

3.10 VEGETATION

3.10.1 Affected Environment

The North I-25 regional study area is within the High Plains Ecoregion with the western portion located in the Front Range Fans sub-ecoregion and the eastern portion in the Flat to Rolling Plains and Rolling Sand Plains sub-ecoregions (USGS, 2006).

What's in Section 3.10?

3.10 Vegetation

- 3.10.1 Affected Environment
- 3.10.2 Environmental Consequences
- 3.10.3 Mitigation Measures

The High Plains Ecoregion is characterized as a dry grassland, receiving 12 to 20 inches of annual precipitation. Smooth, irregular plains are the dominant characteristic of the High Plains Ecoregion, with a high percentage of land cover converted to cropland. The dominant native vegetation within the ecoregion are various grasses, such as blue grama (*Bouteloua gracilis*), little bluestem (*Schizachyrium scoparium*), buffalograss (*Bouteloua dactyloides*), and western wheatgrass (*Pascopyrum smithii*).

Biological resource data for the regional study area were collected from existing sources, such as maps, databases, publications, and agency information. This information was used to provide context of the resource in the region and to assist in assessing direct, indirect, and cumulative effects in the project area. Field studies were conducted in the project area and provide the basis for assessing common species present. Upland plant species common to the regional study area are listed in Table 3.10-1. Due to the geographical size of the regional study area and the scope of the vegetation assessments, impacts to general vegetation communities are described. Impact acreages were calculated using existing CDOT right-of-way areas and evaluation of aerial photography.

The regional study area consists primarily of urban, agricultural, and developed habitats. Native, undisturbed habitats in the regional study area are primarily fragmented areas of remnant native prairie and riparian corridors, which typically have an abundance of non-native plant species. There are also areas classified as ponderosa pine forests, xeric shrublands, and mountain grasslands. The distribution of vegetation communities in the regional study area is presented in **Table 3.10-2**.

Most of the regional study area consists of agricultural land (irrigated or dryland) and urban and developed areas. Affected by rapid development, drought, and weed infestations, vegetation is dominated by non-native plants (Noxious weeds are discussed in **Section 3.11**). Weedy kochia (*Bassia scoparia*) and various species of native and non-native grasses such as barnyard grass (*Echinochloa crus-galli*) and western wheatgrass (*Pascopyrum smithii*) are the dominant species of roadsides. Many fields along project alignments appear to be fallow and dominated by kochia. Landscaped vegetation comprised of bluegrass lawns with ornamental trees and shrubs is present in many residential and business areas.

Narrow bands of riparian vegetation are present along many streams and some irrigation canals. Wetlands also occur in many areas and the vegetation that exists in these areas is described in further detail in **Section 3.8**. Common trees along fence lines and upper riparian areas are native plains cottonwood (*Populus deltoides*) as well as non-native Chinese elm (*Ulmus pumila*) and Russian olive (*Elaeagnus angustifolia*). Wetland species typically include native sandbar willow (*Salix exigua*), cattail (*Typha sp.*), sedges (*Carex sp.*), and rushes (*Juncus sp.*) as well as non-native redtop (*Agrostis stolonifera*) and curly dock (*Rumex crispus*).

1

Table 3.10-1 Common Plant Species of the North I-25 Regional Study Area

Common Name	Scientific Name	Native/Non-native
GRASSES AND GRASS-LIKES		
Alkali sacaton	<i>Sporobolus airoides</i>	Native
Barnyard grass	<i>Echinochloa crus-galli</i>	Non-native
Blue grama	<i>Bouteloua gracilis</i>	Native
Bluegrass	<i>Poa pratensis</i>	Non-native
Buffalograss	<i>Bouteloua dactyloides</i>	Native
Cattail	<i>Typha angustifolia, T. latifolia</i>	Native
Crested wheatgrass	<i>Agropyron cristatum</i>	Non-native
Needle and thread grass	<i>Hesperostipa comata</i>	Native
Redtop	<i>Agrostis gigantea</i>	Non-native
Rush	<i>Juncus</i> sp.	Native
Saltgrass	<i>Distichlis spicata</i>	Native
Sedge	<i>Carex</i> sp.	Native
Sideoats grama	<i>Bouteloua curtipendula</i>	Native
Slender wheatgrass	<i>Elymus trachycaulus</i>	Native
Smooth brome	<i>Bromus inermis</i>	Native
Western wheatgrass	<i>Agropyron smithii</i>	Native
Feather fingergrass	<i>Chloris virgata</i>	Non-native
FORBS (BROAD-LEAVED FLOWERING PLANTS)		
Blueflax	<i>Linum perenne</i>	Native
Canada thistle	<i>Cirsium arvense</i>	Non-native
Clover	<i>Trifolium</i> sp.	Native
Common mullein	<i>Verbascum thapsus</i>	Non-native
Common sunflower	<i>Helianthus annuus</i>	Native
Curly dock	<i>Rumex crispus</i>	Non-native
Field bindweed	<i>Convolvulus arvensis</i>	Non-native
Golden aster	<i>Heterotheca</i> sp.	Native
Kochia (burningbush)	<i>Bassia scoparia</i>	Non-native
Leafy spurge	<i>Euphorbia esula</i>	Non-native
Prostrate pigweed	<i>Amaranthus albus</i>	Non-native
Prickly lettuce	<i>Lactuca serriola</i>	Non-native
Puncture vine	<i>Tribulus terrestris</i>	Non-native
Scotch thistle	<i>Onopordum acanthium</i>	Non-native
Little sunflower	<i>Helianthus pumilus</i>	Native
Yellow sweetclover	<i>Melilotus officinalis</i>	Non-native
SHRUBS		
Sandbar willow	<i>Salix exigua</i>	Native
Tamarisk	<i>Tamarix</i> sp.	Non-native
TREES		
Chinese elm	<i>Ulmus pumila</i>	Non-native
Plains cottonwood	<i>Populus deltoides</i> subsp. <i>monilifera</i>	Native
Russian olive	<i>Elaeagnus angustifolia</i>	Non-native

Source: Nomenclature follows USDA Plants database, accessed at <http://plants.usda.gov/>.

1 **Table 3.10-2 Distribution of Vegetation Types**

County	Primary Upland Vegetation Types	Primary Riparian Areas
Adams	Urban	Clear Creek
Broomfield	Urban, some irrigated and dryland agriculture	None
Boulder	Mostly urban, irrigated agriculture, and native prairie; ponderosa pine, foothills and mountain grassland	None
Denver	Urban	South Platte River
Larimer	Urban, some irrigated and dryland agriculture	Cache la Poudre, Big Thompson River, Little Thompson River
Weld	Urban, some irrigated and dryland agriculture	Big Thompson River, South Platte River, St. Vrain Creek

2 The following description of vegetation types was primarily derived from the Colorado Natural
3 Diversity Information Source (NDIS) data, combined with field observations.

4 **Urban.** These areas are characterized by high density commercial or high density residential
5 development. Urban environments generally lack natural vegetative habitats, and vegetation
6 present in these areas is comprised of landscaped and cultivated plants.

7 **Dryland/Irrigated Agriculture.** These areas are characterized by row crops, irrigated pasture
8 and hay fields, and dry farm crops.

9 **Native Prairie.** Prairie habitat is dominated by grasses and forbs such as crested wheatgrass,
10 buffalograss, sideoats grama, blueflax, and golden aster. Prairie habitat in eastern Colorado is a
11 valuable resource for wildlife, and is home to several endangered species of plants and animals
12 (see **Section 3.12** and **Section 3.13** for further discussion). Two such endangered plant
13 species are the Colorado butterfly plant (*Gaura neomexicana* subsp. *coloradensis*) and Ute
14 ladies'-tress orchid (*Spiranthes diluvialis*). Much of this habitat has been converted to agricultural
15 land or has been converted to residential and commercial areas. Native prairie habitat within the
16 regional study area is fragmented and sparse.

17 **Ponderosa Pine.** Stands of Ponderosa Pine are found along the western edge of the regional
18 study area, and provide various important ecological functions. Ponderosa Pines are a valuable
19 food resource to a variety of animals and provide shelter. Grasses like slender wheatgrass
20 (*Elymus trachycaulus*), needle and thread (*Hesperostipa comata*), and other wildflower species
21 cover the floor of these forests.

22 **Mountain Grassland.** Montane grasslands exist along the western edge of the regional study
23 area along the Front Range and are dominated by native grasses such as western wheatgrass
24 and blue grama. Mountain grasslands provide important habitat for grazing and serve as
25 movement corridors for mountain wildlife.

26 **Riparian Woodland.** Riparian habitats are those areas associated with streams and other water
27 bodies that have distinctly different vegetation due to the presence of surface water or
28 groundwater. Riparian habitat supports a higher diversity of resident wildlife than any other habitat
29 in the Front Range and many of the species that occur exclusively inhabit wetlands or riparian
30 environments. Riparian habitats provide various important ecological functions for resident and

migratory wildlife species, such as nesting opportunities and travel corridors for populations of breeding and migratory avian species. Riparian corridors also link wildlife populations in areas of high quality habitat, allowing movement through the urban environment. Amphibians and many reptile species occur most frequently in riparian habitats and corridors as well. Representative species include plains cottonwood (*Populus deltoides*), sandbar willow, cattail, and various rushes and sedges.

3.10.2 Environmental Consequences

This section addresses vegetation communities along North I-25 that could be affected by the No-Action Alternative or either of the build packages. Native vegetation and riparian habitat along streambanks are protected under conditions of the Senate Bill (SB) 40 permit, regulated by the Colorado Department of Wildlife (CDOW). Special concern species that are listed as federally threatened and endangered are regulated by the US Fish and Wildlife Service (USFWS) and are documented in **Section 3**. Species of special concern in the State of Colorado are listed in a database maintained by the Colorado Natural Heritage Program at Colorado State University. Coordination with the USFWS would be necessary if any species of special concern were identified within the project area.

3.10.2.1 NO-ACTION ALTERNATIVE

The No-Action Alternative includes major and minor structure rehabilitation, replacement or rehabilitation of existing pavement, and minor safety modifications by 2030. These actions would take place regardless of whether any of the proposed improvements in Packages A or B occur. The No-Action Alternative is described in detail in **Chapter 2**.

The No-Action Alternative generally would have only a minimal effect on existing vegetation resources. Existing conditions described in **Section 3.8.1** would continue. With increasing traffic volumes and continuing commercial and residential development in the project area, some effects to vegetation would be expected. Effects from existing or increasing development on vegetation could include population fragmentation, reductions in riparian zones, and ground and soil disturbance which could promote increased germination of noxious weed populations.

3.10.2.2 PACKAGE A

Package A includes safety improvements, construction of additional general purpose lanes on I-25, structure upgrades, and the implementation of commuter rail and bus service. This alternative is described in detail in **Chapter 2**.

Safety Improvements

Under Package A, improvements would occur between SH 1 and SH 14 (A-H1). Safety improvements for Package A would generally affect agricultural and urban landscape vegetation communities.

Direct Impacts—Implementation of safety improvements between SH 1 and SH 14 (A-H1) would result in removal of minor areas of irrigated and dryland pasture, and urban landscape vegetation. Impacts would not be anticipated to extend beyond the existing I-25 right-of-way.

1 **Indirect Impacts**—Safety improvements to the roadway and associated structures would have no
2 indirect impact on existing vegetation communities. Temporary impacts could include ground and
3 soil disturbance allowing for potential germination and invasion of noxious weed species.

4 *General Purpose Lanes*

5 Under Package A, one additional northbound general purpose lane and one additional southbound
6 general purpose lane would be constructed between SH 14 and SH 60 plus auxiliary lanes between
7 Harmony Road and SH 60 (A-H2) and between SH 60 and E-470 (A-H3). Implementation of the
8 general purpose lanes for Package A would generally affect riparian woodlands, emergent and
9 scrub/shrub wetlands, agricultural, and urban landscape vegetation. Wetland impacts are further
10 discussed in **Section 3.8.2**.

11 **Direct Impacts**—Anticipated direct impacts from the development of general purpose and auxiliary
12 lanes would include the removal of approximately 860 acres of riparian, woodland, agricultural,
13 urban landscape, and various wetland vegetation communities. Impacts would be expected from fill
14 placement during construction of transportation improvements and damage by construction
15 equipment. These areas contain large trees along the roadside and various bodies of open water
16 that lie within the alignment with associated emergent wetland habitat.

17 **Indirect Impacts**—The addition of a highway lane on either side of the roadway would increase
18 impervious surfaces, thereby increasing runoff and exposing the surrounding vegetation to higher
19 levels of pollutants. Soil disturbance from construction equipment could also create favorable
20 conditions for weedy species to establish. Other indirect impacts would include the reduction or
21 elimination of upland tree and/or shrub buffers between the proposed roadway and vegetation areas
22 adjacent to perennial and intermittent waterways. Buffers filter pollutants before they reach wetlands,
23 streams, and lakes and also provide habitat for wildlife.

24 *Structure Upgrades*

25 Package A would provide structural upgrades between E-470 and US 36 (A-H4). Upgrades under
26 Package A would generally affect urban landscape vegetation.

27 **Direct Impacts**—Construction equipment and installation of upgrades could have minor impacts on
28 existing vegetation located adjacent to and beneath existing structures. Direct impacts could occur in
29 the form of clearing and grading within the proximity of the structure being improved.

30 **Indirect Impacts**—The structure upgrades would have no indirect impact on existing vegetation
31 communities. Temporary impacts could include ground and soil disturbance allowing for potential
32 germination and invasion of noxious weed species.

33 *Commuter Rail*

34 Package A includes the construction of a double-tracked commuter rail line using the existing BNSF
35 railroad track plus one new track from Fort Collins to downtown Longmont (A-T1). Also included
36 would be a new double-tracked commuter rail line that connects this point to the FasTracks North
37 Metro end-of-line station in Thornton (A-T2). Commuter rail development would generally affect
38 native prairie, agricultural and urban landscape vegetation.

1 **Direct Impacts**—Development of the proposed commuter rail would result in the removal of
2 approximately 107 acres of vegetation in fragmented parcels of native prairie, some of which is
3 inhabited by prairie dogs. Native and non-native grasses, along with several species of flowering
4 plants, would be affected, although these areas contain a larger amount of non-native and weedy
5 species due to past and present land use practices. Vegetation most affected along this
6 component would be that of landscaped trees in developed residential areas and agricultural
7 lands that lie within the alignment.

8 **Indirect Impacts**—The addition of a rail line would increase impervious surfaces, thereby
9 increasing runoff and exposing the surrounding vegetation to higher levels of pollutants. Soil
10 disturbance from construction equipment could also create favorable conditions for weedy
11 species to establish. Other indirect impacts would include the reduction or elimination of upland
12 tree and/or shrub buffers between the proposed alignment and vegetation areas adjacent to
13 perennial and intermittent waterways and the potential introduction of weed species. Buffers filter
14 pollutants before they reach wetlands, streams, and lakes and also provide habitat for wildlife.

15 Indirect impacts resulting from project induced growth, transit oriented development, and carpool
16 lots are discussed within **Section 3.1.5**.

17 *Commuter Bus*

18 Package A includes the addition of commuter bus service between Greeley, Denver, and Denver
19 International Airport (DIA) (A-T3 & A-T4). Because no widening of existing roadways is required,
20 commuter bus service would not result in direct or indirect impacts to existing vegetation
21 communities.

22 **3.10.2.3 PACKAGE B**

23 Package B includes safety improvements, construction of tolled express lanes on I-25, and the
24 implementation of bus rapid transit service. This alternative is described in detail in **Chapter 2,**
25 *Alternatives*.

26 *Safety Improvements*

27 Safety improvements under Package B are the same as those associated with Package A.
28 Therefore, impacts associated with this component would be the same under Package B as
29 under Package A.

30 *Ttolled Express Lanes*

31 Under Package B, a northbound and southbound tolled express lane would be constructed from
32 SH 14 to SH 60 (B-H2), SH 60 to E-470 (B-H3), and E-470 to US 36 (B-H4); the exception being
33 the section between Harmony Road and SH 60, which would include two tolled express lanes in
34 each direction. Construction of tolled express lanes would generally affect riparian woodlands,
35 emergent and scrub/shrub wetlands, agricultural and urban landscape vegetation. Wetland
36 impacts are further discussed in **Section 3.8.2**.

37 **Direct Impacts**—Anticipated direct impacts to this area include removal of approximately 774 acres
38 of riparian woodland, agricultural, urban landscape, and various wetland vegetation communities.
39 Impacts would be expected as a result of fill placement caused by construction of transportation
40 improvements and damage by construction equipment. These areas contain some trees along the
41 roadside and various bodies of open water that lie within the alignment with associated emergent
42 wetland habitat.

1 **Indirect Impacts**—The addition of a highway lane on either side of the roadway would increase
2 impervious surfaces, thereby increasing runoff and exposing the surrounding vegetation to higher
3 levels of pollutants. Soil disturbance from construction equipment could also create favorable
4 conditions for weedy species to establish. Other indirect impacts would include the reduction or
5 elimination of upland tree and/or shrub buffers between the proposed roadway and vegetation areas
6 adjacent to perennial and intermittent waterways. Buffers filter pollutants before they reach wetlands,
7 streams, and lakes and also provide habitat for wildlife.

8 ***Bus Rapid Transit***

9 Package B includes the addition of bus rapid transit from Fort Collins and Greeley to Denver and to
10 DIA (B-T1 & B-T2). Bus rapid transit would not result in direct or indirect impacts on existing vegetation
11 communities.

12 **3.10.2.4 IMPACTS FROM INDUCED GROWTH**

13 Impacts to environmental resources as a result of induced growth caused by the construction of
14 either build package including transit oriented development, and carpool lots are discussed within
15 **Section 3.1.5.2.**

16 **3.10.3 Mitigation Measures**

17 CDOT revegetation best management practices (BMP) and guidelines will be followed to ensure
18 adequate revegetation of the project area. All disturbed areas will be seeded in phases
19 throughout construction. Although specific BMPs to be used will not be determined until final
20 design, mitigation measures will include:

- 21 ▶ Minimize the amount of disturbance and limit the amount of time that disturbed locations are
22 allowed to be non-vegetated. The project will follow CDOT standard specifications for the
23 amount of time that disturbed areas are allowed to be non-vegetated.
- 24 ▶ Avoid existing trees, shrubs, and vegetation to the maximum extent possible, especially
25 wetlands and riparian plant communities. The project team will coordinate with the CDOT
26 landscape architect before construction to determine the types of vegetation that will be
27 protected during construction.
- 28 ▶ Salvage weed-free topsoil for use in seeding.
- 29 ▶ Implement temporary and permanent erosion control measures to limit erosion and soil loss.
30 Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to
31 promote the establishment of vegetation. Slopes will be roughened at all times.
- 32 ▶ Revegetate all disturbed areas with native grass and forb species. Seed, mulch, and mulch
33 tackifier will be applied in phases throughout construction.
- 34 ▶ Develop an acceptable revegetation plan with the CDOT landscape architect and with county
35 personnel in Adams, Boulder, Broomfield, Denver, Larimer, and Weld counties.
- 36 ▶ Senate Bill 40 (33-5-101-107, CRS 1973 as amended) requires any agency of the state to
37 obtain wildlife certification from the CDOW when the agency plans construction in "...any
38 stream or its bank tributaries...". In these areas, trees and shrubs are recommended to be
39 replaced on a 1:1 basis (trees) and square-foot basis (shrubs).

THIS PAGE INTENTIONALLY LEFT BLANK.