

Interpreting the Conservation Lands Network

The establishment of upland habitat goals for the San Francisco Bay Area is a big step forward for strategic biodiversity conservation. Those interested in applying the goals are encouraged to review the approach used by the Upland Habitat Goals Project to understand how its findings are best translated to on-the-ground conservation. Chapter 11 provides a full discussion of how to interpret the Conservation Lands Network to guide conservation actions.

Key guidelines for interpreting the Conservation Lands Network

The Conservation Lands Network is dynamic. The Conservation Lands Network is an analysis based on the distribution of conservation targets, protected lands, and threats – all of which change over time. As these elements change, so will the ideal configuration of areas to conserve. Some areas will be protected while others are developed; research and monitoring will offer new data and insights. The Conservation Lands Network is a work in progress, and it will be revised periodically. Consult www.BayAreaLands.org for the most up-to-date GIS datasets and Conservation Lands Network maps.

Areas outside of the Conservation Lands Network may have high conservation value.

Although a property of interest may fall outside of the Conservation Lands Network, a site visit and biological survey may reveal extraordinary biological resources not evident in the current Conservation Lands Network Database.

Ground truthing is essential. The Conservation Lands Network offers users a first look at the natural resources that may be found in an area of interest. However, the project is regional in scope, covering 4.3 million acres, and while the best available data were used, they are inconsistent and incomplete. Users must visit sites of interest and conduct biological surveys to verify results from the Conservation Lands Network and its reports.

Table of Contents

Preface	i
Executive Summary	vii
Chapter 1 ■ Introduction	1
Chapter 2 ■ Upland Habitats Past and Present	17
Chapter 3 ■ Approach and Methodology	23
Chapter 4 ■ Coarse Filter: Vegetation	43
Chapter 5 ■ Fine Filter: Riparian Habitat and Fish	61
Chapter 6 ■ Fine Filter: Mammals	109
Chapter 7 ■ Fine Filter: Birds	129
Chapter 8 ■ Fine Filter: Amphibians, Reptiles, and Invertebrates	145
Chapter 9 ■ Conservation Target Viability	169
Chapter 10 ■ The Conservation Lands Network: Summary and Conclusions	229
Chapter 11 ■ Interpreting the Conservation Lands Network	245
Chapter 12 ■ Charting the Course: Implementing the Conservation Lands Network	255
Chapter 13 ■ Research Needs, Measuring Success, and CLN 2.0	261
References	267
Glossary	277
Appendix A ■ Partner Outreach Plan	online
Appendix B ■ Data and Methods	online
Appendix C ■ Vegetation Type Conservation Targets by Landscape Unit	online
Appendix D ■ Essential Watersheds	online
Appendix E ■ Fine Filter Conservation Targets	online

This entire report (with appendices) is available at www.BayAreaLands.org/reports

Figures

Figure A	The Conservation Lands Network 1.0	vi
Figure B	The Conservation Lands Network Planning Process	ix
Figure 1.1	Biodiversity Hotspots in the United States	2
Figure 1.2	Endangered by Sprawl	3
Figure 1.3	Lands At Risk in the San Francisco Bay Area	4
Figure 1.4	Conservation Lands Network	7
Figure 1.5	Conservation Lands Network Explorer	8
Figure 1.6	Geographic Scope of the Upland Habitat Goals Project	9
Figure 1.7	Rangeland Prioritization by the California Rangeland Conservation Coalition	14
Figure 1.8	Scope of Major Conservation Plans in the East and South Bay	15
Figure 2.1	Map of Land Uses in the San Francisco Bay Area	18
Figure 2.2	Remaining Acreage of Upland Habitats in the San Francisco Bay Area	20
Figure 2.3	Remaining Acreage for Upland Habitat Goals Vegetation Types	21
Figure 3.1	The Dimensions of Biodiversity from the Convention on Biological Diversity	23
Figure 3.2	The Conservation Planning Process	25
Figure 3.3	Ecoregions within the Upland Habitat Goals Project Study Area	26
Figure 3.4	Landscape Units of the San Francisco Bay Area Upland Habitat Goals Project	28
Figure 3.6	Upland Habitat Goals Project Conservation Target Selection Criteria and Application	32
Figure 3.7	The Conservation Suitability Layer	35
Figure 3.8	The Role of the Fine Filter Focus Teams	37
Figure 3.9	Excluding Converted Lands from the Conservation Lands Network	39
Figure 4.1	Sources Used to Create the Coarse Filter Vegetation Map	44
Figure 4.2	Stratification of Annual Grasslands	46
Figure 4.3	Converted Lands: Urban, Cultivated Agriculture, and Rural Residential Land Uses	47
Figure 4.4	The Coarse Filter Vegetation Map	48
Figure 4.5	Coarse Filter Vegetation Type Descriptions	50
Figure 4.6	Coarse Filter Vegetation Map, Overlaid with Landscape Units	53
Figure 4.7	Distribution of Rarity Rankings in the Sonoma Coast Range Landscape Unit Vegetation Type	54
Figure 4.8	Vegetation Type Acreage Goals	56
Figure 5.1	Current Geographic Distribution and Population Status of Native Stream Fishes of the San Francisco Estuary	64
Figure 5.2	Fish Conservation Targets in San Francisco Bay Area Streams Draining to the Ocean and Bay	67
Figure 5.3	Fish Ranges by Channel Slope for the Napa River Basin	68
Figure 5.4	Anchor Watersheds and Essential Streams of the San Francisco Estuary and Coho Core Areas	70
Figure 5.5	Anchor Watersheds and Essential Streams of the San Francisco Estuary	71
Figure 5.6	Coastal Stream Conservation Targets	73
Figure 5.7	Stream Conservation Targets of the Conservation Lands Network	75
Figure 5.8	Comparison of CEMAR Anchor Watersheds to CalWater 2.2.1 Watersheds	76
Figure 5.9	Comparison of CEMAR Anchor Watersheds and CalWater 2.2.1 Hydrologic Areas	77
Figure 5.10	Inclusion of First- and Second-Order Streams in the Conservation Lands Network	79
Figure 5.11	CalWater 2.2.1 Hydrologic Areas (Watersheds)	80
Figure 5.12	Acreage Goals for Riparian Vegetation Types by Landscape Unit	82
Figure 5.13	The Coarse Filter Conservation Lands Network with CalWater Hydrologic Area Boundaries	84
Figure 5.14	CalWater 2.2.1 Planning Watersheds Gap Analysis	86
Figure 5.15	Watershed Integrity Cluster Analysis	92
Figure 5.16	Watershed Integrity Clusters and Relative Threats	93
Figure 5.17	Gap Analysis of Watershed Integrity Cluster Types and the Conservation Lands Network	97
Figure 5.18	Riparian Buffer Width Recommendations	102
Figure 5.19	TMDL Projects in the Upland Habitat Goals Study Area	104
Figure 6.1	Mammal Target Species Requiring Additional Review	111
Figure 6.2	Crosswalk of California Wildlife Habitat Relationships and Upland Habitat Goals Coarse Filter Vegetation Types	112
Figure 6.3	Habitat Suitability Analysis for American Badger (<i>Taxidea taxus</i>)	114
Figure 6.4	Habitat Suitability Analysis for Red Tree Vole (<i>Arborimus pomo</i>)	115
Figure 6.5	Habitat Suitability Analysis for Mountain Lion (<i>Puma concolor</i>)	116
Figure 6.6	Badger Preliminary Population Analysis	119
Figure 6.7	Mountain Lion Preliminary Population Analysis	120

Figure 6.8	Bobcat Preliminary Population Analysis	121
Figure 6.9	Wildlife Connectivity on Major Highways in the San Francisco Bay Area	123
Figure 6.10	Mammal Conservation Target Species	131
Figure 7.2	Focal Species and Selection Criteria for the Riparian Bird Conservation Plan	133
Figure 7.3	Bird Conservation Target Species Requiring Additional Research	135
Figure 7.4	Bird Conservation Target Species	141
Figure 8.1	Gap Analysis for Visual Inspection of Coarse Filter Conservation Lands Network Coverage for Amphibian, Reptile, and Invertebrate Conservation Targets	148
Figure 8.2	Pond Gap Analysis for Landscape Units	150
Figure 8.3	Pond Protection Levels Under the Coarse Filter Conservation Lands Network	151
Figure 8.4	Distribution of Ponds Protected by the Coarse Filter Conservation Lands Network	152
Figure 8.5	Pond Occupancy Estimates for California Red-legged Frog	153
Figure 8.6	Pond Occupancy Estimates for California Tiger Salamander	154
Figure 8.7	Suitability of Ponds for California Tiger Salamander	154
Figure 8.8	CalWater 2.2.1 Planning Watersheds with Foothill Yellow-Legged Frog CNDDDB Occurrences	156
Figure 8.9	Gap Analysis of Foothill Yellow-Legged Frog Distribution	157
Figure 8.10	Amphibian, Reptile, and Invertebrate Conservation Targets	164
Figure 9.1	Parcel Sizes in the San Francisco Bay Area	172
Figure 9.2	Percent Slope in the San Francisco Bay Area	173
Figure 9.3	WestMap Estimates of Historical Climate in the San Francisco Hydrologic Unit	176
Figure 9.4	Mesoclimate Analysis from PRISM – 1971-2000 Averages	177
Figure 9.5	A Sample Topoclimatic Analysis	180
Figure 9.6	Predicted Levels of Annual Nitrogen Deposition	184
Figure 9.7	Relative Sensitivity of Upland Habitat Goals Vegetation Types to Nitrogen Deposition	185
Figure 9.8	Effects of Grazing on Nitrogen-Enhanced Grasslands	187
Figure 9.9	Ignition Sources for Bay Area Fires Between 1950 and 2005	190
Figure 9.10	Fire Perimeters from All Causes between 1950 - 2009	191
Figure 9.11	Total Acres Burned by Decade in the Bay Area from All Causes	192
Figure 9.12	Acreage Burned by Decade by Landscape Unit	192
Figure 9.13	CAL FIRE Fire Regimes	193
Figure 9.14	Ecosystem Risk from Altered Fire Regimes	195
Figure 9.15	Ecological Effects of Fire for Different Vegetation Types	196
Figure 9.16	Annual Precipitation (July - June) for the San Francisco Bay Hydrologic Unit, 1895 - 2010	204
Figure 9.17	San Francisco Bay Area FEMA Floodplain Map	206
Figure 9.18	Landslide Frequency across the Bay Area	210
Figure 9.19	Sample ABAG Landslide Map	211
Figure 9.20	Erosion Potential Following Fire	212
Figure 9.21	Landslide-created Pond	213
Figure 10.1	The Conservation Lands Network 1.0	230
Figure 10.2	Conservation Lands Network 1.0 Acreage	231
Figure 10.3	Fragmented Areas of the Conservation Lands Network	233
Figure 10.4	Areas for Further Consideration in the Conservation Lands Network	235
Figure 10.5	Summary of Vegetation Type Acreage Goals Compared to Acreage in the Conservation Lands Network	239
Figure 10.6	Landscape Units not Meeting Pond Conservation Goals	241
Figure 10.7	Conservation Lands Network for the Mt. Hamilton Landscape Unit	243
Figure 10.8	Vegetation Map for the Mt. Hamilton Landscape Unit	244
Figure 11.1	Screenshot of Conservation Lands Network Explorer	245
Figure 11.2	Biodiversity Portfolio Report from CLN Explorer	246
Figure 11.3	The Impact of Protected Lands on the Conservation Lands Network	248
Figure 11.4	Features of the Biodiversity Portfolio Report	250
Figure 11.5	Using CLN Explorer to Determine the Number of Times Marxan Selected a Planning Unit	252
Figure 11.6	Evaluating the Conservation Value of a Property	253
Figure 12.1	Grazing Land Within the Upland Habitat Goals Study Area	256