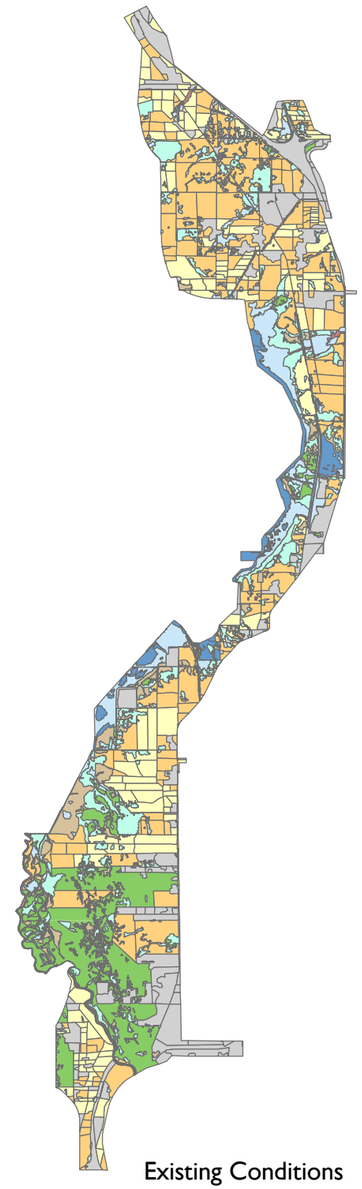
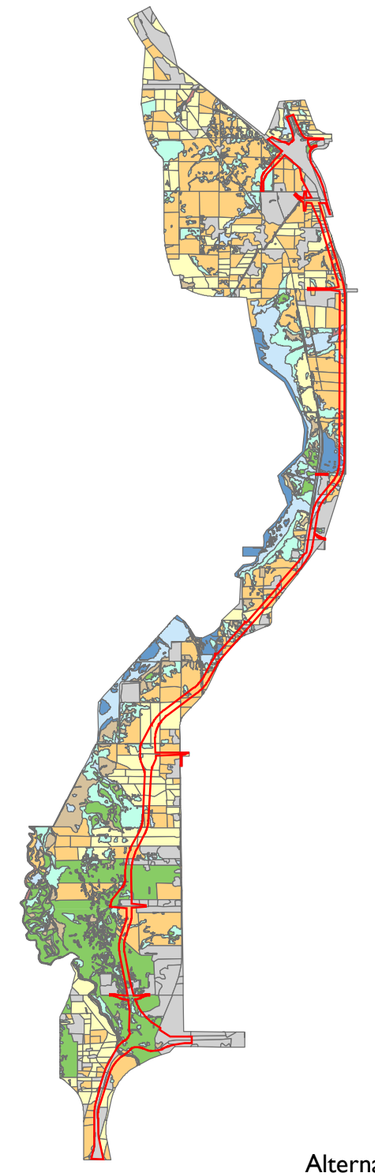
Chapter 3

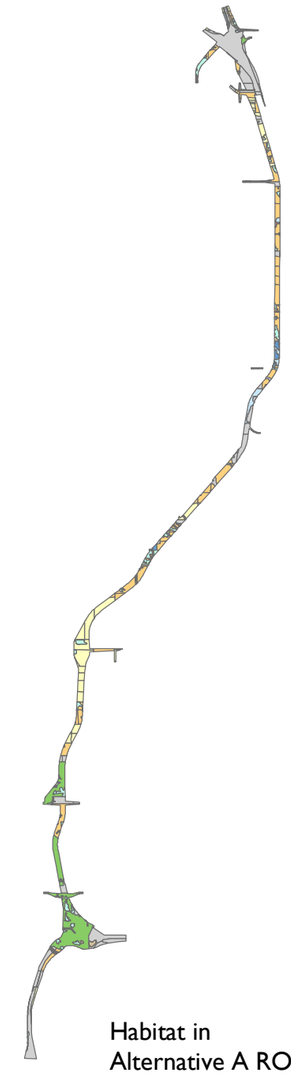
Figures



1 Existing Conditions



2 Alternative A*



3 Habitat in Alternative A ROW*

Legend

- Cropland
- Developed
- Emergent Marsh
- Mudflat/Pickleweed
- Open Water
- Pasture
- Riparian
- Scrub
- Wet Meadow
- Alternative Alignments

N

2.5 1.25 0 2.5 5

Kilometers

Map Production: 12/15/03

Data Sources: UDOT Project Alternatives and Wetland / Wildlife Habitat Data

*Supplemental EIS 312 Foot ROWs used for the Alternatives

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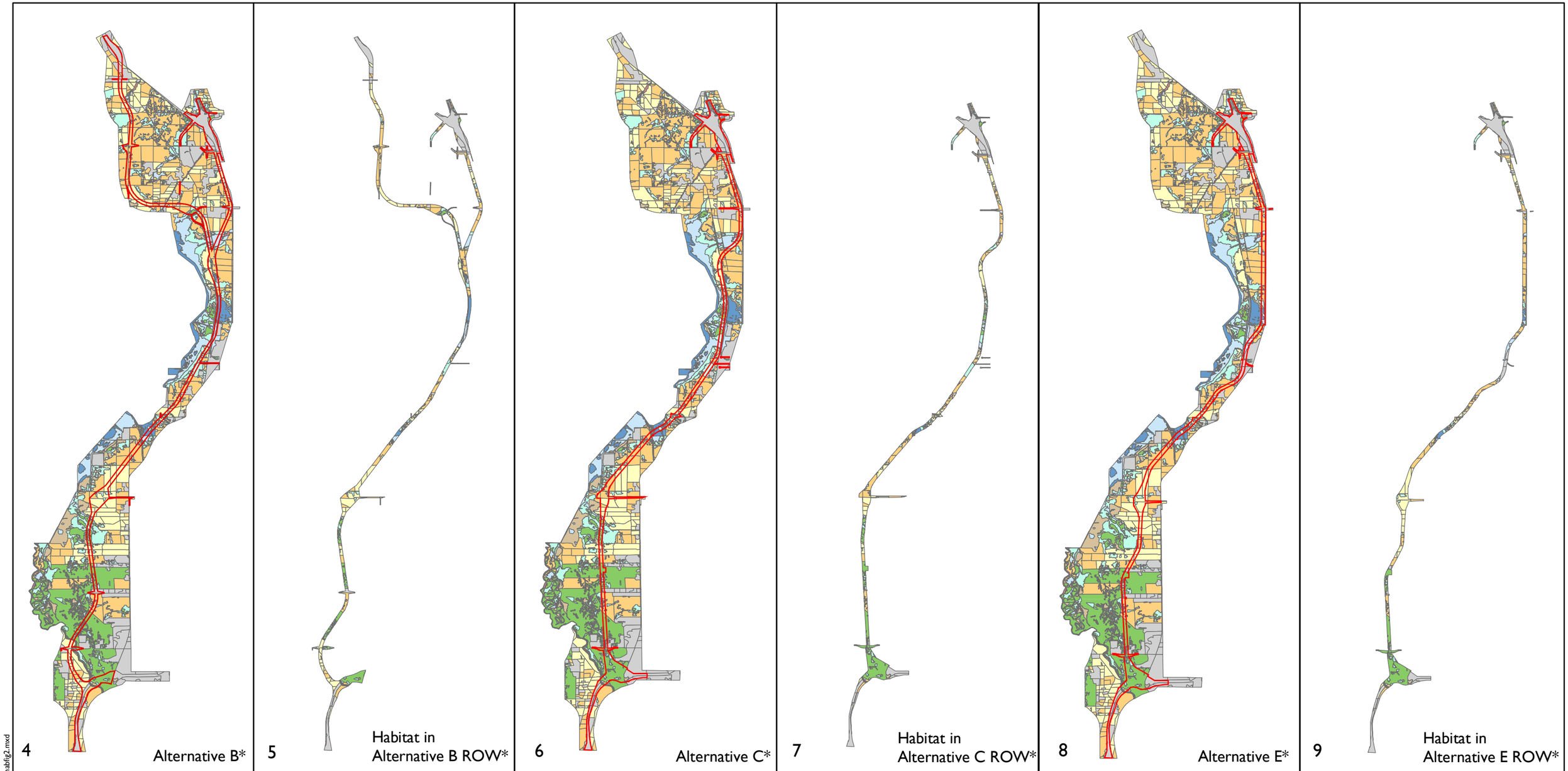
Jones & Stokes

Figure 3-1a

Legacy Parkway Study Area: Potential Direct Habitat Loss



Legend

- Cropland
- Developed
- Emergent Marsh
- Mudflat/Pickleweed
- Open Water
- Pasture
- Riparian
- Scrub
- Wet Meadow
- Alternative Alignment

N

2.5 1.25 0 2.5 5

Kilometers

Map Production: 1/15/04
Data Sources: UDOT Project Alternatives and Wetland / Wildlife Habitat Data
*Supplemental EIS 312 foot ROWs used for the Alternatives

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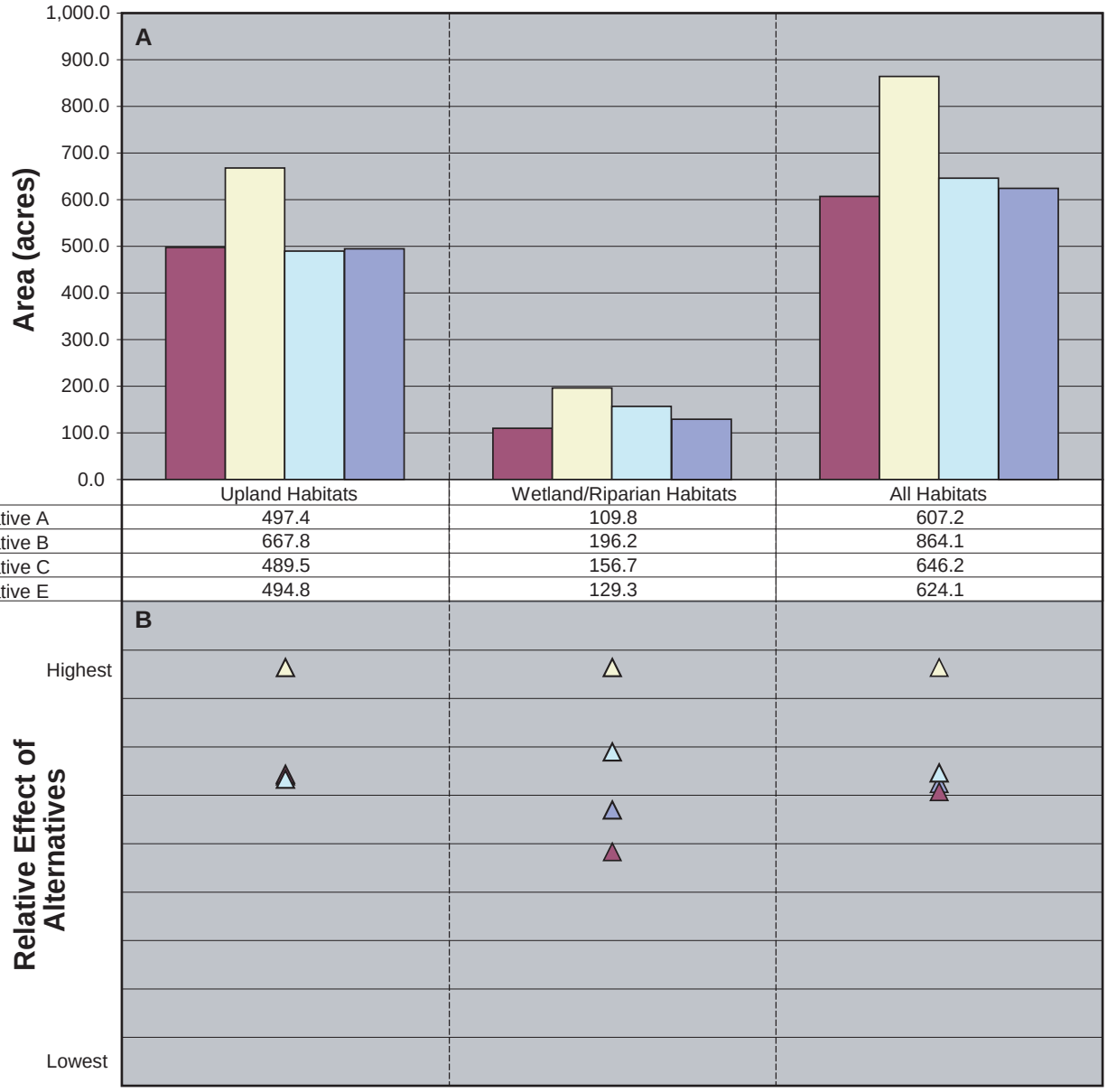
Jones & Stokes

Figure 3-1b
Legacy Parkway Study Area: Potential Direct Habitat Loss



	Upland Habitats	Wetland/Riparian Habitats	All Habitats
Alternative A	497.4	109.8	607.2
Alternative B	667.8	196.2	864.1
Alternative C	489.5	156.7	646.2
Alternative E	494.8	129.3	624.1

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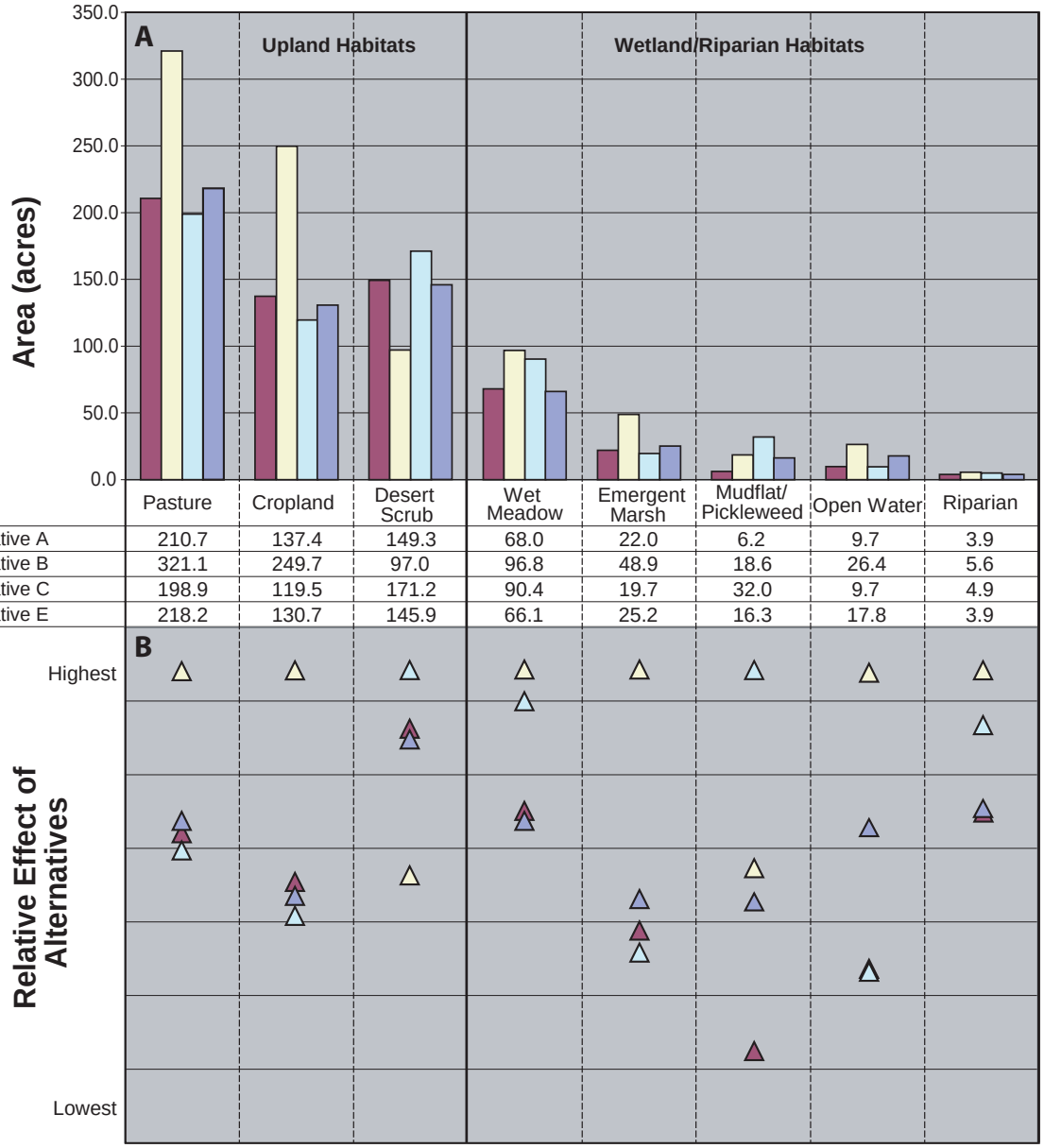
Figure 3-2
Total Direct Habitat Loss in Project Study Area



	Pasture	Cropland	Desert Scrub	Wet Meadow	Emergent Marsh	Mudflat/ Pickleweed	Open Water	Riparian
Alternative A	210.7	137.4	149.3	68.0	22.0	6.2	9.7	3.9
Alternative B	321.1	249.7	97.0	96.8	48.9	18.6	26.4	5.6
Alternative C	198.9	119.5	171.2	90.4	19.7	32.0	9.7	4.9
Alternative E	218.2	130.7	145.9	66.1	25.2	16.3	17.8	3.9

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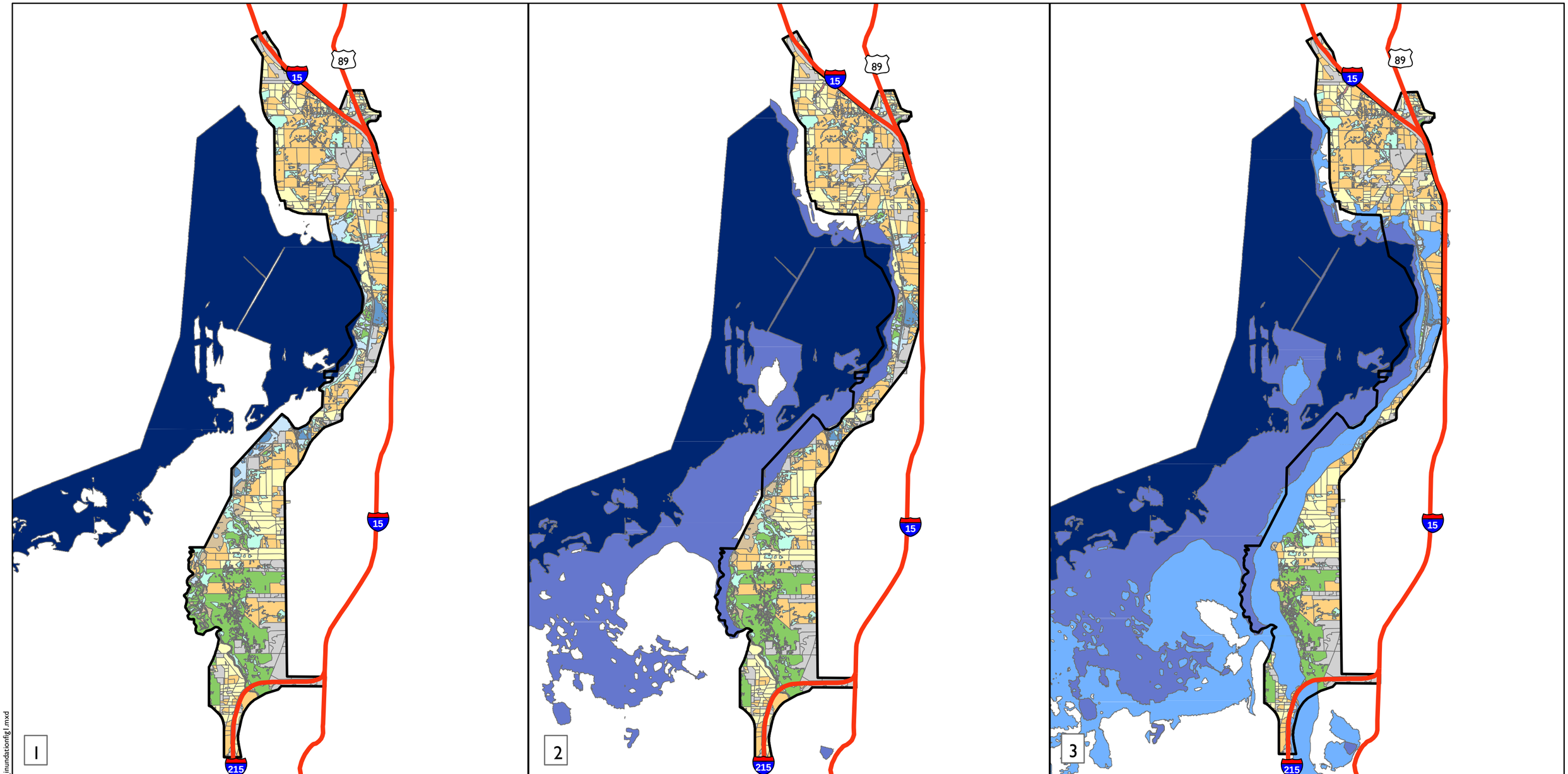
Figure 3-3
Direct Habitat Loss in Project Study Area By Habitat Type



Legend

- Major Existing Roads
- Project Study Area Boundary

Inundation Zones

1 (4200 - 4204)
2 (4204-4208)
3 (4208-4212)
4 (4212-4216)
5 (4216-4220)
6 (>4220)

Wetland / Wildlife Habitats

- Cropland
- Developed
- Emergent Marsh
- Mudflat/Pickleweed
- Open Water
- Pasture
- Riparian
- Scrub
- Wet Meadow

2.5 1.25 0 2.5 5
Kilometers

Map Production: 12/15/03
Data Sources: UDOT Project Study Area Boundary, Exsiting Roads. Contours Generated USGS 10 Meter Digital Elevation Model (DEM)

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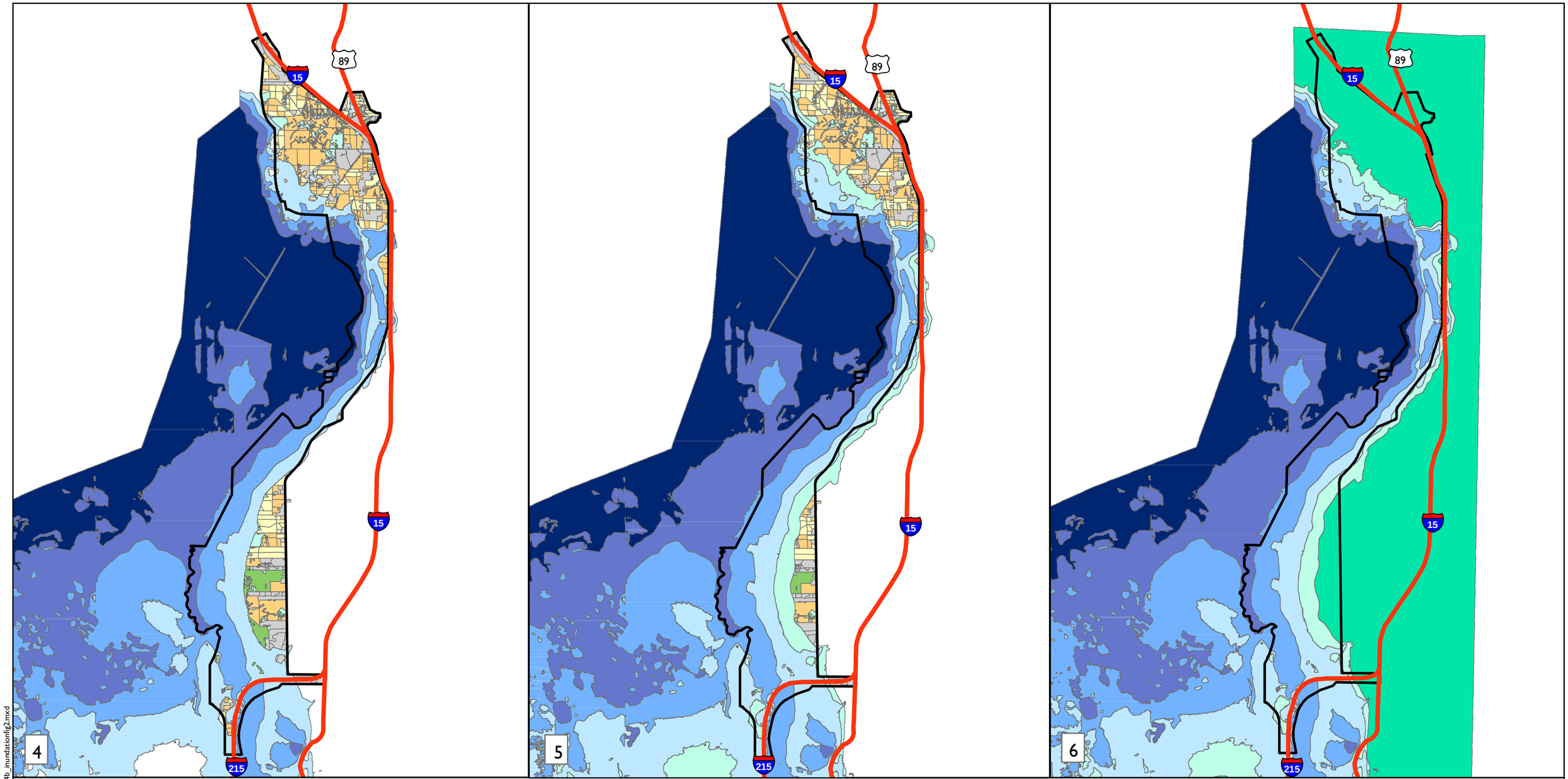
Figure 3-4a
Great Salt Lake Inundation Zones



Legend

- Major Existing Roads
- Project Study Area Boundary

Inundation Zones

1 (4200 - 4204)
2 (4204-4208)
3 (4208-4212)
4 (4212-4216)
5 (4216-4220)
6 (>4220)

Wetland / Wildlife Habitats

- Cropland
- Developed
- Emergent Marsh
- Mudflat/Pickleweed
- Open Water
- Pasture
- Riparian
- Scrub
- Wet Meadow

2.5 1.25 0 2.5 5
Kilometers

Map Production: 12/15/03
Data Sources: UDOT Project Study Area Boundary, Exsiting Roads. Contours Generated USGS 10 Meter Digital Elevation Model (DEM)

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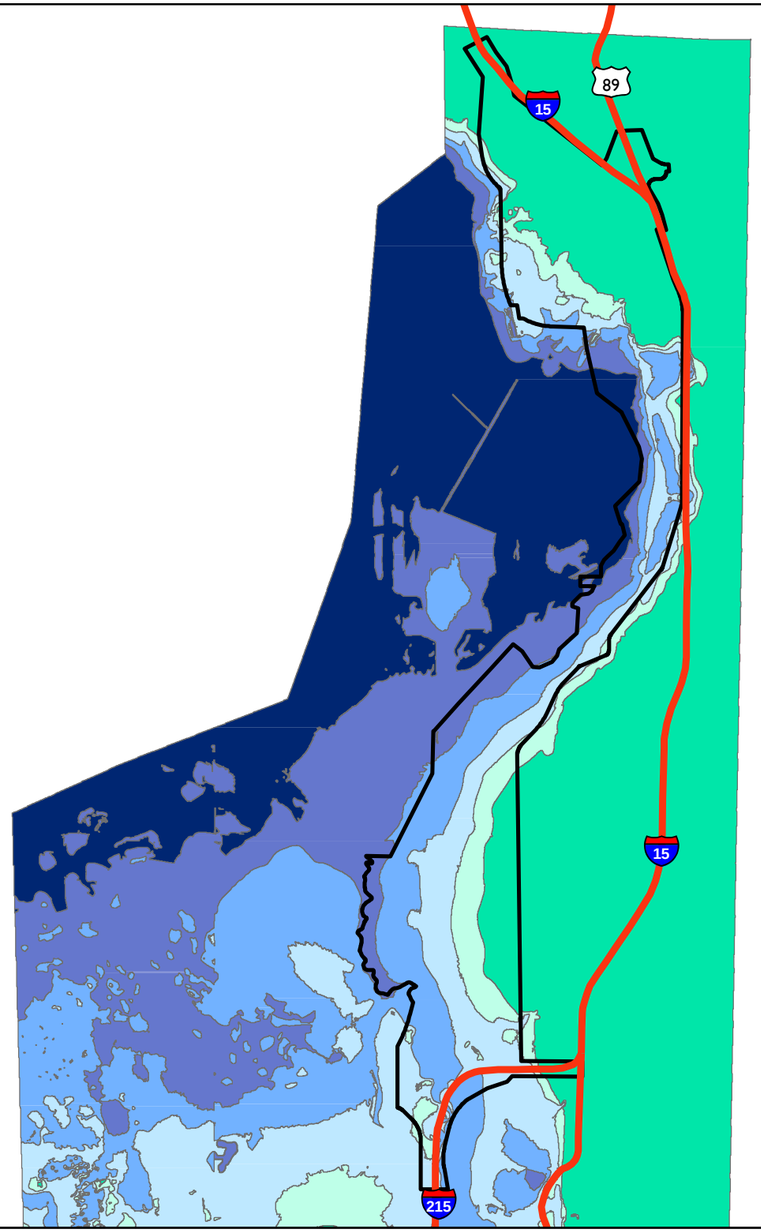
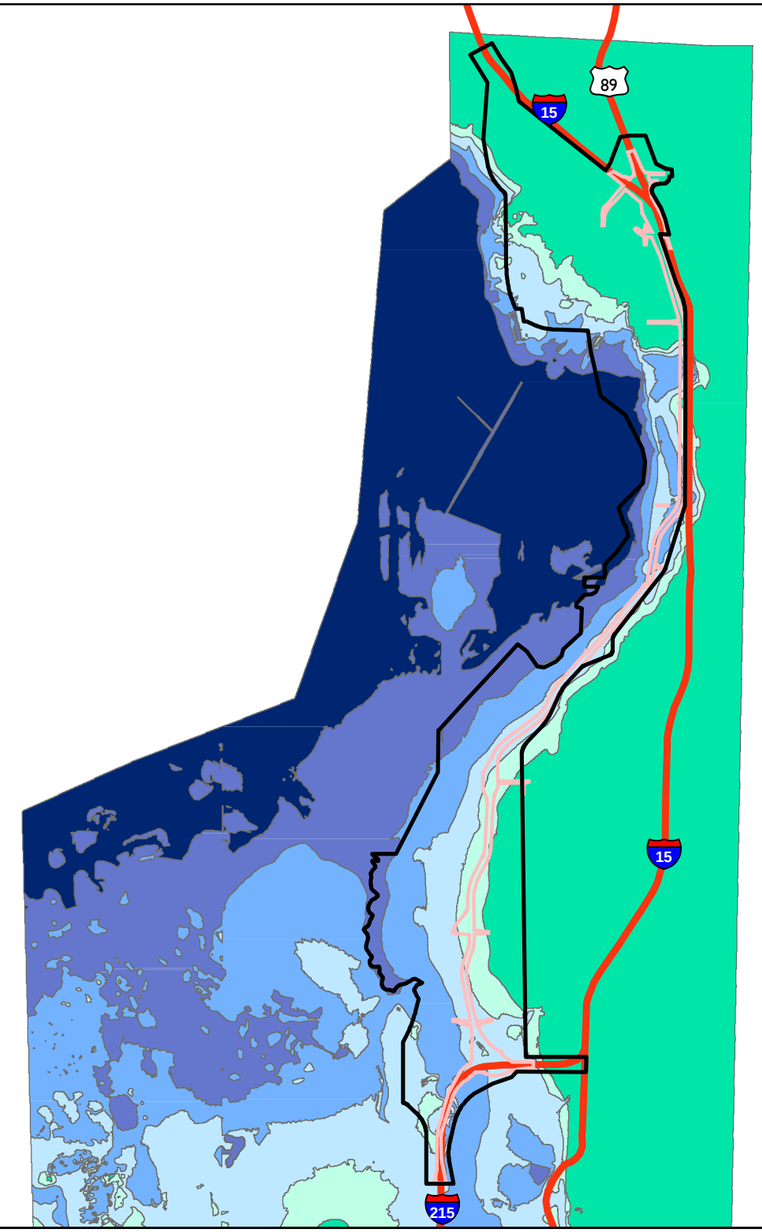
Figure 3-4b
Great Salt Lake Inundation Zones



Existing Conditions



Alternative A*

Legend

- Project Study Area Boundary
- Proposed Right of Way
- Major Existing Roads

Inundation Zones and
Probability That Lake Level Will Occur Within Each Inundation Zone

- (4200 - 4204) 33.0%
- (4204 - 4208) 24.0 %
- (4208 - 4212) 8.3. %
- (4212 - 4216) 1.7 %
- (42126- 4220) 1.7%
- (> 4220) 1.7%

2.5 1.25 0 2.5 5
Kilometers

Map Production: 12/15/03
Data Sources: UDOT Project Study Area Boundary, Project Alternatives and Exsiting Roads. Contours Generated USGS 10 Meter Digital Elevation Model (DEM)
*Supplemental EIS 312 foot ROWs used for the Alternatives

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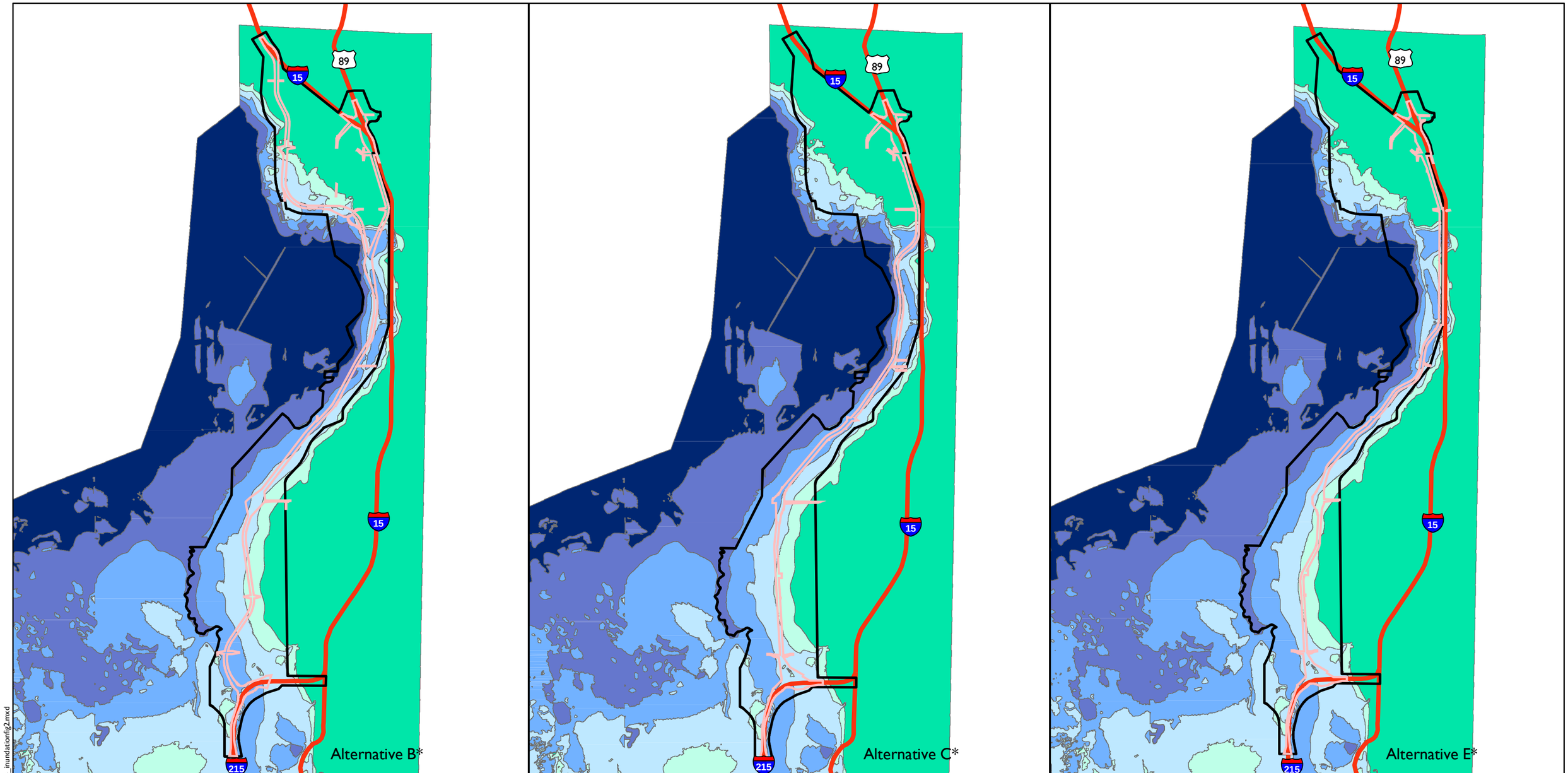
Figure 3-5a
Great Salt Lake Inundation Zones Relative to Build Alternatives



Legend

- Project Study Area Boundary
- Proposed Right of Way
- Major Existing Roads

Inundation Zones and
Probability That Lake Level Will Occur Within Each Inundation Zone

- (4200 - 4204) 33.0%
- (4204 - 4208) 24.0 %
- (4208 - 4212) 8.3. %
- (4212 - 4216) 1.7 %
- (4216- 4220) 1.7%
- (> 4220) 1.7%

2.5 1.25 0 2.5 5
Kilometers

Map Production: 12/15/03
Data Sources: UDOT Project Study Area Boundary, Project Alternatives and Exsiting Roads. Contours Generated USGS 10 Meter Digital Elevation Model (DEM)
*Supplemental EIS 312 foot ROWs used for the Alternatives

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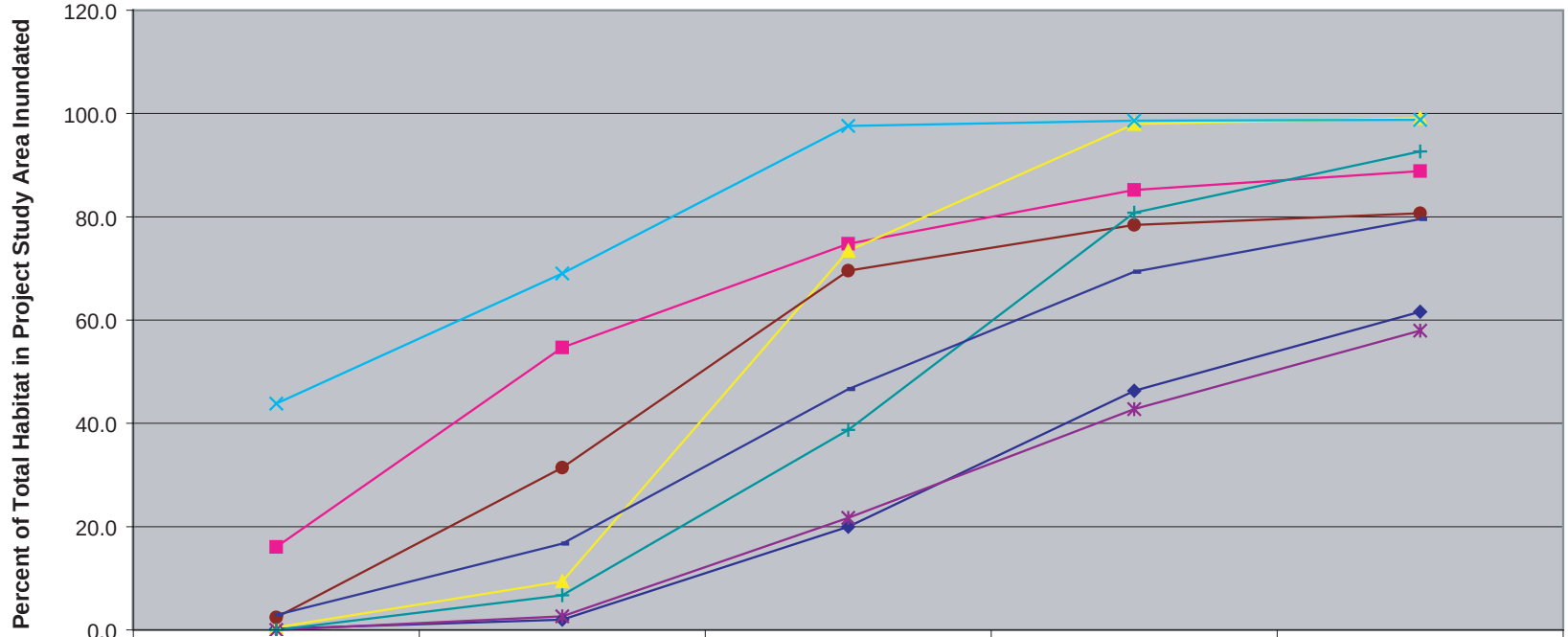
Figure 3-5b
Great Salt Lake Inundation Zones Relative to Build Alternatives



	4,204 ft (elevation)	4,204-4,208 ft	4,208-4,212 ft	4,212-4,216 ft	4,216-4,220 ft
Cropland	0.2	2.0	20.0	46.3	61.6
Emergent Marsh	16.0	54.7	74.8	85.2	88.8
Mudflat/Pickleweed	0.5	9.4	73.4	98.0	99.1
Open Water	43.8	69.0	97.6	98.6	98.8
Pasture	0.0	2.7	21.7	42.7	57.9
Riparian	2.4	31.4	69.6	78.4	80.7
Desert Salt Scrub	0.0	6.7	38.7	80.8	92.7
Wet Meadow	2.9	16.7	46.6	69.3	79.5

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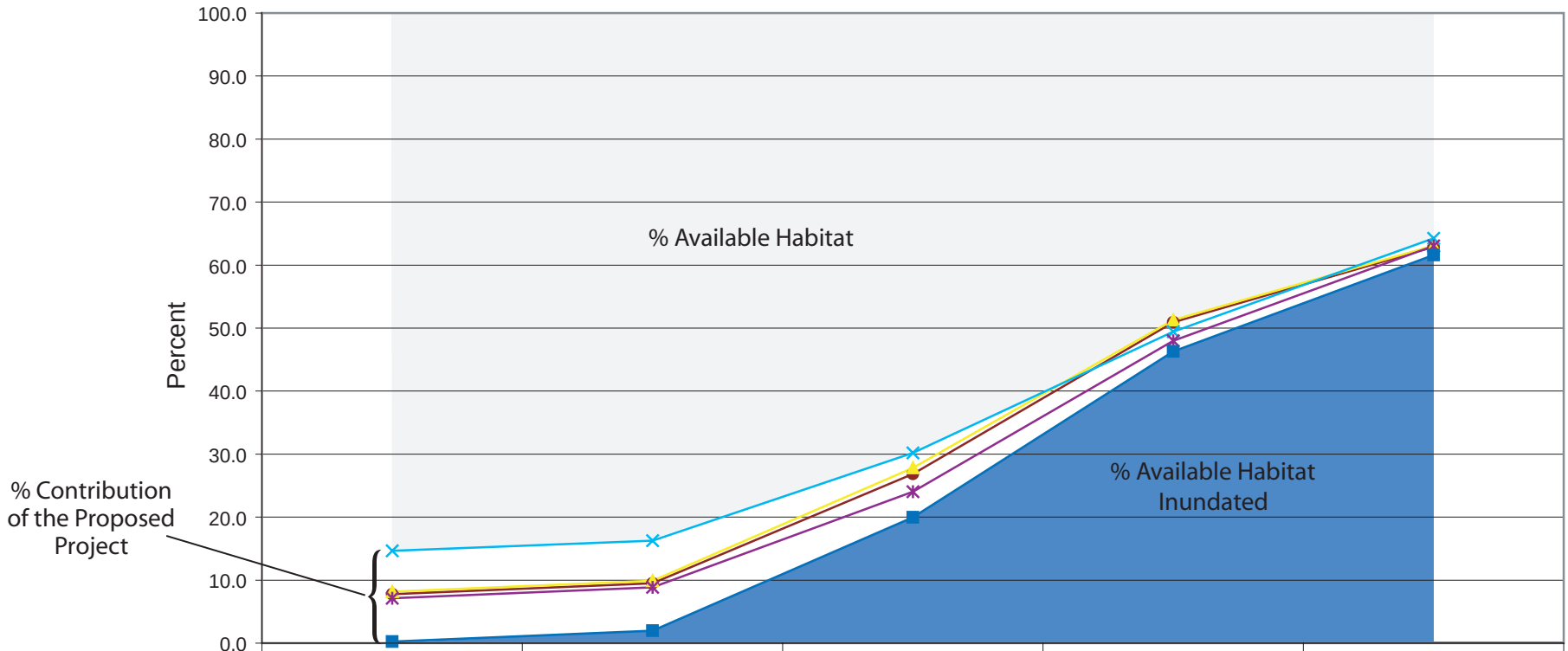
Figure 3-6
Percent Habitat Inundation with Changing Lake Levels



	4,204 ft (elevation)		4,204-4,208 ft		4,208-4,212 ft		4,212-4,216 ft		4,216-4,220 ft	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
No Action	4.2	0.2	34.1	2.0	346.1	20.0	802.4	46.3	1,067.5	61.6
Alternative A	141.6	8.2	171.6	9.9	482.1	27.8	888.9	51.3	1,093.5	63.1
Alternative B	253.9	14.7	281.7	16.3	523.0	30.2	857.0	49.4	1,113.5	64.2
Alternative C	123.7	7.1	153.5	8.9	416.3	24.0	831.5	48.0	1,092.3	63.0
Alternative E	134.9	7.8	164.9	9.5	465.6	26.9	882.6	50.9	1,090.1	62.9

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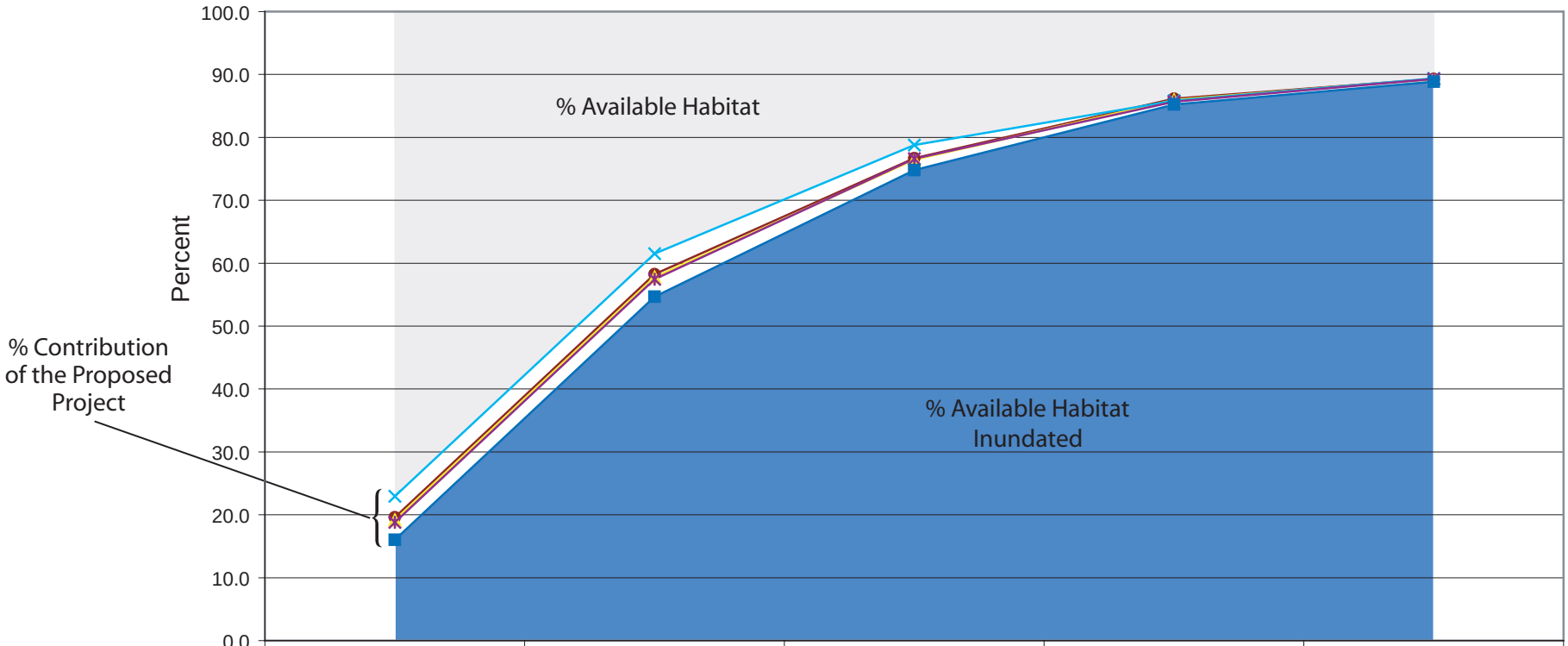
Figure 3-7
Percent Cropland Habitat Loss from Project Alternatives and Varying Lake Lake Levels



	4,204 ft (elevation)		4,204-4,208 ft		4,208-4,212 ft		4,212-4,216 ft		4,216-4,220 ft	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
No Action	113.4	16.0	386.7	54.7	528.9	74.8	602.6	85.2	628.3	88.8
Alternative A	135.4	19.1	408.7	57.8	540.8	76.5	607.8	85.9	631.6	89.3
Alternative B	162.3	22.9	435.1	61.5	557.2	78.8	606.9	85.8	632.1	89.4
Alternative C	133.1	18.8	406.4	57.5	541.8	76.6	605.9	85.7	631.4	89.3
Alternative E	138.7	19.6	412.0	58.3	542.3	76.7	609.2	86.1	631.6	89.3

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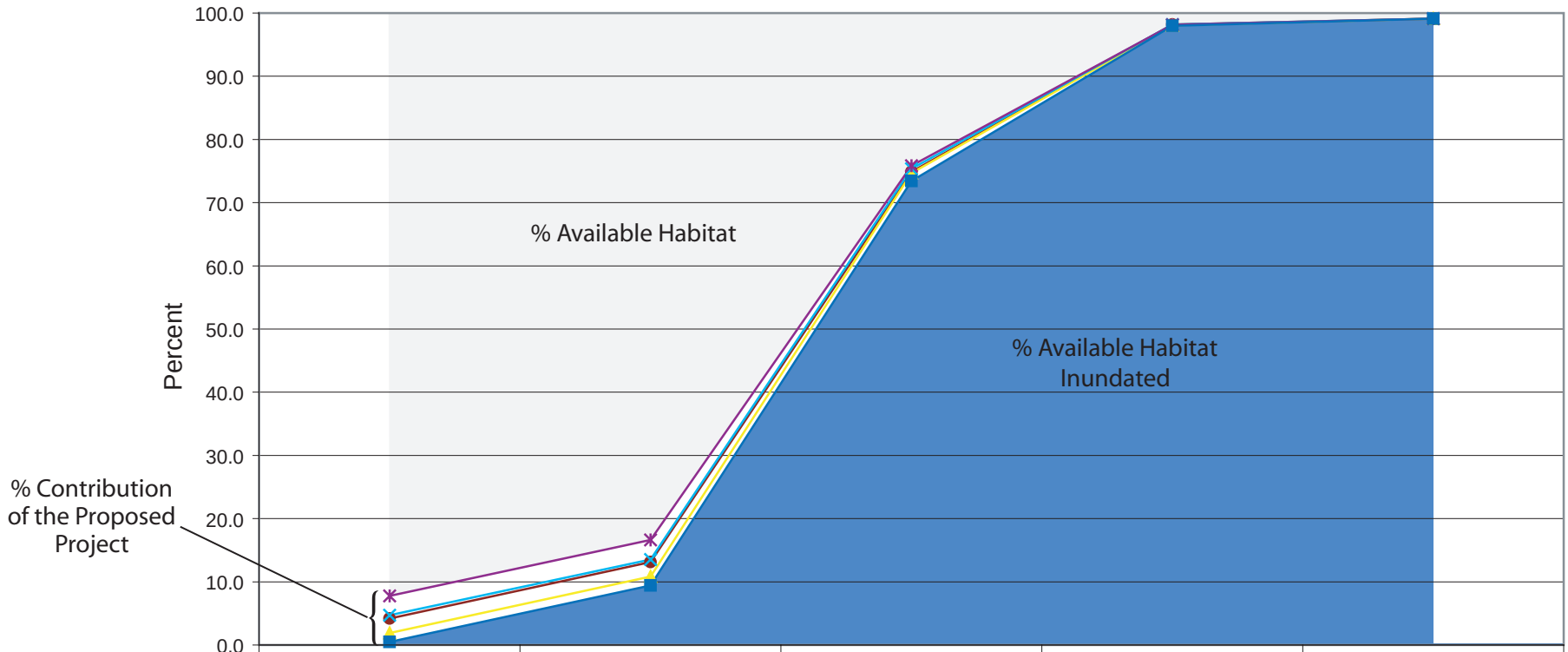
Figure 3-8
Percent Emergent Marshland Habitat Loss from Project Alternatives and Varying Lake Lake Levels



	4,204 ft (elevation)		4,204-4,208 ft		4,208-4,212 ft		4,212-4,216 ft		4,216-4,220 ft	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
No Action	2.2	0.5	41.4	9.4	323.0	73.4	431.0	98.0	435.9	99.1
Alternative A	8.4	1.9	47.6	10.8	328.4	74.7	431.2	98.1	435.9	99.1
Alternative B	20.8	4.7	59.4	13.5	331.5	75.4	431.8	98.2	435.9	99.1
Alternative C	34.1	7.8	73.1	16.6	333.6	75.9	431.7	98.1	435.9	99.1
Alternative E	18.5	4.2	57.7	13.1	329.3	74.9	431.8	98.2	435.9	99.1

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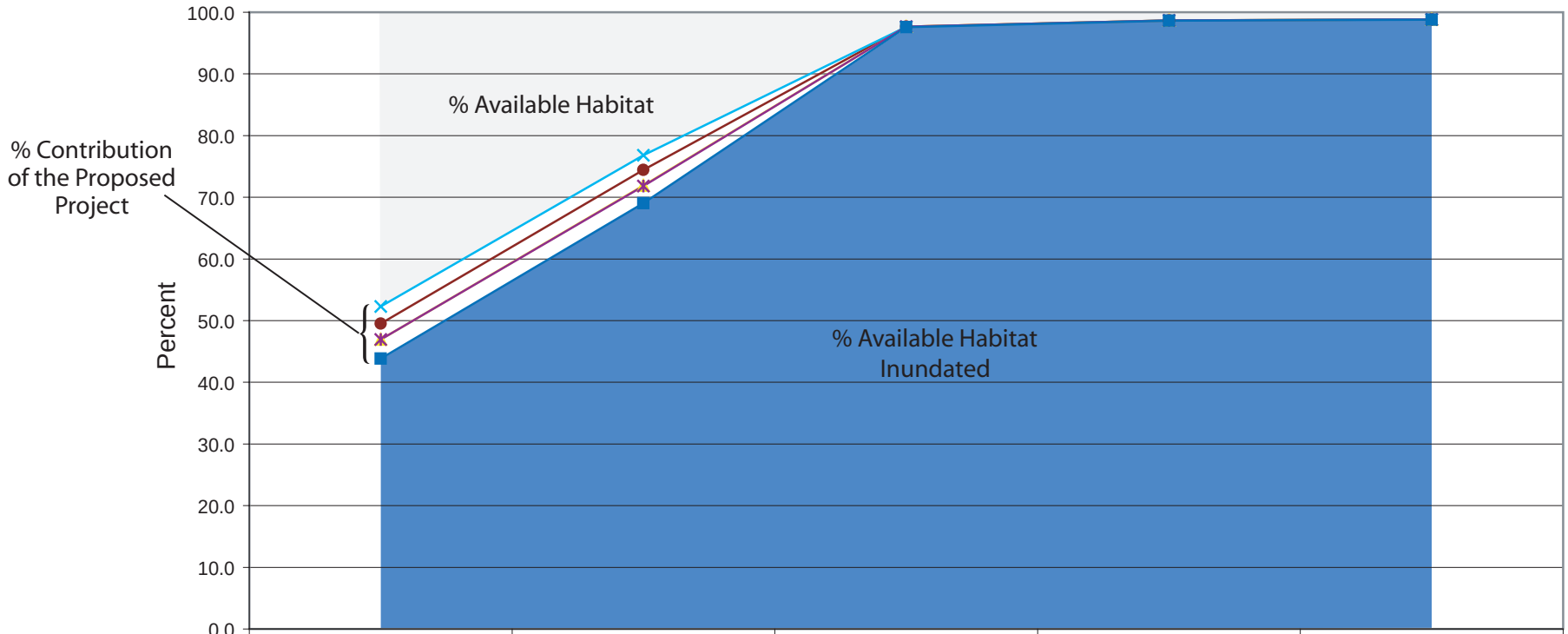
Figure 3-9
Percent Mudflat Pickleweed Habitat Loss from Project Alternatives and Varying Lake Lake Levels



	4,204 ft (elevation)		4,204-4,208 ft		4,208-4,212 ft		4,212-4,216 ft		4,216-4,220 ft	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
No Action	137.1	43.8	215.9	69.0	305.3	97.6	308.5	98.6	309.0	98.8
Alternative A	146.8	46.9	224.9	71.9	305.5	97.7	308.7	98.7	309.1	98.8
Alternative B	163.5	52.3	240.2	76.8	305.4	97.6	308.7	98.7	309.1	98.8
Alternative C	146.8	46.9	224.7	71.8	305.4	97.6	308.7	98.7	309.1	98.8
Alternative E	154.9	49.5	232.8	74.4	305.4	97.6	308.7	98.7	309.1	98.8

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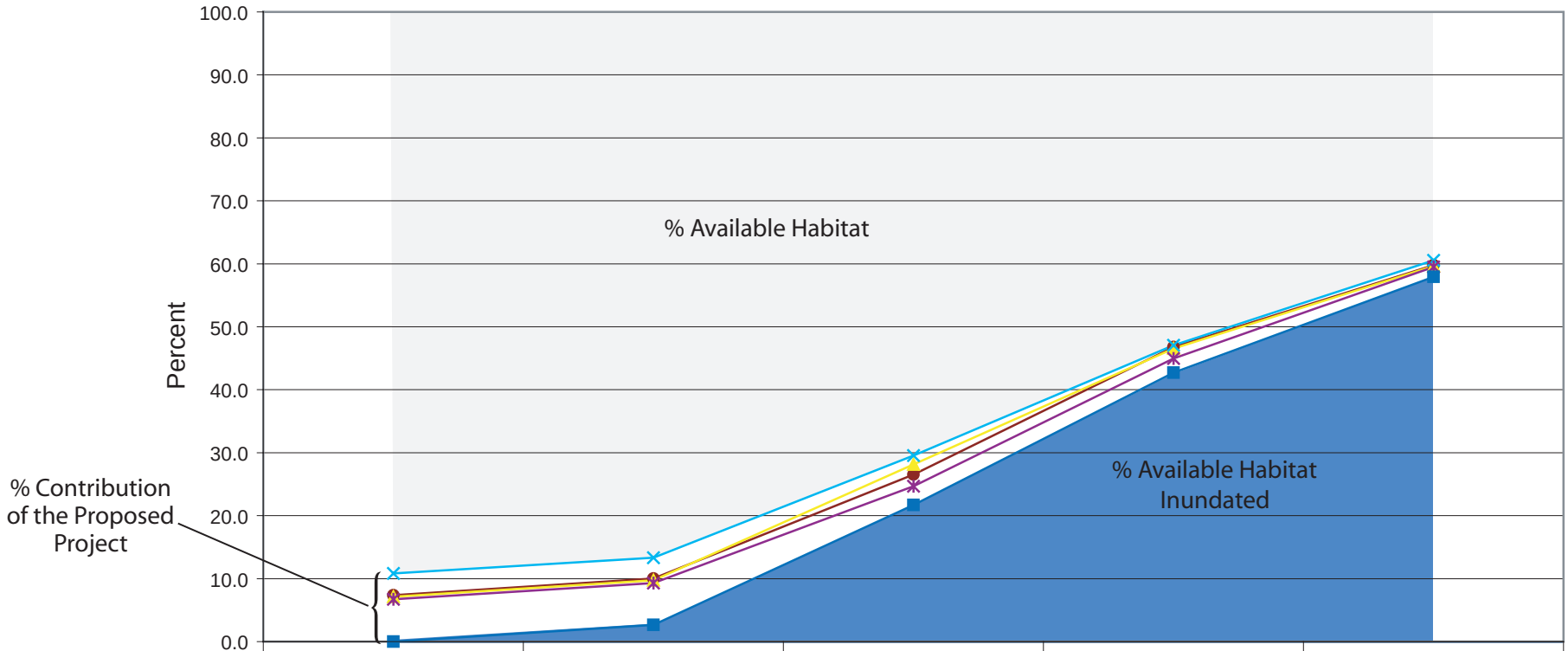
Figure 3-10
Percent Open Water Habitat Loss from Project Alternatives and Varying Lake Lake Levels



	4,204 ft (elevation)		4,204-4,208 ft		4,208-4,212 ft		4,212-4,216 ft		4,216-4,220 ft	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
No Action	0.0	0.0	78.6	2.7	634.0	21.7	1,266.3	42.7	1,717.0	57.9
Alternative A	210.7	7.1	289.2	9.8	834.1	28.1	1,378.6	46.5	1,768.4	59.7
Alternative B	321.1	10.8	394.8	13.3	875.0	29.5	1,394.4	47.1	1,794.7	60.6
Alternative C	198.9	6.7	276.1	9.3	731.1	24.7	1,332.8	45.0	1,762.7	59.5
Alternative E	218.2	7.4	296.8	10.0	786.5	26.5	1,386.8	46.8	1,771.1	59.8

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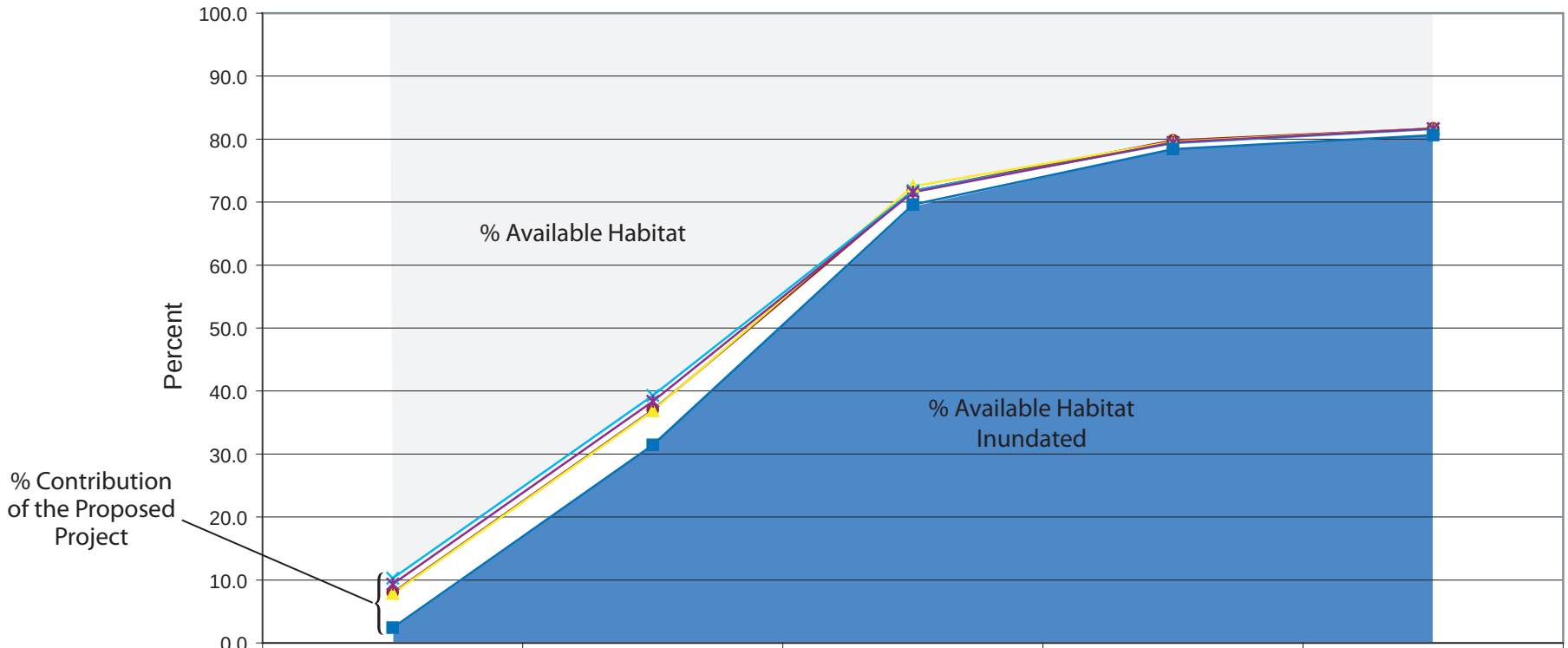
Figure 3-11
Percent Pasture Habitat Loss from Project Alternatives and Varying Lake Lake Levels



	4,204 ft (elevation)		4,204-4,208 ft		4,208-4,212 ft		4,212-4,216 ft		4,216-4,220 ft	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
No Action	1.7	2.4	22.3	31.4	49.3	69.6	55.6	78.4	57.2	80.7
Alternative A	5.6	7.9	26.1	36.9	51.4	72.5	56.4	79.6	57.9	81.7
Alternative B	7.3	10.3	27.8	39.3	50.9	71.8	56.3	79.4	57.9	81.6
Alternative C	6.6	9.3	27.2	38.4	50.7	71.6	56.3	79.4	57.9	81.7
Alternative E	5.7	8.0	26.2	37.0	50.9	71.8	56.6	79.8	57.9	81.7

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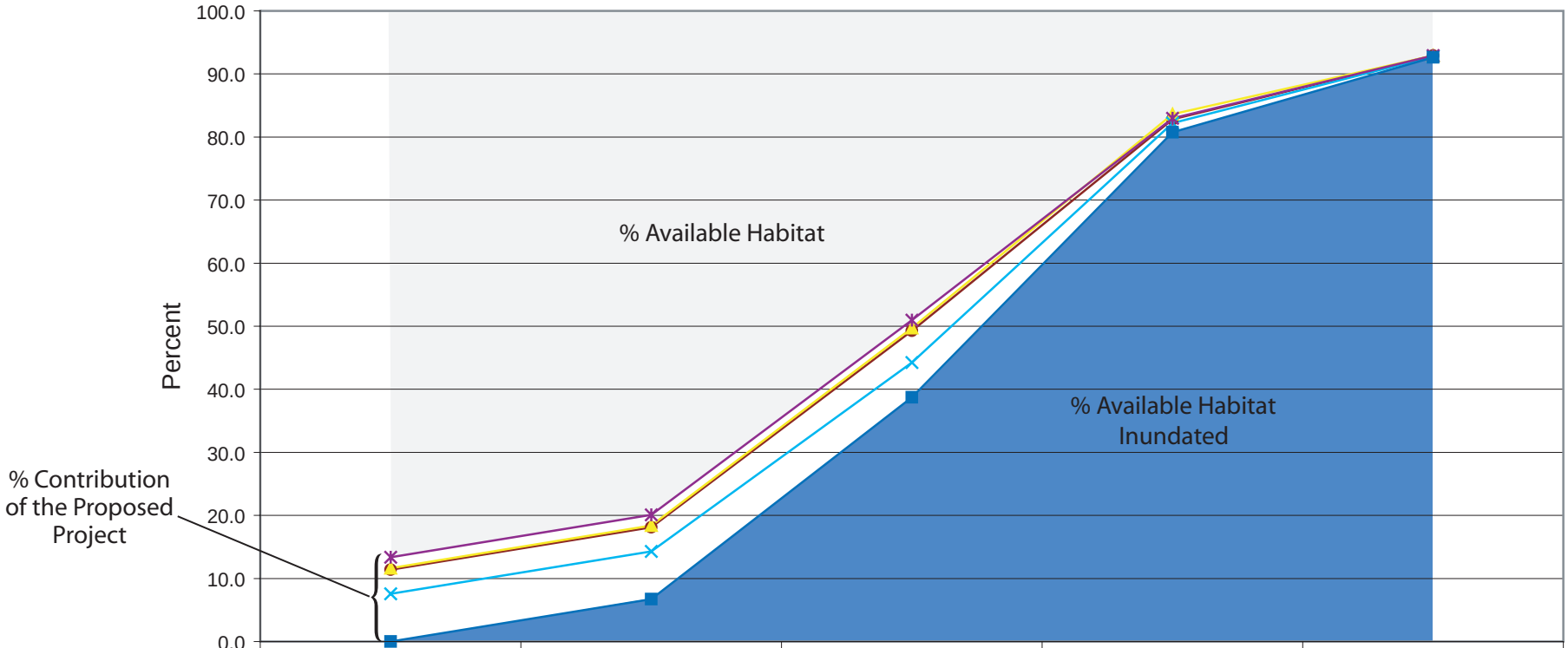
Figure 3-12
Percent Riparian Habitat Loss from Project Alternatives and Varying Lake Lake Levels



	4,204 ft (elevation)		4,204-4,208 ft		4,208-4,212 ft		4,212-4,216 ft		4,216-4,220 ft	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
No Action	0.0	0.0	86.4	6.7	496.7	38.7	1,035.7	80.8	1,187.9	92.7
Alternative A	149.3	11.6	235.7	18.4	637.2	49.7	1,071.9	83.6	1,191.4	92.9
Alternative B	97.0	7.6	183.4	14.3	567.2	44.2	1,053.8	82.2	1,190.0	92.8
Alternative C	171.2	13.3	257.6	20.1	653.2	50.9	1,063.6	83.0	1,191.5	92.9
Alternative E	145.9	11.4	232.2	18.1	631.6	49.3	1,061.9	82.8	1,191.4	92.9

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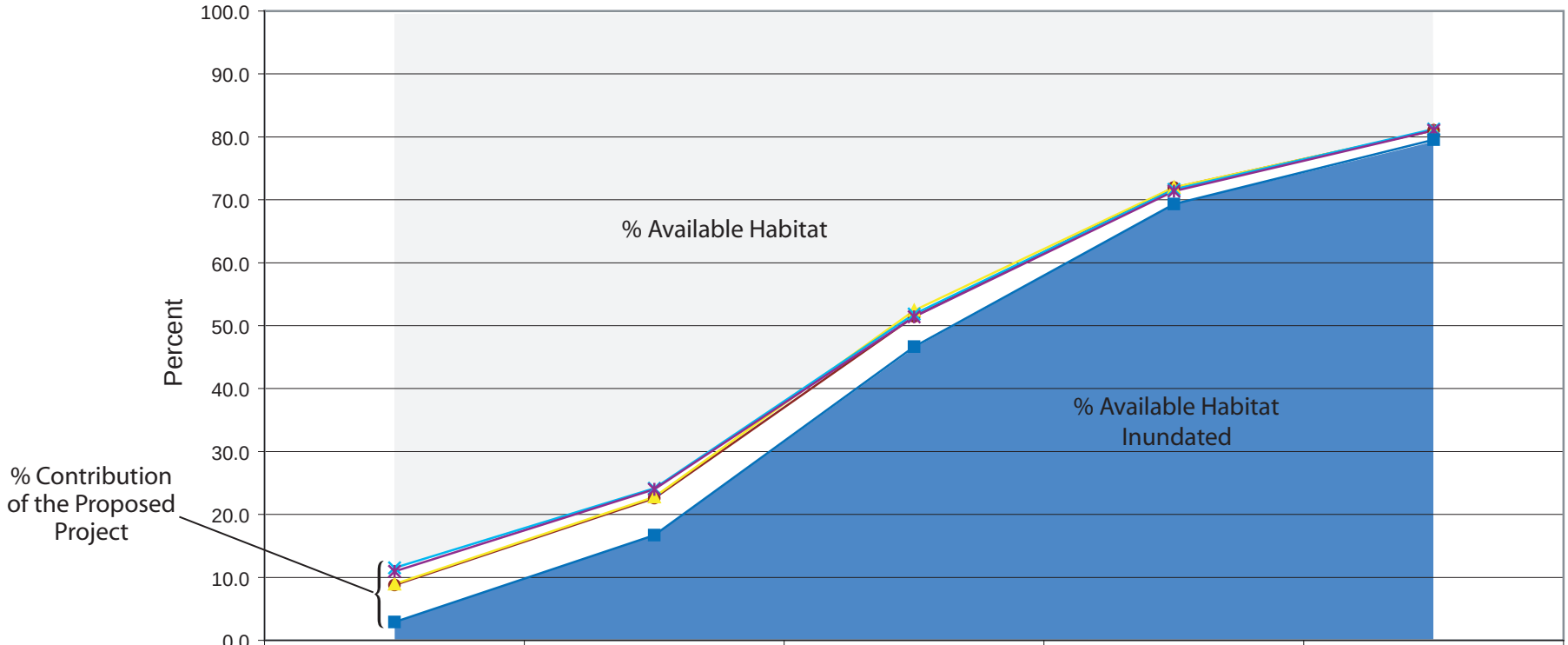
Figure 3-13
Percent Scrub Habitat Loss from Project Alternatives and Varying Lake Lake Levels



	4,204 ft (elevation)		4,204-4,208 ft		4,208-4,212 ft		4,212-4,216 ft		4,216-4,220 ft	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
No Action	32.2	2.9	186.8	16.7	522.0	46.6	775.8	69.3	890.1	79.5
Alternative A	100.2	9.0	254.8	22.8	586.5	52.4	805.6	72.0	906.7	81.0
Alternative B	129.0	11.5	270.4	24.2	580.2	51.8	801.6	71.6	909.1	81.3
Alternative C	122.6	11.0	268.5	24.0	575.1	51.4	798.6	71.4	906.7	81.0
Alternative E	98.3	8.8	252.9	22.6	575.8	51.5	805.0	71.9	906.7	81.0

03076.03 Wildlife Tech Memo

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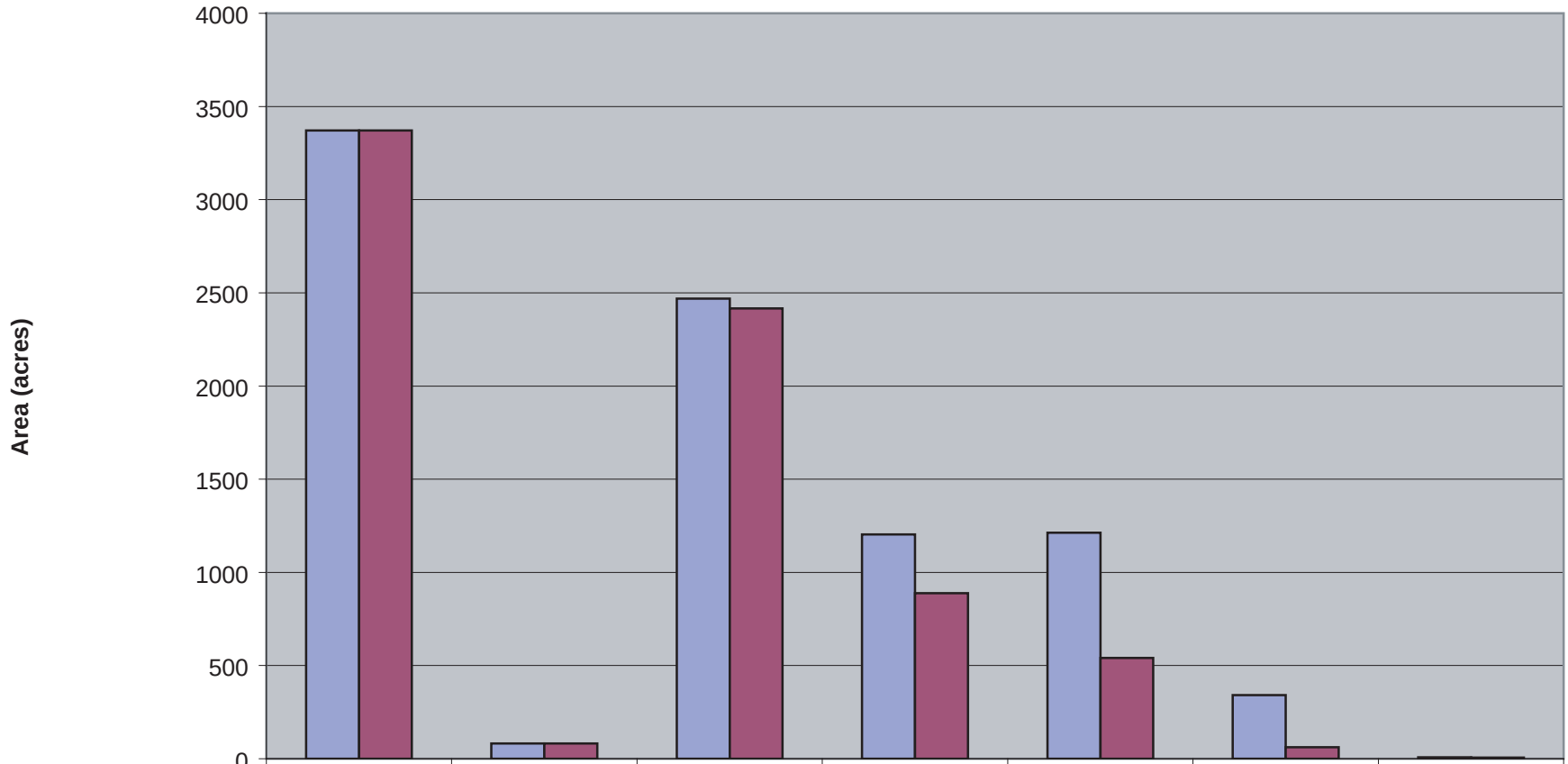
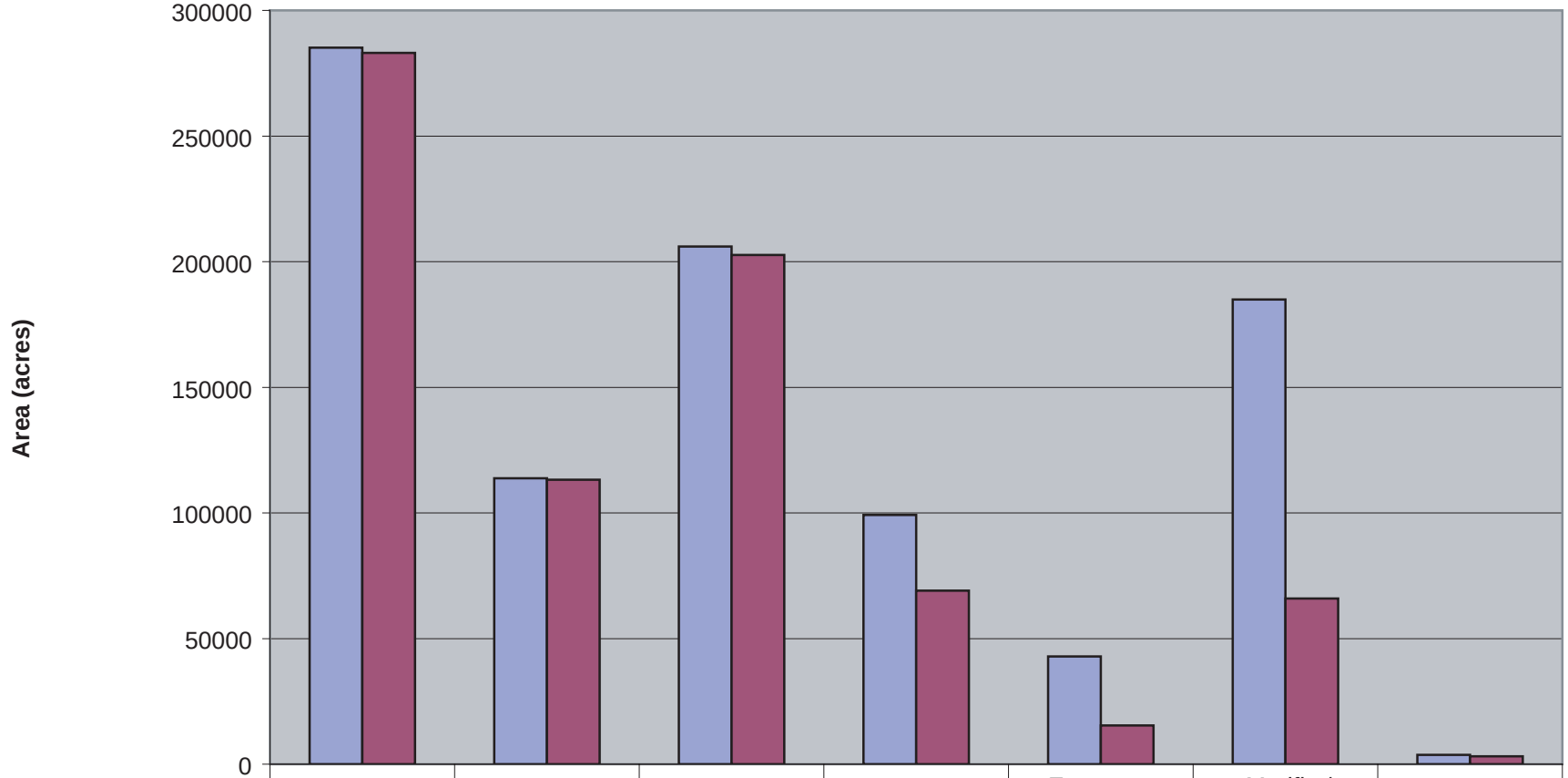
Figure 3-14
Percent Wet Meadow Habitat Loss from Project Alternatives and Varying Lake Lake Levels



	Pasture	Cropland	Scrub	Wet Meadow	Emergent Marsh	Mudflat/ Pickleweed	Riparian
Total Habitat at Low Water (acres)	3,372	83	2,469	1,203	1,212	341	8
Total Habitat at High Water (acres)	3,371	81	2,416	888	541	62	6

03076.03 (11/04)

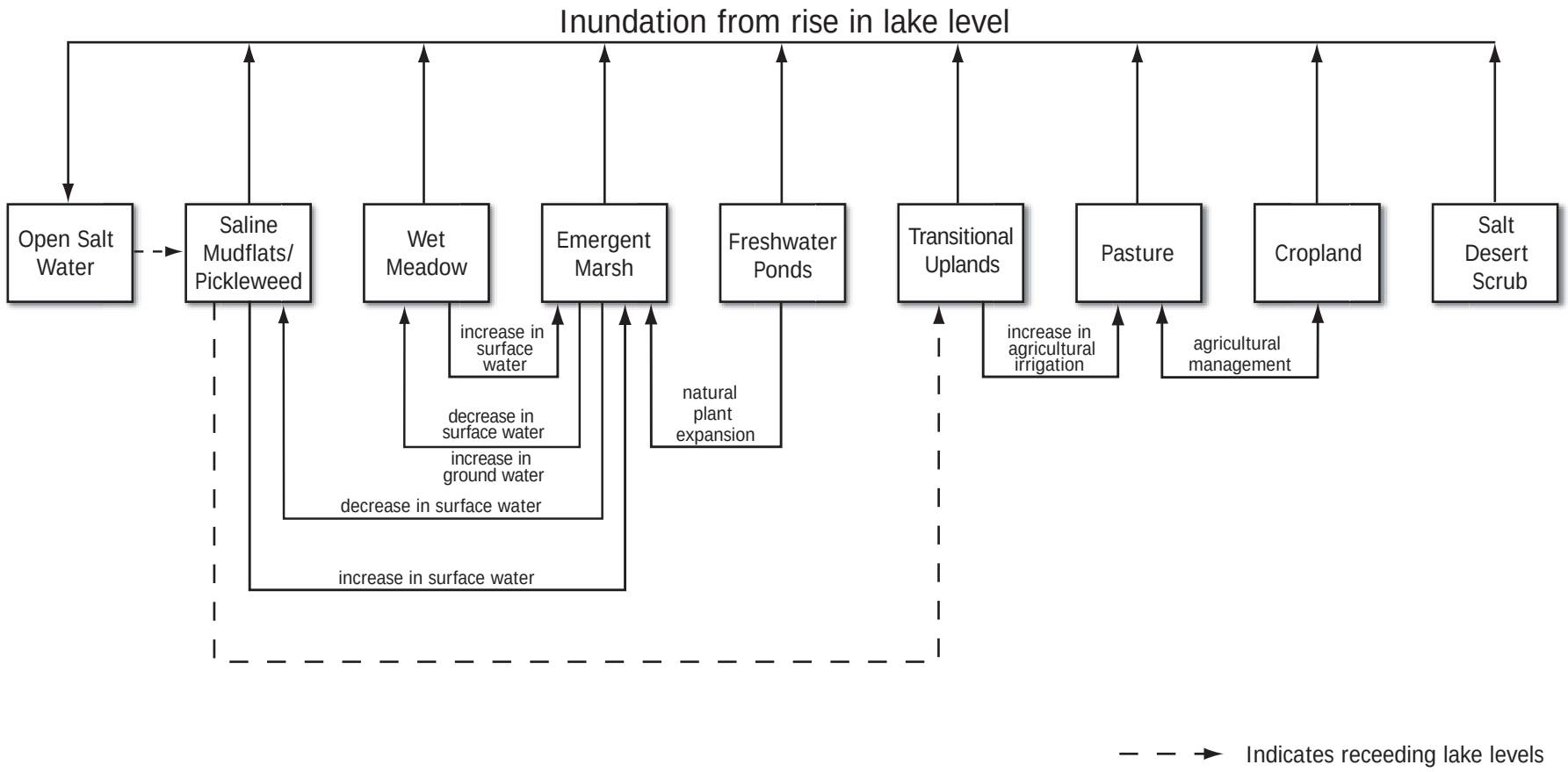
Figure 3-15
Wildlife Habitat Availability in Project Study Area at Low and High Lake Levels



	Pasture	Cropland	Scrub	Wet Meadow	Emergent Marsh	Mudflat/ Pickleweed	Riparian
Total Habitat at Low Water (acres)	285,165	113,742	206,017	99,139	42,817	184,915	3,728
Total Habitat at High Water (acres)	283,104	113,195	202,614	69,005	15,431	65,938	3,139

03076.03 (11/04)

Figure 3-16
Wildlife Habitat Availability in Regional Study Area at Low and High Lake Levels

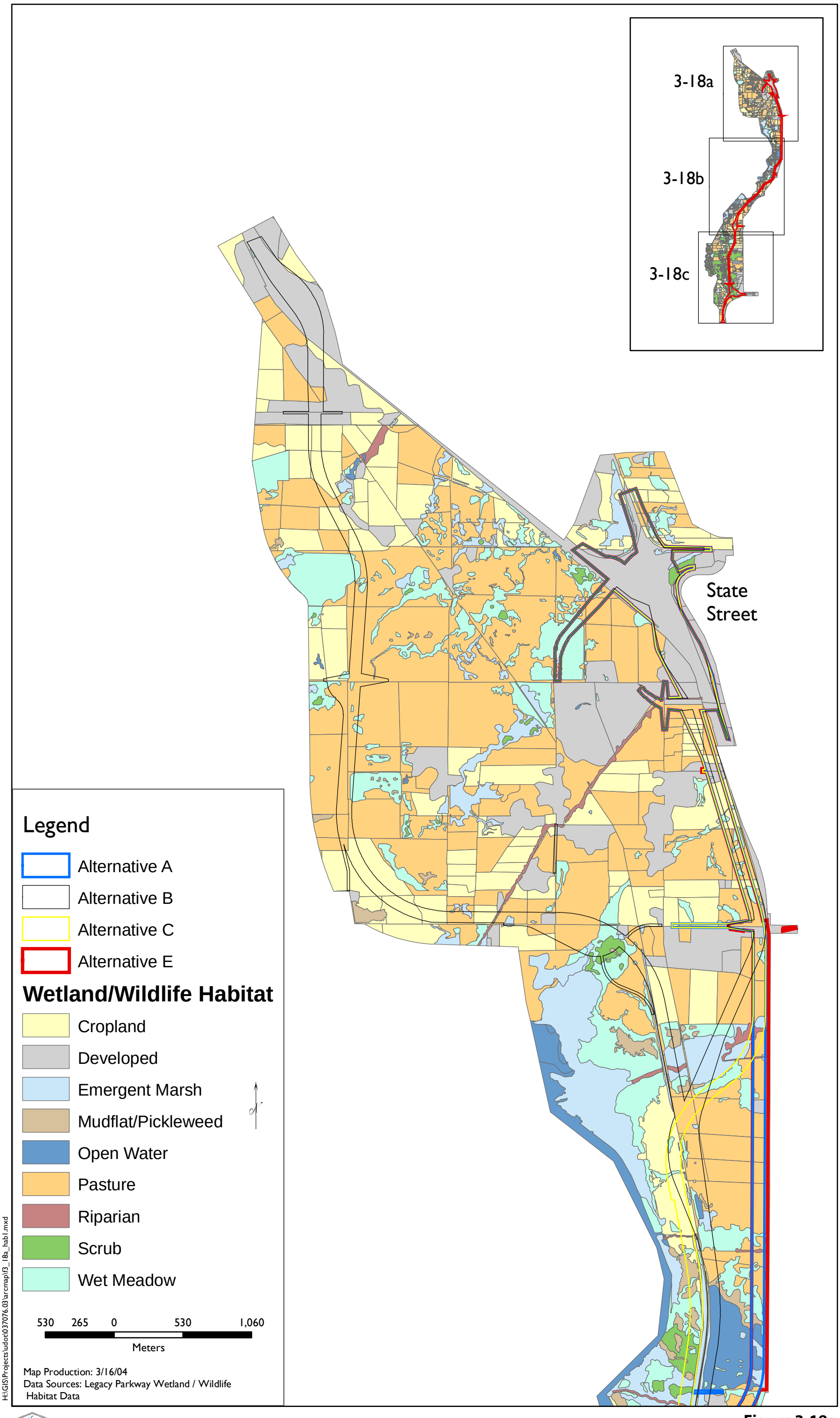


Source: modified from - Bellagamba/Dolling/Peterson

03076.03 002 Wildlife Tech Memo

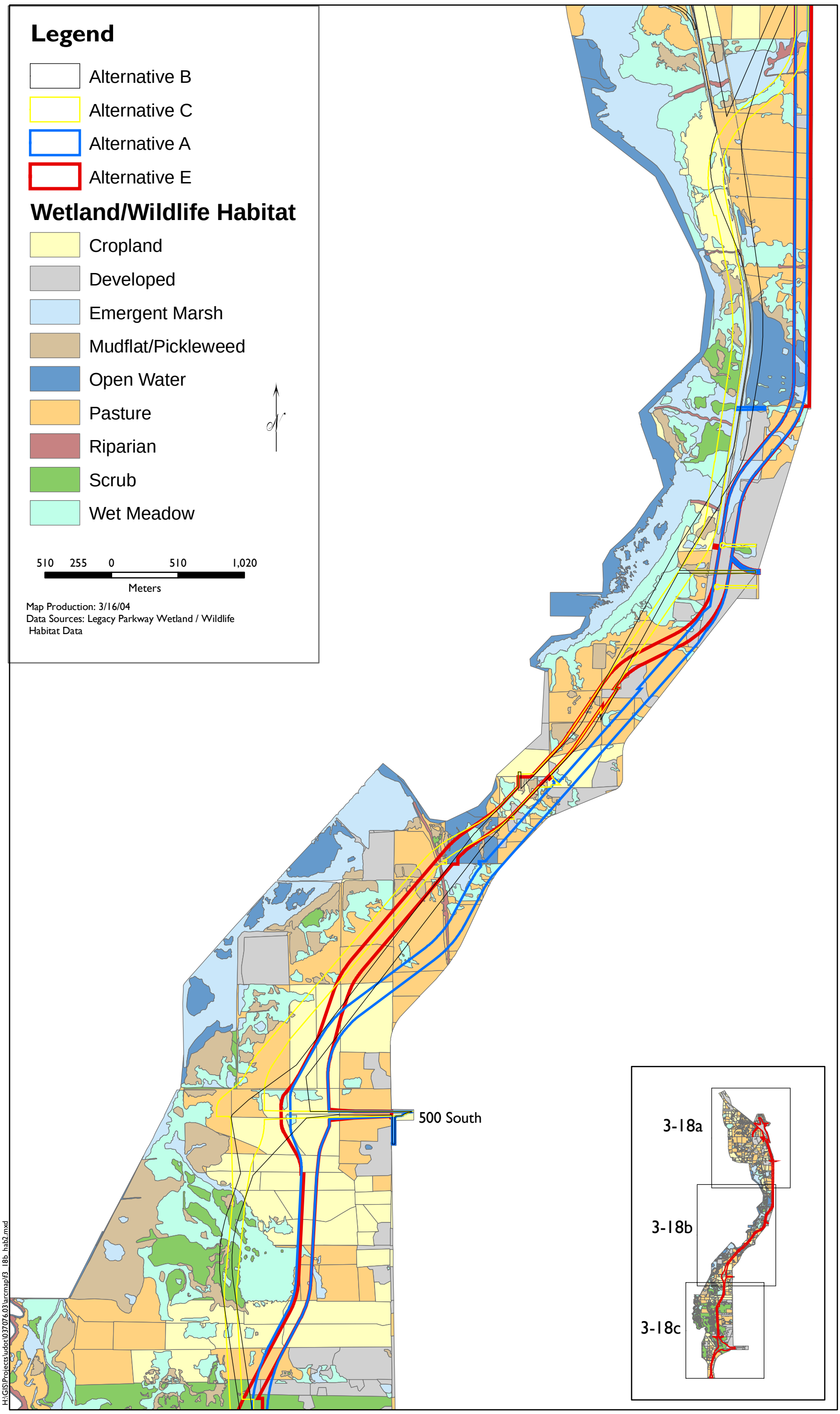
Jones & Stokes

Figure 3-17
Conceptual Ecological Model:
Dynamics of Great Salt Lake Shoreline Habitats



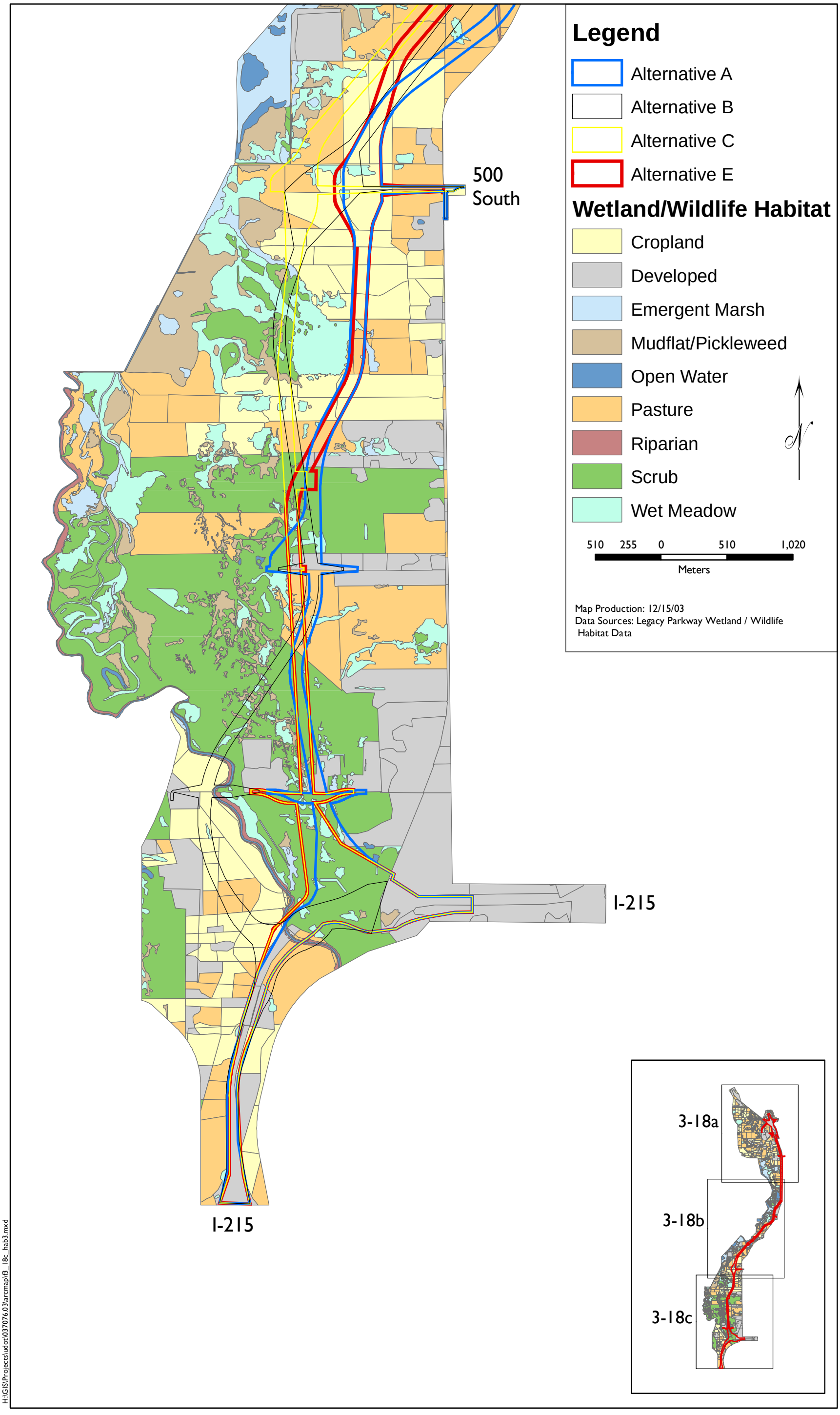
Jones & Stokes

Figure 3-18a
Wildlife Habitats and Build Alternatives in the Legacy Parkway Project Study Area



Jones & Stokes

Figure 3-18b
Wildlife Habitats and Build Alternatives in the Legacy Parkway Project Study Area



Jones & Stokes

Figure 3-18c
Wildlife Habitats and Build Alternatives in the Legacy Parkway Project Study Area

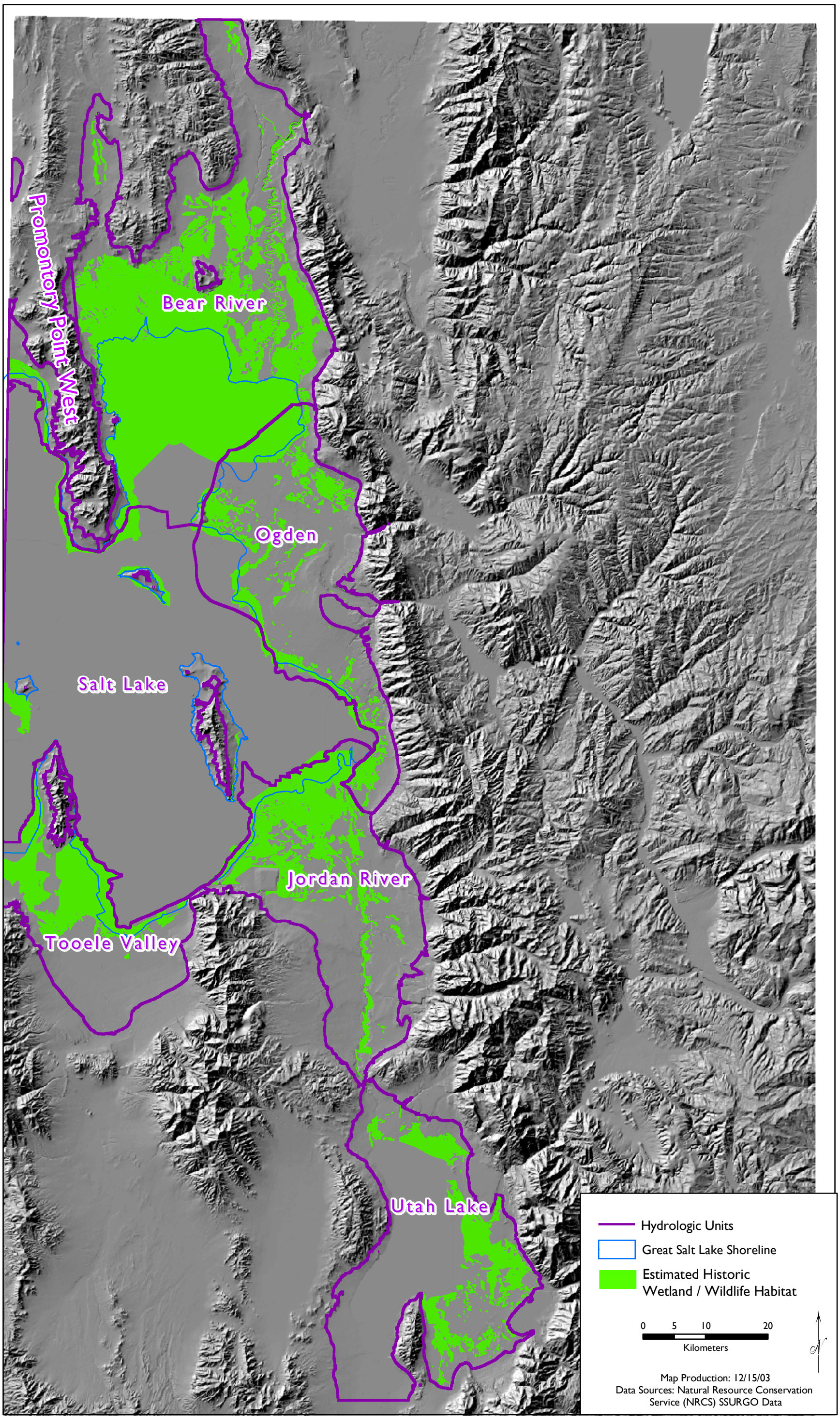


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Figure 3-19
Regional Study Area Estimated Historic Extent of Wetland/Wildlife Habitat

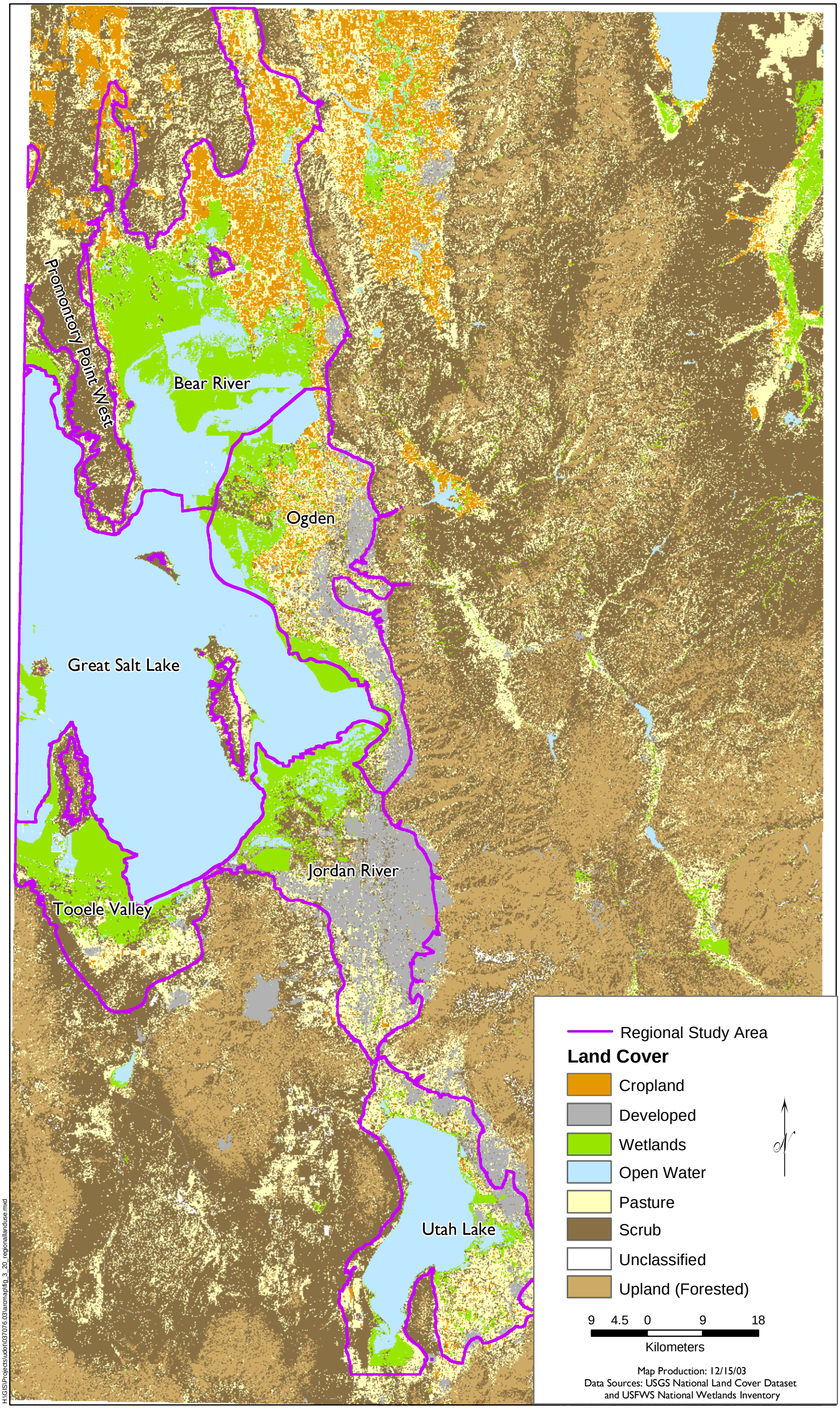

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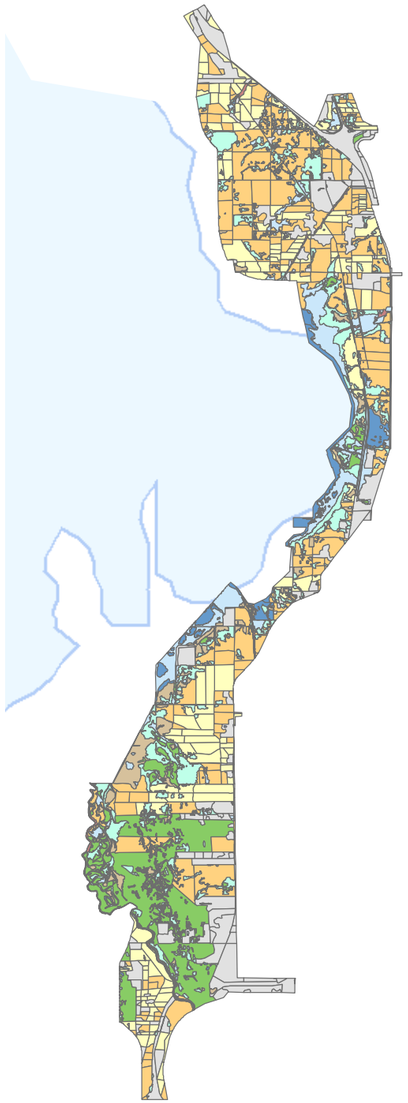
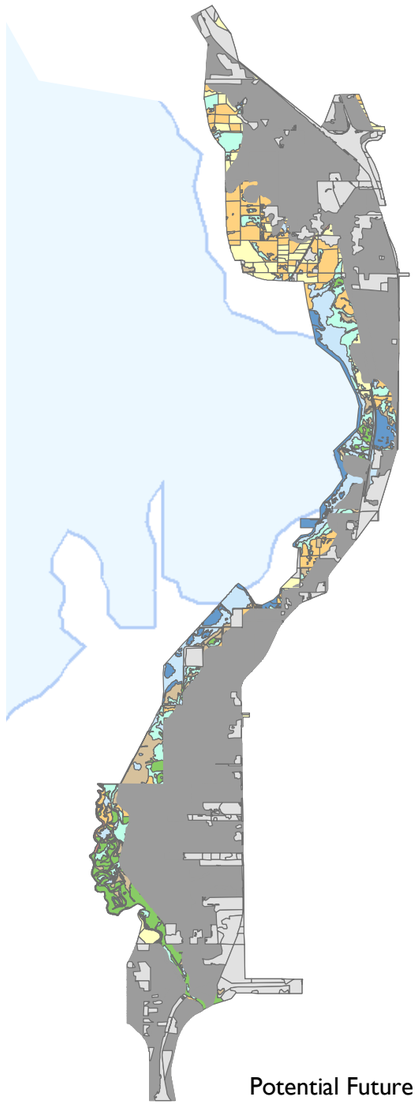
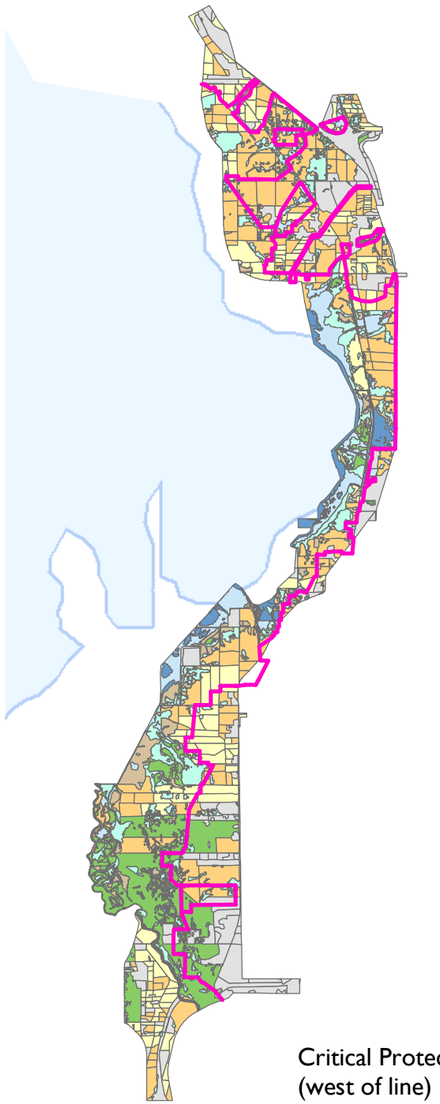
Figure 3-20
Regional Study Area Land Cover





Potential Future Development



Critical Protection Areas*
(west of line)

3

Legend

Critical Protection Areas (west of line)*

Potential Future Development

- Developed
- Developable

Wetland / Wildlife Habitat

- Cropland
- Developed
- Emergent Marsh
- Mudflat/Pickleweed
- Open Water
- Pasture
- Riparian
- Scrub
- Wet Meadow

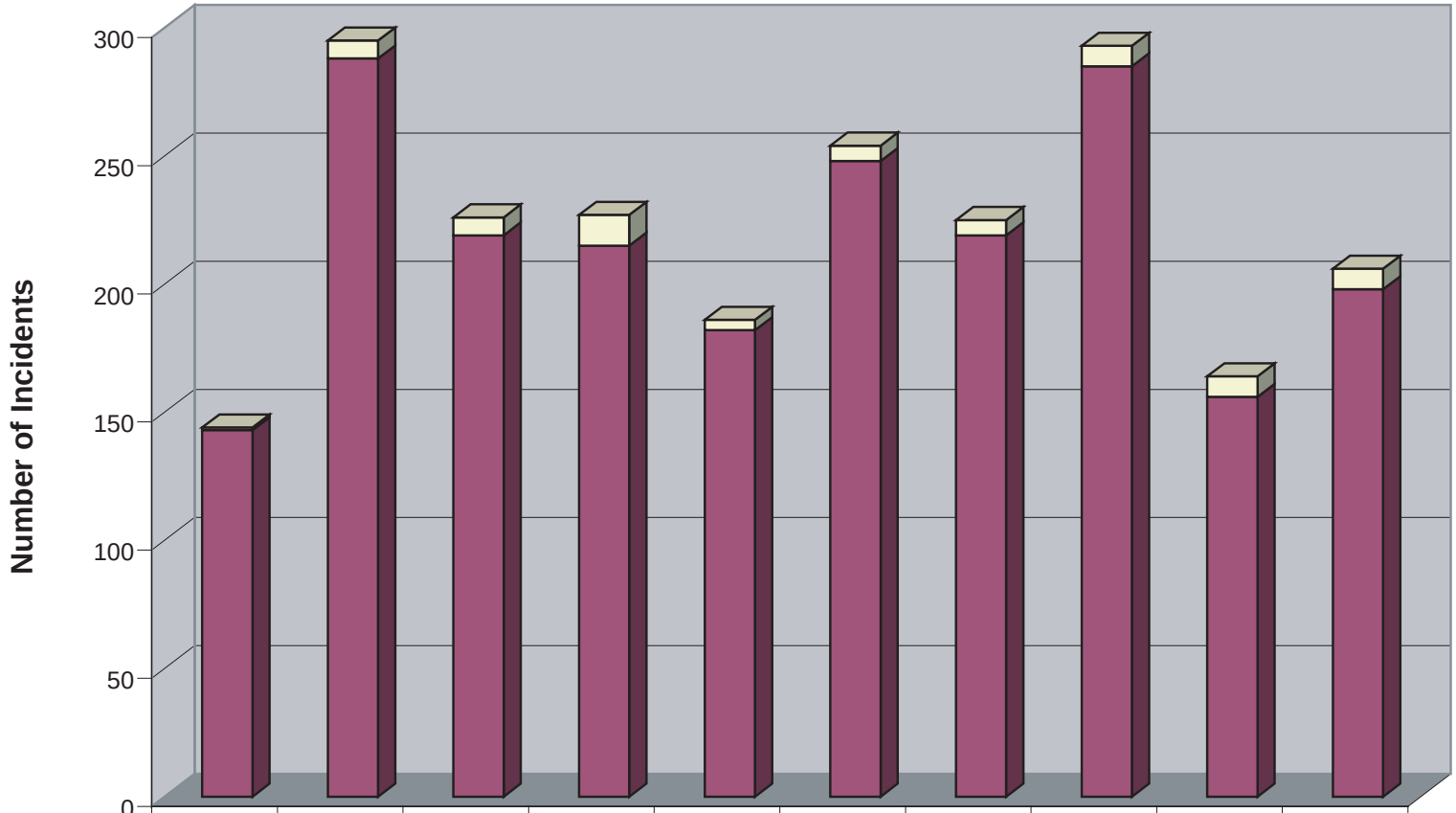
1 0.5 0 1 2
Kilometers

Jones & Stokes

Map Production: 12/15/03
Data Sources: UDOT Project Alternatives and Wetland / Wildlife Habitat Data, Potential Future Development modified from the Final EIS
*Davis County Critical Protection Area from the Wetlands Conservation Plan -- A Plan for Protection of the Great Salt Lake Wetlands Ecosystem in Davis County (December 1996).

H:\GIS\Projects\udot\037076.03\arcmap\f3_21_futuredevelop.mxd

Figure 3-21
Legacy Parkway Study Area Potential Future Development



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Serious Incidents	1	7	7	12	4	6	6	8	8	8
Highway Incidents	143	288	219	215	182	248	219	285	156	198

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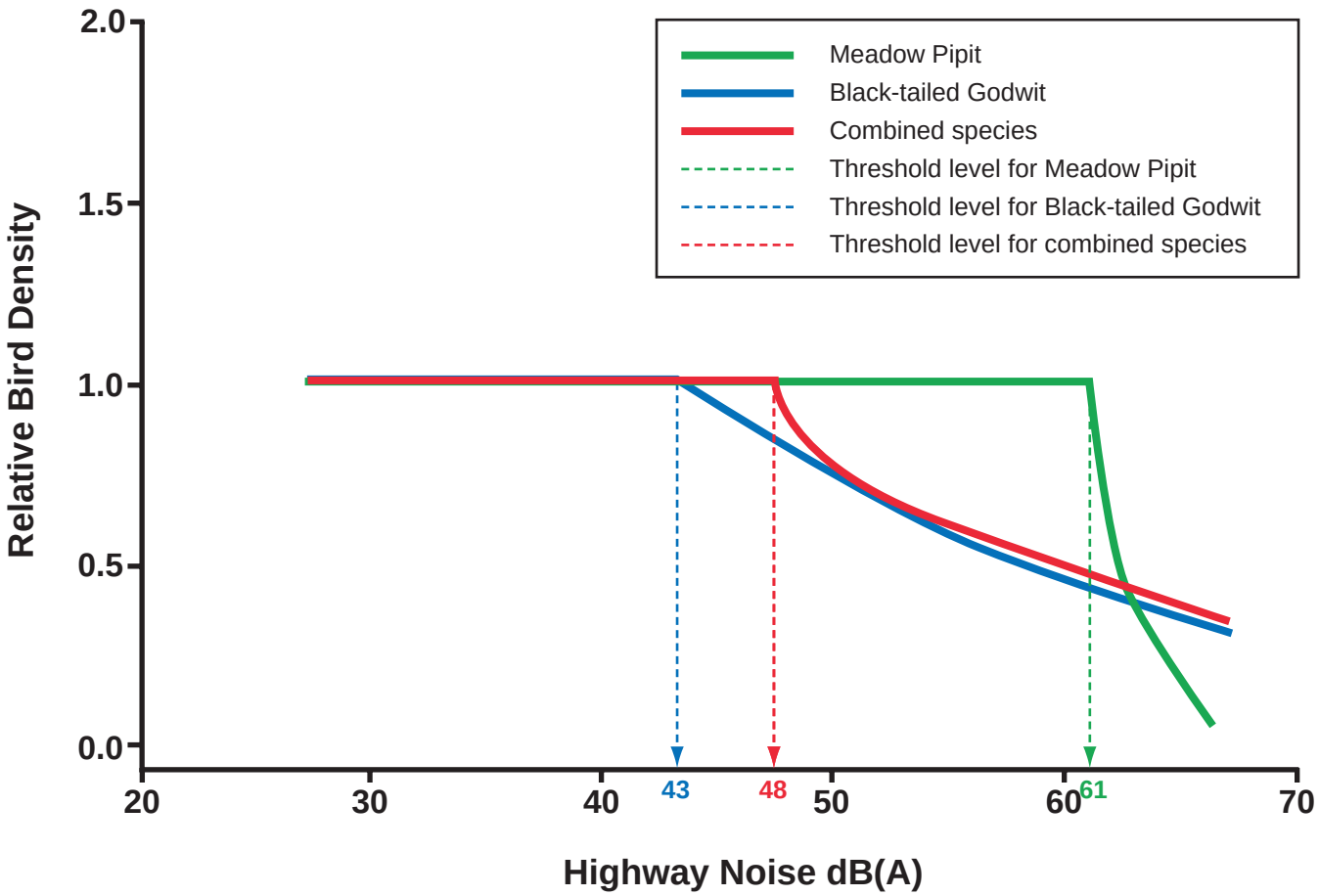
Figure 3-22
Highway Incidents Involving Hazardous Materials in Utah



Source: Modified from Reijnen, Foppen, Meeuwsen (1995)

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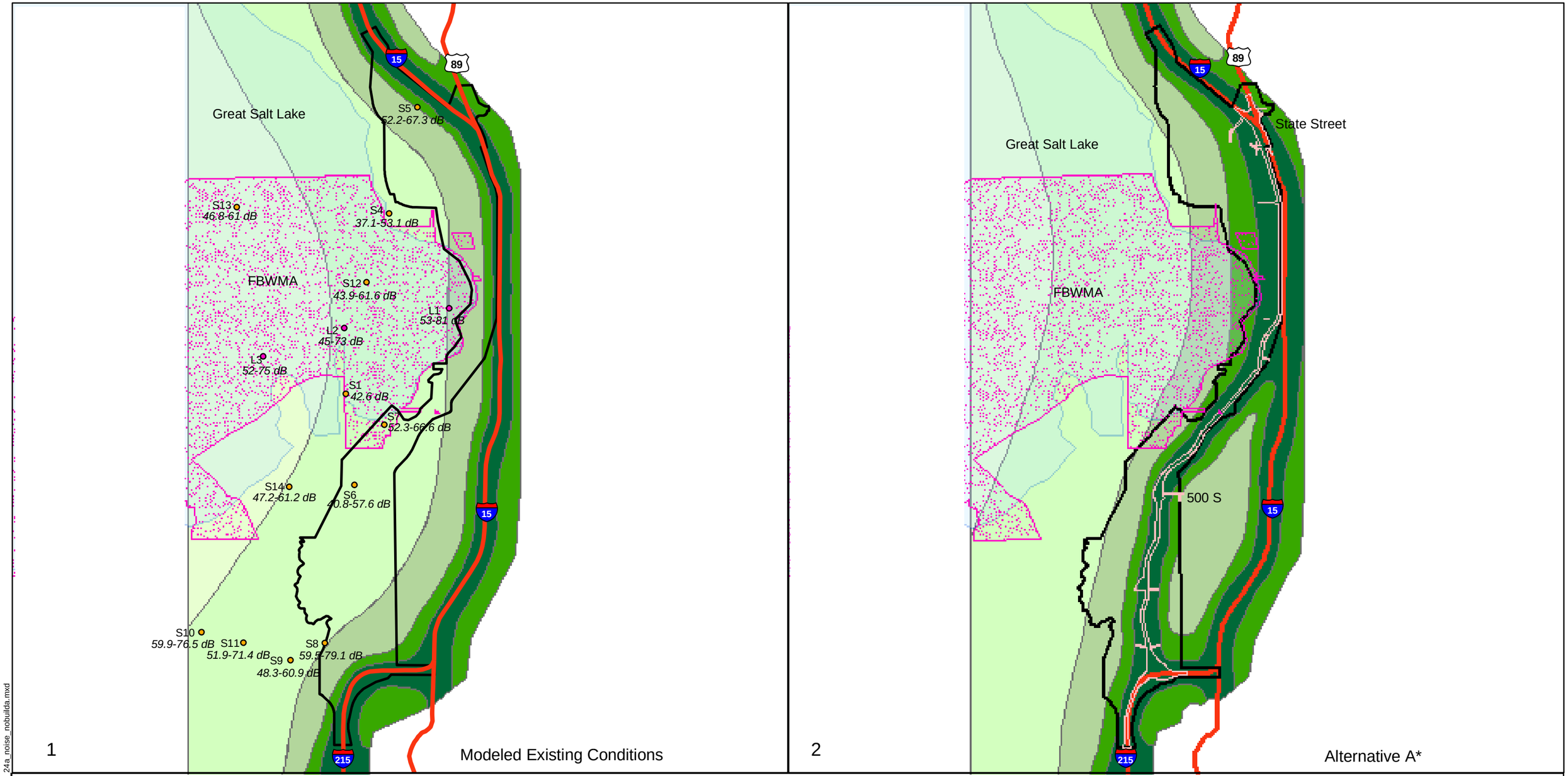
Figure 3-23
Threshold Noise Level Determination for Representative Grassland Birds



Legend

- Local Study Area Boundary
- Proposed Right of Way
- Major Existing Roads
- Great Salt Lake
- Farmington Bay Wildlife Management Area (FBWMA)

TNM Modeled Noise Levels (Decibels dBA)[1]

- <45
- > = 45 < 50
- > = 50 < 55
- > = 55 < 60
- > = 60

Monitoring Type

- Short-term Noise Measurements (Leq-Lmax): Table F-3
- Long-term Noise Measurements (Leq-Lmax); Table F-4

2.5 1.25 0 2.5 5
Kilometers

Map Production: 12/15/03
Data Sources: UDOT Project Study Area Boundary, Project Alternatives and Exsiting Roads. Contours Generated from Field Data
*Supplemental EIS 312-ft ROWs used for the Alternatives

[1] The noise level contours generated by the traffic noise model have not yet been verified beyond 305m (1000ft). The locations of contours beyond this distance are projected estimates only and could vary significantly depending on existing background noise, atmospheric conditions, and substrate type.

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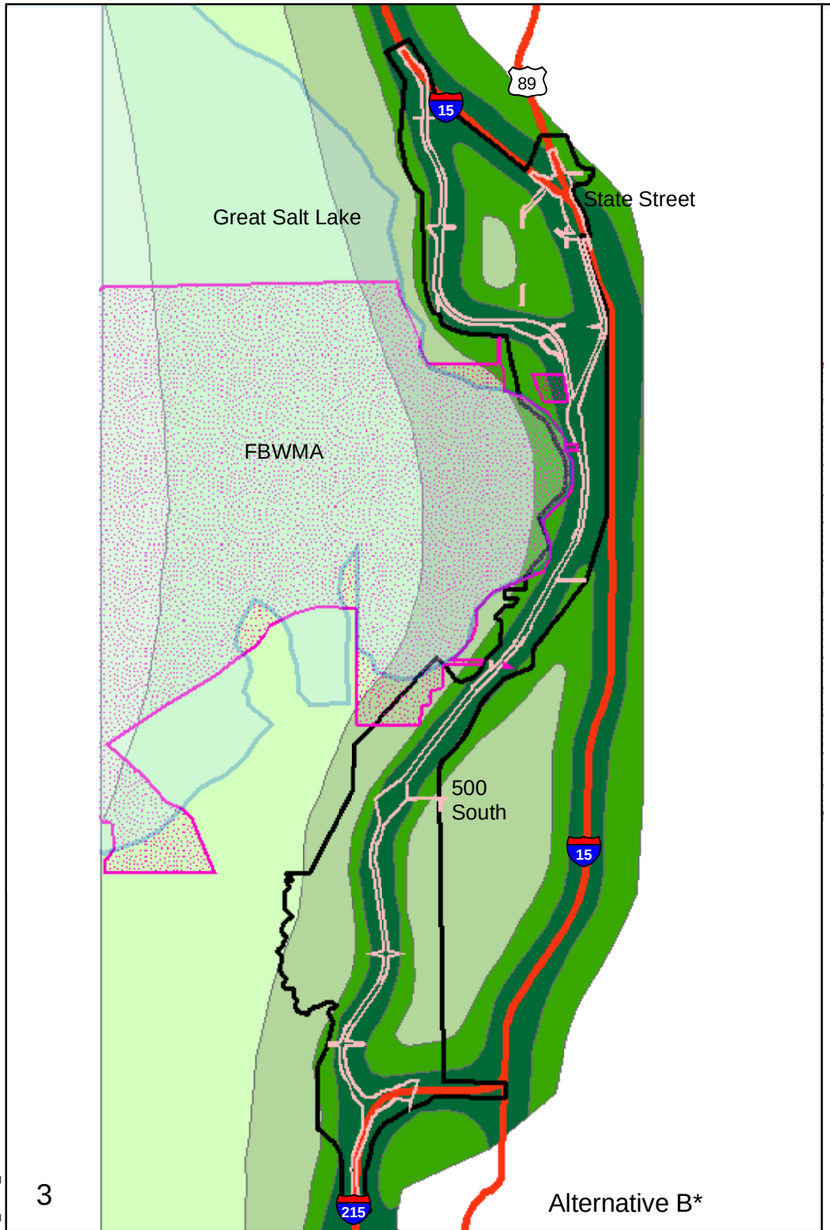
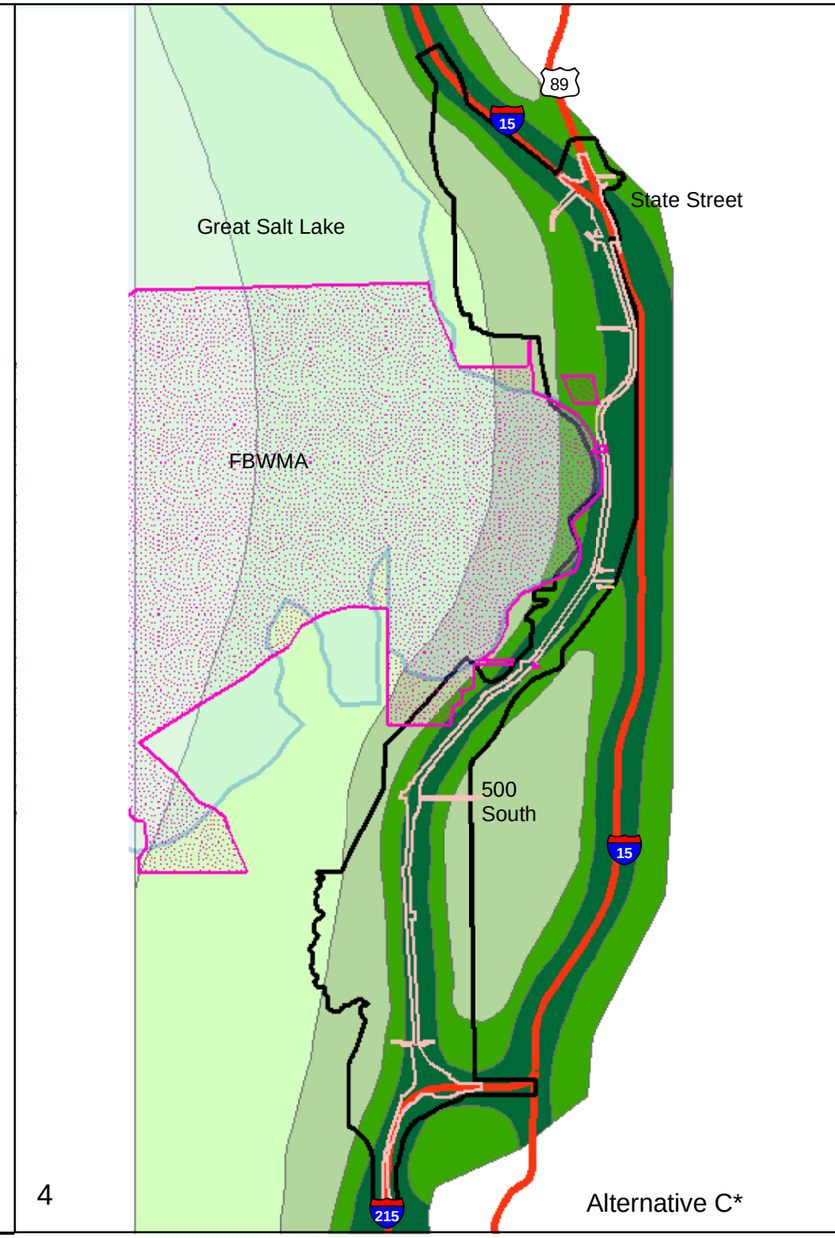
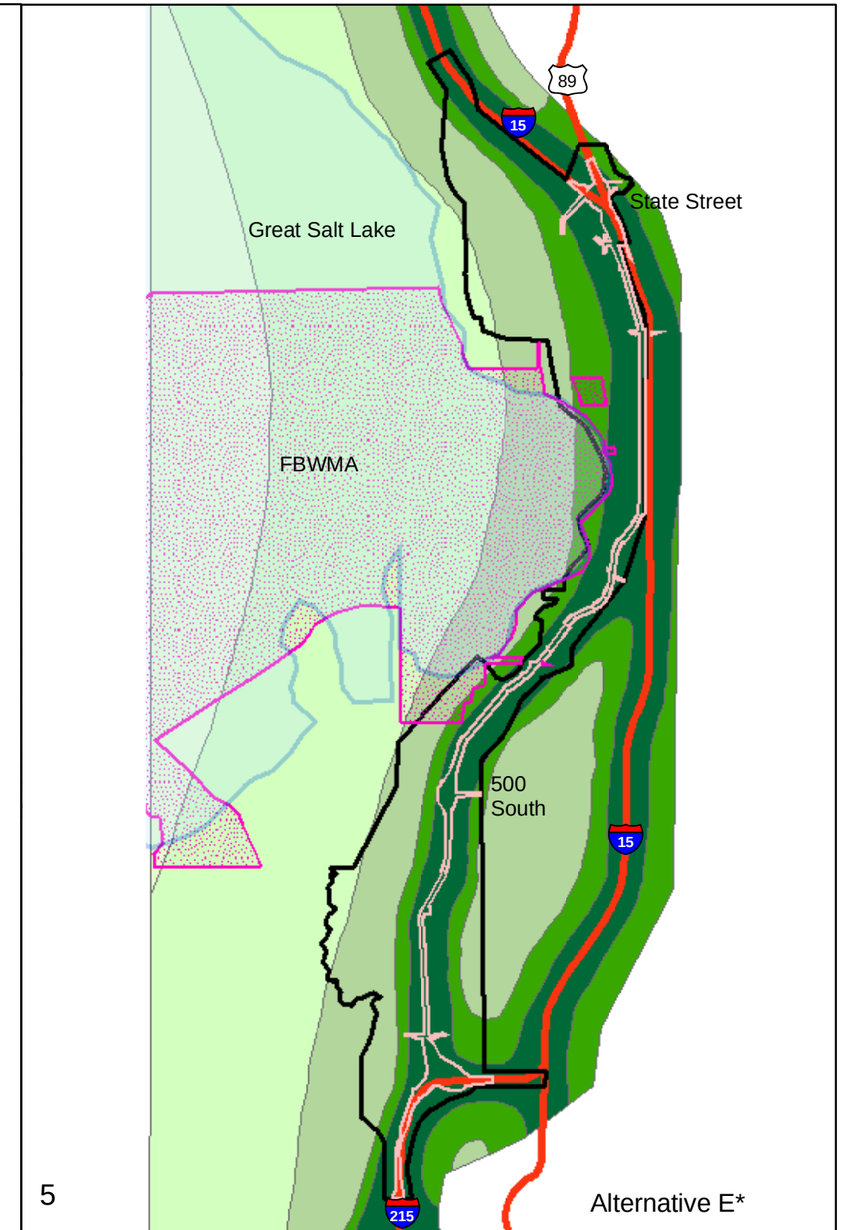
Jones & Stokes

Figure 3-24a
Highway Noise Level for the Legacy Parkway







Legend

- Local Study Area Boundary
- Proposed Right of Way
- Major Existing Roads
- Great Salt Lake
- Farmington Bay Wildlife Management Area (FBWMA)

TNM Modelled Noise Levels (Decibels)[1]

- <45
- > = 45 < 50
- > = 50 < 55
- > = 55 < 60
- > = 60

N

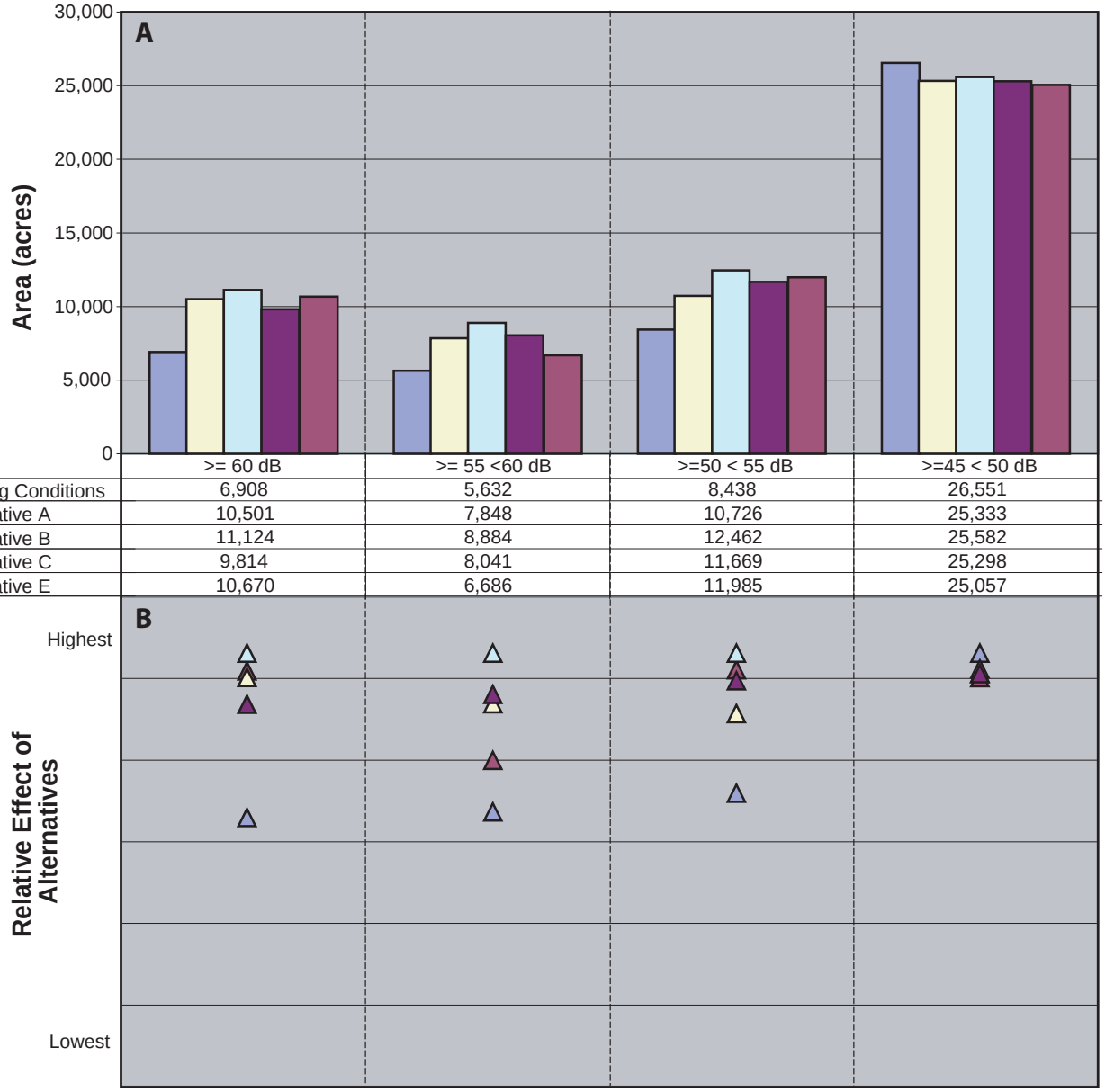
2.5 1.25 0 2.5 5
Kilometers

Map Production: 12/15/03
Data Sources: UDOT Project Study Area Boundary, Project Alternatives and Exsiting Roads. Contours Generated from Field Data
*Supplemental EIS 312 foot ROWs used for the Alternatives
[1]The noise level contours generated by the traffic noise model have not yet been verified beyond 305m (1000ft). The locations of contours beyond this distance are projected estimates only and could vary significantly depending on existing background noise, atmospheric conditions, and substrate type.

H:\GIS\Projects\udot\037076.03\arcmap\f3_24b_noise_alt.mxd

Jones & Stokes

Figure 3-24b
Highway Noise Level for the Legacy Parkway

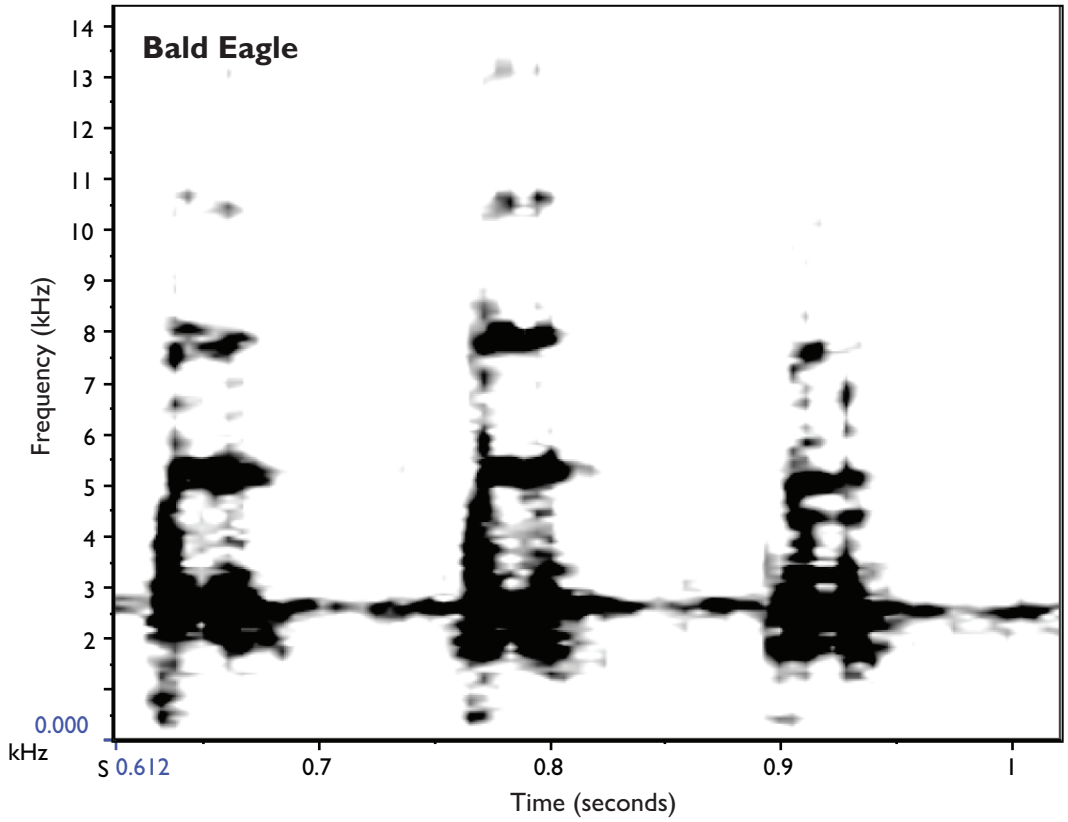


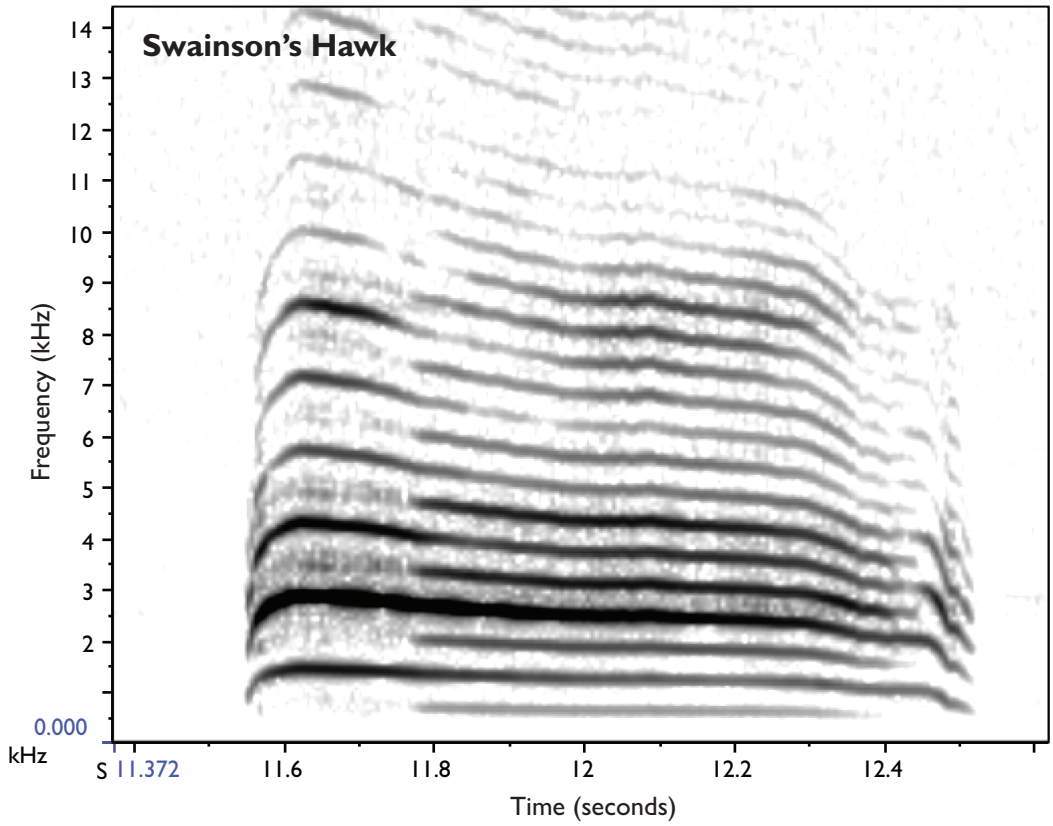
	>= 60 dB	>= 55 <60 dB	>=50 < 55 dB	>=45 < 50 dB
Existing Conditions	6,908	5,632	8,438	26,551
Alternative A	10,501	7,848	10,726	25,333
Alternative B	11,124	8,884	12,462	25,582
Alternative C	9,814	8,041	11,669	25,298
Alternative E	10,670	6,686	11,985	25,057

Note: The noise level contours generated by the traffic noise model (Fig 3-22) have not been verified beyond 305 m (1,000 ft). The locations of contours beyond this distance are projected estimates only and could vary significantly depending on existing background noise, atmospheric conditions, and substrate type.

Jones & Stokes

Figure 3-25
TNM Predicted Total Habitat Area Affected by Highway Noise





03076.02 Wildlife Tech Memo

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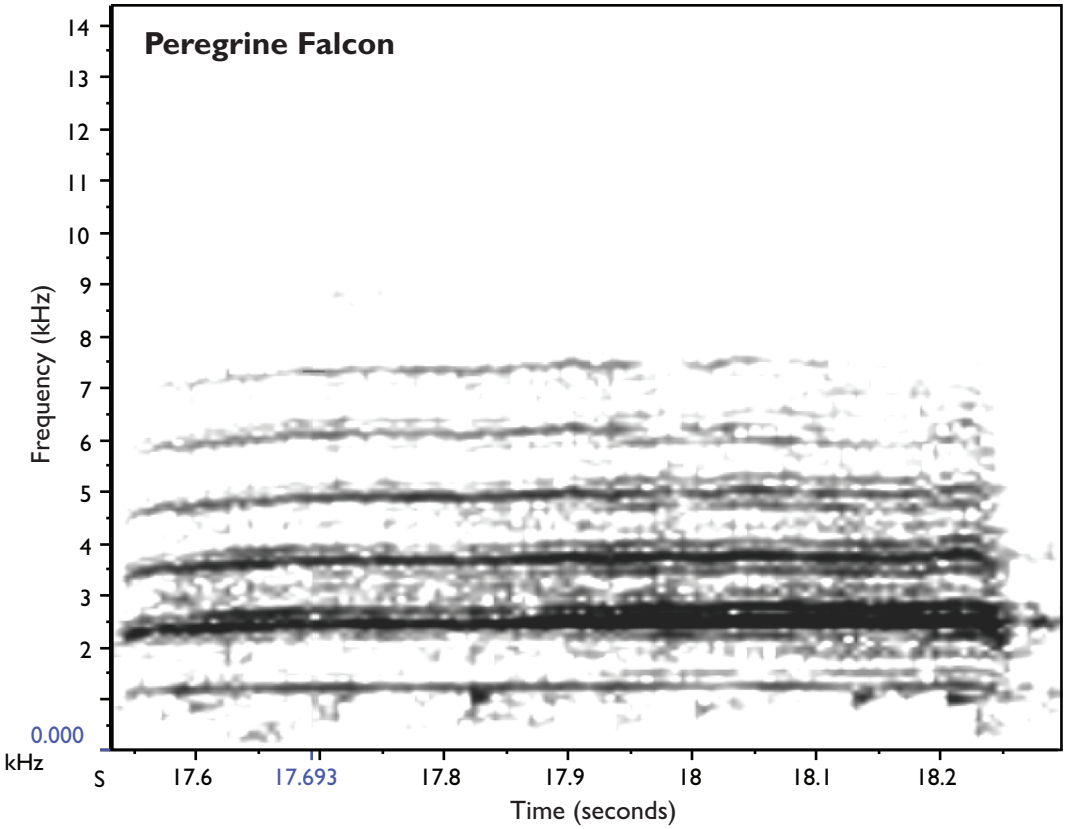
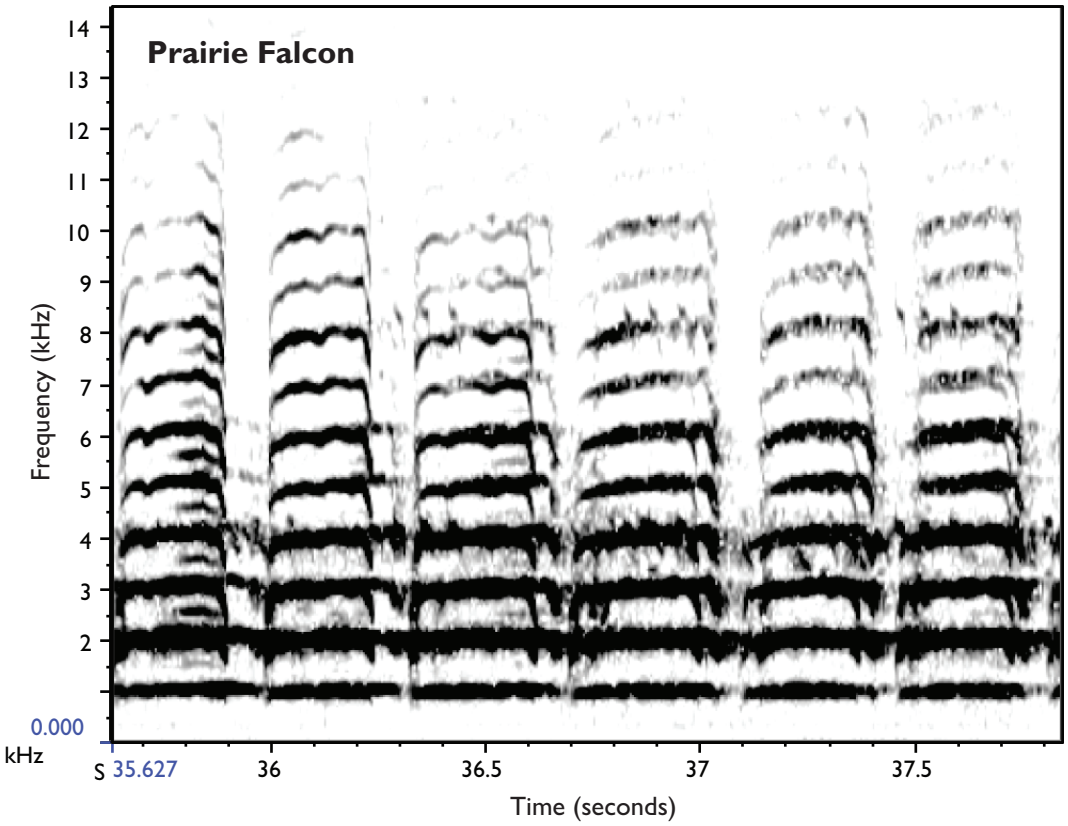
Figure 3-26a
Bird Vocalization Sonograms
Bald Eagle and Swainson's Hawk





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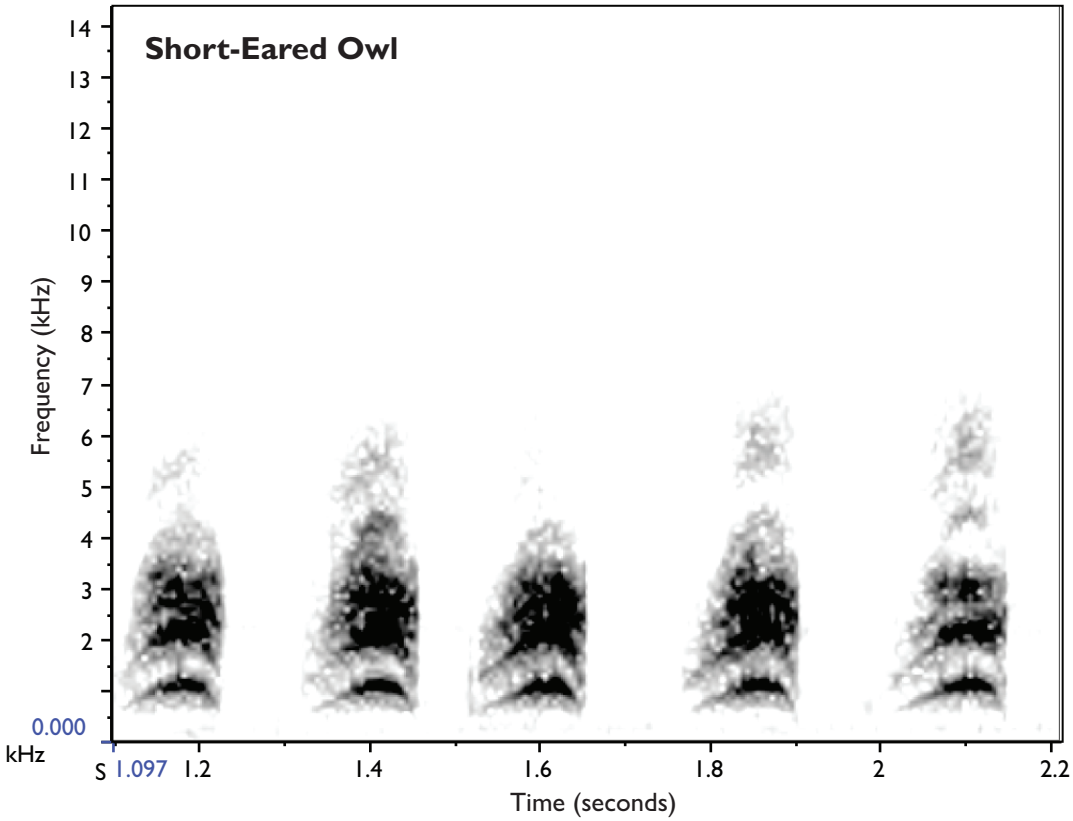
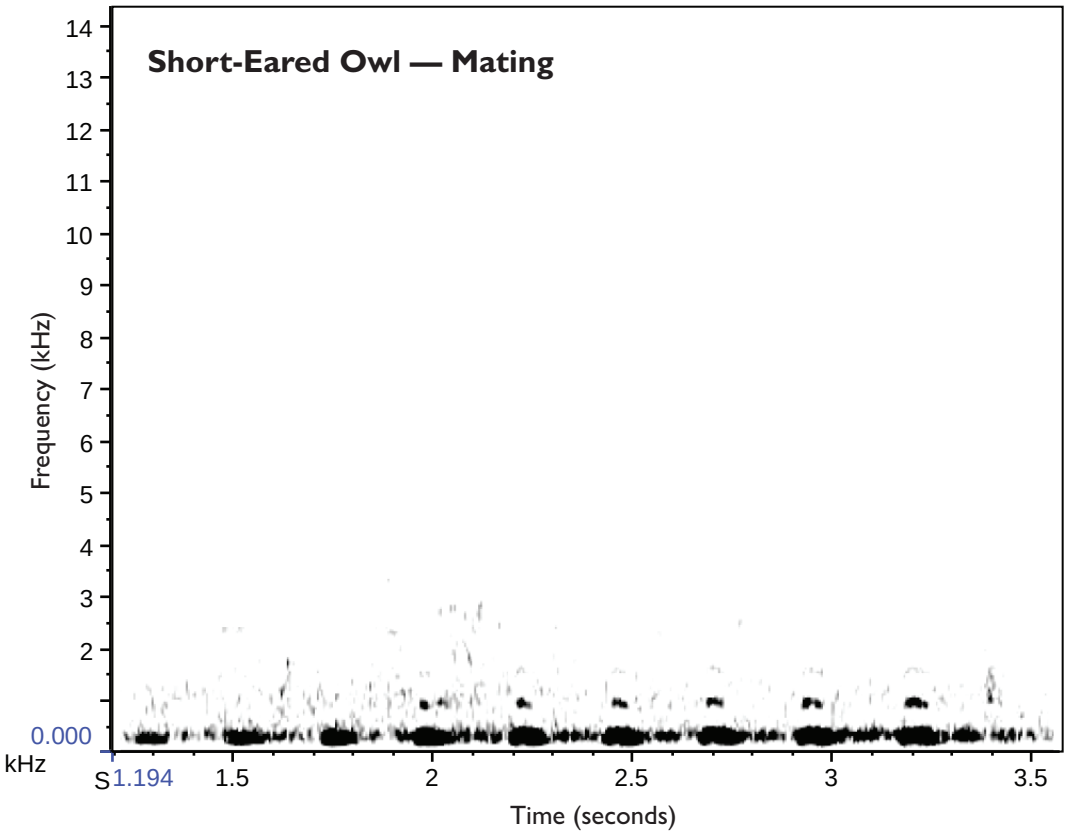
Jones & Stokes

Figure 3-26b
Bird Vocalization Sonograms
Peregrine Falcon and Prairie Falcon

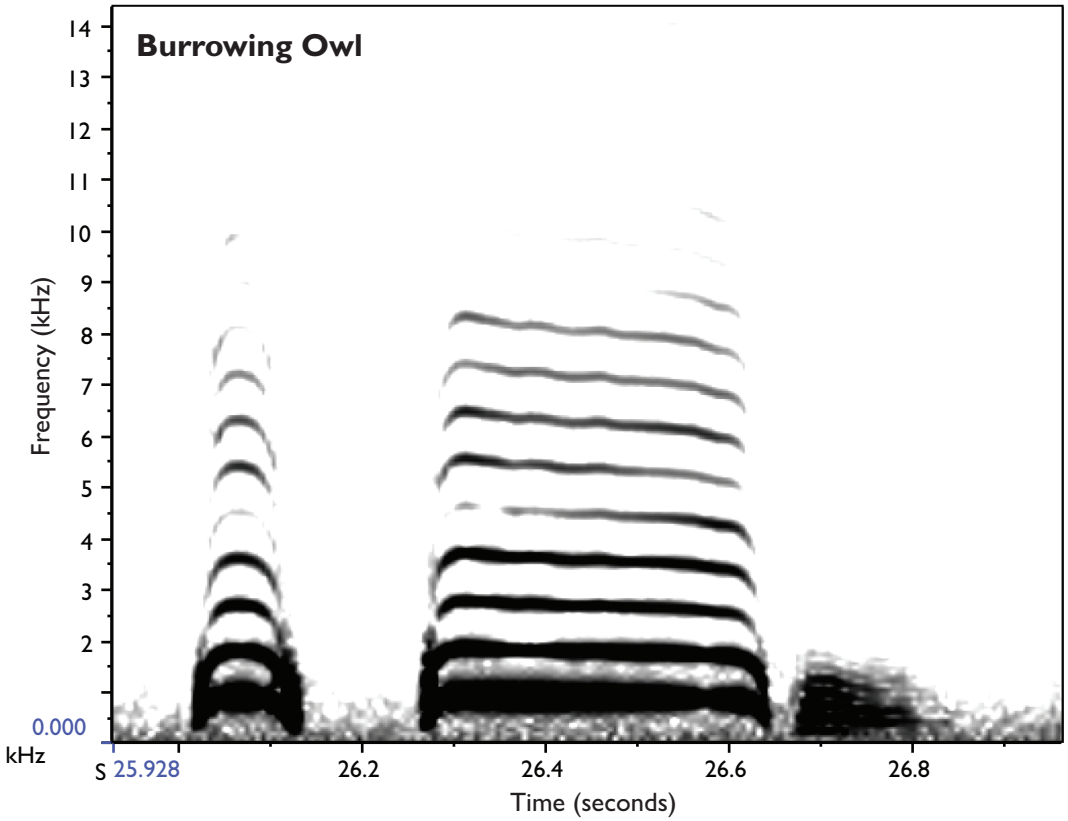


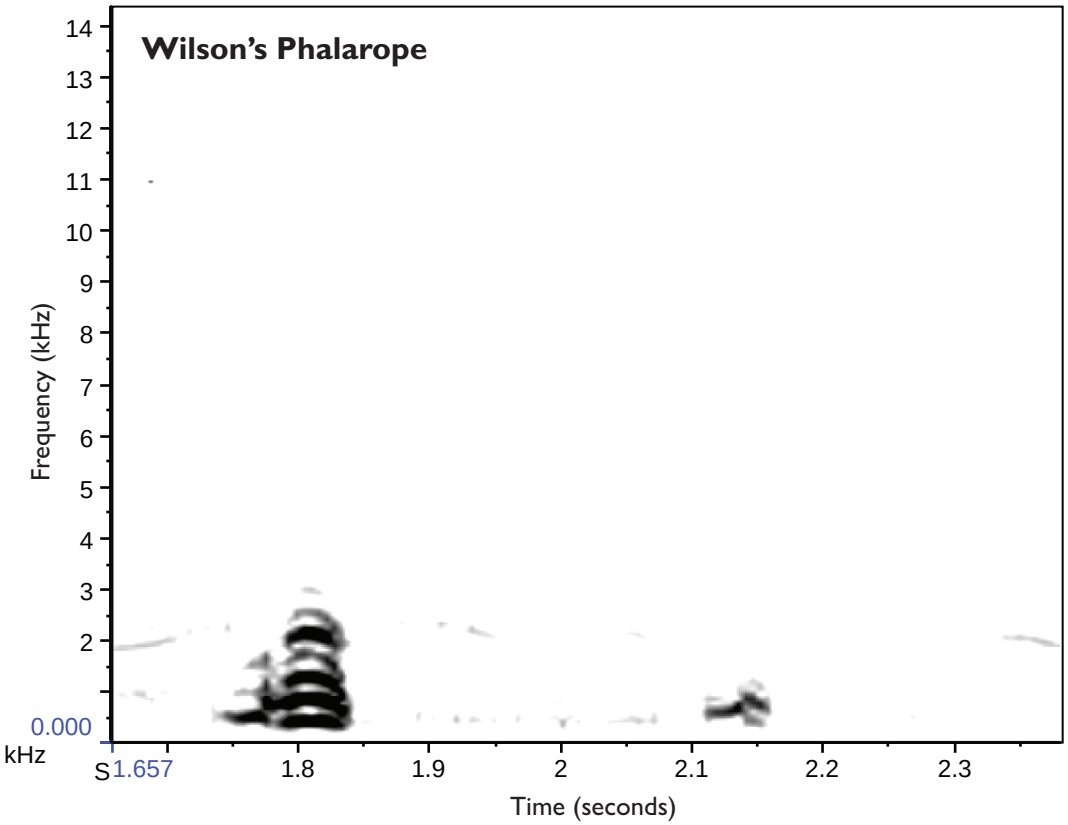


03076.02 Wildlife Tech Memo

Jones & Stokes

Figure 3-26c
Bird Vocalization Sonograms
Short-Eared Owl





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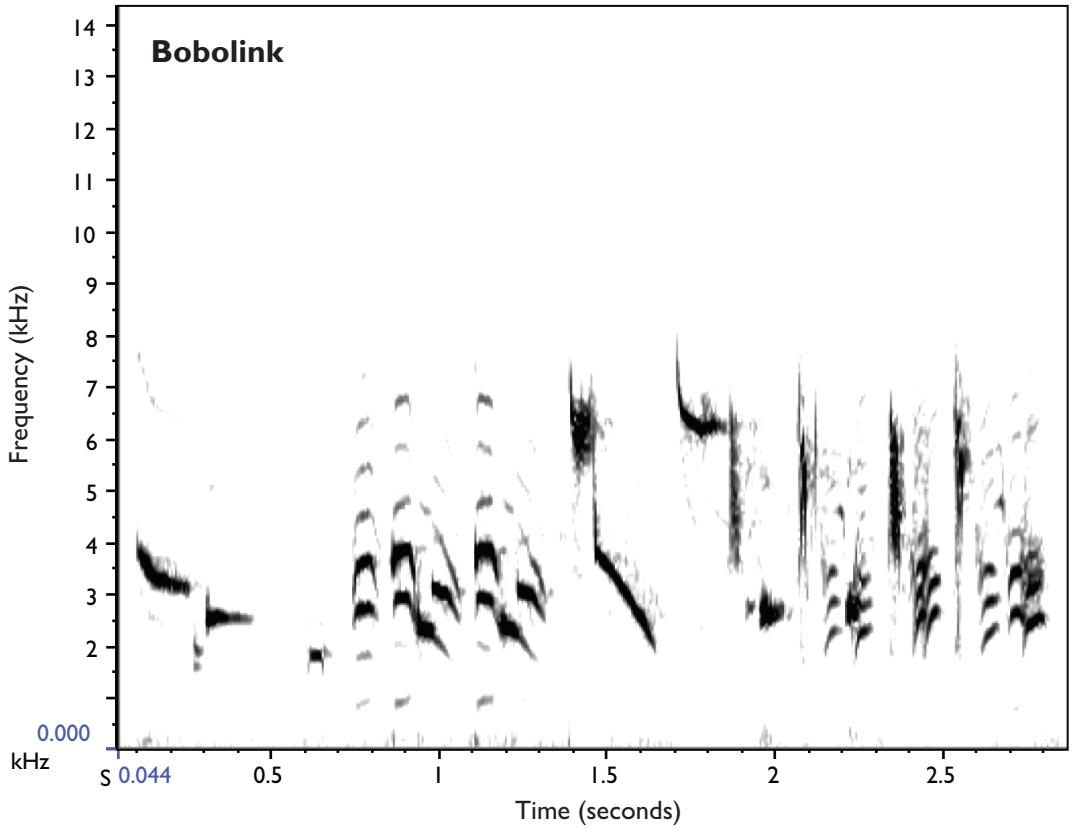
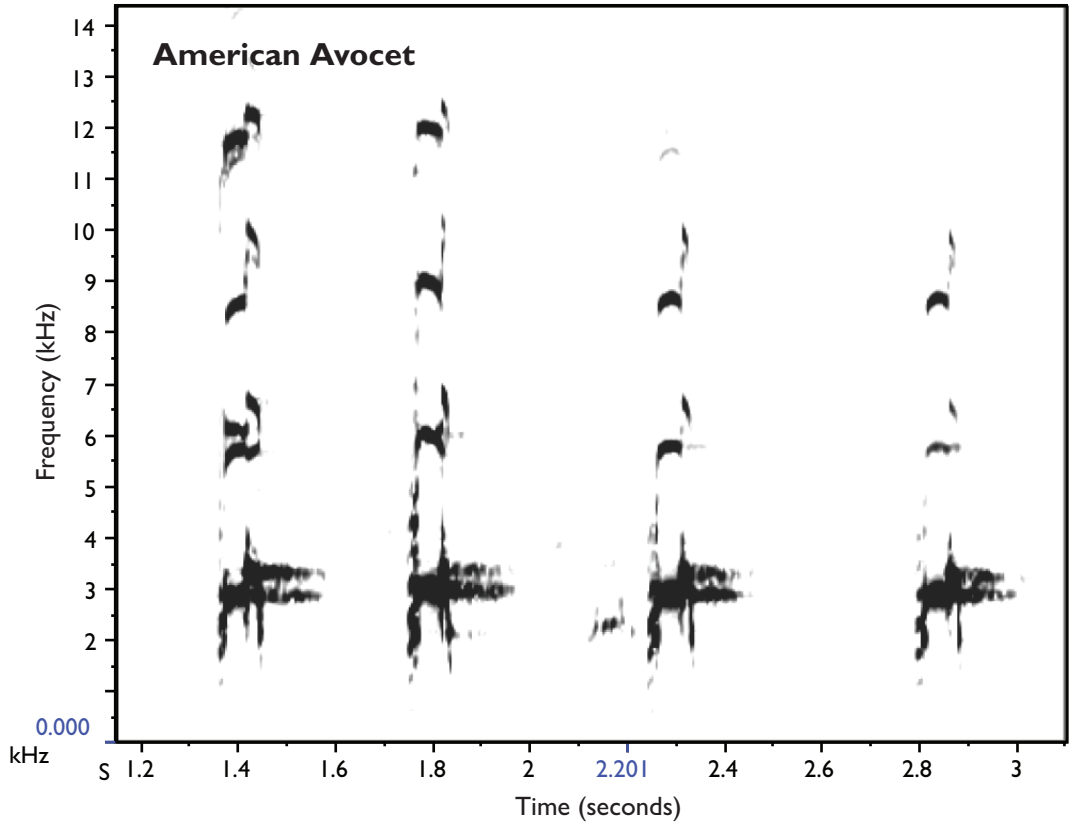
Jones & Stokes

Figure 3-26d
Bird Vocalization Sonograms
Burrowing Owl and Wilson's Phalarope





03076.02 Wildlife Tech Memo

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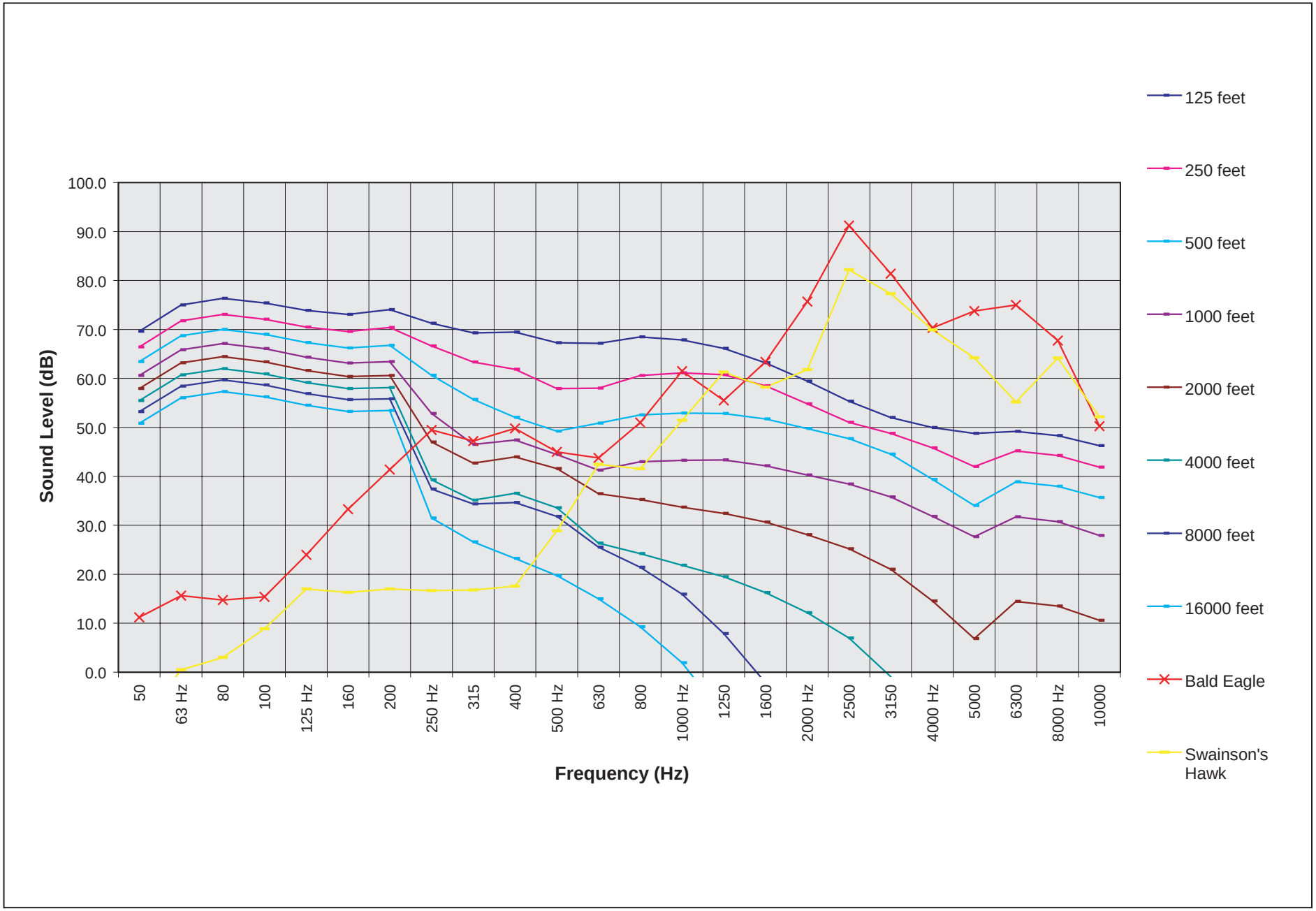
Figure 3-26e
Bird Vocalization Sonograms
Bobolink and American Avocet



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Jones & Stokes

Figure 3-27a
Traffic Noise Masking Thresholds and Vocal Signal Profiles at 50 Feet
Bald Eagle and Swainson's Hawk

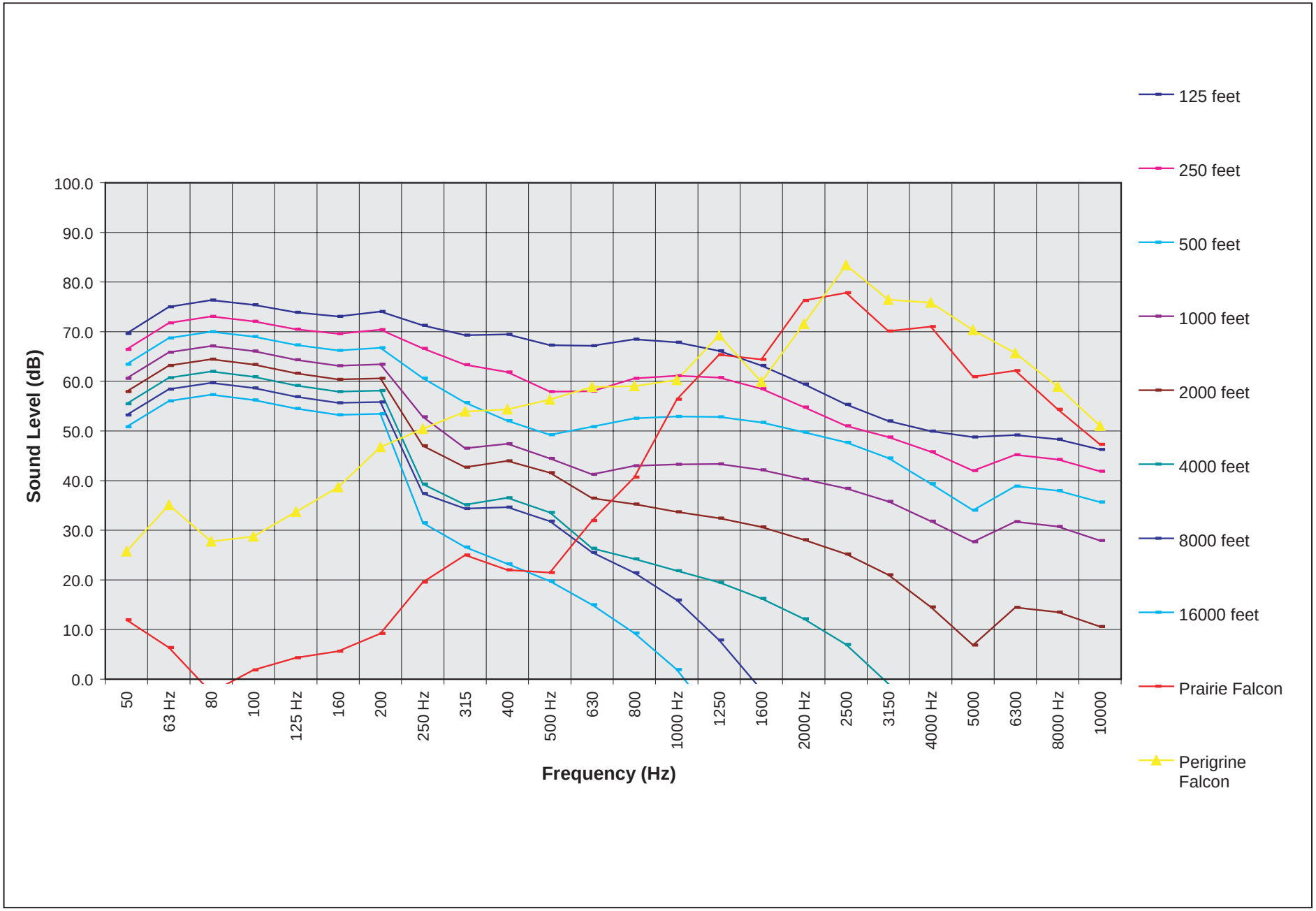

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Figure 3-27b
Traffic Noise Masking Thresholds and Vocal Signal Profiles at 50 Feet
Peregrine Falcon and Prairie Falcon

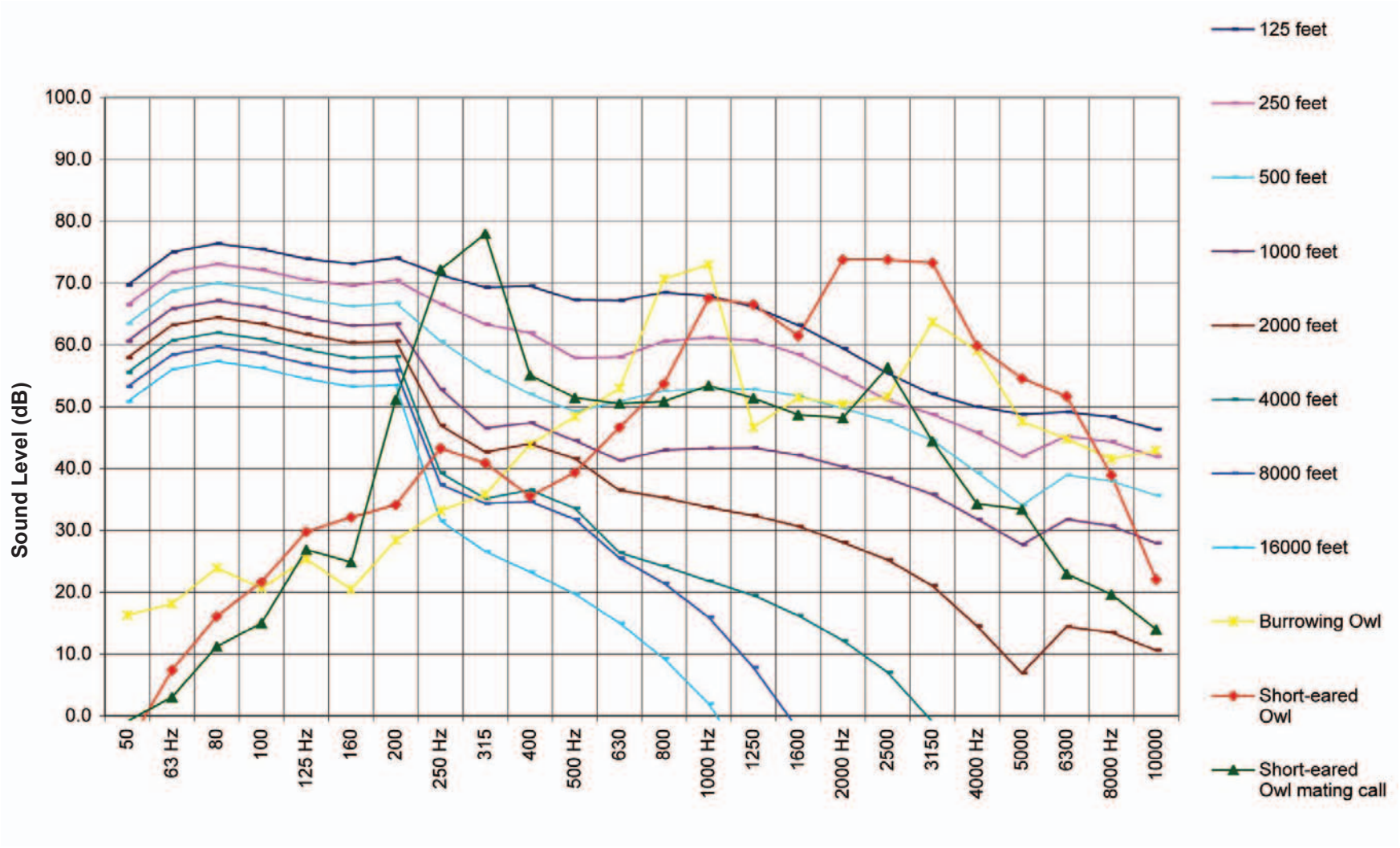

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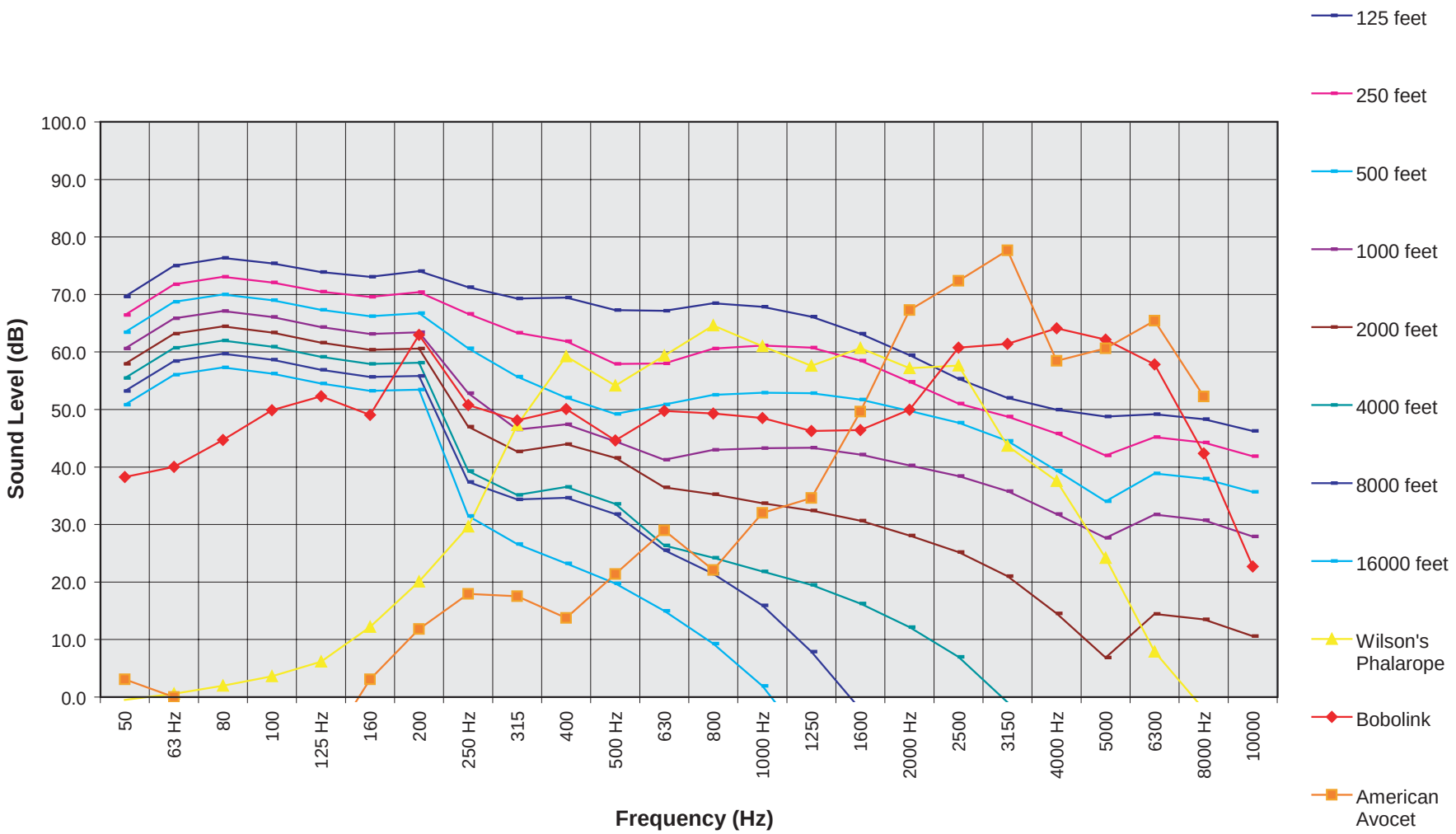
Figure 3-27c
Traffic Noise Masking Thresholds and Vocal Signal Profiles at 50 Feet
Burrowing Owl and Short-Eared Owl



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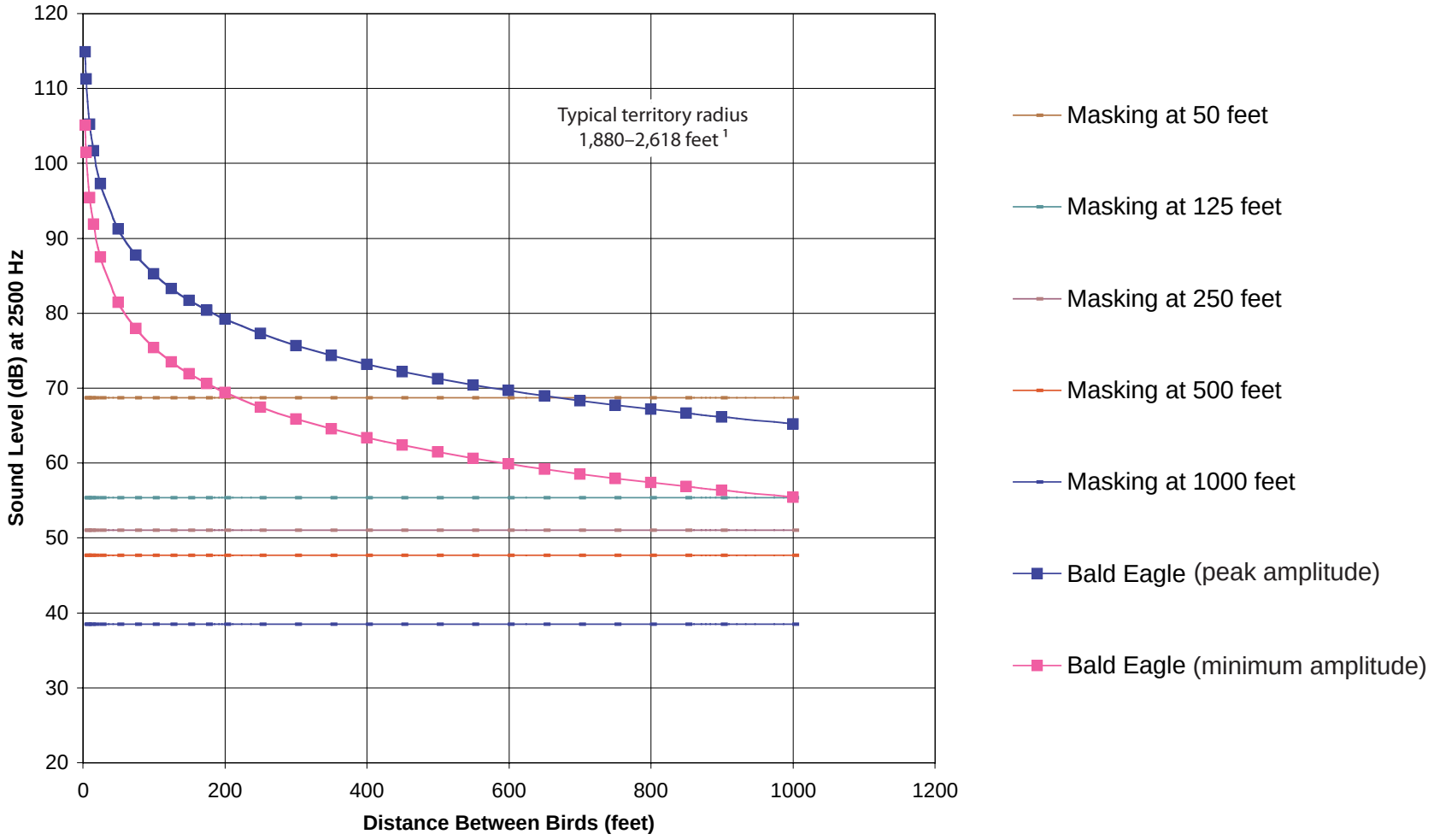
Jones & Stokes

Figure 3-27d
Traffic Noise Masking Thresholds and Vocal Signal Profiles at 50 Feet
Wilson's Phalarope, Bobolink and American Avocet



[1] Buehler 2000

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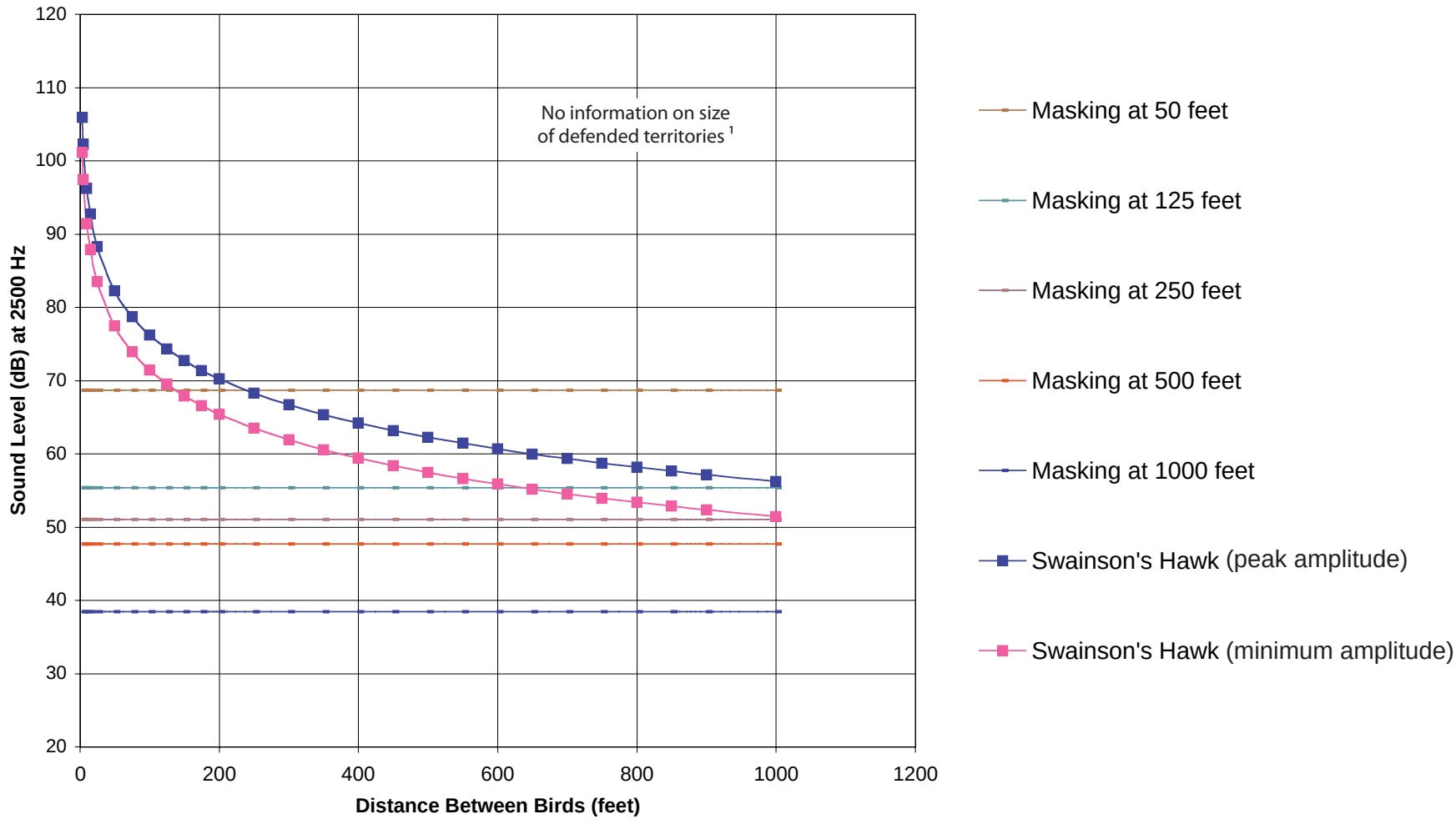
Figure 3-28a
Bald Eagle Masking Distance



[1] England et al. 1997

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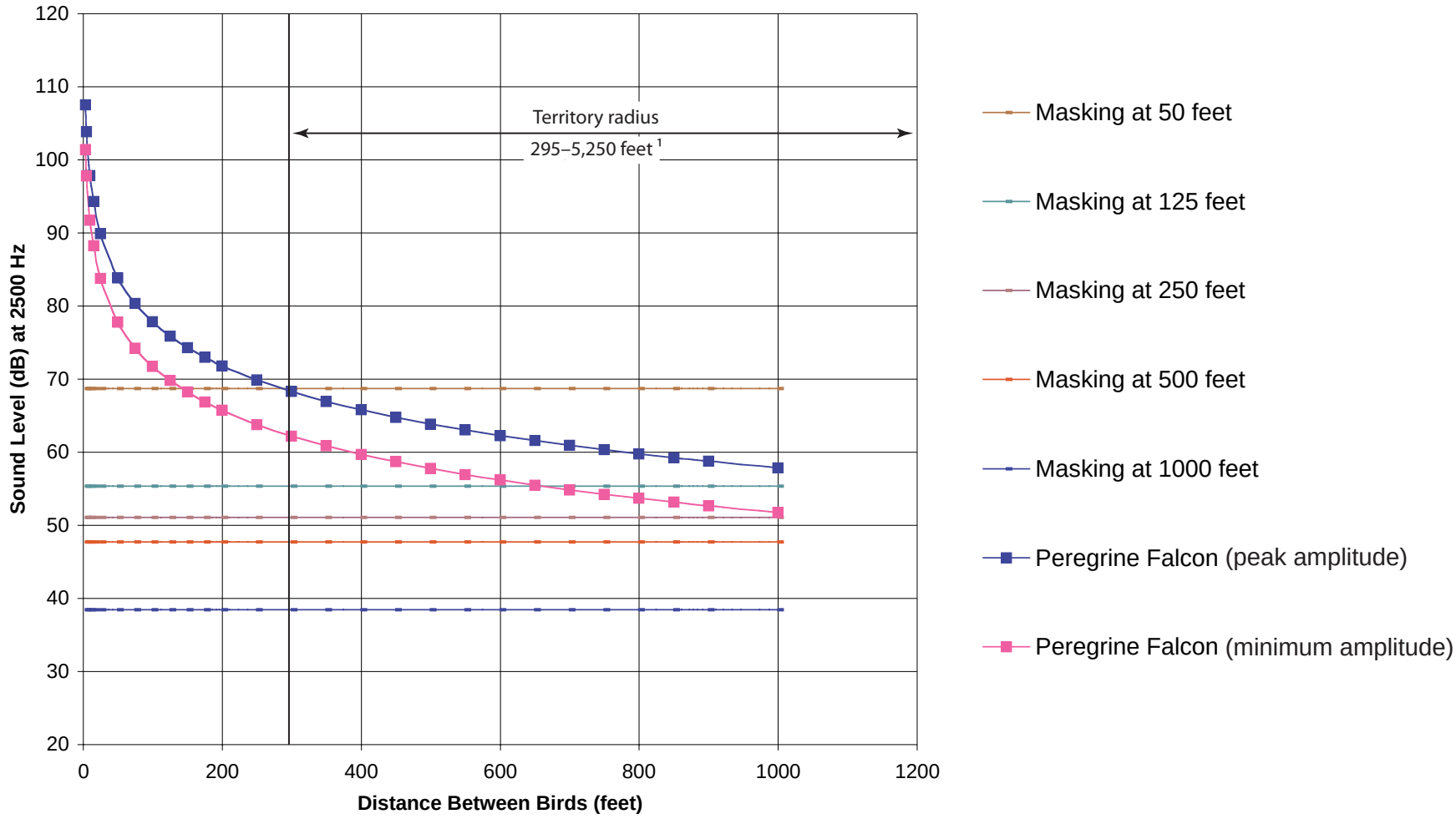
Figure 3-28b
Swainson's Hawk Masking Distance



[1] Johnsgard 1990

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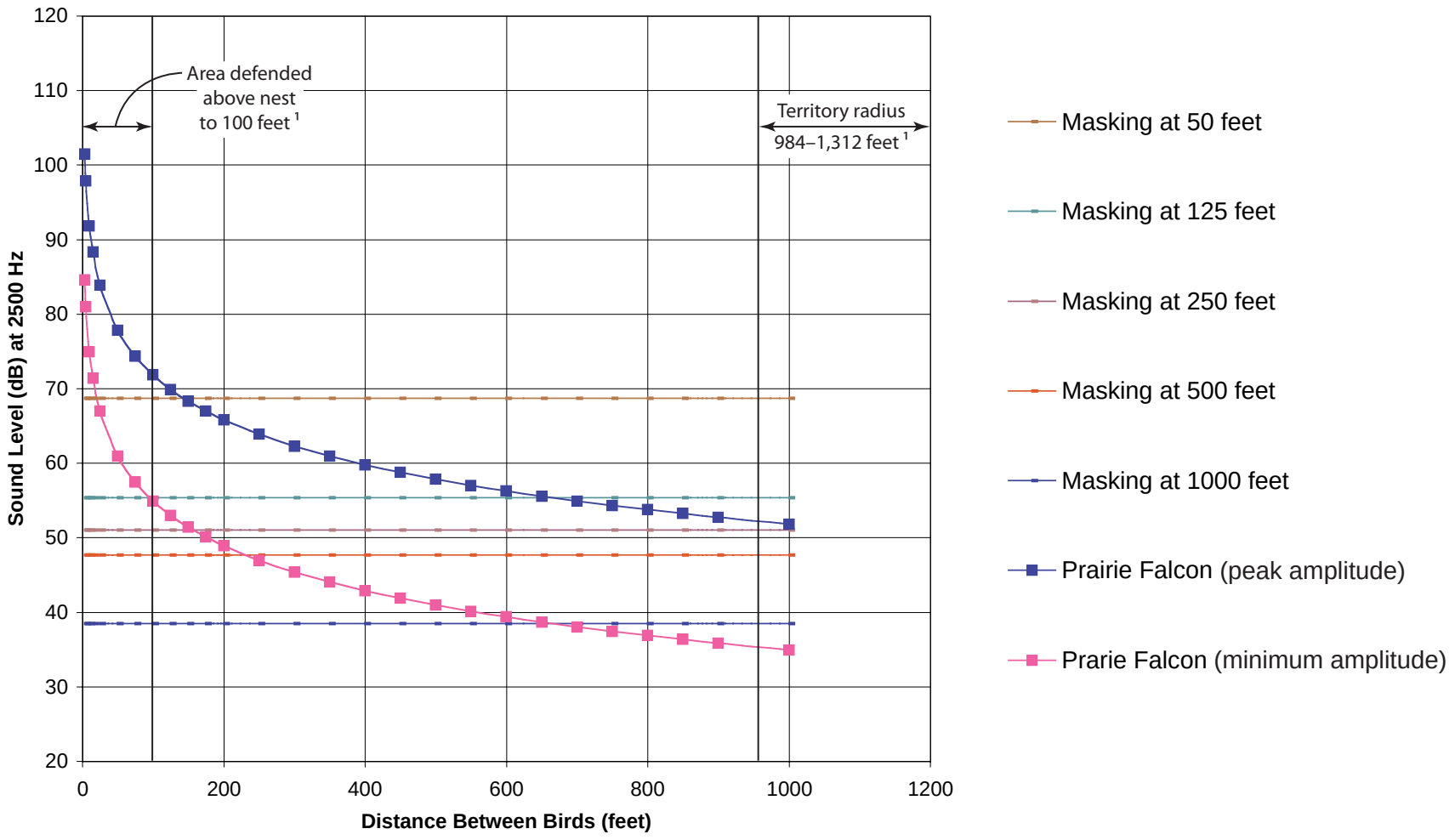
Figure 3-28c
Peregrine Falcon Masking Distance

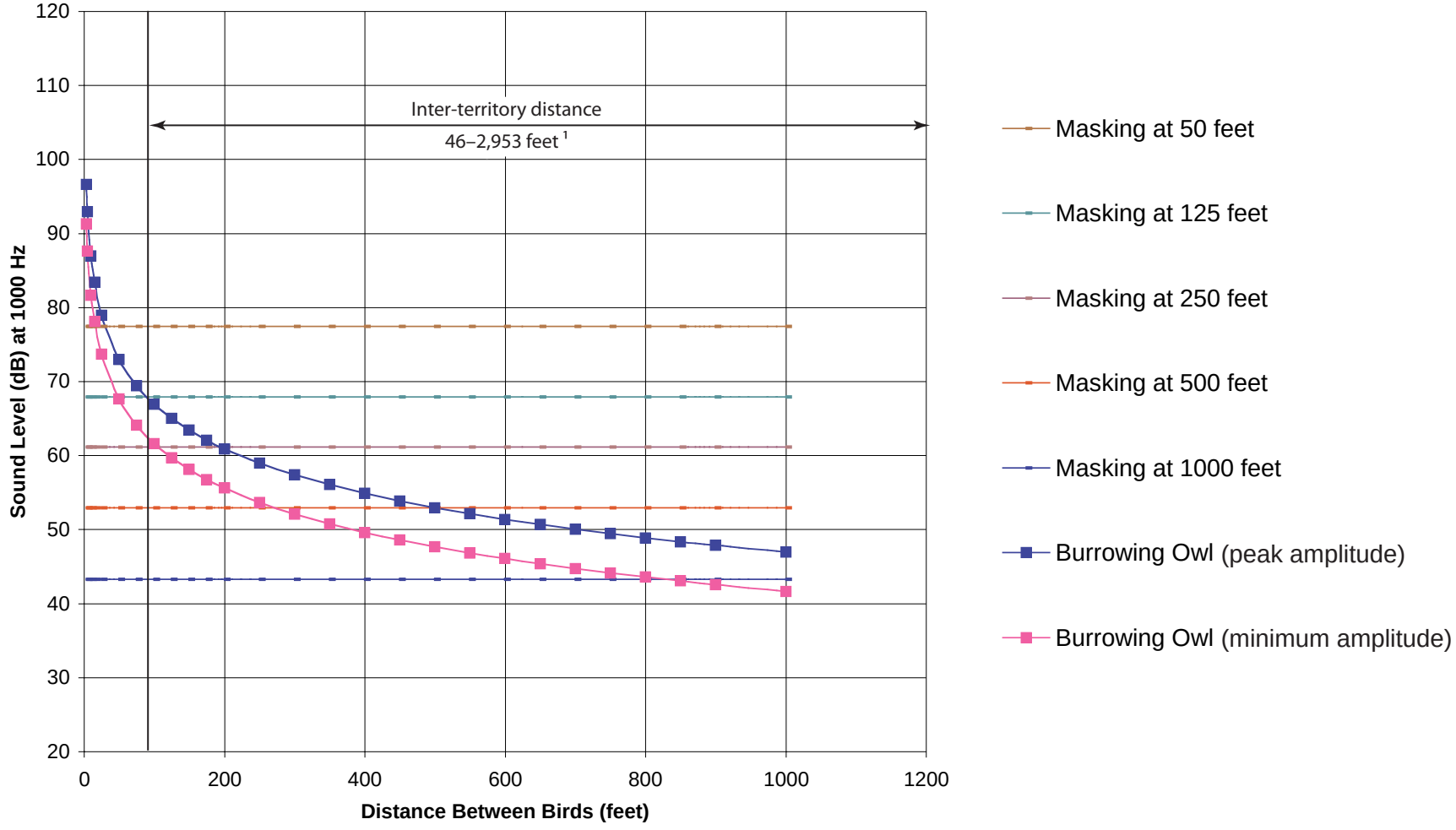


[1] Steenhof 1998

03076.03 Wildlife Tech Memo

Jones & Stokes

Figure 3-28d
Prairie Falcon Masking Distance

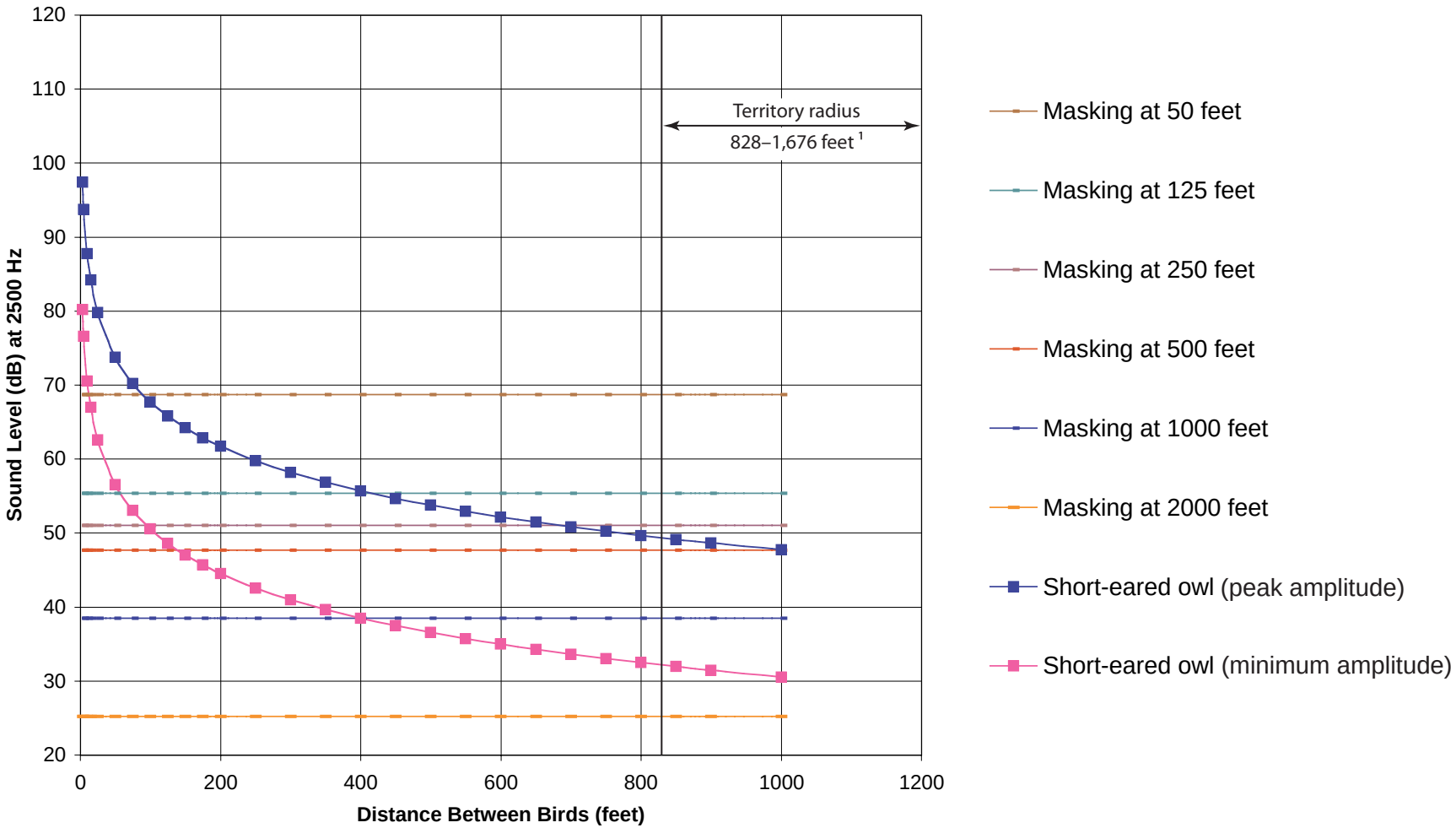


[1] Haug et al. 1993

03076.03 Wildlife Tech Memo

Jones & Stokes

Figure 3-28e
Burrowing Owl Masking Distance

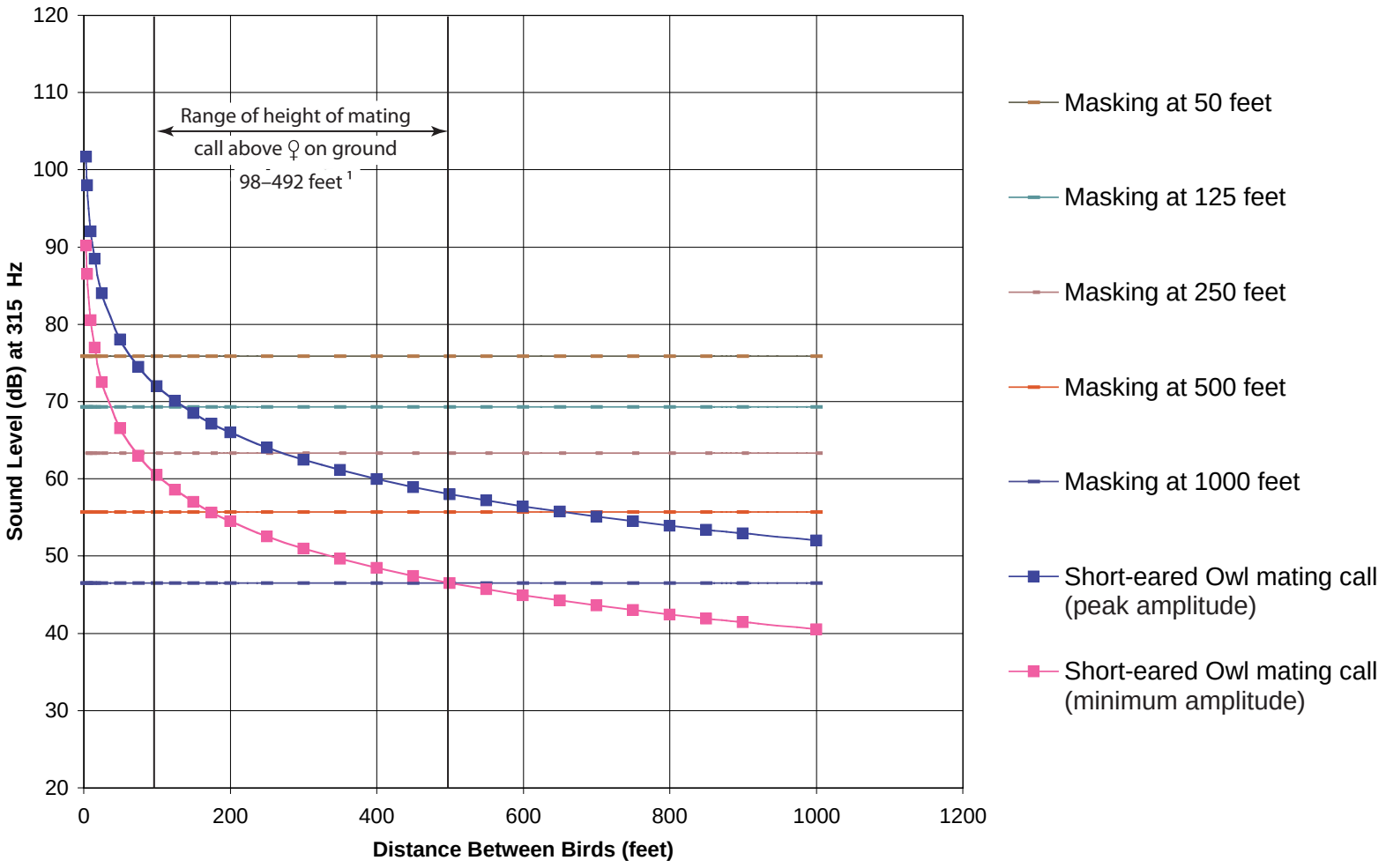


[1] Holt and Leasure 1993

03076.03 Wildlife Tech Memo

Jones & Stokes

Figure 3-28f
Short-Eared Owl Masking Distance

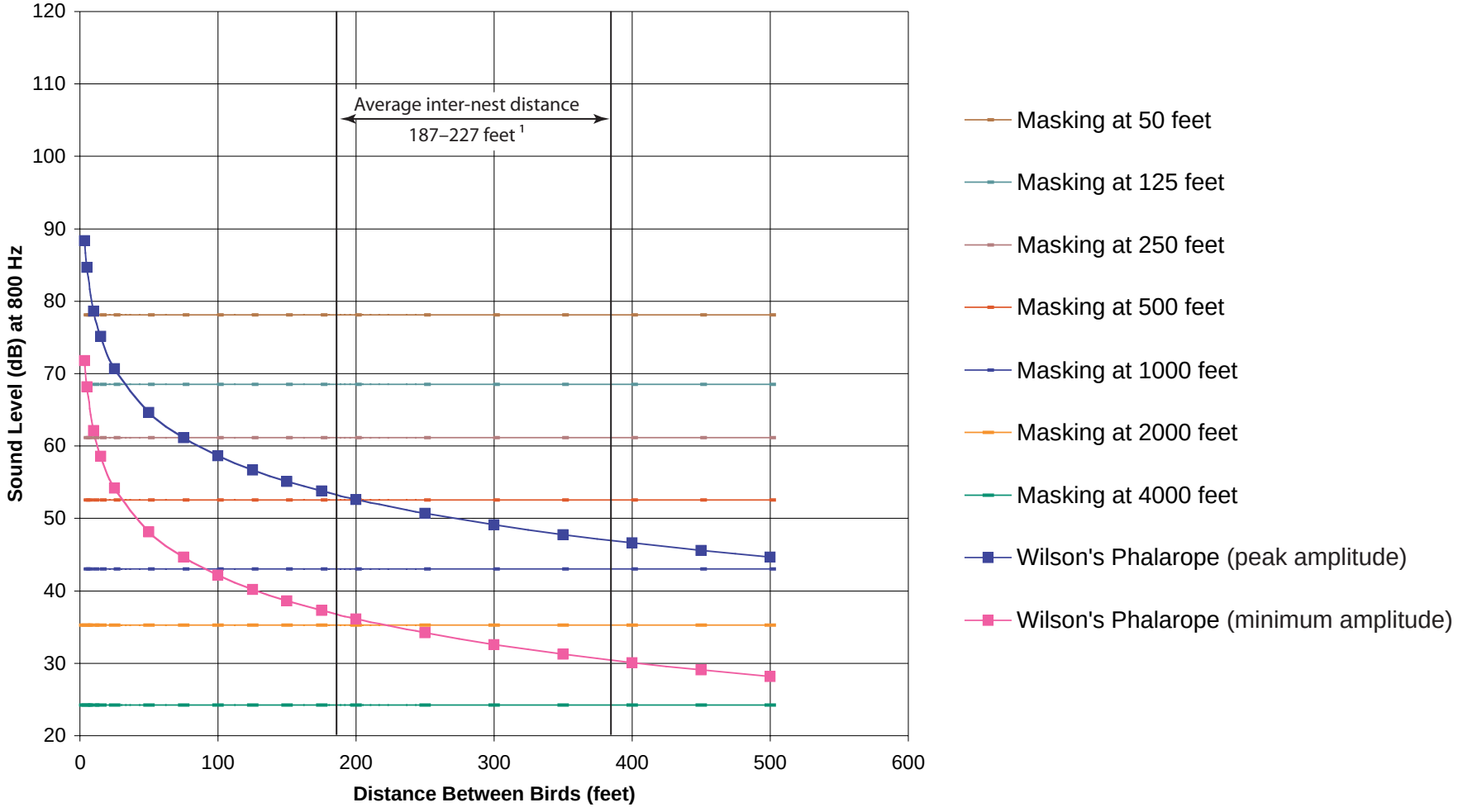


[1] Holt and Leasure 1993

03076.03 Wildlife Tech Memo

Jones & Stokes

Figure 3-28g
Short-Eared Owl (Mating Call) Masking Distance



[1] Colwell and Jehl 1994

03076.03 Wildlife Tech Memo

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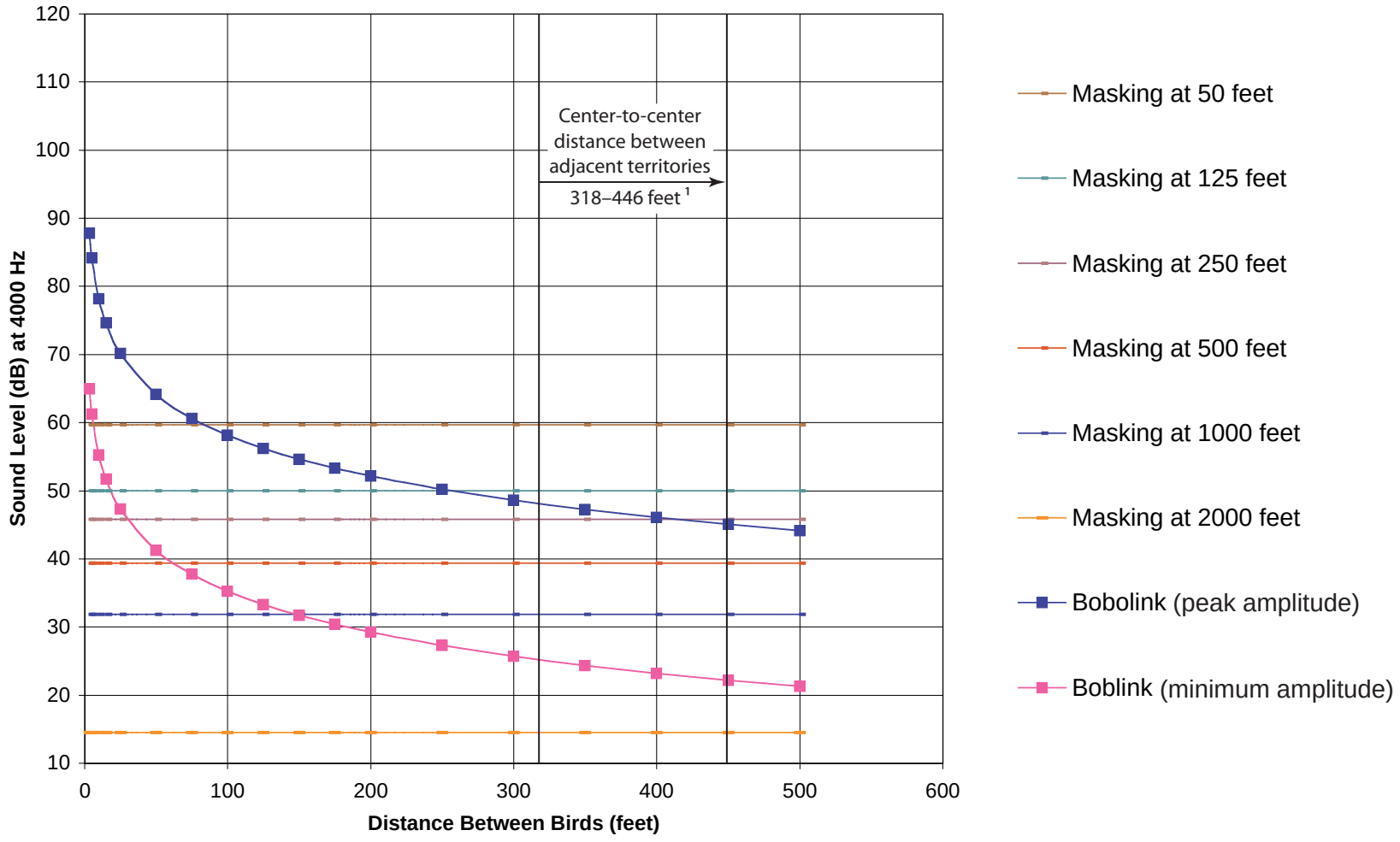
Figure 3-28h
Wilson's Phalarope Masking Distance

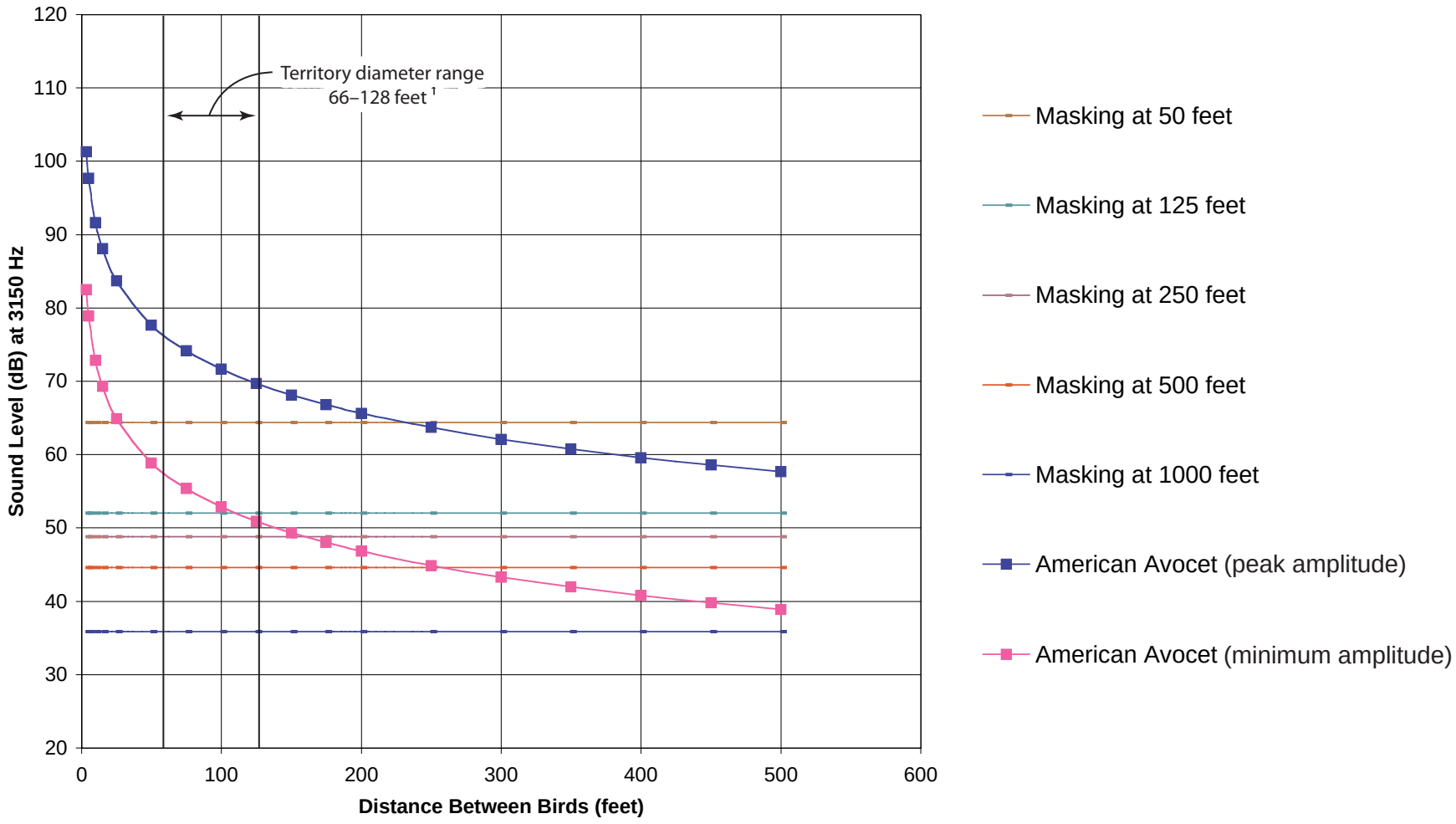


[1] Martin and Gavin 1995

03076.03 Wildlife Tech Memo

Jones & Stokes

Figure 3-28i
Bobolink Masking Distance

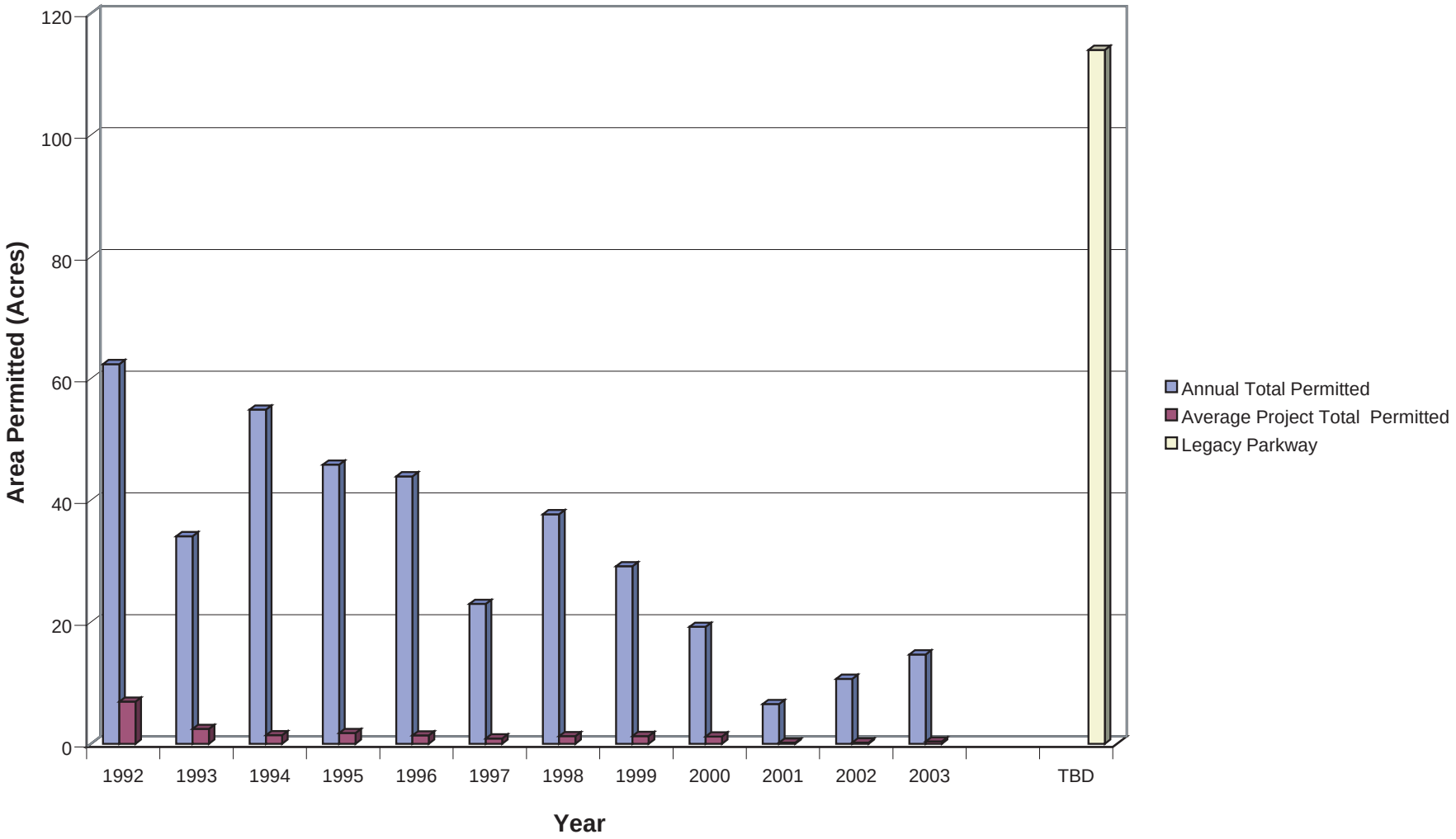


[1] Robinson et al. 1997

03076.03 Wildlife Tech Memo

Jones & Stokes

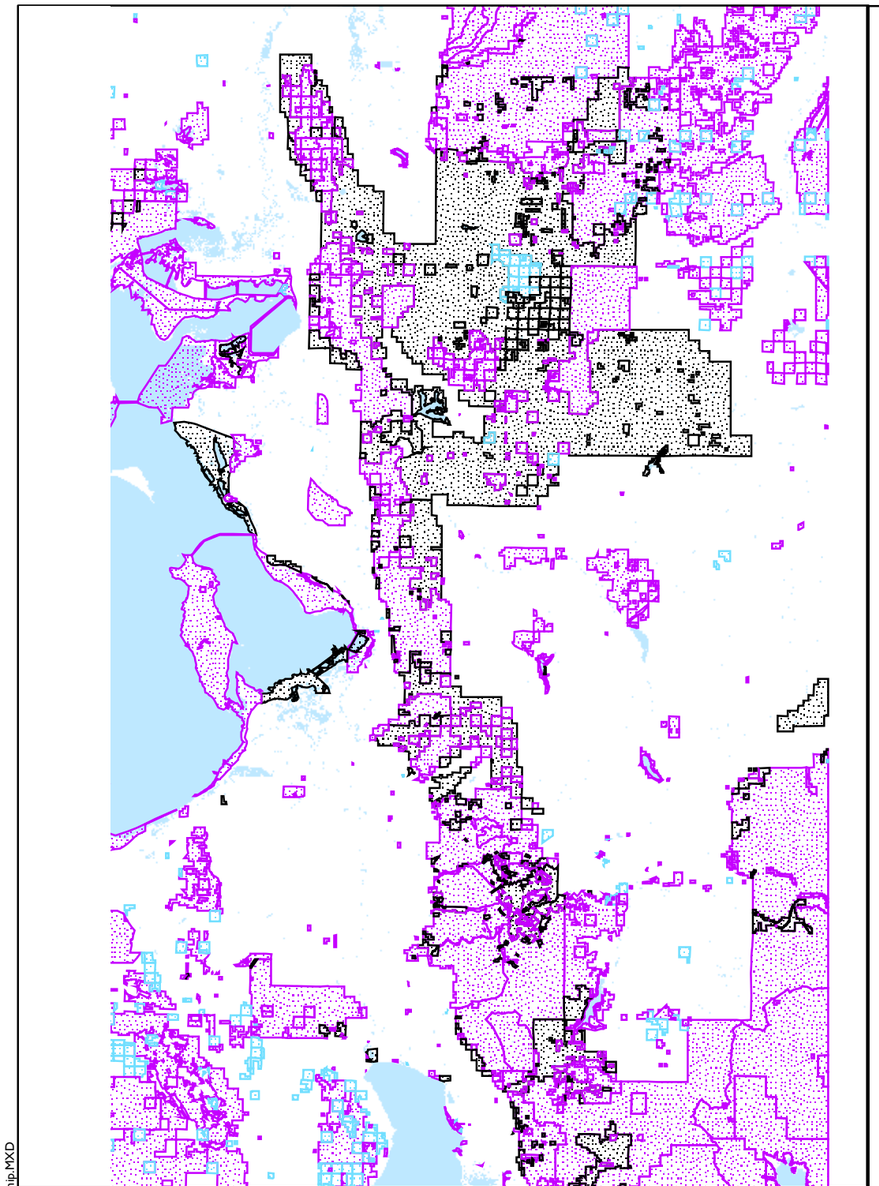
Figure 3-28j
Avocet Masking Distance



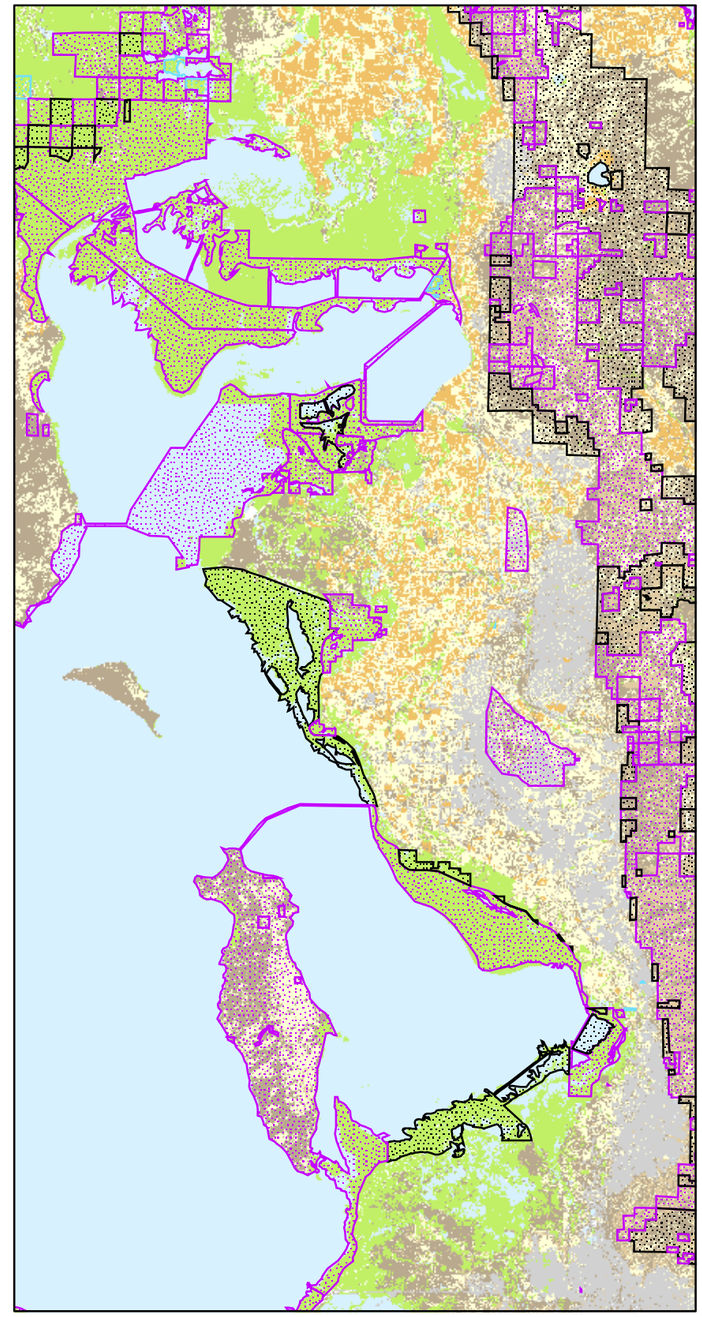
03076.03 002 Wildlife Tech Memo

Jones & Stokes

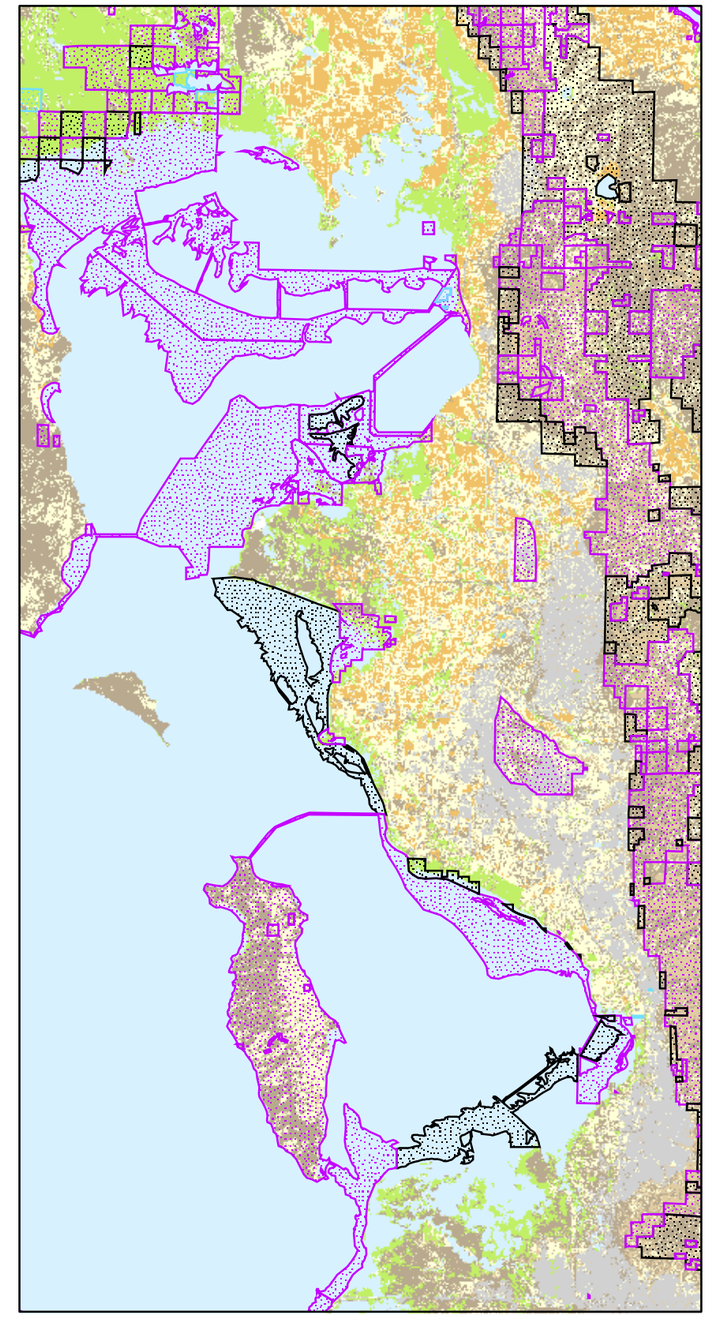
Figure 3-29
Extent of Permitted Actions in Wetlands in Salt Lake and Davies Counties (1992–2003)



Low Water



High Water



Legend

Ownership
- Private
- Public
- Public - Private
- Public Trust

Land Cover
- Cropland
- Developed
- Wetlands
- Open Water
- Pasture
- Scrub
- Unclassified
- Upland (Forested)

N

Map Production: 12/15/03

Data Sources: USGS National Land Cover Dataset and USFSW National Wetlands Inventory, Utah School and Institutional Trust Lands Administration

Low Water is based on the water level at the time of the USGS and USFWS mapping. High Water is 1984 (Univeristy of Utah)

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Jones & Stokes

Figure 3-30
Land Cover, Ownership Status, and Lake Level Change