



WEST DAVIS
CORRIDOR

Wildlife Assessment Methodology – Existing Conditions

Technical Memorandum 9
in support of the
Environmental Impact Statement

West Davis Corridor Project

Federal Highway Administration
Utah Department of Transportation



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Prepared by
HDR Engineering, Inc.
3949 South 700 East, Suite 500
Salt Lake City, UT 84107

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Contents

1.0	PURPOSE OF THIS TECHNICAL MEMORANDUM	1
2.0	PROJECT OVERVIEW	1
3.0	INTRODUCTION TO THE STUDY AREA	3
3.1	Methods Used To Acquire Existing Information	3
3.1.1	Task 1 – Initial Identification of Habitats (Office Studies)	3
3.1.2	Task 2 – Field Work and Assessment.....	4
4.0	PROPOSED ANALYSIS METHODOLOGY	6
5.0	REFERENCE	7
	APPENDIX A – RAPID ASSESSMENT CHECKLIST	8



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1.0 Purpose of This Technical Memorandum

The purpose of this technical memorandum is to document the methodology that the Federal Highway Administration (FHWA), the Utah Department of Transportation (UDOT), and UDOT's consultants will use to characterize fish, wildlife, and sensitive species and their habitat in the West Davis Corridor (WDC) study area. This methodology was developed in coordination with the U.S. Army Corps of Engineers (USACE), the U.S. Fish and Wildlife Service (USFWS), the Utah Division of Wildlife Resources (UDWR), and the U.S. Environmental Protection Agency (EPA).

This memorandum explains the methodologies that will be used to gather and characterize information about the affected environment in the study area, information that will then be used in the Environmental Impact Statement (EIS) to analyze the impacts of the WDC Project.

This memorandum also briefly summarizes the analysis that will be performed to evaluate the impacts of the project's build alternatives on wildlife. The methodology of the approach for analyzing the impacts of the build alternatives on wildlife and their habitats will be provided after the data are collected. This memorandum provides only a summary of the impact analysis methods that are being considered in order to help identify the appropriate existing wildlife data that will be collected in the study area.

2.0 Project Overview

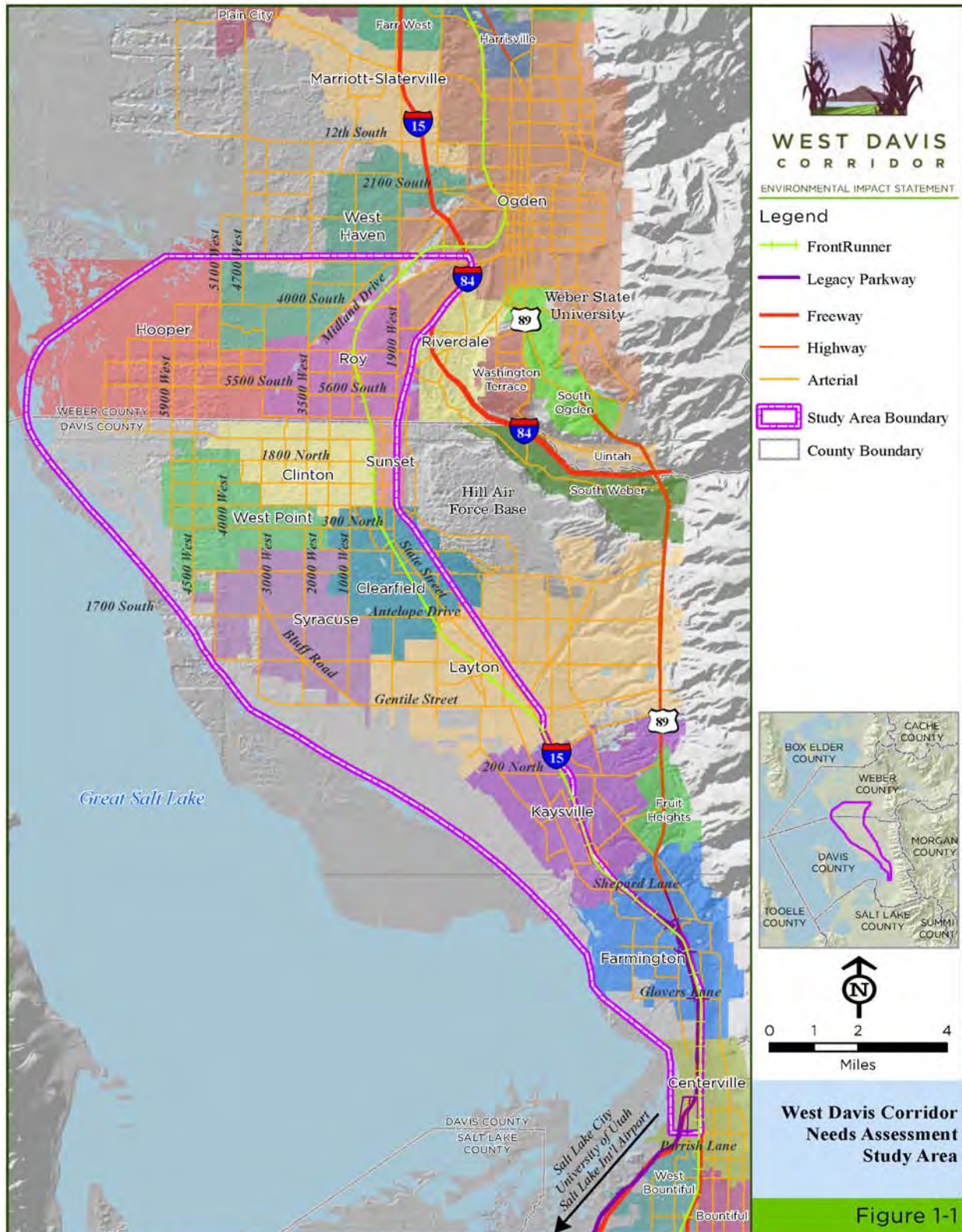
FHWA, in cooperation with UDOT, is in the process of preparing an EIS on a proposed action to address projected transportation demand in western Davis and Weber Counties. The study area for the project is from Centerville in the south to 3000 South in Hooper and West Haven in the north and from the Great Salt Lake on the west to Interstate-15 (I-15) on the east (see Figure 1 below).

Alternatives to be considered include:

- Taking no action (no-build)
- Transportation system management
- Build alternatives for various modes of transportation
- Other alternatives identified during the study process

The WDC EIS wildlife study area, which includes the smaller wetland study area, covers about 35,750 acres on the west side of I-15. As part of the EIS, direct, indirect, and cumulative impacts to wildlife resources will be evaluated.

Figure 1. West Davis Corridor Needs Assessment Study Area



3.0 Introduction to the Study Area

The WDC study area is adjacent to the Great Salt Lake. The Great Salt Lake and the wetlands surrounding its shoreline provide important habitat for a great variety of amphibians, reptiles, birds, and mammals, some of which are rare and have small geographical distributions. The Great Salt Lake supports a rich and dynamic biological system of regional, national, and global importance.

Having no outlet, the lake water varies in both elevation and salinity over time due to the combined effects of freshwater flowing in from four rivers (Bear, Weber, Ogden, and Jordan), precipitation, and groundwater and outflow from evaporation. This variation in water level influences the nutrient base and habitats for plants, invertebrates, reptiles, amphibians, mammals, and birds. The variation also creates a mosaic of habitats including wetlands (ranging from freshwater to hyper-saline playas), shorelines, and uplands.

Because of the breadth and abundance of shorebirds at the Great Salt Lake, it is designated as a Hemispheric Site of Importance by the Western Hemisphere Shorebird Reserve Network. Birds of regional, national, and international importance are drawn to its 15,000 square miles of water environment, remote islands, shoreline, and 400,000 acres of wetlands. An estimated 5 million birds representing 257 species rely on the lake for resident feeding and sanctuary, breeding, or migratory stopovers (WHSRN, no date).

The project study area is located between the Great Salt Lake Shorelands Preserve and I-15 and contains a mix of wetland and upland areas. Much of this area between the Great Salt Lake Shorelands Preserve and I-15 to the east has been either modified for agriculture (such as being cleared, ditched, drained, leveled, or irrigated) or developed for residential or commercial uses. This area also contains a variety of drainages including irrigation canals, streams, and rivers that flow generally from the east to the west and into the Great Salt Lake.

3.1 Methods Used To Acquire Existing Information

The analysis and methodology presented in this memorandum will be used to characterize existing fish and wildlife and their habitat in the WDC study area. The following methods will be used to acquire information on migratory birds, upland and wetland habitats, and special-status species in the study area.

3.1.1 Task 1 – Initial Identification of Habitats (Office Studies)

Species Identification

The project team will compile lists of all sensitive species, defined by and including but not limited to Endangered Species Act (ESA)-listed species, state-listed sensitive species, conservation agreement species, birds of conservation concern, Wildlife Action Plan species, and Partners in Flight priority species that could be found in or adjacent to the project study area. Available data from scientific literature, state and federal wildlife data, and conservation organization data for the area will be gathered and used by the team biologists to identify

known or potential habitats for the sensitive wildlife species. These known or potential habitats will be determined based on ecological criteria such as breeding and foraging needs, migratory status and use, and general habitat requirements. Habitat needs for individual species will be characterized from readily available, published data and the professional opinion of staff biologists. Identified habitats of importance to sensitive species will then be used to guide the habitat delineation.

Geographic Information Systems (GIS) Mapping

Known GIS data layers that will be used to determine sensitive species habitats will include but will not be limited to National Wetland Inventory (NWI) wetland layers, Utah Division of Wildlife Resources (UDWR) Automated Geographic Reference Center (AGRC) wildlife layers, the Great Salt Lake floodplain elevation (4,217 feet) contour, aerial and infrared imagery, mitigation area and wildlife management area layers, and land-use layers (that include uses such as farmland and urbanized areas). These layers will be used to determine focus areas of potential sensitive species habitat and areas that are unsuitable for sensitive species habitat (such as urbanized areas). The GIS mapping will also provide the base layers to be refined during the habitat delineation step for the habitat mapping for individual species.

3.1.2 Task 2 – Field Work and Assessment

Habitat Delineation (Sensitive Species)

Wildlife habitats identified as important for sensitive species will be mapped based on known GIS data layers compiled in Task 1. These wildlife habitats will likely include but are not limited to categories such as open water, riparian, emergent marsh, wet meadow, mudflat/pickleweed, pasture, croplands, shrubland, salt desert scrub, and disturbed/developed lands. These delineated habitats will guide the field verification effort during the habitat evaluation step.

The habitat delineation will be divided into two phases: field survey and habitat assessment.

- **Field Survey.** The first step for the field survey is to assemble the GIS information that defined habitats on a broader scale in the project study area to determine areas that are of ecological importance for all wildlife, with an emphasis toward habitat for sensitive species (as defined above on page 3). This will help guide the team to focus their efforts on suitable habitat and away from developed urban areas. The individual parcels of the habitats that have potential to be used by sensitive species will be more closely scrutinized during field verification.

The field teams will then characterize parcels of land using a rapid assessment checklist (see attachment) that is based on eight representative sensitive species that have the potential to be found within the study area. Field notes on, and sometimes photos of, the parcels will also be taken. On their first day in the field, the team will visit representative areas together to develop a consistent approach to evaluating habitat for the representative species. For each area surveyed, a GIS polygon will be developed. A limit of about 5 acres will be used by the field team as the minimum

parcel or feature size; features or habitats smaller than 5 acres will be included as part of the larger parcel and not delineated separately. However, in cases where parcels are a mosaic of habitats, the entire parcel will be evaluated and considered for all of the potential species of the different habitat types within the parcel. The field team will characterize parcels in terms how suitable they are as habitat for the representative sensitive species based on known necessary habitat parameters.

- **Habitat Assessment.** After the field work, the team will evaluate the data from the rapid assessment checklist for each GIS polygon to determine the overall rank of the parcel (high, medium, or low) by calculating the mean rank if more than one species was considered for that parcel. If only one species was considered for a parcel, then that rank will be used. A numeric value for each of the three ranks will be given and will be non-geometric; the low rank will be 0.2, the medium rank will be 0.5, and the high rank will be 1.0. The mean rank for each parcel will then be multiplied by the acreage of that parcel as a means of weighting the importance of that parcel.

During the alternatives analysis, the acreage of impact for each parcel will be calculated and multiplied by the mean rank. This adjusted acreage will then be used to compare the expected impacts among the alternatives. The different habitat types used by the representative species will be kept separate in the analysis and results, since habitats such as playa and riparian are rarer than other habitats such as grasslands. In the situations of mosaic parcels, the entire parcel might be counted in multiple habitat categories.

Literature Review

Scientific literature, including peer-reviewed literature, agency white papers and reports, and conservation organization papers and reports, will be gathered on topics including the effects of highway noise, artificial light, highway mortality, habitat modification and fragmentation, and human disturbance on wildlife, and this literature will be reviewed. Special attention will be paid to literature pertaining to the species known to be present in the project study area.

4.0 Proposed Analysis Methodology

The purpose of this technical memorandum is to present the methods that will be used to characterize the existing conditions in the project study area. After the existing conditions information is collected and documented, the team will prepare a technical memorandum on the methods that will be used to analyze impacts to wildlife and wildlife habitat. However, to help determine what information should be collected, this memorandum provides a summary below of the analysis that will be conducted.

A GIS analysis will be conducted to determine how wildlife habitat would change in the project study area if the WDC is built and how these changes would affect species that use the habitats. Measures of habitat change include habitat loss, habitat fragmentation, and habitat degradation. The following items describe the methods that would be used to assess these parameters.

- **Habitat Loss.** Direct habitat loss will be determined by overlaying the right-of-way boundary for each build alternative onto the wildlife habitat map and using GIS software to measure the total area of each habitat within those boundaries. Habitat quality ranks for levels of disturbance and sensitive species use will be incorporated into the GIS database so that alternatives can be evaluated not only for acreage impacts but also for comparative rankings of those impacts.
- **Habitat Fragmentation.** Several different habitat fragmentation metrics, including mean patch size, mean perimeter-to-area ratio, and mean nearest neighbor distance, will be considered to evaluate the fragmentation effects of changes in size and distribution of suitable habitats resulting from the build alternatives. The habitat fragmentation analysis might also consider trends in fragmentation (that is, trends in the number of patches in each size group and of the total extent of each habitat type by patch size) and mean and median patch size.
- **Habitat Degradation from Road Effect.** Using readily available and applicable scientific literature, an appropriate buffer distance will be identified and used in a GIS analysis to determine what habitats within the buffer distance could be potentially affected indirectly by the project.
 - *Study area borders* – If the alternative under analysis is close to either the east or west border of the study area, assumptions of habitats will be made by these means: (1) to the east, areas not obviously riparian corridors or other densely vegetated areas from aerial imagery (very little if any areas) will be considered developed; (2) to the west, areas not obviously developed or farmed (very little if any areas) will be considered high-quality wetlands and lake shore migratory bird habitat. This analysis will be used as a part of the alternatives analysis and will be discussed in the EIS impact analysis.
 - *Water and air* – Based on the impact area defined by the air quality and water quality analyses in the EIS, a qualitative assessment of changes in air quality and water quality resulting from construction and operation of the proposed build

alternatives will be completed to determine habitat degradation effects on sensitive wildlife species in the project buffer area. This analysis will depend on whether scientific literature is readily available on the effects of air and water quality changes on similar wildlife habitats to those found in the study area.

- *Roadway* – This assessment will include a qualitative evaluation based on review of existing literature of wildlife mortality resulting from exposure to a new roadway system as well as how changes from the addition of artificial lighting and landscaping could further affect existing sensitive species habitat.
- *Noise* – To estimate the distance at which project highway noise could affect wildlife communication, the team will review existing literature to determine the bioacoustics requirements of representative birds and the masking potential of highway noise on those species’ communications. Species to be analyzed will be selected to represent the range of sound frequencies present in the bird songs and calls in the project area. Data currently being collected for the Legacy Parkway Project will also be used.
- **GIS Analysis of Changes in Lake Level and Dynamics of Habitat Availability and Distribution.** A GIS analysis will be conducted to compare the direct habitat availability and losses that would result from the build alternatives to the direct habitat availability and losses that could result from different levels of the Great Salt Lake. The wildlife habitat maps will be combined with an inundation zone dataset for the Great Salt Lake to compare the habitat loss from natural lake level fluctuation and the build alternatives.

5.0 Reference

[WHSRN] Western Hemisphere Shorebird Reserve Network

No date Great Salt Lake. www.whsrn.org/site-profile/great-salt-lake. Accessed September 17, 2010.



Appendix A – Rapid Assessment Checklist

Sensitive Species Habitat Quality Rapid Assessment Checklist

Location (sheet):		Date:	
Evaluator name(s):		GPS Pt/Poly#:	
Surrounding area(s): <input type="checkbox"/> Cleared/Disturbed <input type="checkbox"/> Developed <input type="checkbox"/> Cropland <input type="checkbox"/> Habitat: _____			
Open pasture & grasslands – long-billed curlew		Open pasture & grasslands – grasshopper sparrow	
<input type="checkbox"/> L: Not grazed, tall (>18") bunchgrasses with other tall weeds and/or shrubs and trees. Surrounded by developed or disturbed lands. <input type="checkbox"/> M: Some mowing/grazing, medium (10-18") or mixed height grasses with some weeds and/or few shrubs. <input type="checkbox"/> H: A mix of low (2" - 10") grasses or forbs (including saline meadows) and bare ground patches, and close to aquatic areas or other native habitats for forage.		<input type="checkbox"/> L: Heavy shrub or brushy presence (>30%), especially with trees. OR: close-cropped grasses w/ barren areas and nearly no shrubs (<10%). Isolated habitat. <input type="checkbox"/> M: Mixed shrub and grasses, mixed heights, but surrounded by development or disturbance. <input type="checkbox"/> H: Bunchgrass or other mixed grasses, moderate shrub component (10-30%), no trees. Surrounded by non-developed habitats.	
Sage-steppe shrubland – Brewer's sparrow		Wet meadow & old hayfields (wet) – bobolink	
<input type="checkbox"/> L: Salt desert shrub or non-native community (no sagebrush); OR low height (<20") and/or canopy cover (<30%) of other shrub types; OR steep slopes (>30°). <input type="checkbox"/> M: Mixed shrub community (few sagebrush); OR tall height (>36") if more sage present. <input type="checkbox"/> H: Sagebrush dominated shrub community, mid-height (20-36"), mid to high cover (>30%), and mild to flat slopes (<30°).		<input type="checkbox"/> L: Newer hayfields with high cover of alfalfa, or smaller (<25 acres) fields; OR smaller wet meadows with low to no cover of broad-leaf forbs or sedges. <input type="checkbox"/> M: Older, wet hayfields with a mix of forbs, grasses, & sedges but mid-sized fields (25-70 acres); OR wet meadows with some cover of forbs or sedges, but disturbed (heavily grazed or mowed during spring). <input type="checkbox"/> H: Old, wet, abandoned hayfields, large (>70 acres); OR extensive, low disturbance wet meadows with cover of broad-leaf forbs or sedges.	
Riparian – yellow-billed cuckoo		Mixed cover; trees, shrubs & grasses – mule deer	
<input type="checkbox"/> L: Lack of mixed native canopy riparian (willows & cottonwoods) woods (either too short & brushy, non-native, or lack of understory); OR lack of large, contiguous riparian forest area (<10 acres). <input type="checkbox"/> M: Mixed native canopy willow/cottonwood riparian woodlands but lack of large, contiguous riparian forest area (<50 acres). <input type="checkbox"/> H: Mixed native canopy willow/cottonwood riparian woodlands of a large, contiguous riparian forest area (>50 acres).		<input type="checkbox"/> L: Native shrub cover either sparse (<10%) or dense (>30%), with low perennial grass cover (<10%), but high annual grass cover (>30%). Weedy and disturbed, low (<12") woody cover. <input type="checkbox"/> M: Either medium native shrub (10-30%) and herbaceous (>10%) cover with low woody cover, OR sparse/dense shrub cover with low herbaceous cover and taller (12-36") woody cover. <input type="checkbox"/> H: Medium native shrub cover, perennial cover (>10%), and low annual grass cover (<25%). Taller woody cover (>36"). Also, large area of connected habitat.	
Emergent marsh & aquatic edges – northern leopard frog		Playa and saline meadow wetlands – American avocet	
<input type="checkbox"/> L: Highly disturbed and/or polluted pond/ditch wetland areas with short (≤6") or absent aquatic vegetation. <input type="checkbox"/> M: Limited or abrupt riparian or wetland fringes between aquatic zone and uplands. Wetland/aquatic vegetation mid-height or taller (>6"). <input type="checkbox"/> H: Extensive or gradual undisturbed emergent marsh or wet meadow vegetated zone between aquatic areas and uplands.		<input type="checkbox"/> L: Playa/flats where vegetation cover >30% and height >12", OR inundated too deep (>10"), or not at all for most of the year. <input type="checkbox"/> M: Playa/flats where vegetation cover >20% or height >6", OR inundated some or most of the year, then too deep (>10"). <input type="checkbox"/> H: Playa/flats where vegetation cover sparse (≤20%) and short (≤6"), and perennially inundated 1"-10" throughout most of the year.	

