

February 20, 2019

UIC Rights-of-Way as
Habitat Working
Group

An integrated approach to revegetation: new online resources for practitioners



Matt Horning, USDA Forest Service



U.S. Department of Transportation
Federal Highway Administration

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An integrated approach to revegetation: new online resources for practitioners

DRAFT!



Matt Horning, USDA Forest Service



U.S. Department of Transportation
Federal Highway Administration

A heavy lift...



U.S. Department of Transportation
Federal Highway Administration

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Shane Roberts
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Vicky Erickson
Matt Horning
Lynda Moore
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David Steinfeld (Native Restoration Consulting)



CHICAGO BOTANIC GARDEN

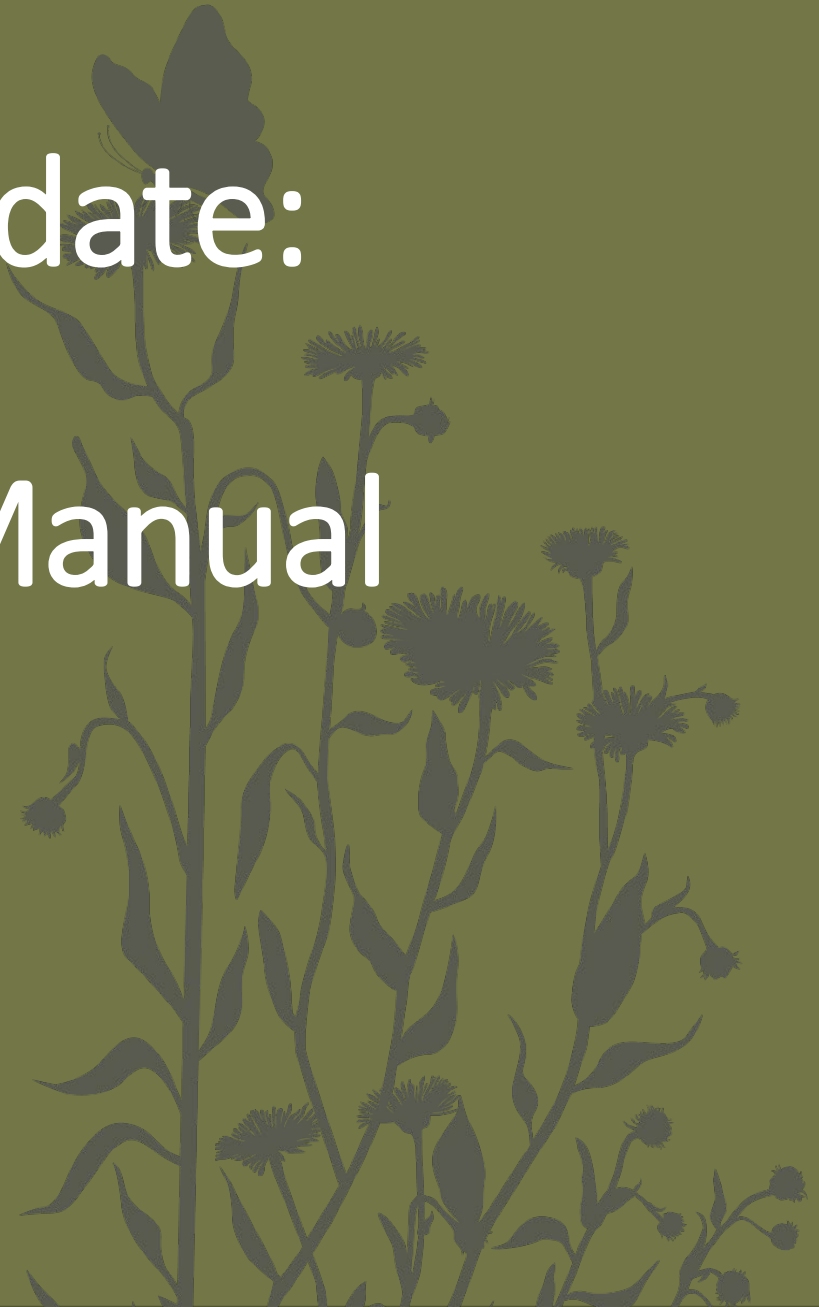
Andrea Kramer
Abbey White

ROADSIDE REVEGETATION

An Integrated Approach to Establishing Native Plants and Pollinator Habitats

Technical resource update:

FHWA Revegetation Manual



The original manual

David Steinfeld, Scott Riley, Kim Wilkinson,
Thomas Landis, and Lee Riley

- Published 2007 (424p)
- Western US-centric
- Applicable to any highly disturbed sites
- Powerful training resource

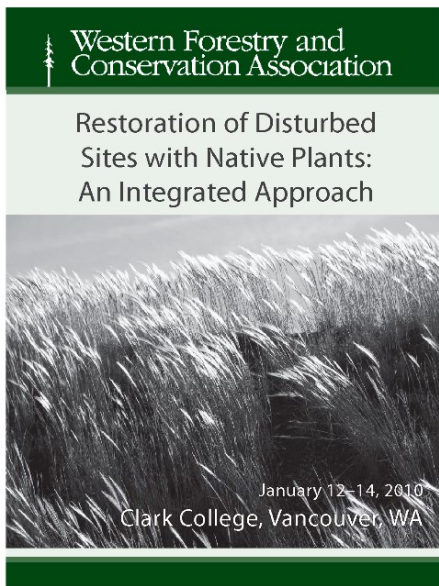
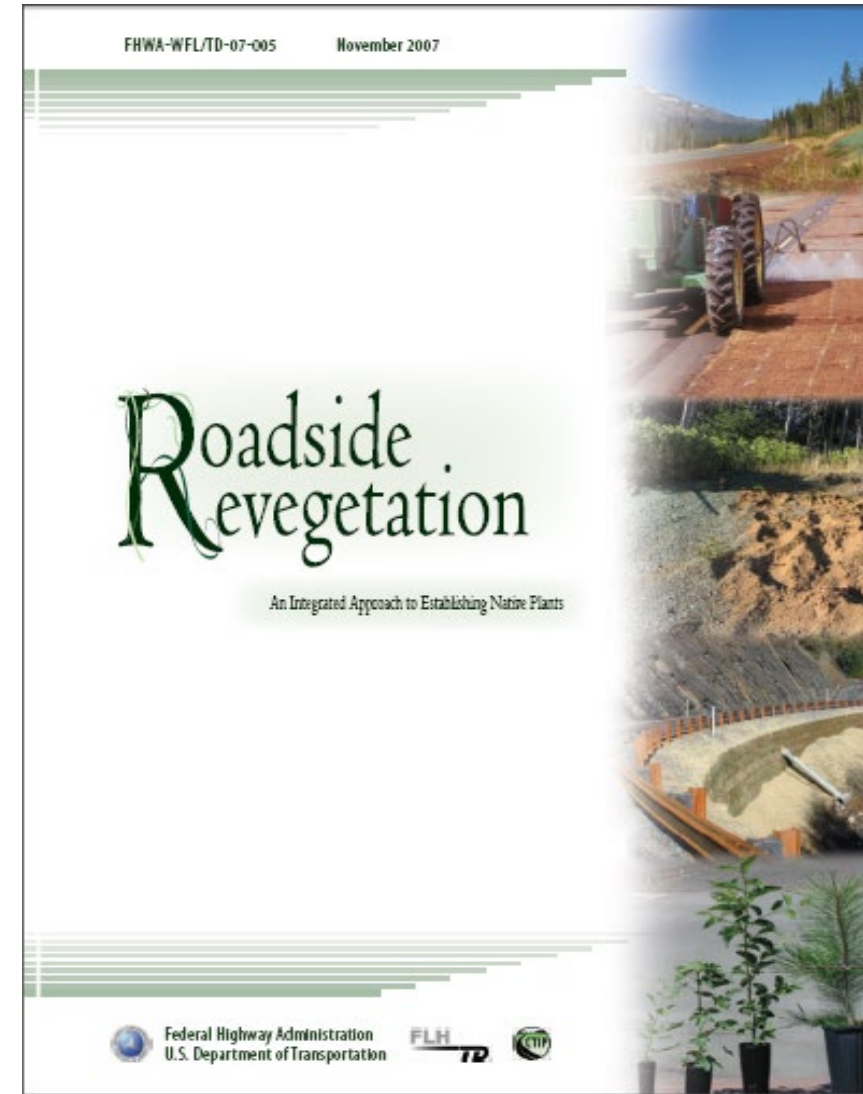


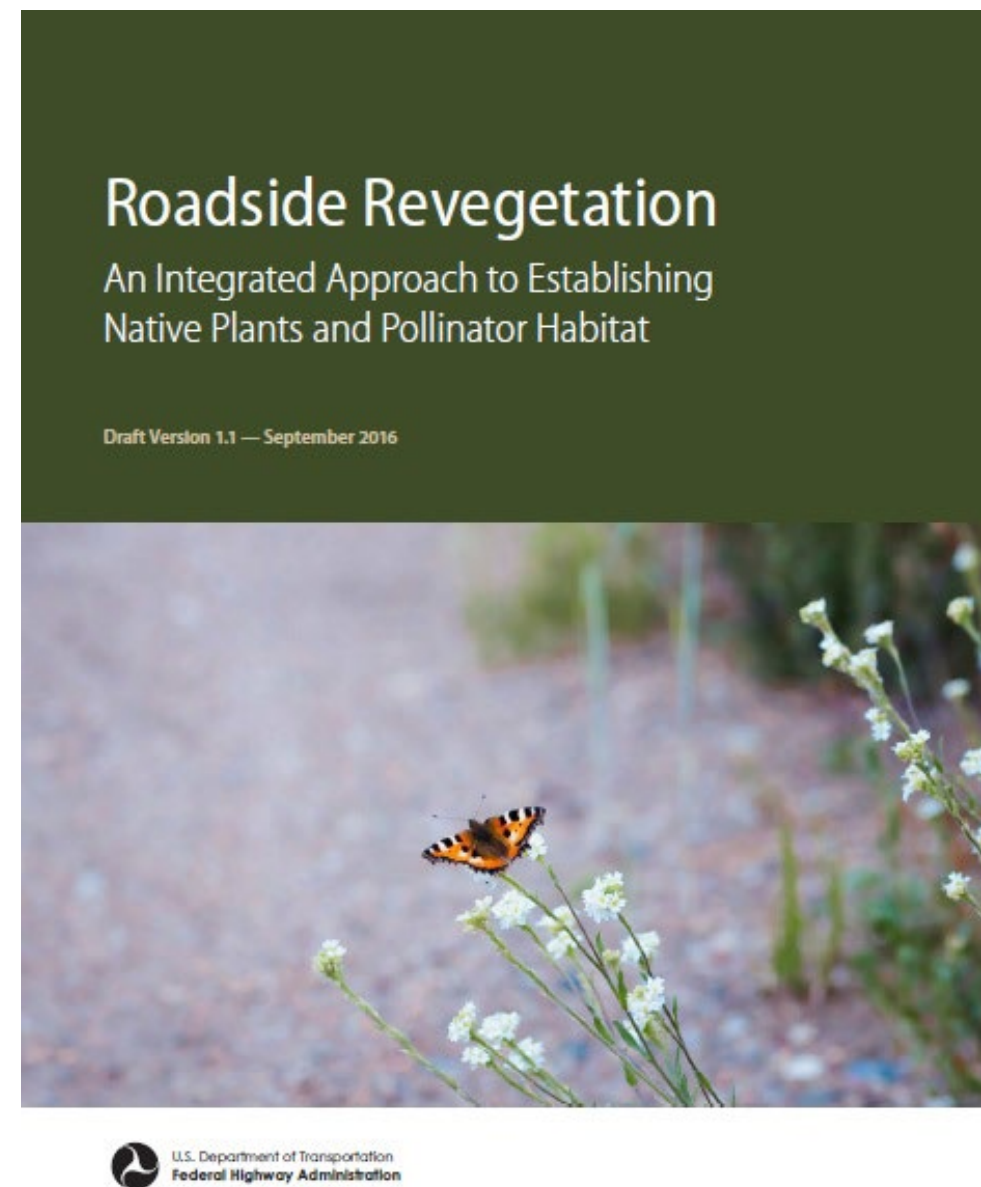
Photo credit: Kristina Bell



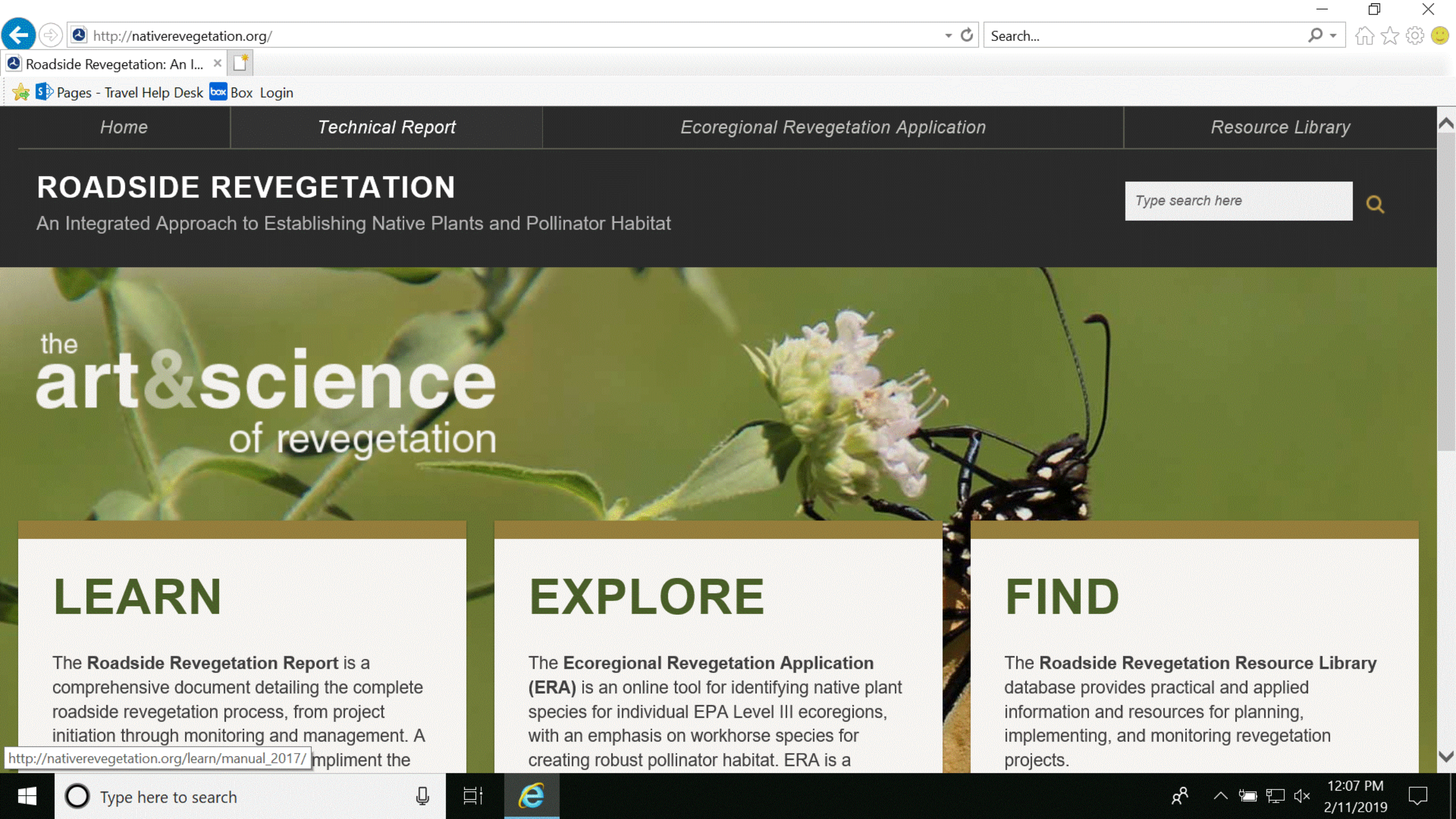
ROADSIDE REVEGETATION
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Modifications

- **National scope**
 - 10 year update
 - Regional caveats
 - Peer-reviewed
- **Discussion of pollinators and their importance**
 - Nectar and shelter needs
 - Phenology
 - Plant palette selection
- **Incorporation of FHWA and Xerces Society BMP's**
 - Pollinator-specific objectives in project design
 - Vegetation maintenance



ROADSIDE REVEGETATION
An Integrated Approach to Establishing Native Plants and Pollinator Habitats



Home

Technical Report

Ecoregional Revegetation Application

Resource Library

ROADSIDE REVEGETATION

An Integrated Approach to Establishing Native Plants and Pollinator Habitat

Type search here



the
art&science
of revegetation

LEARN

The **Roadside Revegetation Report** is a comprehensive document detailing the complete roadside revegetation process, from project initiation through monitoring and management. A

http://nativerevegetation.org/learn/manual_2017/ Implement the

EXPLORE

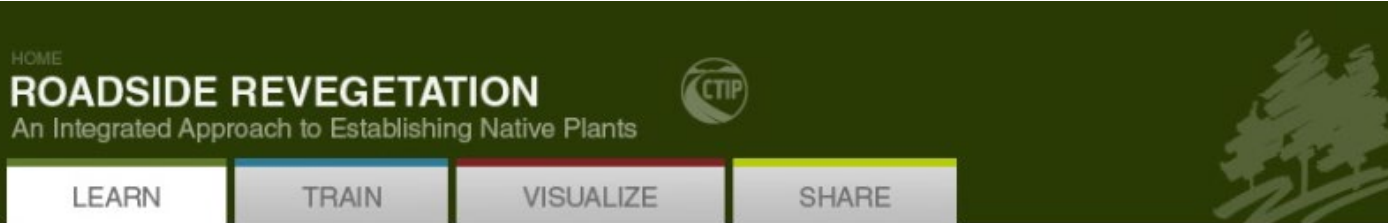
The **Ecoregional Revegetation Application (ERA)** is an online tool for identifying native plant species for individual EPA Level III ecoregions, with an emphasis on workhorse species for creating robust pollinator habitat. ERA is a

FIND

The **Roadside Revegetation Resource Library** database provides practical and applied information and resources for planning, implementing, and monitoring revegetation projects.

www.nativerrevegetation.org

revegetation guide(s)



Technical Guide » Table of Contents

 print page  download page

Table of Contents

Acronyms

Select Chapter ▼

1 Introduction

- 1.1 Introduction
- 1.2 The Ecological Effects of Roads
- 1.3 Objectives of This Report
- 1.4 Scope
- 1.5 Approach
- 1.6 How This Report is Organized
- 1.7 Summary

2 Initiation Part One: Cooperators and Processes for Road Projects

- 2.1 Introduction
- 2.2 Preliminary Tasks of Initiation
- 2.3 The Process of Road Development
- 2.4 Next Steps

3 Initiation Part Two: Road Plans and Terminology

- 3.1 Introduction
- 3.2 Reading Plans
- 3.3 Interpreting Engineering Views for Revegetation Planning
- 3.4 Understanding Technical Concepts and Terminology
- 3.5 Next Steps

4 Planning Phase One: Orient

- 4.1 Introduction
- 4.2 Step One — Define Revegetation Objectives
- 4.3 Step Two — Define and Map Revegetation Units
- 4.4 Step Three — Locate and Describe Reference Sites

Draft products:

- pdf format
- html format
- E reader flip book



Robin Christians
Todd Teuscher



Figure 3-82 | Mowing pattern can facilitate pollinator habitat
Cutting the clear zone with well-defined edge looks groomed and provides safe run-off zone.
Photo credit: Magnus Bernhardt/ODOT

- 3.1 Introduction
- 3.2 Defining Revegetation Objectives
- 3.3 Gathering Pre-field Information
- 3.4 Defining Revegetation Units
- 3.5 Identifying Reference Sites
- 3.6 Gathering Field Information
- 3.7 Defining the Desired Future Condition
- 3.8 Identifying Limiting Factors to Plant Establishment
- 3.9 Identify Factors That Affect Pollinator Habitat**

Chapter

Actual Applied Rates. Tables 5 and 6 convert what was actually applied back to pounds per acre to compare what was originally planned from Table 1. For example, 33 bales of mulch were applied in Tank 4 (shaded cell in Table 4). It is converted to actual pounds per acre as follows:

*33 * 45 (shaded cell in Table 5) * 0.95 (shaded cell in Table 6) = 1,563 lbs/ac (circled cell in Table 6)*

Compared to the original plan, this was three-quarters of the planned rates because the slurry tank was applied over a greater area than originally planned. For seed rates, this means that a one-quarter fewer seeds were applied.

Table 5

	Tackifier	Mulch	Fertilizer
Pounds per	50	45	50
Product unit	Bucket	Bale	Bags

Table 6

Tank	Map	Date	Start	Finish	ac/Tank	Water (gal)	Seed mix	Products			
								Seed	Tackifier	Mulch	SlowGro Fertilizer
								Bags/ac	Buckets/ac	Bales/ac	Bags/ac
1	A2	10/18/07	9:15	9:50	1.20	3,300	Mix 1	5.0	83	1,238	1,250
2	A2	10/18/07	10:10	10:50	1.80	3,300	Mix 1	3.3	56	825	833
3	B1	10/18/07	11:20	11:55	0.70	3,300	Mix 1	4.3	357	2,121	1,071
4	B1	10/18/07	13:00	13:35	0.95	3,300	Mix 1	3.2	263	1,563	789

5.1 Introduction

5.2 Soil and Site Treatments

5.3 Obtaining Plant Materials

5.4 Installing Plant Materials

5.5 Post-Installation Care of Plant Materials

Online application:

Ecoregional
Revegetation
Application (ERA)



Ecoregional Revegetation Application

■ Objectives

- Support the inter-agency seed strategy and pollinator health initiatives
- Support native plant materials infrastructure
- Assist revegetation practitioners in project design and implementation
- Create a utility structured around ecoregions (rather than admin boundaries)

■ Audience

- Revegetation practitioners/project designers
- All agencies/sectors - national in scope



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Ecoregional Revegetation Application

- **Data sources: pollinator-friendly species**

- Robertson 1927
- NRCS pollinator database developed by Mark Skinner
- USDA Logan Bee Lab
- Xerces Society expert opinion
- Western Hummingbird Partnership
- Pollinator Partnership (pollinator.org)
- Various literature and web sources

- **Data sources: workhorse species (use and commercial availability)**

- USDA PLANTS distribution and characteristics data
- The Chicago Botanic Garden (Abbey White and Andrea Kramer)

- **Validation with regional experts**

- USFS and BLM botanists
- State DOT landscape architects

~ 51 fields of information

Ecoregion

Height

Flower color

Showy

Flowering

Sun exposure

Soil moisture

Soil texture

Salt tolerance

Palatability

Active growth period

Pollinator value

Benefits to Pollinators

Propagation

Commercial Availability

ROADSIDE REVEGETATION

An Integrated Approach to Establishing Native Plants and Pollinator Habitats



ERA DATA

- Workhorse/Pollinator (1675)
- Pollinator (1327)
- Workhorse (889)



Family	No. of Species
Asteraceae	1166
Fabaceae	728
Poaceae	443
Rosaceae	415
"Scrophulariaceae"	389
Cyperaceae	306
Polygonaceae	206
Lamiaceae	199
Brassicaceae	192
Liliaceae	178
Apiaceae	160
Onagraceae	159
Ericaceae	137
Ranunculaceae	124
Malvaceae	123
Hydrophyllaceae	114
Boraginaceae	101
Salicaceae	94
Pinaceae	82
Cactaceae	81
Caprifoliaceae	80
Solanaceae	80
Polemoniaceae	79
Fagaceae	79
Asclepiadaceae	75
Agavaceae	69
Rhamnaceae	68
Caryophyllaceae	64

Commercial availability

- ~5600 species
- 106 ecoregions

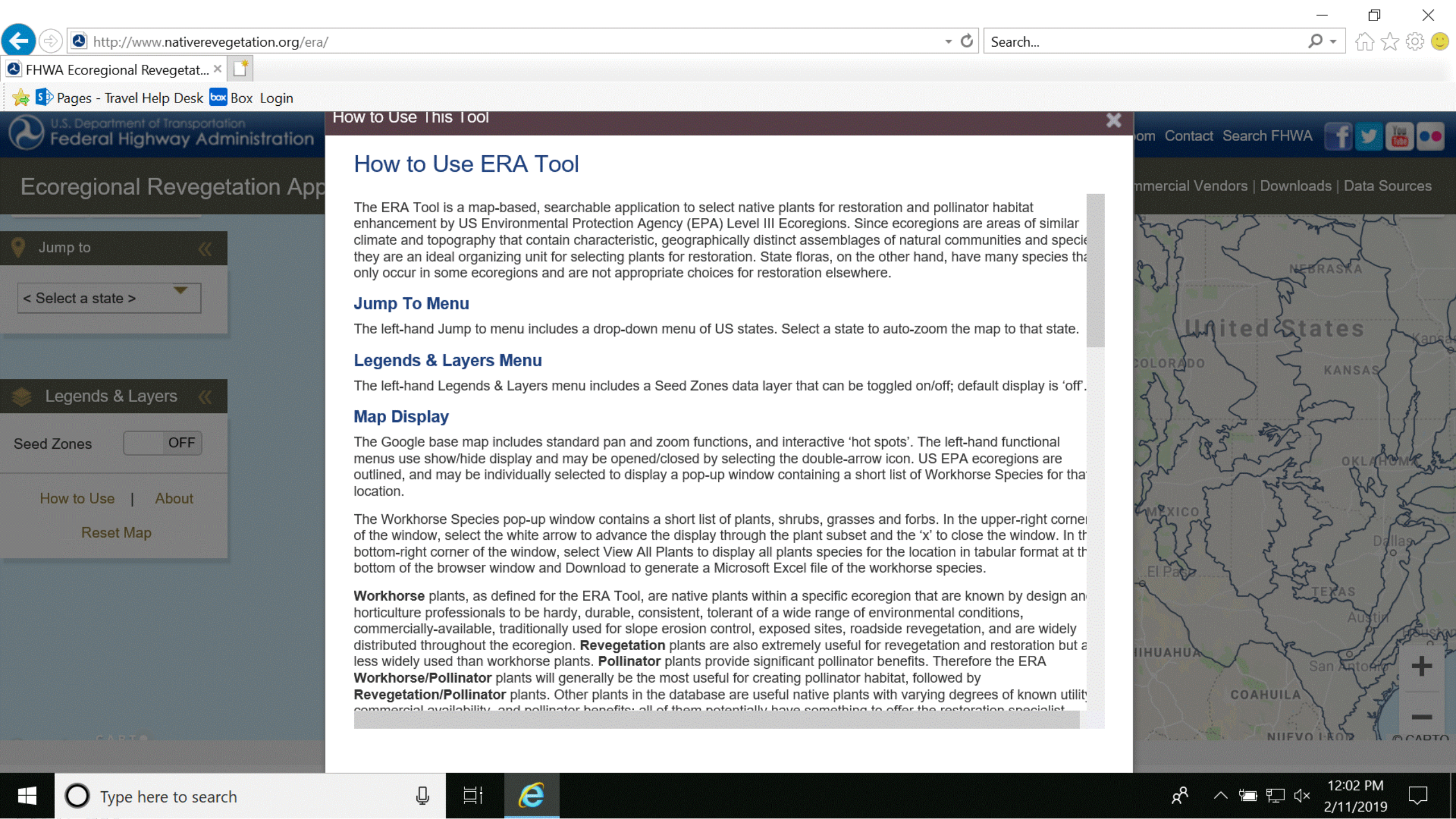
Table 3. Representation of growth habits in the commercial industry compared to the USDA PLANTS database.

Growth Habit	Commercial Production	USDA PLANTS	Proportion
Forb	2982	14432	0.21
Graminoid	762	2626	0.29
Shrub	703	1983	0.35
Tree	880	1850	0.46
Vine	195	706	0.28
Fern	98	623	0.16
Whisk-fern	1	3	0.33
Lycopod	2	104	0.02
Horsetail	8	19	0.42
Average:			0.28



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How to Use This Tool

How to Use ERA Tool

The ERA Tool is a map-based, searchable application to select native plants for restoration and pollinator habitat enhancement by US Environmental Protection Agency (EPA) Level III Ecoregions. Since ecoregions are areas of similar climate and topography that contain characteristic, geographically distinct assemblages of natural communities and species they are an ideal organizing unit for selecting plants for restoration. State floras, on the other hand, have many species that only occur in some ecoregions and are not appropriate choices for restoration elsewhere.

Jump To Menu

The left-hand Jump to menu includes a drop-down menu of US states. Select a state to auto-zoom the map to that state.

Legends & Layers Menu

The left-hand Legends & Layers menu includes a Seed Zones data layer that can be toggled on/off; default display is 'off'.

Map Display

The Google base map includes standard pan and zoom functions, and interactive 'hot spots'. The left-hand functional menus use show/hide display and may be opened/closed by selecting the double-arrow icon. US EPA ecoregions are outlined, and may be individually selected to display a pop-up window containing a short list of Workhorse Species for that location.

The Workhorse Species pop-up window contains a short list of plants, shrubs, grasses and forbs. In the upper-right corner of the window, select the white arrow to advance the display through the plant subset and the 'x' to close the window. In the bottom-right corner of the window, select View All Plants to display all plants species for the location in tabular format at the bottom of the browser window and Download to generate a Microsoft Excel file of the workhorse species.

Workhorse plants, as defined for the ERA Tool, are native plants within a specific ecoregion that are known by design and horticulture professionals to be hardy, durable, consistent, tolerant of a wide range of environmental conditions, commercially-available, traditionally used for slope erosion control, exposed sites, roadside revegetation, and are widely distributed throughout the ecoregion. **Revegetation** plants are also extremely useful for revegetation and restoration but are less widely used than workhorse plants. **Pollinator** plants provide significant pollinator benefits. Therefore the ERA **Workhorse/Pollinator** plants will generally be the most useful for creating pollinator habitat, followed by **Revegetation/Pollinator** plants. Other plants in the database are useful native plants with varying degrees of known utility, commercial availability, and pollinator benefits; all of them potentially have something to offer the restoration specialist.



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Technical Review Committee

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