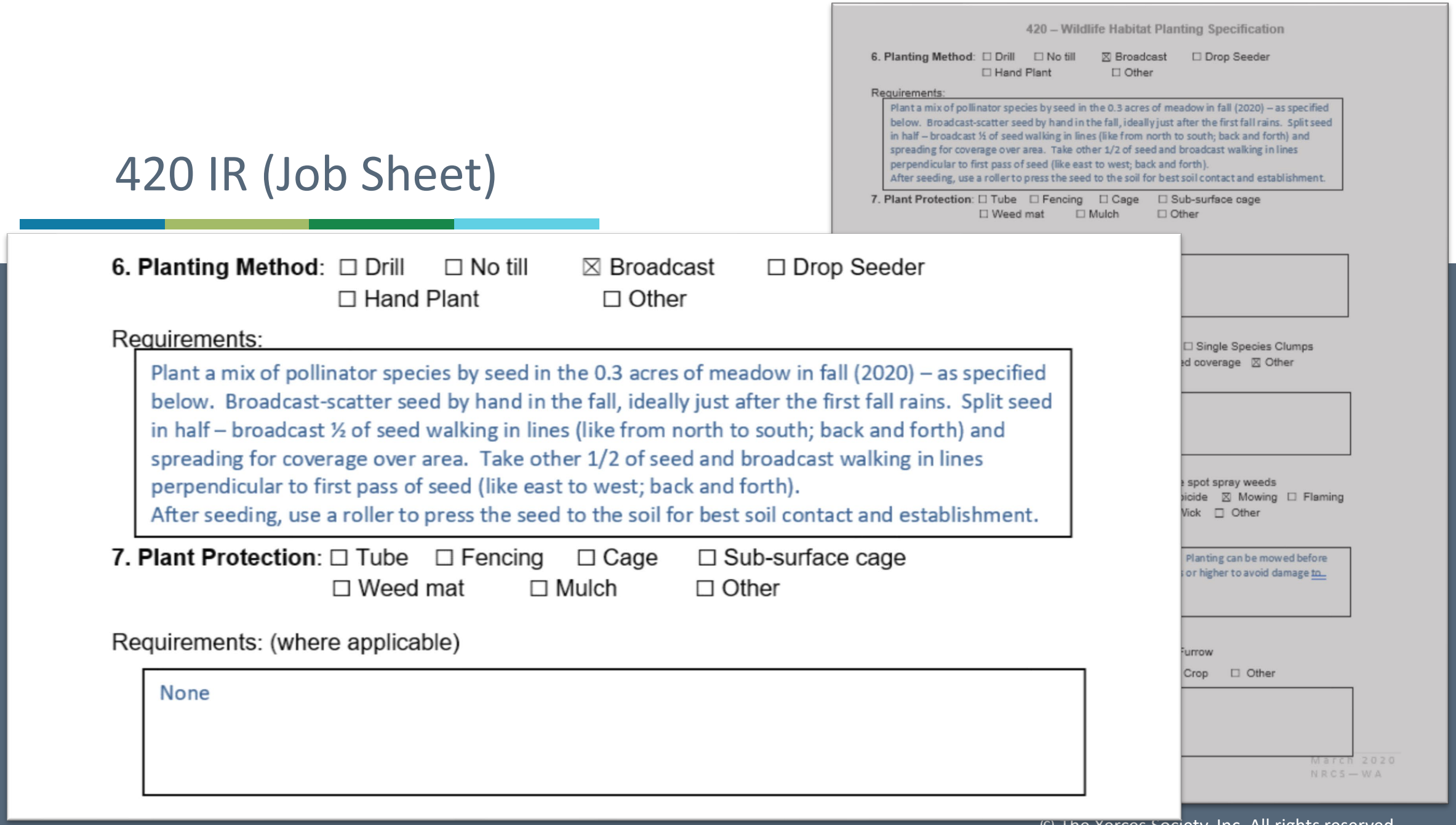
420 IR (Job Sheet)



420 – Wildlife Habitat Planting Specification

6. Planting Method: ☐ Drill ☐ No till ☒ Broadcast ☐ Drop Seeder
☐ Hand Plant ☐ Other

Requirements:

Plant a mix of pollinator species by seed in the 0.3 acres of meadow in fall (2020) – as specified below. Broadcast-scatter seed by hand in the fall, ideally just after the first fall rains. Split seed in half – broadcast ½ of seed walking in lines (like from north to south; back and forth) and spreading for coverage over area. Take other 1/2 of seed and broadcast walking in lines perpendicular to first pass of seed (like east to west; back and forth).
After seeding, use a roller to press the seed to the soil for best soil contact and establishment.

7. Plant Protection: ☐ Tube ☐ Fencing ☐ Cage ☐ Sub-surface cage
☐ Weed mat ☐ Mulch ☐ Other

☐ Single Species Clumps
ed coverage ☒ Other

spot spray weeds
icide ☒ Mowing ☐ Flaming
Vick ☐ Other

Planting can be mowed before
or higher to avoid damage to.

Furrow
Crop ☐ Other

March 2020
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6. Planting Method: ☐ Drill ☐ No till ☒ Broadcast ☐ Drop Seeder
☐ Hand Plant ☐ Other

Requirements:

Plant a mix of pollinator species by seed in the 0.3 acres of meadow in fall (2020) – as specified below. Broadcast-scatter seed by hand in the fall, ideally just after the first fall rains. Split seed in half – broadcast ½ of seed walking in lines (like from north to south; back and forth) and spreading for coverage over area. Take other 1/2 of seed and broadcast walking in lines perpendicular to first pass of seed (like east to west; back and forth).
After seeding, use a roller to press the seed to the soil for best soil contact and establishment.

7. Plant Protection: ☐ Tube ☐ Fencing ☐ Cage ☐ Sub-surface cage
☐ Weed mat ☐ Mulch ☐ Other

Requirements: (where applicable)

None

Planting Method: Seeding

Seeding overview

- Timing: Dormant season is best
- Plant grass and forb seed separately
- Mix the seed with an inert carrier (e.g. sand, coarse cornmeal, cracked corn, kitty litter, etc.)

Broadcast Seeding

- Well prepared seed bed (1st step in site prep)
- Surface sow small seeds
- Post-seeding: roll with cultipacker

Photos: Sarah Foltz Jordan

Planting Method: Seeding

Mechanical Seeding: Broadcasters

- Mid-large sized areas
- Easy to operate and calibrate
- ATV or Tractor
- Post-seeding: roll with cultipacker

Mechanical Seeding: Seed Drills

- For larger areas
- Calibrate equipment
- Cultipacker not needed
- Order seed packaged separately by species

Photos: Kim Gallagher, Sarah Foltz Jordan (bottom layer); Kelly Gill cultipacker and calibration on top layer)

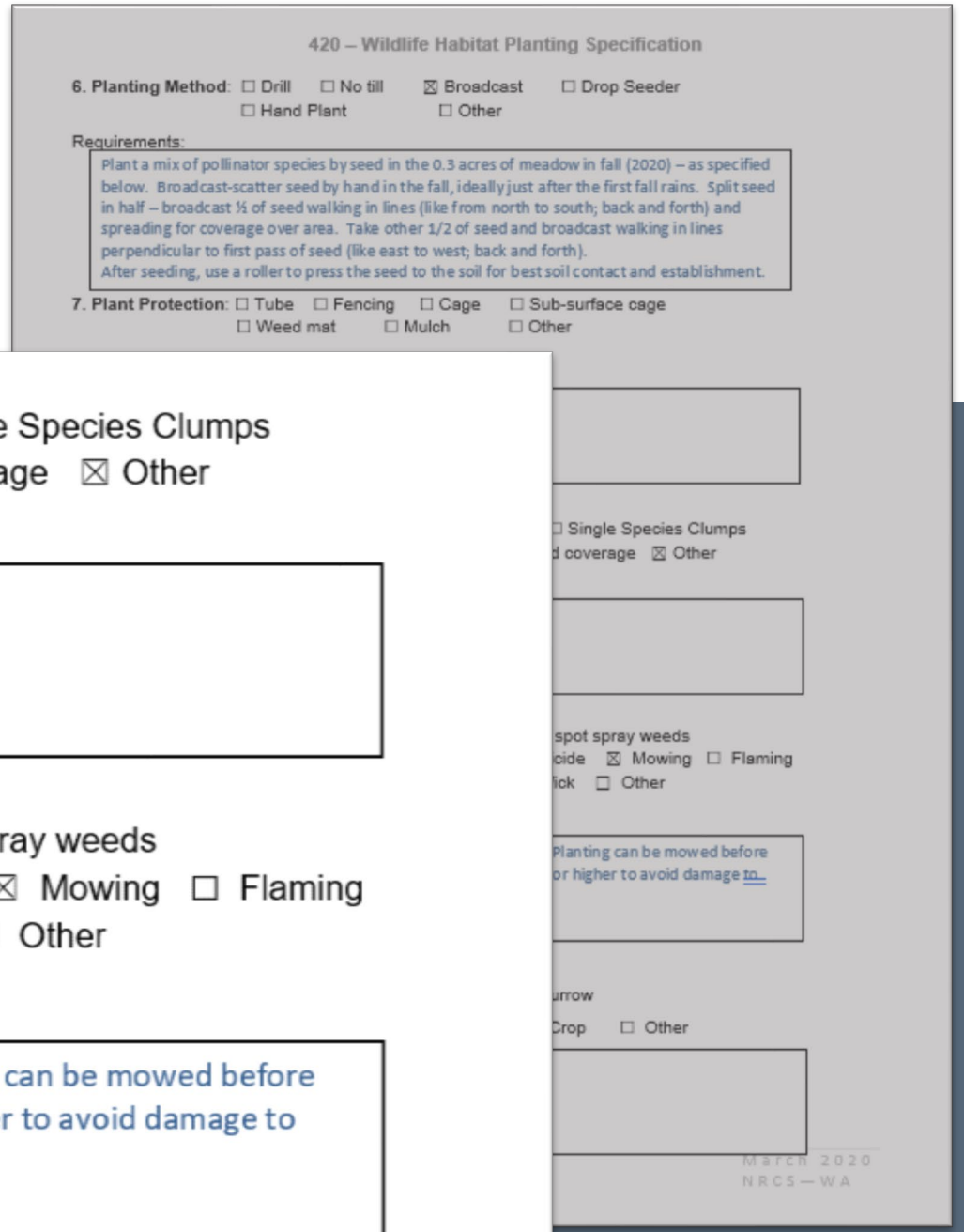
Planting Method: Transplants

Considerations:

- Native flowering shrubs, forb and grass plugs
- Spacing and container size
- Access to irrigation
- Compost, cardboard, top mulch, landscape fabric (weed mat)
- Protection from animal damage (shrub cages, temporary fencing)
- Alternate host for insect pests or diseases of crops

Photos: Tim Dunne, Kelly Gill

420 IR (Job Sheet)


420 – Wildlife Habitat Planting Specification

6. Planting Method: ☐ Drill ☐ No till ☒ Broadcast ☐ Drop Seeder ☐ Hand Plant ☐ Other

Requirements:

Plant a mix of pollinator species by seed in the 0.3 acres of meadow in fall (2020) – as specified below. Broadcast-scatter seed by hand in the fall, ideally just after the first fall rains. Split seed in half – broadcast ½ of seed walking in lines (like from north to south; back and forth) and spreading for coverage over area. Take other 1/2 of seed and broadcast walking in lines perpendicular to first pass of seed (like east to west; back and forth).
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ick ☐ Other

Planting can be mowed before
or higher to avoid damage to

urrow
Crop ☐ Other

March 2020
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8. Layout/Arrangement: ☐ Single Row ☐ Two Rows ☐ Single Species Clumps ☐ Alternate large/small shrub ☐ extended coverage ☒ Other

Requirements:

Seeds are broadcast in selected areas (see map)

9. Weed Management during establishment: ☒ Herbicide spot spray weeds ☐ Broad spectrum herbicide ☐ Grass specific herbicide ☒ Mowing ☐ Flaming ☐ String - trimming ☐ Hand weed / hoe ☐ Wick ☐ Other

Frequency:

Monitor weeds and spot spray weeds as needed. 3x per year. Planting can be mowed before less aggressive weeds go to seed. Mow at a height of 6 inches or higher to avoid damage to planted seedlings.

Photo: Xerces Society / Eric Lee Mader

Establishing Meadows

What to expect

Review:

- Site-specific recipe
- Multi-year process, requires certain equipment
- Sleep, Creep, Leap
- Requires excellent site preparation to reduce competing vegetation and exhaust weed seed bank (esp. on site with high weed pressure)

Year 1-2 after seeding – weed management:

- High mowing during establishment for weed control – each time vegetation reaches 12-18 in. trim back to 8 in. in yr 1)
- Spot-treatment of pervasive species

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Establishing Meadows: Year 1

12-April-2017 (3 harrowings)

19-May-2017 seeding

12-June-2017

3-July-2017 (mowed 6 July)

11-July-2017 (mowed 28 July)

4-Aug-2017 (mowed 15 August)

11-Sep-2017 (after 3 cuts)

3-Nov-2017

14-Dec-2017

Northeast example: Establishment time and methods will vary by region and site.

Photos courtesy of Hawthorn Valley Farmscape Ecology Program & Hudson Valley Farm .

Photo courtesy of: Hawthorn Valley Farmscape Ecology Program & Hudson Valley Farm

Establishing Meadows

What to expect

Important: Monitor and assess

- First year after planting, look for indicator species
- Continue to monitor for weeds and manage invasive species
- First detection is critical
- In years 2 and 3, more flowers and greater diversity
- Once established, wildflowers become competitive

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Establishing Meadows: Year 2

27-April-2018

25-May-2018 (selective weeding)

8-June-2018

19-June-2018

10-July-2018

18-July-2018

9-Aug-2018

13-Sept-2018

23-Oct-2018

Northeast example: Establishment time and methods will vary by region and site.

Photos courtesy of Hawthorn Valley Farmscape Ecology Program & Hudson Valley Farm .

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Establishing Meadows

Photos courtesy of: Hawthorn Valley Farmscape Ecology Program & Hudson Valley Farm

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Weed Management During Establishment

Mowing to help perennials and woody plants

- High mow in the spring
- Summer mow over perennials
- Fall mow for maintaining diversity
- Tight mow around shrubs

Hand-weeding, weed whacking,
and spot-spraying weeds
to reduce competition

Before: weedy mustards about to set seed

After mowing: wildflower seedlings can grow

Photos: Dave Williams, Eric Mader; Brianna Borders

647 for Long-Term Maintenance

- Maintaining habitat function and diversity
- Rotational-patch mow
- Only mow 1/3 of area in any given year, leave the rest standing for winter cover
- Mow in fall (may vary by region)
- Mow high
- May not need to mow every year depending on woody encroachment
- Allow for long recovery times if grazing
- Remove/spot-treat weeds as needed, time activities when species are most vulnerable
- Periodic thatch removal / haying

- Rx burning
- Rotational grazing

Photos: Dave Williams

420 IR (Job Sheet)

420 – Wildlife Habitat Planting Specification

11. Long-term Management (Operation and Maintenance):

11A. Plant Protection Maintenance Schedule:

None

11B. Weed and/or Pest Management Frequency/Duration:

Monitor weed abundance in the first three years and spot spray weeds to reduce competition.

11C. Irrigation Management Years / monitoring and maintenance schedule:

None

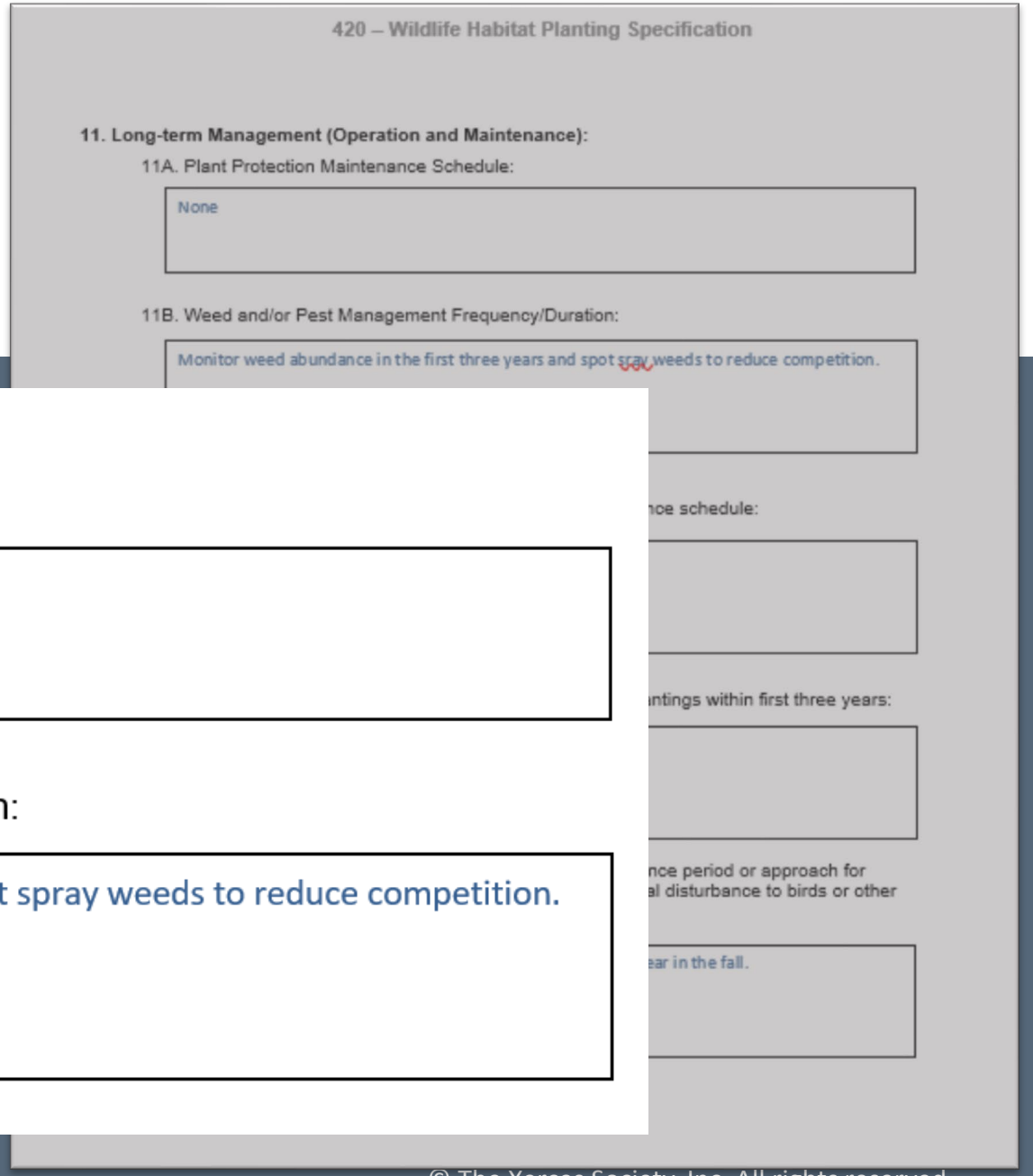
11D. Replacement strategy for dead woody or herbaceous plantings within first three years:

Re-seed areas as needed

11E. For Pollinator or Wildlife Enhancement purposes, avoidance period or approach for implementing management practices that reduce potential disturbance to birds or other wildlife:

Consider mowing less than a third or half of the habitat each year in the fall.

420 IR (Job Sheet)


420 – Wildlife Habitat Planting Specification

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11A. Plant Protection Maintenance Schedule:

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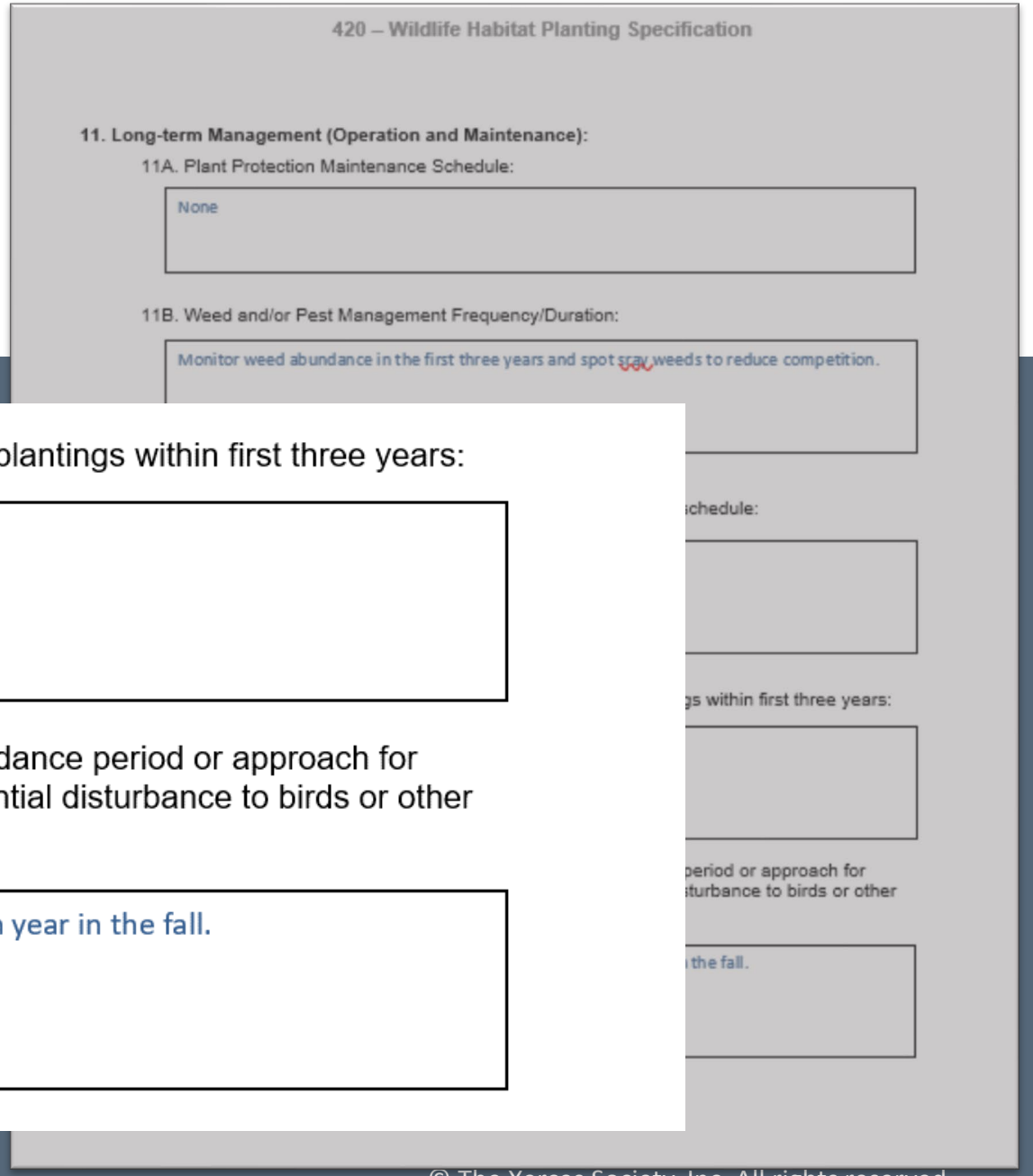

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11E. For Pollinator or Wildlife Enhancement purposes, avoidance period or approach for implementing management practices that reduce potential disturbance to birds or other wildlife:

Consider mowing less than a third or half of the habitat each year in the fall.

420 IR (Job Sheet)

12. Fertilizers, Amendments, and/or Mulch (as *needed*)

Mulch Material Category		Type	Amount
Fabric	☐		
Straw	☐		
Wood Chips	☐		
Other:	☐		

13. Fertilizer and/or Soil Amendments (as needed)

Material	Type	Formulation	Bulk lbs/acre

Requirements: (where applicable):

14. Implementation Timeline - Summary

Component/Requirement	Notes	Date(s) to complete	Done?
Order plant materials	Order Seed	Spring 2020	☐
Site prep: weed abatement	Broadcast a broad-spectrum herbicide to kill weedy pasture vegetation.	Spring, summer, and fall 2019	☐
Site prep: weed abatement	Broadcast a broad-spectrum herbicide to kill weedy pasture vegetation	Spring and fall 2020	☐
Site prep: final bed prep	Rake surface just ahead of seeding	Fall, 2020	☐
Irrigation plan complete	None – will establish with precipitation	n/a	☐
Planting period woody materials	Herbaceous species only	n/a	☐
Planting period herbaceous materials	Broadcast seed as instructed above; first fall rains; roll after seeding	Fall, 2020	☐
Install plant protection			☐
Mulch &/or fertilizer			☐
Weed management during establishment	Continue spot-spraying and mowing, as needed to control non-native and weedy plants	Winter, 2020 onward	☐
O&M plan complete	Spot spraying		☐

420 IR (Job Sheet)

14. Implementation Timeline - Summary

Component/Requirement	Notes	Date(s) to complete	Done?
Order plant materials	Order Seed	Spring 2020	☐
Site prep: weed abatement	Broadcast a broad-spectrum herbicide to kill weedy pasture vegetation.	Spring, summer, and fall 2019	☐
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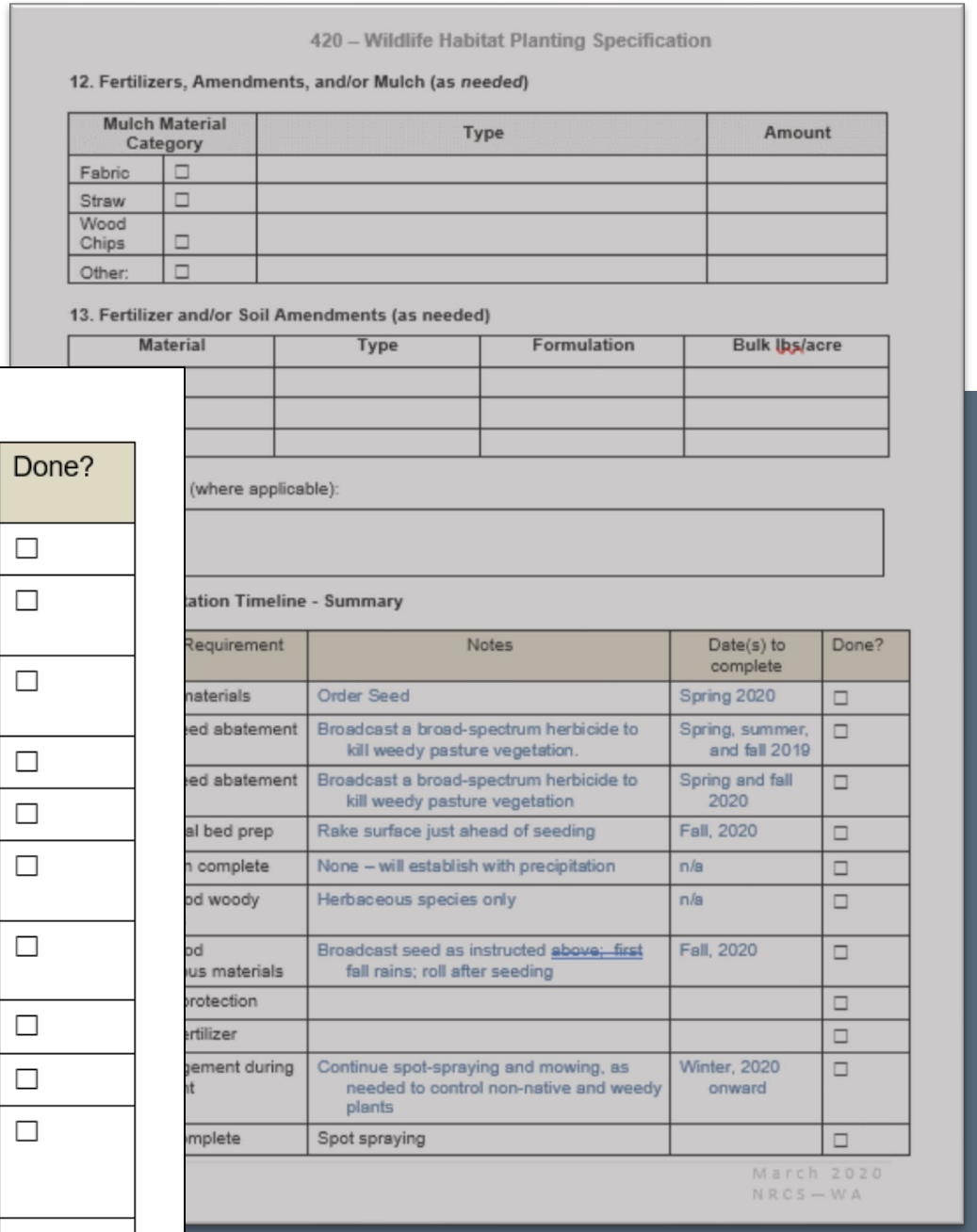
Site prep: final bed prep	Rake surface just ahead of seeding	Fall, 2020	☐
Irrigation plan complete	None – will establish with precipitation	n/a	☐
Planting period woody materials	Herbaceous species only	n/a	☐
Planting period herbaceous materials	Broadcast seed as instructed above; first fall rains; roll after seeding	Fall, 2020	☐
Install plant protection			☐
Mulch &/or fertilizer			☐
Weed management during establishment	Continue spot-spraying and mowing, as needed to control non-native and weedy plants	Winter, 2020 onward	☐
O&M plan complete	Spot spraying		☐



420 – Wildlife Habitat Planting Specification

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rotection			☐
rtilizer			☐
gement during t	Continue spot-spraying and mowing, as needed to control non-native and weedy plants	Winter, 2020 onward	☐
mplete	Spot spraying		☐

March 2020
NRCS – WA

Thoughts on Contracting Habitat Restoration Process

Photo by Justin Meissen (Flickr Creative Commons)

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Audience Poll Question #5

Have you contracted either 315 or 314 to eliminate competing weedy vegetation during the site preparation phase?

- ❑ Yes
- ❑ No

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Contracting Site Preparation

Value of setting this up as a stand-alone phase in a pollinator habitat contract.

Photo: Linda Rinta

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Contracting Site Preparation

Value of setting this up as a stand-alone phase in a pollinator habitat contract.

Photo by Anne Averille (UMass)

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Photo by Eric Mader (Xerces Society)

Herbaceous Weed Treatment (315) and Brush Management (314)

Can be contracted on all land uses EXCEPT active cropland.

Approved for the removal of weedy or competing vegetation to prepare a site for a planting practice, such as 420 or 327

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315 Waiver

IF used to address pervasive plant species on a list maintained by your state technical leads (e.g. State Biologist, Range Specialist, Plant Materials Specialist, Agronomist)

315 may be contracted up to 3 times to be able to eliminate pervasive species of concern

Photo by Leslie Mehrhoff / UCT / Bugwood

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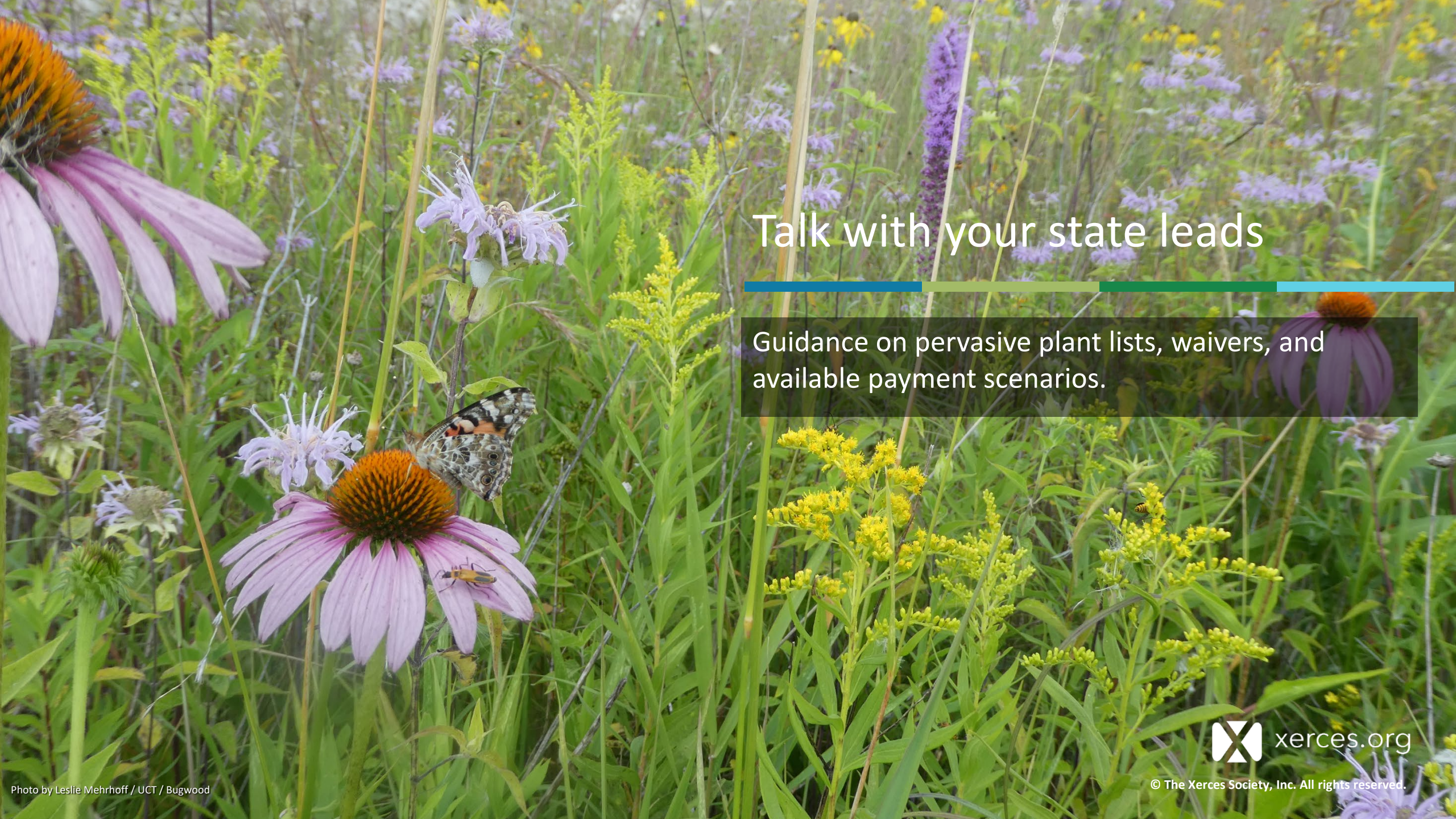

Talk with your state leads

Guidance on pervasive plant lists, waivers, and available payment scenarios.

Photo by Leslie Mehrhoff / UCT / Bugwood

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After good prep…

Planting practice…like 420 or 327

Photo by Kelly Gill (Xerces Society)

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Then when you've got habitat established…

Consider need for management practices.

Remember: If you already have decent habitat, don't destroy it for Pollinators. Start with Early Successional Habitat Management (647) or Rare and Declining Habitat (643), or other management practices, rather than removing all of the cover and starting over.

Photo: Justin Wheeler

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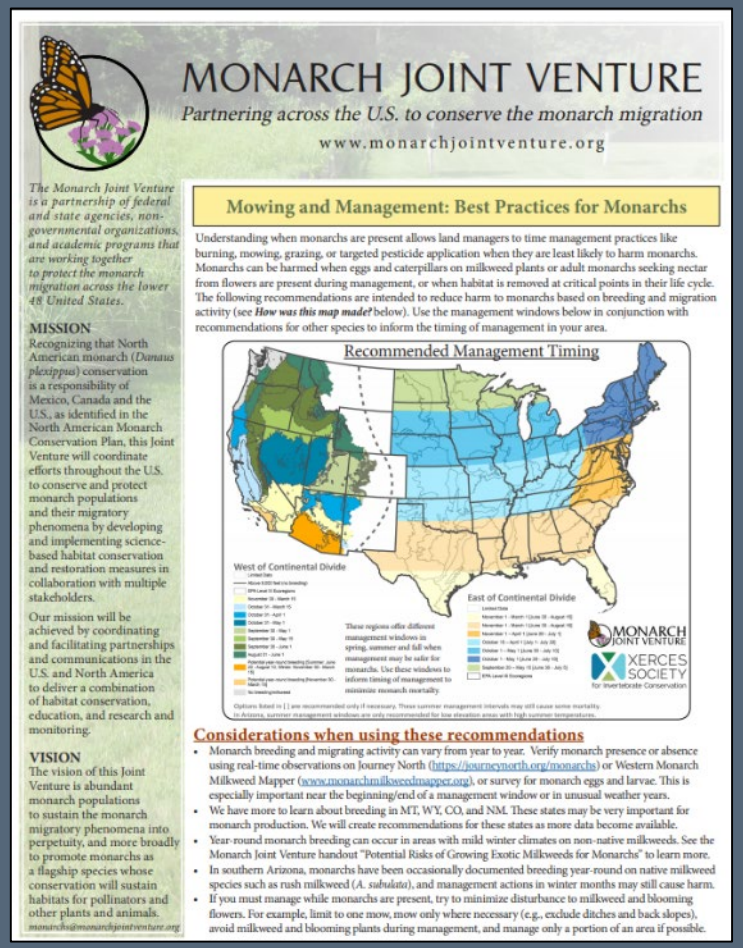
Photo: Stephanie McKnight (Xerces Society)

If you're managing good habitat

Consider timing for monarchs



MONARCH JOINT VENTURE

Partnering across the U.S. to conserve the monarch migration

www.monarchjointventure.org

The Monarch Joint Venture is a partnership of federal and state agencies, non-governmental organizations, and academic programs that are working together to protect the monarch migration across the lower 48 United States.

MISSION

Recognizing that North American monarch (*Danaus plexippus*) conservation is a responsibility of Mexico, Canada and the U.S., as identified in the North American Monarch Conservation Plan, this Joint Venture will coordinate efforts throughout the U.S. to conserve and protect monarch populations and their migratory phenomena by developing and implementing science-based habitat conservation and restoration measures in collaboration with multiple stakeholders.

Our mission will be achieved by coordinating and facilitating partnerships and communications in the U.S. and North America to deliver a combination of habitat conservation, education, and research and monitoring.

VISION

The vision of this Joint Venture is abundant monarch populations to sustain the monarch migratory phenomena into perpetuity, and more broadly to promote monarchs as a flagship species whose conservation will sustain habitats for pollinators and other plants and animals.

monarchs@monarchjointventure.org

Mowing and Management: Best Practices for Monarchs

Understanding when monarchs are present allows land managers to time management practices like burning, mowing, grazing, or targeted pesticide application when they are least likely to harm monarchs. Monarchs can be harmed when eggs and caterpillars on milkweed plants or adult monarchs seeking nectar from flowers are present during management, or when habitat is removed at critical points in their life cycle. The following recommendations are intended to reduce harm to monarchs based on breeding and migration activity (see ***How was this map made?*** below). Use the management windows below in conjunction with recommendations for other species to inform the timing of management in your area.

Recommended Management Timing

West of Continental Divide

East of Continental Divide

These regions offer different management windows in spring, summer and fall when management may be safe for monarchs. Use these windows to inform timing of management to minimize monarch mortality.

MONARCH JOINT VENTURE

XERCES SOCIETY for Invertebrate Conservation

Considerations when using these recommendations

- Monarch breeding and migrating activity can vary from year to year. Verify monarch presence or absence using real-time observations on Journey North (https://journeynorth.org/monarchs) or Western Monarch Milkweed Mapper (www.monarchmilkweedmapper.org), or survey for monarch eggs and larvae. This is especially important near the beginning/end of a management window or in unusual weather years.
- We have more to learn about breeding in MT, WY, CO, and NM. These states may be very important for monarch production. We will create recommendations for these states as more data become available.
- Year-round monarch breeding can occur in areas with mild winter climates on non-native milkweeds. See the Monarch Joint Venture handout "Potential Risks of Growing Exotic Milkweeds for Monarchs" to learn more.
- In southern Arizona, monarchs have been occasionally documented breeding year-round on native milkweed species such as rush milkweed (*A. subulata*), and management actions in winter months may still cause harm.
- If you must manage while monarchs are present, try to minimize disturbance to milkweed and blooming flowers. For example, limit to one mow, mow only where necessary (e.g., exclude ditches and back slopes), avoid milkweed and blooming plants during management, and manage only a portion of an area if possible.

https://monarchjointventure.org/images/uploads/documents/MowingForMonarchs.pdf

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Additional Resources: The USDA-NRCS

Natural Resources Conservation Service

- Technical Assistance
- Financial Support for Conservation

Find out more at:

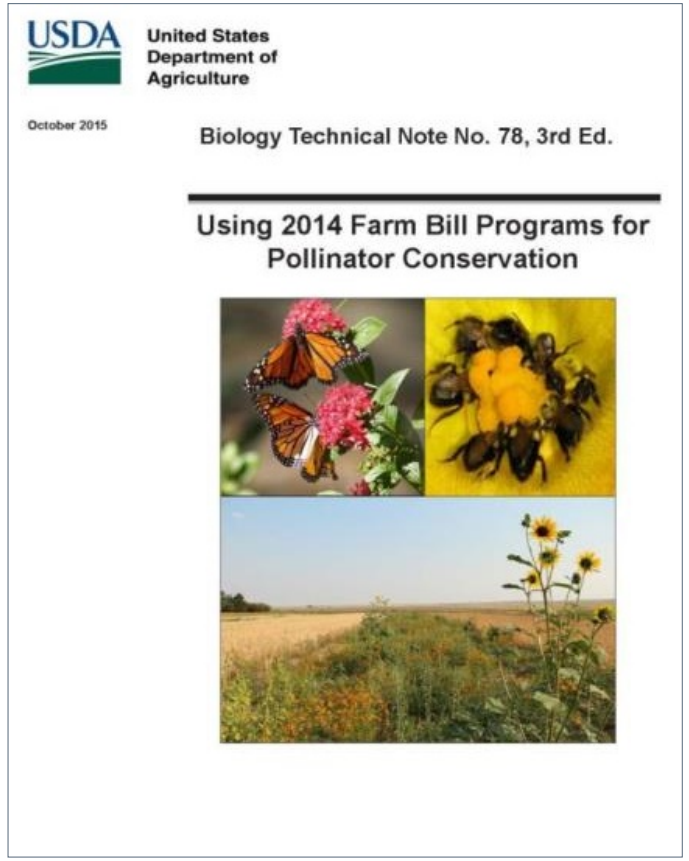
www.nrcs.usda.gov

http://plants.usda.gov/

//plants.usda.gov/pollinators/ NRCSdocuments.html

United States Department of Agriculture NRCS Natural Resources Conservation Service

- **Core Programs for Pollinators**
  - EQIP, CSP, ACEP, CRP
- **Tech Note 78**
  - Using Farm Bill Programs for Pollinator Conservation
- **Practices for Pollinators**
  - Wildlife Habitat Planting
  - Conservation Cover
  - Hedgerow Planting
  - Tree/Shrub Establishment
  - Cover Cropping
  - Forest stand improvement
  - Prescribed burning
  - Prescribed grazing
  - Early Successional Habitat Development/ Management
  - And many more…



http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=37370.wba

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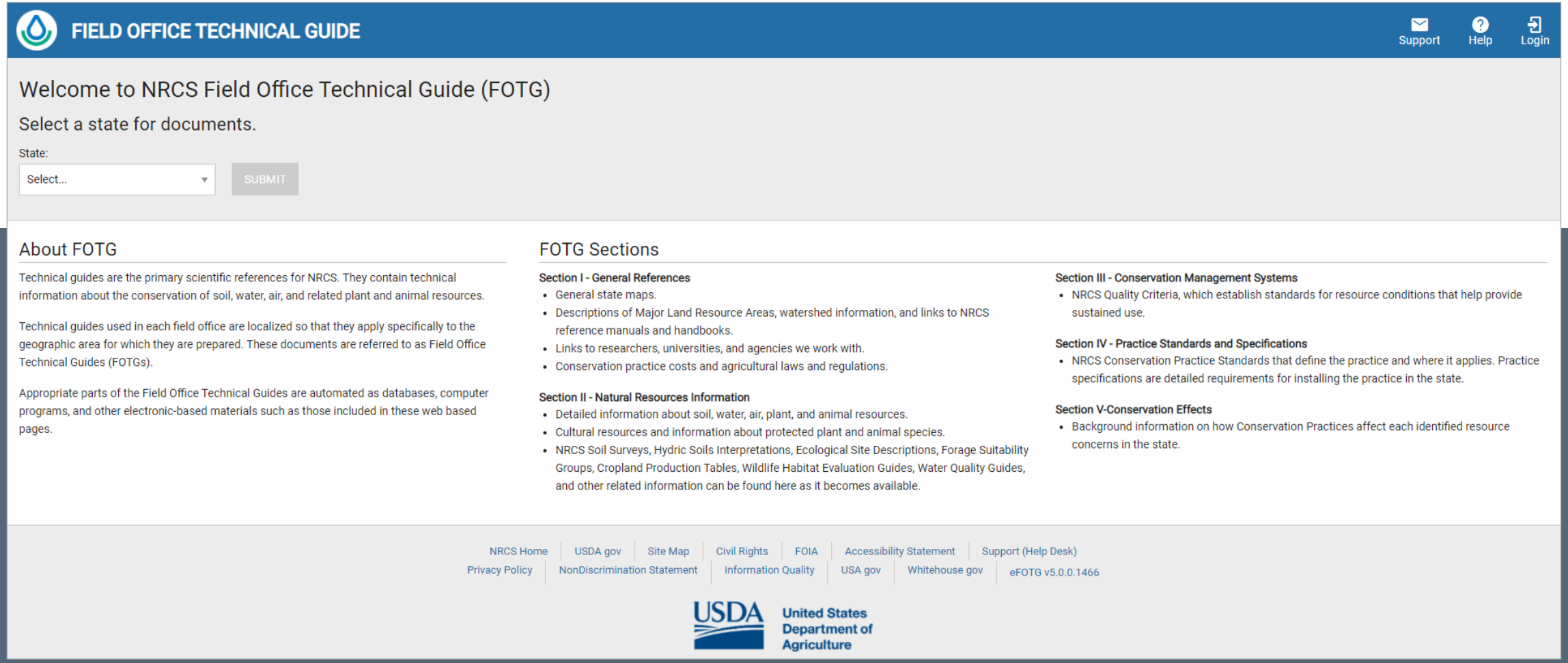
Additional Resources: The USDA-NRCS



Field Office Technical Guide (https://efotg.sc.egov.usda.gov/#/**)**

- Select your state and keyword search for pollinators, monarchs, etc.

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Guidance for planting and maintaining pollinator habitat

Resources for Selecting Plants

Use native, locally-adapted species with high pollinator value:

- Xerces' Pollinator Conservation Resource Center
  - Regional plant lists
  - Habitat installation guides
  - Habitat management guides

https://www.xerces.org/pollinator-resource-center

xerces.org

Questions? Thoughts?

We'd love to hear from you!

Mace Vaughan

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Bumble bee on rosinweed, *Silphium* sp.

Photo: Nancy Lee Adamson