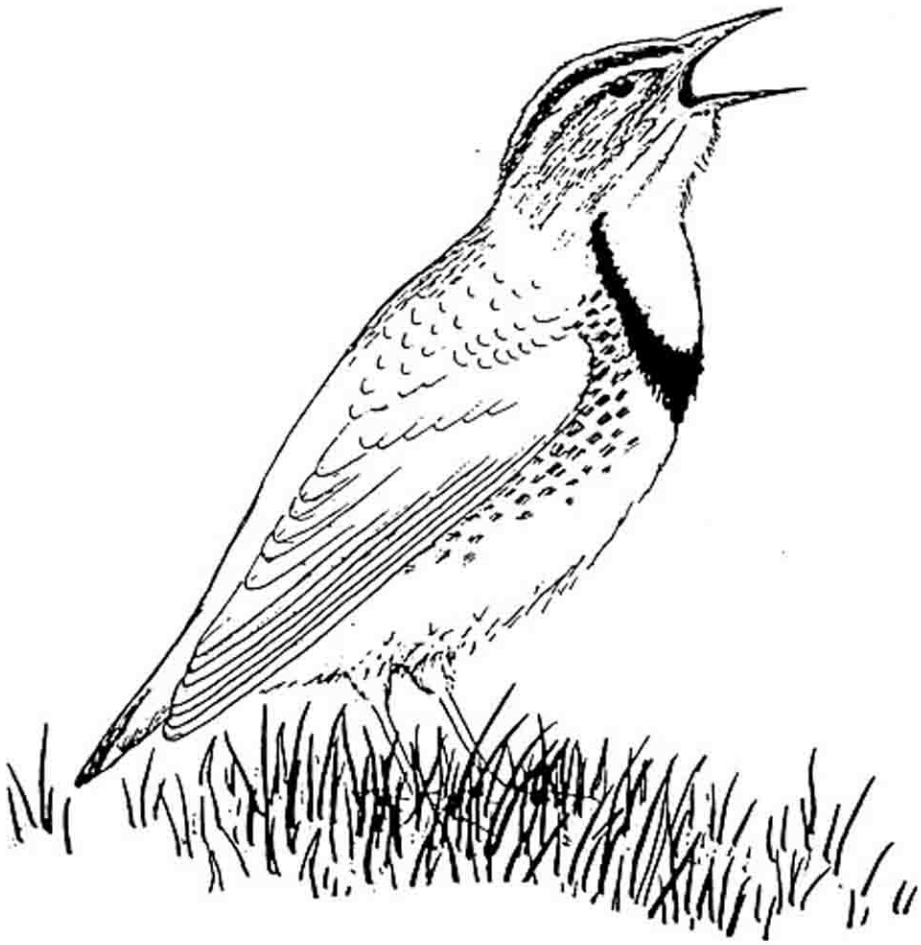
CONSERVATION STRATEGY FOR LANDBIRDS IN LOWLANDS AND VALLEYS OF WESTERN OREGON AND WASHINGTON

Version 1.0
March 2000



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EXECUTIVE SUMMARY

This document has been prepared to stimulate and support an active approach to conservation of landbirds in the lowlands and valleys of western Oregon and Washington (hereafter referred to as Westside Lowlands and Valleys). It represents the collective efforts of individuals from multiple agencies and organizations within the Oregon-Washington Chapter of Partners in Flight. Participants included biologists and ecologists from Federal and State agencies, industry, private consulting firms, environmental organizations, and academia in order to ensure a full range of ideas, information flow, and practicalities.

Recommendations included in this document are intended to guide planning efforts and actions of land managers, direct expenditures of government and non-government organizations, and stimulate monitoring and research to support landbird conservation. The recommendations also are expected to be the foundation for developing detailed conservation strategies at multiple geographic scales to ensure functional ecosystems with healthy populations of landbirds.

Background

The Westside Lowlands and Valleys are physiographically distinct and relatively disjunct islands of low elevation habitat amid the vast coniferous forests of western Oregon and Washington. This includes the Rogue and Umpqua Valleys in Oregon, the Willamette Valley in Oregon and a small area in southwest Washington, the Puget Lowlands and San Juan Islands in Washington, and Coastal Lowlands and Valleys in both states.

Pre-European settlement vegetation of Westside Lowlands and Valleys was a mosaic of prairies, savannas, oak woodlands, chaparral (Rogue and Umpqua Valleys), riparian woodland and shrub, wetlands, and patches of coniferous forest. Present-day vegetation and habitat for landbirds has changed dramatically in the last 150 years as a result of tremendous expansion of the human population. Contributing factors include cultivation of lands for agriculture, loss of habitat to development, livestock grazing, introductions of exotic species, fire suppression, harvest of oaks and cottonwoods, drainage of wetlands, and channelizing of waterways. The greatest change has been the near extirpation of grassland and savanna habitat. Current estimates of grassland and savanna habitat are <1% of the historic extent in the Willamette Valley and <10% in the Puget Lowlands. The two most significant factors contributing to loss and alteration of oak woodlands have been removal by harvest for development or agriculture, and invasion by conifers and dense exotic shrubs from fire suppression and grazing. Much of the riparian woodland and shrub communities have been lost, and most of those that remain have been highly altered due to flood control, irrigation systems, channelizing waterways, wetland draining, and intensive development of bottomlands for agriculture.

The loss and alteration of historic vegetation communities has impacted landbird habitats and resulted in species range reductions, population declines, and some local and regional extirpations. In western Oregon and Washington (includes areas outside Westside Lowlands and Valleys), 50 species have significant recent (1980-1998) and/or long-term (1966-1998) declining trends based on Breeding Bird Survey (BBS) data, while only 16 species have significantly increasing trends. Several other species which lack sufficient BBS data are considered by many to be declining (e.g., Oregon vesper sparrow, streaked horned lark, northern harrier). Additionally, formerly common species such as burrowing owl, Lewis' woodpecker, and yellow-billed cuckoo have been extirpated as breeding species from parts or all of the Westside Lowlands and Valleys, and white-breasted nuthatch has been nearly extirpated from the Puget Lowlands.

Conservation Strategy

The overall goal of Partners In Flight Bird Conservation Planning is to ensure long-term maintenance of healthy populations of native landbirds. This document is intended to facilitate that goal by describing the process and the recommended actions to implement landbird conservation in Westside Lowlands and Valleys. The four principal components of that process are:

- identify habitats and habitat attributes important to landbirds,
- describe the desired habitat conditions based on the habitat relationships of a select group of priority species,
- provide interim management targets (i.e., biological objectives) to achieve the desired conditions, and
- recommend management actions (i.e., conservation strategies) that can be implemented by various entities at multiple scales to achieve the biological objectives

Because of the diversity of landbird species and habitats in the Westside Lowlands and Valleys, conservation will require a complex array of conditions within variable landscape patterns. Management goals need to be carefully designed and integrated across several scales to meet the needs of multiple species. Landbird conservation will likely require areas that function as reserves, and areas that incorporate a wide range of management activities within various land uses. Thus, our conservation emphasis is three-fold:

- initiate conservation actions in accordance with the ecological potential of the site (i.e., within the framework of potential natural vegetation and natural ecosystem processes),
- emphasize conservation within high priority designated conservation areas and where opportunities exist (i.e., receptive land owners and land managers), and

- emphasize conservation at multiple scales such that habitat conditions for one or a few species are nested within a landscape that provides a mosaic of conditions for multiple species.

Our conceptual approach for landbird conservation was to emphasize ecosystem management through a hierarchy of conservation recommendations within a suite of priority habitat types, habitat attributes or conditions within those habitat types, and landbird species highly associated with those habitats and habitat attributes. Four habitats were selected as priority habitats:

- grassland-savanna
- oak woodland
- riparian
- chaparral

Our strategy for achieving functioning ecosystems for landbirds is described through the habitat requirements of "focal species" highly associated with important attributes or conditions within each habitat type. The rationale for using focal species is to draw immediate attention to habitat attributes most in need of conservation or most important in a functioning ecosystem. By managing for a group of species representative of important components in a functioning ecosystem, many other species and elements of biodiversity also will be conserved. The following focal species were selected for the Westside Lowlands and Valleys:

Habitat	**Habitat Attribute**	**Focal Species**
Grassland-Savanna	large patches	western meadowlark *
Grassland-Savanna	short grass - bare ground	streaked horned lark
Grassland-Savanna	short grass- bare ground	common nighthawk
Grassland-Savanna	moderate-tall grass	grasshopper sparrow
Grassland-Savanna	burrows	burrowing owl
Grassland-Savanna	scattered shrubs	Oregon vesper sparrow
Grassland-Savanna	scattered shrubs	lark sparrow *
Grassland-Savanna	wet prairie/grassland	northern harrier
Grassland-Savanna	large oaks - cavities	American kestrel *
Grassland-Savanna	large oaks - cavities	western screech owl
Grassland-Savanna	large conifer trees	Lewis' woodpecker
Oak Woodland	large patches, large oaks	white-breasted nuthatch
Oak Woodland	large oaks - cavities	acorn woodpecker *
Oak Woodland	large oaks - cavities	downy woodpecker
Oak Woodland	large oaks - cavities	ash-throated flycatcher *
Oak Woodland	canopy edges and openings	western wood-pewee *
Oak Woodland	young (subcanopy) oaks	bushtit *

Oak Woodland	herbaceous cover	chipping sparrow *
Oak Woodland	native shrub understory	Bewick's wren
Oak Woodland	native shrub understory	house wren *
Oak Woodland	native shrub understory	Nashville warbler
Riparian - Open Water	snags	purple martin
Riparian - Open Water	snags	tree swallow
Riparian Shrub	dense shrub layer	willow flycatcher *
Riparian Shrub	dense shrub layer	yellow-breasted chat
Riparian Woodland	large canopy trees	red-eyed vireo
Riparian Woodland	large canopy trees	Bullock's oriole *
Riparian Woodland	subcanopy, tall shrub foliage	yellow warbler
Riparian Woodland	dense shrub understory	Swainson's thrush *
Riparian Woodland	dense shrub understory	wrentit *
Riparian Woodland	snags	downy woodpecker
Riparian Woodland	large, structurally diverse patches	yellow-billed cuckoo
Riparian Woodland	large, structurally diverse patches	red-shouldered hawk
Riparian Woodland	large, structurally diverse patches	Cooper's hawk

* Significantly declining population trend in the Southern Pacific Rainforest BBS Physiographic Region.

Based on the habitat relationships of these species, biological objectives are recommended and management actions (i.e., conservation strategies) to achieve them are identified. Simply stated, biological objectives are "***what we think the birds need***." They are intended to stimulate conservation actions, but are **not regulatory** nor do they represent the policies of any agency or organization. Biological objectives provide a management target for planning and implementation, and a benchmark for measuring success. They also should be used as a starting point for discussion of integration with broader ecosystem-based objectives. Because data are limited for many species, biological objectives often are based on assumptions. These are stated as such, and are considered to be testable hypotheses for research.

Biological objectives may include site- and/or landscape-level habitat objectives or population objectives. Habitat objectives are derived from current knowledge and professional judgement about bird-habitat relationships (see Appendix E for a summary). Population objectives are primarily trend objectives for declining focal species, and density or distribution objectives for a few species.

Conservation is emphasized where it is ecologically appropriate and where presumably the habitat is most suitable for the focal species. To facilitate this at a regional scale, recommended management is prioritized for focal species and their associated habitat attributes by habitat type and physiographic subprovince (see Appendix D for a summary).

Implementation

Implementation of this conservation strategy will require careful consideration of options to maximize conservation efforts, and the integration of diverse values and goals of land owners/managers with those of bird conservation. Implementation also will require a broad range of partnerships, extensive cooperation, and considerable financial resources. To be successful, participation will not only include land owners and managers, but also increased public awareness, commitment, and political support.

Implementation of parts or all of the strategy should help prevent reactionary approaches typically needed to address listed species issues. When this ecosystem-driven conservation strategy is fully implemented at large geographic scales, the aggregated effect will be the creation of landscapes that should function to conserve landbird communities.

This conservation strategy has been designed for participation at any level. This includes directing management actions for small landowners to provide habitat for a single species, and as the foundation for comprehensive, integrated, complex multi-agency/organization, multi-species conservation within large-scale management units (e.g., watersheds, land management districts, physiographic regions). At smaller scales, management actions should be based on site-specific conditions, and fit into the context of conservation across the landscape or region. At larger scales, management should emphasize functioning ecosystems with adequate representation of appropriate habitat attributes to support the entire landbird community.

The strategy has broad applicability to many other conservation planning efforts. Information presented in this document can be used in development of site-specific conservation plans such as State and private Habitat Conservation Plans, agency and inter-agency Management Plans, and local land-use planning strategies. Conversely, areas designated for conservation or management in other land management plans (e.g., The Nature Conservancy Ecoregion Plans) should be evaluated for potential support of landbird conservation as recommended in this document.

Adaptive Management

All conservation actions implemented on the basis of recommendations described in this document should include a monitoring and/or research component. This will be necessary not only to test the effectiveness of management actions, but also to evaluate assumptions upon which many of the biological objectives are based. The direct outgrowth of monitoring and research conducted as part of this strategy will be adaptive management. Monitoring and research are an integral part of the adaptive management component of this document, and will

function to increase our knowledge base and provide scientific data to revise biological objectives as necessary.

The Future

This is the first version of what is intended to be a "dynamic" document with continual revisions and expansions as new information becomes available. Future versions will likely include an expansion of the number of species addressed, and additional habitat and population objectives. As additional species are added and biological objectives are updated, a more complex ecosystem management plan will be formulated. Ultimately, we envision a regional landscape of Bird Conservation Areas where integrated conservation for multiple species is being implemented as part of ecosystem management.

Acknowledgments

I would like to extend appreciation and thanks to the many individuals who contributed their time and expertise in the development of this plan. I especially thank members of the Westside Lowlands and Valleys Working Group of the Oregon-Washington Partners in Flight chapter who provided input and review on all aspects of plan development. These people include: Paul Adamus, John Alexander, Ed Alverson, Norm Barrett, Kat Beal, Jock Beall, Darren Borgias, Michael Bornstein, Heidi Brunkal, Chris Chappell, Dave Clouse, Sam Cuenca, Steve Dowlan, Pat Dunn, Jim England, Joe Engler, Terry Farrell, Laura Finley, Elizabeth Gaynor, Walt Gaynor, Rebecca Goggans, John Grettenberger, Joan Hagar, Stewart Janes, Susan Kedzi-Webb, Ron Maertz, Rachael Maggi, Mario Mamone, Kelly McAllister, Ruth Milner, Don Norman, Dave Peterson, Jim Ramakka, Chris Regan, Russell Rogers, Kevin Sands, Jay Schleier, Mary Lou Schnoes, Nanette Seto, Mark Stern, Colleen Stinson, Pepper Trail, Dennis Vroman, Jennifer Weikel, and Simon Wray. Funding was provided by the American Bird Conservancy through a grant from the Packard Foundation. Jenny Valdivia prepared the cover artwork and Dan Battaglia provided Figure 1.

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CHAPTER 1. INTRODUCTION

Continental and local declines in numerous bird populations have lead to concern for the future of migratory and resident landbirds. Reasons for the declines are complex. Habitat loss, degradation, and fragmentation on breeding and wintering grounds and along migratory routes have been implicated for many species. Additional factors may include reproductive problems associated with brood parasitism, nest predation, and competition with exotic species.

Scientists and the concerned public agreed that a coordinated, cooperative, conservation initiative focusing on landbirds was needed to address the problem of declining species. In late 1990, Partners in Flight (PIF) was conceived as a voluntary, international coalition of government agencies, conservation groups, academic institutions, private organizations, and citizens dedicated to "keeping common birds common" and "reversing the downward trends of declining species".

PIF functions to direct resources for the conservation of landbirds and their habitats through cooperative efforts in the areas of monitoring, research, management, and education, both nationally and internationally. The foundation of PIF's long-term strategy for bird conservation is a series of geographically based Landbird Conservation Plans, of which this document is one.

A. Goal

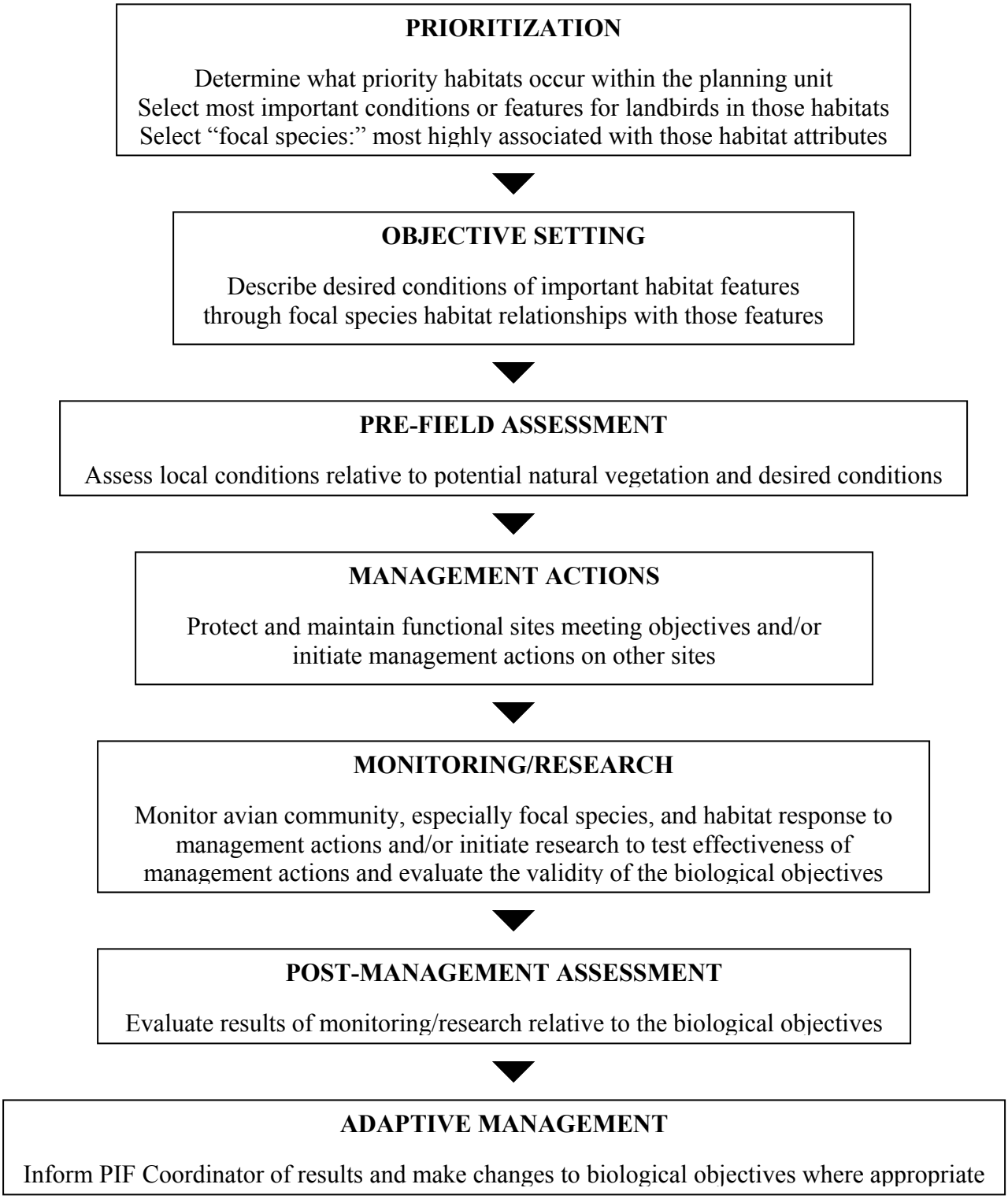
The goal of PIF Landbird Conservation Planning is to ensure long-term maintenance of healthy populations of native landbirds. This document was prepared to facilitate that goal by stimulating an active approach to landbird conservation. An overview of the process and recommended actions is presented in Figure 1. The conservation strategy primarily addresses nongame landbirds, which have been vastly under-represented in conservation efforts, and many of which are exhibiting significant declines that may be reversed if appropriate management actions are taken. PIF Landbird Conservation Planning provides the framework to develop and implement conservation strategies by recommending actions on the ground that may prevent the need for future listings.

B. Process

PIF Landbird Conservation Planning emphasizes effective and efficient management through a four-step process designed to describe and achieve actions necessary for landbird conservation. These include:

- identify habitats and species that are conservation priorities,
- describe desired conditions for priority habitats and species,
- develop biological objectives that can be used as management targets to achieve desired conditions, and
- recommend conservation strategies that can be implemented at multiple scales to achieve biological objectives.

Figure 1. Flow chart of the process for implementing landbird conservation in the Westside Lowlands and Valleys Conservation Planning Region.



C. Integration

This conservation plan is one of five plans that will be coalesced into a bi-state plan that will cover all the priority habitats and landbirds in Oregon and Washington. The plan has benefitted from extensive review and integration with other state PIF plans. PIF Landbird Conservation Plans also are intended to complement other conservation initiatives such as the North American Waterfowl Management Plan, the National Shorebird Conservation Plan, and North American Colonial Waterbird Plan. Ongoing efforts to integrate with these initiatives during objective setting and implementation will help ensure that healthy populations of all native bird species continue to exist, and that all of our native ecosystems have complete and functional avifaunal communities.

PIF Bird Conservation Plans are one of many recent efforts that address conservation of natural resources and ecosystems in the Pacific Northwest. This plan is intended to supplement and support other planning and conservation processes (e.g., Habitat Conservation Plans, Washington State Landowner Landscape Plans, The Nature Conservancy Ecoregion Plans) and regulatory enactments (e.g., State Forest Practices Act, Endangered Species Act) by describing a conservation strategy for landbirds that are often not addressed or only incidentally addressed in other plans. In particular, we envision extensive integration with other comprehensive land management plans for the region, such as the Willamette River Initiative and the Oregon Biodiversity Plan (Defenders of Wildlife 1998). It is anticipated that biological objectives and conservation strategies described in this document and future versions will be integrated not only with these plans, but also with other ongoing and future conservation planning in the Westside Lowlands and Valleys to provide functioning ecosystems for the region's diverse array of landbird species.

CHAPTER 2. THE PLANNING UNIT

A. Scope

The geographic scope of this conservation strategy is the lowlands and valleys of western Oregon and Washington (Figure 2). This includes the Rogue and Umpqua Valleys in Oregon, the Willamette Valley in Oregon and a small area in southwest Washington, the Puget Lowlands and San Juan Islands in Washington, and Coastal Lowlands and Valleys in both states. Elevational or geographical boundaries are not rigorously defined but dependent upon the presence of our priority habitats (i.e., grassland-savanna, oak woodland, riparian, chaparral - see Chapter 5). For example, we include riparian forests that extend up into the montane foothills as long as canopy cover remains >70% deciduous, because avifaunal composition in these habitats is often similar to that in lower elevations as long as the deciduous component is dominant. The extension of these riparian forests where canopy cover is >30% coniferous is included in another conservation plan "*Conservation strategy for landbirds in coniferous forests of western Oregon and Washington*". Additional examples of non-lowland or valley habitats considered in this plan are grassland balds embedded in coastal forests, and montane chaparral in southwest Oregon.

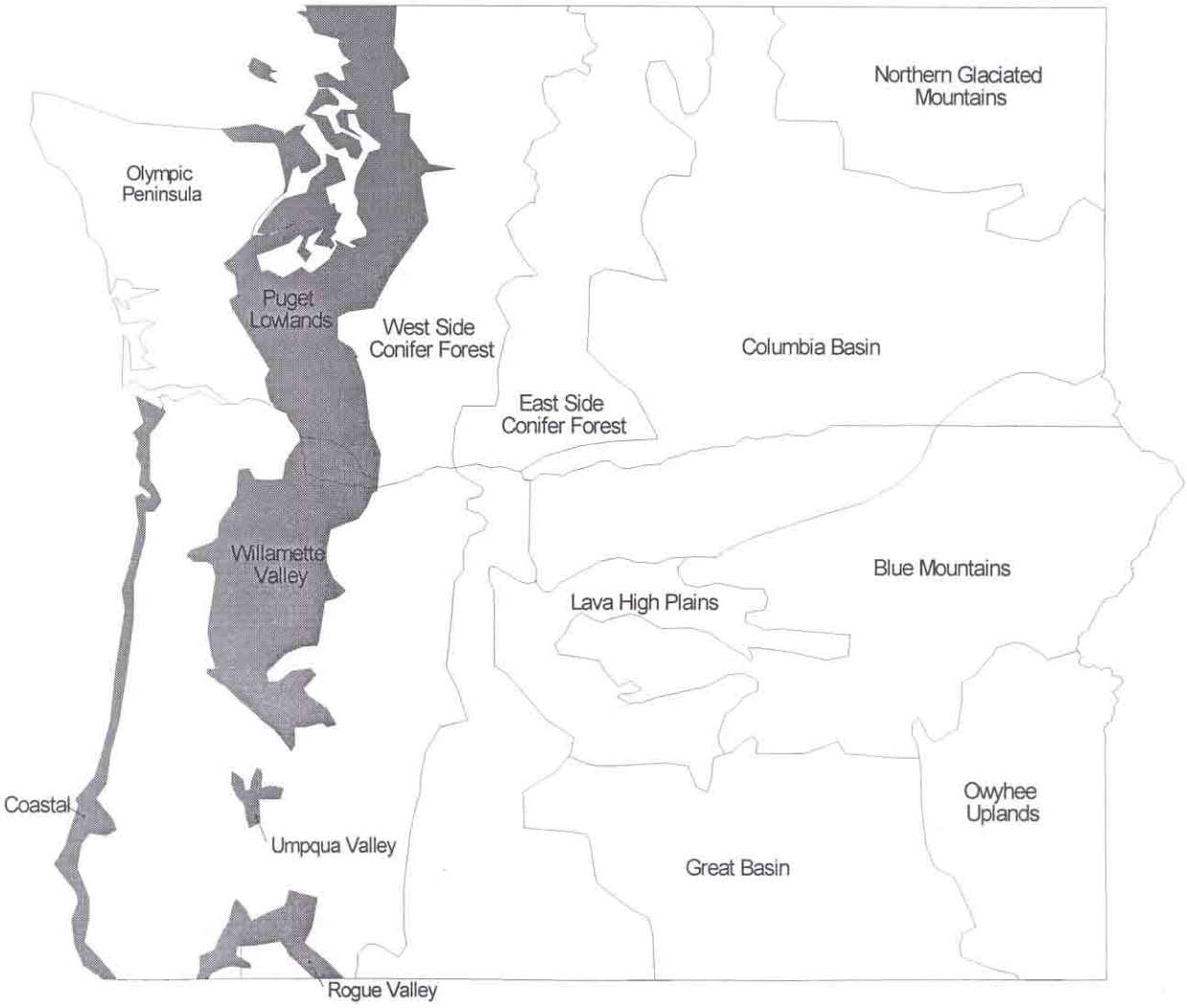
B. Physical Features

The Westside Lowlands and Valleys are physiographically distinct and relatively disjunct islands of low elevation habitat amid the vast coniferous forests of western Oregon and Washington. The Willamette, Rogue, and Umpqua Valleys in Oregon, and the Puget Lowlands and part of the Willamette Valley in Washington are relatively large "interior" valleys and lowlands enclosed primarily by mountain ranges and to a lesser extent bodies of water. Coastal Lowlands and Valleys also are disjunct islands of habitat, but are much smaller than the interior valleys, and bordered by ocean and bay in addition to mountains. The San Juan Islands are surrounded by water, embedded within the Puget Sound.

The Willamette Valley is a low elevation broad alluvial plain of approximately 3,500 square miles (100 miles long by 35 miles wide) in northwestern Oregon. It is bounded by mountain ranges on three sides and the Columbia River on the north. The mountain ranges include the Coast Range to the west, Cascade Mountains to the east, and Calapooya Mountains to the south. The drainage system is dominated by the northward flowing Willamette River for approximately 187 river miles.

The Puget Lowlands are a low elevation glacial trough extending from the Canadian border to their physiographic and geologic continuation in the Willamette Valley of southwestern Washington. The northern portion is a glaciated depression much of which is now under water (Puget Sound). It lies in the rain shadow of the Olympic Mountains. The southern portion is largely the Cowlitz River Valley and the upper basin of the Chehalis River.

Figure 2. Location of Westside Lowlands and Valleys Landbird Conservation Planning Region in western Oregon and Washington



The Rogue and Umpqua Valleys are interior valleys and rolling foothills that transition between the mesic lowlands of the Willamette Valley and the xeric interior valleys of northern California (Smith 1985). They are completely embedded within several major mountain ranges including the Cascades, Klamath, and Siskiyou Mountains.

Coastal Lowlands and Valleys are mostly floodplain or prominent headland grasslands along the Pacific ocean. Examples of floodplain and valley lowlands are the Ho, Quinalt, and Quinette in Washington; and Tillamook and Coos Bay in Oregon. Examples of headland grasslands include Heceta Head and Cacscade Head in Oregon.

C. Vegetation

A thorough description of the historic and current vegetation in the planning area is beyond the scope of this document. The information presented below is a cursory overview of the principal features of the vegetation and plant associations that provide habitat for landbirds. Detailed accounts have been described in many sources, but especially Habeck (1961), Lang (1961), Thilenius (1968), Franklin and Dyrness (1973), Towle (1974), Smith (1985), Riegel et al. (1992), and Chappell and Crawford (1997). A summary of the physiography, potential natural vegetation, and land uses within each distinct subprovince is presented in Appendix A.

1. Pre-European Settlement

Pre-European settlement vegetation of Westside Lowlands and Valleys was a mosaic of prairies, savannas, oak woodlands, chaparral (Rogue and Umpqua Valleys), riparian forest and shrub, wetlands, and patches of coniferous forest (Habeck 1961, Franklin and Dyrness 1973, Towle 1974). The most characteristic native vegetation is listed in Table 1. The mosaic of prairie, savanna, oak woodland, and most chaparral was maintained by periodic natural fires and fires set by Native Americans (Johannessen et al. 1971).

Table 1. Native vegetation characteristic of upland and riparian habitats in the Westside Lowlands and Valleys Landbird Conservation Planning Region.[a]

Vegetation Type	Dominant Trees	Common Shrubs	Common Herbaceous Plants
Bottomland Forest	willows, alder, Oregon ash, black cottonwood	creek dogwood, ninebark, Indian plum, vine maple, hazelnut	sedges, stinging nettle

Vegetation Type	Dominant Trees	Common Shrubs	Common Herbaceous Plants
Bottomland Prairies	Oregon ash	Douglas spirea	tufted hairgrass, sedges, rushes, Willamette daisy, Bradshaw's lomatium, Nelson's checker mallow
Upland Woodland/ Forests	Oregon white oak, madrone, Douglas-fir, big leaf maple, western hemlock, grand fir	vine maple, hazelnut, ocean spray	bracken fern, blue wildrye, tall bugbane, Howell's bentgrass, sword fern
Foothill Savanna/ Prairie	Oregon white oak, California black oak, Douglas-fir, ponderosa pine	baldhip rose, sweetbrier rose	California fescue, blue wildrye, Roemer fescue, California oatgrass, Lemmon's needlegrass
Chaparral	California black oak, Oregon white oak, mountain mahogany	wedgeleak ceanothus, whiteleaf manzanita, squaw bush, yerba santa	Roemer fescue, California oatgrass, California brome

[a] Does not include emergent wetland habitats; sources include Franklin and Dyrness (1973), Riegel et al. (1992), Titus et al. (1996), and Wilson (1998).

Prior to European settlement, the landscape of the Willamette Valley, particularly south of Salem, was largely an open expanse of prairie and savanna. It has been estimated that there were over 400,000 ha (1,000,000 ac) of prairie (approximately 122,000 ha [300,000 ac] of wet prairie and 282,000 ha [700,000 ac] of dry prairie) and over 200,000 ha (500,000 ac) of savanna within the Willamette Valley at the time of European settlement (Christy et al. 1999). This ecosystem comprised approximately 45% (30% prairie and 15% savanna) of the Willamette Valley ecoregion.

In the Puget Lowlands, prairies were a less significant part of the pre-European settlement landscape than in the Willamette Valley. An assessment of pre-settlement vegetative conditions based on soil type indicates approximately 60,000 ha (150,000 ac) of prairie habitat, which comprised about 10% of the landscape (Crawford and Hall 1997). There are no quantitative data on grass-dominated balds on shallow soils of south-facing slopes in the San Juan Islands, although they were more extensive pre-settlement than now (C. Chappell pers. comm.). There are few descriptive data and no quantitative estimates on the historic extent of grassland-savanna vegetation in the Rogue and Umpqua Valleys (Franklin and Dyrness 1973, Smith 1985).

Wet prairies are seasonally flooded ecosystems that occurred primarily on poorly drained soils at low elevations (Wilson 1998), especially in the southern half of the Willamette Valley. Common species are tufted hairgrass, camas, rushes, and sedges. Dry prairies occurred on better drained soils in the valley lowlands and particularly along valley margins (Wilson et al. 1995). They were

dominated by perennial grasses and forbs whose growth form resulted in spatial heterogeneity and intervals of open soil or ground cover forb species (Wilson 1998). Diagnostic species of dry prairie included Idaho fescue, California oatgrass, Lemmon's needlegrass, and red fescue.

Savanna includes the same dry prairie herbaceous vegetation with singular widely scattered trees or small open tree groves, usually savanna-form Oregon white oak, but in some areas Ponderosa pine or Douglas-fir. Tree canopy cover is generally <25% (Agee 1993, Larsen and Morgan 1998), and the average distance between trees is >20 m (66 ft) (E. Alverson pers. comm.).

Oak woodlands were characterized by a canopy of Oregon white oak (also black oak in the Rogue and Umpqua Valleys and southern part of the Willamette Valley), and a relatively open understory. Big-leaf maple, Douglas-fir and Pacific madrone were other canopy associates (Franklin and Dyrness 1973). Oak woodlands are defined as stands of pure oak, or oak-conifer where canopy cover is >25% and oak accounts for >50% of the cover present (Larsen and Morgan 1998). Understory species composition is dominated by poison oak, California hazel, snowberry, oceanspray, serviceberry, and sword fern (Franklin and Dyrness 1973). Historic distribution was generally limited to low elevation relatively drier areas with limited conifer competition. Oak woodlands often occupied a narrow ecotone between prairie/savanna and conifer forest. In the Rogue Valley and to a lesser extent the Umpqua Valley, oak woodland refers to the full spectrum of Oregon white oak, California black oak, and madrone.

Chaparral occurs mostly in the interior valley and foothills (<6,900 ft [2,100 m]) of the Rogue, Illinois, and Umpqua River drainages in southwestern Oregon. Chaparral includes medium to tall shrublands which range from closed canopy to widely spaced shrubs with an herbaceous understory, depending on the fire history. The dominant plants share a number of characteristics. They are multi-stemmed shrubs, usually between 0.5 to 4 m tall, tend to be densely branched and rigid, and their leaves are usually small, hard, thick, and possess a waxy cuticle. Many of these features are adaptations to life in a seasonally hot and water-limited environment.

Valley chaparral is a northern extension of the California chaparral types, and generally occurs below 1,100 m. Primary species in valley chaparral include wedgeleaf ceanothus and whiteleaf manzanita (Detling 1961). In the Illinois Valley, hoary manzanita and yerba santa are also important species. Bunchgrasses dominate the understory of good condition sites. Oak chaparral includes valley chaparral species with a scattered component of a scrub form of Oregon white oak. Other commonly encountered species include birchleaf mountain mahogany, silk tassel, and poison-oak. Some chaparral communities are believed to be climax (e.g., wedgeleaf ceanothus on the Rogue Valley floor) and others are believed to be fire maintained.

A higher elevation chaparral with a different species composition occurs between 1,100-2,100 m (3,600-6,900 ft) on south-facing slopes of the Siskiyou Mountains in the Klamath River drainage. This montane chaparral is dominated by greenleaf manzanita, snowbrush, and chinquapin.

Lowland (bottomland) riparian woodland and shrub communities were dominated by deciduous canopies of pure or mixed stands of willow, Oregon ash, and black cottonwood (Titus et al. 1996), with red alder significant in some lowland areas of the Puget Lowlands (Chappell and Crawford 1997). Understory dominants included red-osier dogwood, snowberry, and Pacific ninebark. Higher terrace riparian sites were drier and more mixed in composition, including big leaf maple and a conifer component of western redcedar, Douglas fir, and grand fir in addition to the aforementioned bottomland forest species.

Vegetative communities that provided habitat for landbirds but comprised a small portion of Westside Lowlands and Valleys include Ponderosa pine savanna and woodland, and patches of coniferous forest and mixed deciduous-coniferous forest which were scattered throughout the planning area.

2. Current Vegetation

Current vegetation has changed radically from original vegetation as a result of tremendous expansion of the human population. Contributing factors include cultivation of lands for agriculture, loss of habitat to development, livestock grazing, introductions of exotic species, fire suppression, harvest of oaks and cottonwoods, drainage of wetlands, and channelizing of waterways.

The greatest change in vegetation in the Westside Lowlands and Valleys has been the near extirpation of grassland and savanna habitat. Native grassland and savanna habitat in the Willamette Valley has been reduced from the most abundant vegetative community to a few small, scattered parcels of semi-natural remnants amid farmland and urban and rural residential development. Current estimates of grassland and savanna habitat are <4,000 ha (10,000 ac) or <1% of the historic extent (Ed Alverson, pers. comm.). Principal factors contributing to native grassland loss were conversion to agriculture (includes grazing and cropland), and enhanced natural succession due to fire suppression. Cultivated cropland now dominates much of the vegetation of the Willamette Valley, particularly in the southern half of the valley.

Current estimates of prairie habitat in the South Puget Sound are 5,094 ha (12,582 ac), and most of this (91%; 4,656 ha [11,500 ac]) occurs on Fort Lewis Military Installation (Crawford and Hall 1997). Only 1,212 ha (2,993 ac) or 3% are considered "intact prairie" and again most of this

(71%; 862 ha [2,130 ac]) occur on Ft. Lewis. Thus, prairie vegetation has been reduced by greater than 90% from presettlement conditions. Causes of prairie loss in the southern Puget Lowlands have been attributed to urban development (33%), forest invasion and conversion (32%), and agricultural uses (30%) (Hall et al. 1995).

Sampling conducted in the Umpqua Valley indicated <4% of the area is native or semi-native grasslands, and almost 30% in heavily managed pasturelands (Smith 1985). It is unknown if most or all of the later was native grassland at the time of European settlement, but essentially all grasslands have been modified by grazing and agriculture. In southwest Oregon, the largest areas with some semblance to historical conditions are tablelands north of Medford in the Rogue Valley.

Changes in oak woodlands also have been accelerated by human activities. The two most significant factors (past and present) are removal by harvest for development or agriculture, and invasion by conifers and dense exotic shrubs from fire suppression and grazing (Habeck 1961, Smith 1985). Current distribution is patchy and discontinuous with variable-sized patches of different quality. Conifer and mixed deciduous/coniferous forests occupy large areas of what was formerly prairie-savanna habitat. These forests are often dominated by an overstory of Douglas-fir, and an understory of exotics such as Himalayan blackberry. In some areas, fire suppression also has resulted in oak savanna being replaced by oak woodland.

Much of the riparian woodland and shrub communities have been lost, and most of those that remain have been highly changed from pre-settlement conditions. Primary causes of loss have been flood control, irrigation systems, channelizing waterways, and intensive development of bottomlands for agriculture that occurred along with the intensification of wetland draining and flood control (Titus et al. 1996). In the Willamette Valley, over 70% of the bottomland hardwood forest has been lost. Riparian stands once 2-11 km (1-7 mi) wide along the Willamette River, are now mostly less than a few hundred feet, with some just a thin strip of trees.

D. Land Uses

Current land uses in the Westside Lowlands and Valleys revolve around developed areas associated with human settlement (urban, suburban, rural residential, commercial), and various types of agriculture. A list of the predominant land uses is presented in Appendix A.

The Willamette Valley supports most of Oregon's economic activity including extensive agricultural, industrial, and recreational activities (Shearman 1976). Agricultural activities occur throughout the valley but are dominant in the central and southern valley. Greater diversification

occurs in the northern valley in terms of trade, service, and manufacturing industries. Some sand and gravel mining activities occur adjacent to and within the main stem of the Willamette River and major tributaries. Land use in the Puget Lowlands is similar to the Willamette Valley, but less dominated by large areas of similar agriculture (e.g., grass-seed fields) and more diversification in agriculture types and smaller areas of coverage. The principal land use in the Umpqua Valley is livestock pasture. The Rogue Valley is more diverse agriculturally, with extensive fruit production (i.e., orchards) in addition to livestock grazing.

E. Conservation Issues

Landbird conservation in the Westside Lowlands and Valleys faces numerous challenges, either directly or indirectly associated with human economic and social issues. For example, the Willamette Valley is the most populated and heavily impacted region in Oregon. It includes approximately 2 million people, 70% of the states population (Bonn et al. 1995), and the 5 largest cities (Center for Population Research and Census 1992). Land ownership is over 96% private (Puchy and Marshall 1993). The extensive human use of the land base in the Westside Lowlands and Valleys presents the biggest constraint for conservation.

The two principal current conservation issues affecting bird populations throughout the Westside Lowlands and Valleys are 1) habitat loss and degradation due directly or indirectly to an expanding population, and 2) extensive private land ownership. Urban and residential sprawl has eliminated and/or degraded most of the few remaining parcels of quality habitat, and landscape-scale restoration activities are problematic due to private land ownership.

Another principal factor contributing to the change and degradation of pre-European settlement vegetation was alteration of natural ecological processes such as fire and flooding. Fire suppression has contributed to encroachment of conifers, particularly Douglas-fir, into oak savannas and woodlands, and limited recruitment of young oaks. Flood control has contributed to reducing the areal extent of wetlands and wet prairies, and altered a dynamic system that provided young willow floodplain shrub habitat by allowing a forest community to develop in areas formerly kept in early successional habitat.

Other factors affecting landbird conservation include intensification of farming practices which has reduced vegetative diversity; changes in agricultural types which has reduced suitable habitat (e.g., reductions in pastureland and increased acreage of row-crops); and alteration of hydrological regimes, particularly in riparian habitats.

Rural development in the valleys and foothills of southwest Oregon presents a threat to chaparral habitat far in excess of the land cleared for yard and house. As development of private lands presses up against public lands, land managers are pressured to manage federal lands to reduce fire hazard to adjacent residences. Typically this involves the manual removal of chaparral plants. However, the chaparral community is adapted to recurring fire. The attempt to eliminate fire will inevitably lead to a great many changes in the distribution and abundance of both plant and animal species. For example, the recruitment of new generations of shrubs will likely be affected. The germination of many chaparral plants is triggered by the heat of fire or the chemicals found in smoke. Without wildfire, new recruitment may be limited or involve a different mix of species or existing species in different relative abundances.

The highly urban and agricultural nature of Westside Lowlands and Valleys has also resulted in hostile landscapes for birds, even where habitat is suitable. Several non-native bird pest species (e.g. starling, house sparrow), and residential species (e.g., domestic cats), have successfully established themselves and negatively impacted native bird species. Additionally, agricultural lands have provided suitable habitat for a brood parasite species, brown-headed cowbird, which originally was distributed in the east and midwest.

Other issues that have likely affected landbird populations and their habitats include:

- exotic and invasive plant species such as European annual grasses and forbs, Scot's broom, Himalayan blackberry, star thistle, and medusa head;
- disturbances from machinery, feral animals, and recreation vehicles;
- logging of oaks and cottonwoods;
- human recreation (passive and active-illegal);
- extensive chemical use on agricultural lands;
- fragmentation of habitats (e.g., road building); and
- poplar plantations in riparian areas of Willamette Valley and Puget Lowlands.

In addition to the negative aspects of habitat loss and conversion, there has been some expansion of suitable habitat for grassland birds through the creation of agricultural grassland habitat where grasslands did not previously exist. This occurred primarily from extensive wetland draining which converted wetlands into agricultural lands. Examples of these places include the Skagit and Sammish Flats in northwestern Washington and much of the historic floodplain of the Willamette River in Oregon. Some grasslands birds such as western meadowlark have been able to maintain populations in some types of agricultural grasslands.

F. Conservation Opportunities

Despite extensive habitat losses and conversions from native plant communities, opportunities exist for restoration and management to provide quality landbird habitat. Some various-sized patches of native or semi-native vegetation remain in preserves and refuges, designated wildlife areas or research natural areas, riparian corridors, and small unaltered areas within agricultural landscapes. Additionally, there are opportunities for landbird conservation on some active and passive agricultural lands such as pastures, fallow fields, and conservation set-asides such as Conservation Reserve Program (CRP) lands. Approximately 13,300 ha (33,000 ac) in the Willamette Valley, and 1,615 ha (4,000 ac) in the Rogue Valley are managed or set aside for wildlife and other natural area values (Puchy and Marshall 1993). In the South Puget Lowlands, there are approximately 5,000 ha (12,500 ac) of managed or protected prairie habitat in six locations (Crawford and Hall 1997).

In addition to existing managed or protected areas, there are ongoing attempts to engage private landowners in restoration of native vegetation or management to create suitable habitat conditions for landbirds, particularly in grassland and riparian/wetland habitats. This includes several economic incentive programs of the Natural Resources Conservation Service (NRCS) (see Chapter 9), and the Willamette Valley Grassland Bird Conservation Program of the Oregon Department of Fish and Wildlife. These efforts provide opportunities to establish quality landbird habitat and link habitat patches to increase the area of contiguous patches.

G. Subprovinces

The Westside Lowlands and Valleys Bird Conservation Planning Region is a large area. Many habitats, management practices, and land uses are common to the entire area. However, environmental and anthropogenic differences exist within several relatively distinct geographic areas. This provides an opportunity to establish biological objectives at smaller geographic scales where appropriate. Throughout this document, we refer to the following six subprovinces:

- Puget Lowlands
- Willamette Valley
- Umpqua Valley
- Rogue Valley
- Coast Valleys and Lowlands
- San Juan Islands

CHAPTER 3. AVIFAUNA

A. Scope

This strategy addresses the conservation of breeding landbirds and their habitats in Westside Lowlands and Valleys. Clearly, factors operating outside the nesting season may also be adversely affecting populations of birds breeding in this area. This may be particularly true for migratory birds subject to habitat changes and other factors on their wintering grounds and during migration, but also for resident birds where adverse factors affecting breeding populations may be doubly affecting species wintering in the same habitats. There is an underlying assumption throughout this document that maintaining quality habitat for breeding landbirds is also important in supporting populations of wintering and migrant birds of the same and other species.

The conservation strategy does not directly address all landbird species, but instead uses numerous "focal species" to describe the conservation objectives for the avian community. The strategy also does not address birds that primarily use aquatic habitats such as shorebirds and wading birds (e.g., spotted sandpiper, great blue-heron), waterfowl (e.g., mallard), and colonial waterbirds (e.g., yellow-headed blackbird). Conservation planning for these types of birds is being conducted by other entities and programs (i.e., North American Waterfowl Management Plan, National and Regional Shorebird Plans, and North American Colonial Waterbird Plan, respectively).

B. Species Composition

We considered 93 native landbird species to be highly associated breeding species in all or part of the Westside Lowlands and Valleys (Appendix B). This does not include several species that may occur in the planning unit (particularly in riparian habitats), even occasionally as breeding species, but which are not considered to be highly associated or regular components of the avifauna of Westside Lowlands and Valleys. Additionally, many other species may occur as migrants or wintering species only. This diversity reflects the variety of habitats and environmental influences within the area.

Several breeding species in the Westside Lowlands and Valleys are found nowhere else in Oregon and Washington. For example, blue-gray gnatcatcher, California towhee, and oak titmouse, are largely restricted to chaparral habitats of southwestern Oregon, but have a much broader geographic distribution in California. Species such as white-tailed kite, wrentit, Allen's hummingbird, and Anna's hummingbird have a broad distribution in California, but only occur in

western Oregon and/or Washington in the lowland valleys and/or foothills. Endemic subspecies of vesper sparrow and horned lark also only occur in the Westside Lowlands and Valleys.

A few landbird species have been extirpated as breeding species from all or some of the Westside Lowlands and Valleys. The burrowing owl was considered "a familiar sight" (Gabrielson and Jewett 1940) and a "common breeding species" (Browning 1975) in the 1920s and 1930s in the Rogue Valley, and may have nested in the Willamette Valley (Graf 1939) and Puget Lowlands (Smith et al. 1997). The last suspected nesting in westside grasslands was in the early 1980s (O. Swisher, pers. comm). They occur as an occasional wintering species throughout the Westside Lowlands and Valleys.

Yellow-billed cuckoo has been extirpated as a breeding species from cottonwood-willow dominated woodlands along major water bodies in the Willamette Valley and Puget Lowlands. Prior to European settlement, it was considered "abundant during the summer" along the Columbia River near Vancouver, WA (J.K. Townsend in Jobanek and Marshall 1992). Even into the 1920s it was fairly common around the Puget Sound (Burleigh 1929) and along the Columbia River (Gabrielson and Jewett 1940). It has not been reported from Westside Lowlands and Valleys in Oregon since 1977 (Gilligan et al. 1994), and the last confirmed breeding in Oregon was in the 1940s (Littlefield 1988). The last confirmed breeding in western Washington was in the 1930s (Littlefield 1988).

Lewis' woodpecker formerly nested in oak and pine savannas and cottonwood riparian woodland of the Puget Lowlands (Jewett et al. 1953) and Willamette Valley (Gabrielson and Jewett 1940). Prior to 1965, they were fairly common residents in Columbia River bottomlands (Galen 1989), and nested in a few oak savanna locations in the Willamette Valley (e.g., Finley National Wildlife Refuge) into the early 1970s (A. Contreras pers. comm.). A drastic reduction in the population occurred in the late 1960s and early 1970s, and the last documented breeding record in the Willamette Valley was in 1977 near Scapoose along the Columbia River (Gilligan et al. 1994). Lewis' woodpeckers may nest infrequently in Rogue and Umpqua valley savanna habitats, but have declined in those areas also (Marshall et al. 1996). It occurs as a regular wintering species in the Rogue Valley, and as an occasional migrant and wintering bird in the other valleys.

Common nighthawk was "very abundant on the prairies near Puget Sound" (Suckley and Cooper 1860), and nested in grasslands in the Willamette Valley (Gabrielson and Jewett 1940), but may be extirpated there (Altman 1999). Two species, Say's phoebe and the sandhill crane, occurred in small local breeding populations in westside grasslands, but disappeared as breeding species many years ago. Say's phoebe was considered a "regular resident of Rogue, Umpqua, and Willamette valleys" (Gabrielson and Jewett 1940). It maintained a small breeding population

near Corvallis at least through the 1940s (Evenden 1949), but has not been reported as a nesting species since. Sandhill cranes formerly were a "summer resident in the prairies of western Washington" (Jewett et al. 1953). At the time of European settlement they were considered a "common summer resident" (Suckley and Cooper 1860).

Lark sparrow has been extirpated as a breeding species in the Willamette Valley, but still maintains breeding populations in the Rogue and Umpqua valleys. Shortly after European settlement, lark sparrows were reported as "common breeders in the Willamette Valley" (Johnson 1880), and into the early 1900s were considered an "uncommon summer resident at Corvallis and Dayton" (Woodcock 1902). It has not been reported as a breeding species in the Willamette Valley for approximately 50 years.

1. Grassland-Savanna

We considered 44 species to be highly associated breeding species in grassland habitats (Appendix B). Species richness generally increases from wet prairie (16 species) to dry prairie (21 species) to savanna (26 species) (Altman et al. in prep.). Wet prairie is characterized by species associated with a mixture of grasses and forbs in mesic sites such as common snipe, northern harrier, and short-eared owl. Dry prairie is characterized by species associated with upland areas dominated by extensive grass cover. Dry prairie associated species include Oregon vesper sparrow, streaked horned lark, grasshopper sparrow, and western meadowlark. Where a scattered shrub component occurs, species diversity may increase to include lazuli buntings which nest in the shrubs, and species abundance may increase for some of the obligate species such as Oregon vesper sparrow and western meadowlark which use the shrubs as singing perches. The presence of singular or small groves of scattered oaks or occasionally ponderosa pine or Douglas-fir (savanna) results in an entirely new group of highly associated species such as American kestrel, white-tailed kite, western bluebird, chipping sparrow, western kingbird, and acorn woodpecker. These species are responding to several features provided by oak trees including the availability of cavities for nesting (e.g., American kestrel, western bluebird), presence of acorns as a food source (e.g., acorn woodpecker), elevated perches for singing (e.g., chipping sparrow), and/or the availability of branch structure for nesting substrate (e.g., western kingbird, white-tailed kite).

2. Oak Woodlands

We considered 47 species to be highly associated breeding species in oak woodlands (Appendix B). Among the most highly associated species, some are associated with the production of

acorns (e.g., acorn woodpecker and scrub jay), the presence of large oak trees with natural or woodpecker excavated cavities (e.g., white-breasted nuthatch, black-capped chickadee, ash-throated flycatcher in Rogue and Umpqua Valleys), the presence of young regenerating oaks in the subcanopy (e.g., bushtit), an open, herbaceous dominated understory (e.g., chipping sparrow), or openings in the canopy that increase the amount of edge habitat (e.g., western wood-pewee). The amount of shrubby understory present often determines species composition. In mostly open understories, typical of fire-maintained presettlement conditions, species such as chipping sparrow and dark-eyed junco would be favored. Where the understory has become a dense shrubby thicket from fire suppression and encroachment, species such as Bewick's wren, spotted towhee, Swainson's thrush, and orange-crowned warbler are fairly common.

3. Riparian

We considered 49 species to be highly associated breeding species in riparian forest and shrub habitats (Appendix B). Many of these species are generalists that also occur as breeders in other habitat types (e.g., American robin, Bewick's wren, Swainson's thrush). However, others such as red-eyed vireo, yellow warbler, yellow-breasted chat, warbling vireo, and Bullock's oriole are obligate or near obligate to riparian habitat. Most species are primarily insectivores that take advantage of the high insect productivity that occurs in riparian habitats. In general, the greater the structural layering and complexity of the habitat, the greater the insect productivity, and the greater the bird species diversity. Many studies have reported higher species richness, abundance, or diversity in riparian zones than adjacent habitats, particularly at lower elevations (Stauffer and Best 1980, Knopf 1985). Other riparian associated bird species are tied to unique features such as nesting cavities provided by snags (e.g., downy woodpecker, black-capped chickadee, tree swallow), nectar of flowering plants in the understory (e.g., rufous hummingbird), fruit from berry producing plants in the understory and subcanopy (e.g., cedar waxwing), or a dense, diverse shrub layer (e.g., Swainson's thrush).

4. Chaparral

We considered 40 species to be highly associated breeding species in chaparral habitats of southwestern Oregon (Appendix B). Species composition changes markedly as the structure of the chaparral changes. Some species are limited to chaparral of a specific configuration while others occur across the full range of habitat types. In general, bird species richness is lowest in the "pure" chaparral habitats (chaparral shrub), those containing relatively dense stands of woody shrubs and lacking trees. Only 20 species regularly breed among wedgeleaf ceanothus and whiteleaf manzanita in chaparral shrub (Altman et al. in prep.). Some of the most common

species include western scrub-jay, spotted towhee, California towhee, and lesser goldfinch. Diversity is slightly higher if chaparral contains substantial amounts of grassland. This feature adds species such as western meadowlark and lark sparrow. Species richness increases greatly on chaparral sites that have hardwood trees, especially oaks and madrone. Species such as oak titmouse, white-breasted nuthatch, and black-headed grosbeak become part of the avifauna. Higher elevation montane chaparral includes a different group of species such as dusky flycatcher, green-tailed towhee, and fox sparrow.

C. Species and Habitat Associations

An essential component for deciding appropriate management actions to conserve landbirds is an understanding of the relationships between species and habitat. Available data on species-habitat relationships are presented under each species account in Chapter 6. Two other databases should be consulted for a synthesis of knowledge on bird species and habitat relationships. One is a bi-state project entitled *Wildlife Habitats and Species Associations in Oregon and Washington* (Johnson and O'Neil in prep.), and the other, a more regionally specific project entitled *Terrestrial vertebrate species of the Willamette River Basin: a species-habitat relationship matrix and spatial modeling approach* (Adamus 2000). Both should be considered appendiums to this document, and function as an information source used to make appropriate decisions on species management within specific habitat conditions.

D. Population Trends

The Breeding Bird Survey (BBS) (Robbins et al. 1986) is the primary source of population trend information for North American landbirds. There is one BBS Physiographic Region within the geographic boundaries of this conservation strategy - Southern Pacific Rainforest. This region also includes areas outside Westside Lowlands and Valleys, primarily coniferous forests of the Klamath Mountains, Coast Ranges, and Olympic Peninsula. BBS trend estimates for native species primarily associated with Westside Lowlands and Valleys in the Southern Pacific Rainforest BBS Region are presented in Appendix B for the 30-year period (1968-1998) and the most recent period (1980-1998).

Of the 50 species with either long-term or short-term significantly declining trends, 22 could be considered exclusively or primarily breeding within Westside Lowlands and Valleys (Table 2). An additional 19 species use both low elevation valley habitats and higher elevation coniferous forest habitat similarly (e.g., western bluebird, orange-crowned warbler, willow flycatcher, rufous hummingbird). The remaining 9 species are predominantly coniferous forests species. Additionally, several species that lack sufficient BBS data (e.g., streaked horned lark, Oregon

vesper sparrow) are considered by many to be declining in Westside Lowlands and Valleys based on anecdotal knowledge. In contrast to declining species, only 16 species have significantly increasing trends, and 10 of those are exclusively or primarily associated with the Westside Lowlands and Valleys (Table 2).

Table 2. Native landbird species with significantly declining or increasing population trends in the Westside Lowlands and Valleys Landbird Conservation Planning Region within the Southern Pacific Rainforest BBS Physiographic Region.

SIGNIFICANTLY DECLINING TRENDS[a]		SIGNIFICANTLY INCREASING TRENDS[a]	
Lowland Valleys[b]	**Valleys and Coniferous Forests[c]**	**Lowland Valleys[b]**	**Valleys and Coniferous Forests[c]**
Killdeer (L)	Band-tailed pigeon (L)	Canada goose (R)	Turkey vulture (R)
California quail (L)	Common nighthawk (L)	Red-tailed hawk (R)	Black-headed grosbeak(R)
Mourning dove (L,R)	Vaux's swift (L)	Osprey (L, R)	Red-breasted sapsucker(R)
American kestrel (L,R)	Rufous hummingbird (L)	Western scrub jay (L)	American robin (R)
Belted kingfisher (L)	Willow flycatcher (L,R)	Black phoebe (L,R)	Western tanager (R)
Spotted sandpiper (L)	Western wood-pewee (L)	California towhee (L,R)	Cassin's vireo (R)
Acorn woodpecker (L,R)	Pacific-slope flycatcher (L,R)	Common yellowthroat (L,R)	
Western kingbird (R)	Western bluebird (L,R)	Yellow-breasted chat (R)	
Ash-throated flycatcher (R)	Swainson's thrush (L)	Savannah sparrow (L)	
Brown-headed cowbird (L,R)	House wren (R)	Red-winged blackbird (L,R)	
Western meadowlark (L,R)	Orange-crowned warbler (L,R)		
Brewer's blackbird (L,R)	Wilson's warbler (R)		
Bullock's oriole (L)	MacGillivaries warbler (L,R)		
American goldfinch (L,R)	White-crowned sparrow (L,R)		
Lesser goldfinch (L)	Chipping sparrow (L,R)		
Lark sparrow (L)	Song sparrow (L,R)		
Lazuli bunting (L)	Dark-eyed junco (L,R)		
Cliff swallow (L,R)	Purple finch (R)		
Barn swallow (L,R)	Wrentit (R)		
Black-capped chickadee (R)			
Bushtit (L,R)			
Oak titmouse (L)			

[a] Sauer et al. (1999); includes only species that occurred on a minimum of 14 routes and had statistically significant trends (p# 0.20); L= long-term trend (1968-1998); R= recent trend (1980-1998).

[b] Exclusively or primarily breed in low elevation valley habitats.

[c] Breed similarly in low elevation valley and higher elevation coniferous forest habitats.

In addition to documented declining species in Westside Lowlands and Valleys, there have been extirpations of breeding populations for several species. Burrowing owl has been extirpated as a breeding species from grasslands in the Rogue and Umpqua Valleys, and may have formerly

nested in the Willamette Valley (Graf 1939). Yellow-billed cuckoo has been extirpated as a breeding species in cottonwood riparian habitat along the Lower Columbia River and major rivers in the Willamette Valley and Puget Lowlands. Lewis' woodpecker has been extirpated as a savanna, oak woodland, and cottonwood riparian breeding species in the Willamette Valley and Puget Lowlands, and has declined as a breeding species in similar habitat in the Rogue and Umpqua Valleys (Marshall et al. 1996). Common nighthawk formerly nested in grasslands throughout the Westside Lowlands and Valleys, but may be extirpated as a breeding species in these habitats. Say's phoebes formerly nested in low densities in the central and southern Willamette Valley (Evenden 1949). Black-billed magpies likely formerly nested in small numbers in the northern Willamette Valley (Johnson 1880, Anthony 1886, Shelton 1917).

In addition to identifying declining species, we used BBS data for some species as a baseline to set population trend objectives for reversing or stabilizing declining trends over some period of time. A list of BBS routes is presented in Table 3.

Table 3. Breeding Bird Survey routes in the Westside Lowlands and Valleys Landbird Conservation Planning Region.[a]

Region	Route Numbers
Puget Lowlands	2, 3, 10, 11, 27, 34, 41, 42, 66, 72, 79, 111, 905, 907, 910
Willamette Valley	2, 19, 24[b], 33, 34, 40, 41, 202, 233, 237, 900
Umpqua Valley	18
Rogue Valley	59, 226, 250
Coastal Valleys and Lowlands	

[a] Includes route if it is mostly within these regions; some routes also extend into Westside Coniferous Forests.

[b] Route is in Willamette Valley portion of southwestern Washington.

For some resident species, Christmas Bird Count (CBC) data are presented to supplement BBS data. In some cases, these data provide corroboration of BBS trends. However, these data should be used cautiously because wintering populations may include individuals that have migrated or dispersed from outside our planning unit. Thus, CBC data may not be indicative of populations on the breeding grounds.

CHAPTER 4. CONCEPTUAL APPROACH

Numerous approaches for wildlife conservation have been proposed and implemented in recent decades. These approaches have focused on various elements such as single species, management indicator species, guilds, management assemblages, and ecosystems (reviewed by Block et al. 1995). All of the approaches have inherent practical or biological limitations that make implementation of conservation plans or management actions problematic. For example, the single-species approach is usually not cost effective or practical for many species, and a broad-based biodiversity approach can have conflicting objectives among the myriad of species involved, and can be ambiguous in terms of design and evaluation without reference to specific habitat requirements for individual species (Lambeck 1997).

Given the limitations of these approaches, we developed a "hybrid" strategy for landbird conservation in the Westside Lowlands and Valleys that emphasizes ecosystem management, but includes components of single-species and guild or indicator species management. This approach is based on the following assumption:

- A conservation strategy that emphasizes ecosystems is more desirable than one that emphasizes individual species.

In the typical PIF approach to bird conservation, species most in need of conservation action are designated as priority species primarily by a quantitative scoring system. The National PIF Priority Scores Website (Partners in Flight Bird Prioritization Technical Committee 1999) is the source used for prioritizing birds based on a scoring system of seven variables (Carter et al. in press). When using this process exclusively, the emphasis is on single-species conservation, but there is an underlying assumption that conservation of priority species supports ecosystem management because other species will likely benefit from actions implemented to conserve priority species. This assumption may be appropriate when priority species are associated with declining habitat (e.g., old-growth forest, grasslands), degraded habitat (e.g., western riparian systems), or habitat features that are reduced across the landscape (e.g., snags).

We supplemented the typical PIF approach by placing a greater emphasis on ecosystems. We recognized that there were a number of important habitat features or attributes for birds in a functioning ecosystem that did not have a priority species associated with them. In addition, we recognized the potential importance of community dynamics operating at various spatial scales that may involve species that are not considered priority. Thus, desired conditions for these habitat attributes or functional relationships would not be described by the priority species approach. In order to have a more complete ecosystem approach, and provide a better planning

framework for dealing with future species of concern, we first identified the most important habitat conditions and features used by landbirds within the scope of this plan. After the initial PIF priority species were determined and their habitat associations and conditions matched with our list, additional species were selected based on their degree of association with the remaining important habitat conditions and features.

This approach resulted in a conservation strategy that includes both uncommon (even rare) and common species. Uncommon species are typically high-scoring PIF priority species based on populations status, declining trends, vulnerability, etc. Common species are representative of some habitat condition or feature that did not have an associated high-scoring priority PIF species, but that we felt was important for birds in a functioning ecosystem of that habitat type. In some instances, extirpated or nearly extirpated species (e.g., yellow-billed cuckoo, Lewis' woodpecker) are included as priority species if we felt they could potentially be reestablished and/or were highly indicative of some desirable habitat condition.

Using this blend of approaches, we feel there is a much greater likelihood of maintaining key habitat attributes and providing functioning ecosystems for birds because the most important habitat conditions and attributes for landbirds are described through this expanded group of species. We refer to these species as "focal species" (see below) because they are our focus for describing desired conditions and attributes. The rationale for using focal species is to draw immediate attention to habitat attributes most in need of conservation or most important in a functioning ecosystem. Although conservation is directed towards focal species, establishment of conditions favorable to focal species also will likely benefit a wider group of species with similar habitat requirements.

Most of what we know about landbird ecology in Westside Lowlands and Valleys exists at the scale of individual birds, small populations, or the site-level. Since this strategy is designed to be an ecosystem planning tool, it will be necessary to design and implement management at the landscape-level. Landscape planning will require addressing regional populations or sub-populations of birds that occur across several subprovinces. However, little is known about relationships between landbird populations and habitat at this larger scale. The strategy will introduce hypotheses, using currently known biological information as the basis, to be tested in an effort to expand our knowledge of landbird biology and management toward the landscape scale.

Finally, monitoring of habitat attributes and focal species will provide a means of tracking progress towards conservation. Monitoring will provide essential feedback for demonstrating

adequacy of conservation efforts on the ground, and guide the adaptive management component that is inherent in this approach.

A. Biological Objectives

Biological objectives are the cornerstone of this conservation strategy. Stated simply, they are "***what we think the birds need***". They are **not regulatory, nor do they represent the policies of any agency or organization**. Our biological objectives are intended to stimulate conservation action, and to function as a starting point for discussion of integration with broader ecosystem-based objectives. Our development of biological objectives emphasized the following assumption:

- Measurable, quantitative objectives are more desirable than descriptive, qualitative objectives.

Thus, we attempted to establish quantitative objectives whenever possible. Establishing quantitative biological objectives serves several purposes:

- They stimulate conservation actions to a greater degree than descriptive, qualitative objectives by providing land managers with numerical targets within an ecological context (e.g., habitat, landscape)
- They provide targets for designing management plans and benchmarks for measuring success of management actions.
- They provide hypotheses for research, particularly when objectives are based on assumptions and/or professional judgement due to lack of data.
- They are probably our best form of outreach to communicate to others what is needed to conserve landbirds.

Our biological objectives are primarily habitat-based, and are derived from current knowledge and professional judgement about bird-habitat relationships. Because of variability in the type, quality, and amount of data on focal species, some biological objectives are detailed and quantitative and others are descriptive and qualitative. Because data are limited for many species, biological objectives are often based on assumptions, which become the basis for research as testable hypotheses.

Two factors were paramount in setting quantitative biological objectives: 1) means (rather than minimums) of available data were used because they more likely provide adequate conditions for maintaining populations, and 2) optimal or high quality habitat was emphasized (to the degree of our knowledge) for self-sustaining populations in geographic areas most suitable for maintaining

or providing that habitat. Focal species also may occur at various population levels in habitats with conditions outside the range of our objectives, and areas outside of our geographic emphasis. These populations may or may not be source habitats (i.e., provide resources for successful reproduction), and may or may not contribute to conservation of that species. However, this strategy emphasizes setting biological objectives for the most desirable habitat conditions, within areas where ecologically appropriate, and where habitat is or should be most suitable for focal species.

Unless otherwise indicated, data on population density or abundance are used to indicate habitat suitability. This assumes healthy, viable populations where species are most abundant, despite widely accepted recognition that population density and associated habitat quality can be a misleading or inaccurate measure of population viability (Van Horne 1983). From a practical standpoint, this habitat-based approach has been widely used because of 1) the ease and cost effectiveness of collecting such data, and 2) demographic information is often unavailable. A consistent theme throughout this conservation strategy is that use of habitat quality to represent population health is an assumption that will ultimately need to be validated with demographic data to determine relationships between habitat characteristics and population viability.

B. Conservation Strategies

Conservation strategies are examples of management approaches that may be used to achieve biological objectives or enhance conservation relative to a habitat attribute or focal species. They are recommendations that can be incorporated into management practices or implemented on an opportunistic basis within the broader context of ecosystem management. Management techniques suggested include only a few of the wide variety of options available. Land managers and biologists should consult with plant ecologists and scientisits from other disciplines to ascertain appropriate conservation options to prescribe for specific areas. These individuals also can be a valuable source of information for additional management actions to achieve biological objectives.

C. Bird Conservation Areas

We identified several Bird Conservation Areas (BCAs) to function as an additional tool for bird conservation (see Appendix C). BCAs are desirable because habitat losses and landbird species declines have been extensive, and habitats that remain are disjunct and threatened by continued development or conversion to non-suitable habitat. Some bird species may only be able to persist if actions are taken to emphasize conservation in selected areas.

BCAs are intended to provide a focus for any agencies, non-governmental organizations or companies, or private individuals to prioritize where conservation should occur. They represent what we feel are currently the best geographic options for maintaining or enhancing healthy populations of landbirds to stem the tide of declines and prevent further listings of species. It should not be inferred, however, that they are the only areas suitable for bird conservation. It also will be important to initiate conservation actions where opportunities present themselves. BCAs should function to direct conservation efforts where actions have the greatest opportunity for regional success.

BCAs were selected based on the professional knowledge of biologists and ecologists that participated in this planning process. Numerous factors were considered including uniqueness of the area, existing populations of focal species, historic and current condition of the habitat, current and projected land uses and land management, threats and risk of loss/degradation of the habitat, and land ownership.

It is hoped that various partners in landbird conservation will adopt either singularly or in partnership each of the BCAs to facilitate coordination of conservation actions within each area. This should include an assessment of existing habitat conditions within the BCA, and specific management strategies on how to achieve conservation objectives. Management and evaluation of BCAs should emphasize healthy, native vegetation within the historical range of variation for each habitat type. The result should be a managed landscape mosaic within the BCA that includes potential habitat for some or all priority species.

CHAPTER 5. PRIORITY HABITATS AND SPECIES

A. Selection

Priority habitats were selected by the PIF Westside Lowland and Valley Working Groups for each of the subprovinces (see Acknowledgements). Selection was based on a combination of factors including:

- priority status in an OR-WA PIF prioritization scheme (Andelman and Stock 1994);
- loss, alteration, and current condition of the habitat relative to that of historic conditions;
- recognition of current threats of loss or conversion of the habitat; and
- importance of the habitat to one or more high priority species.

Herbaceous dominated wetlands are not emphasized in this conservation strategy for a couple reasons. First, only a few landbirds are closely associated with these habitats (e.g., common snipe, common yellowthroat, marsh wren, red-winged blackbird). Additionally, these habitats are being addressed by other bird conservation initiatives (e.g., North American Waterfowl Management Plan, Regional Shorebird Plans) and by several regulatory enactments (e.g., Section 404 of the Clean Water Act). Thus, our emphasis was to focus on several upland habitats that are not receiving much conservation emphasis or regulatory protection.

Priority species were selected on a combination of several factors including:

- primary association with priority habitats for breeding;
- specialist species with a high degree of association with key habitat features or conditions important in a functioning ecosystem;
- declining population trends (Appendix B) or reduction in their historic breeding range (may include extirpated species);
- special management or conservation status such as endangered, threatened, species of concern, management indicator species, etc.;
- high Management Index scores in the OR-WA PIF prioritization process (Andelman and Stock 1994);
- high total or AI (Area Importance) + PT (Population Trend) scores in the PIF National Database for the Southern Pacific Rainforest physiographic province (Appendix B);
- species for which the Southern Pacific Rainforest BBS Physiographic Region has a high national responsibility (i.e., high percent population scores) (Appendix B), and

- professional knowledge on species of local interest.

B. Priorities

The four priority habitats for Westside Lowlands and Valleys are:

- grassland-savanna,
- oak woodland,
- riparian, and
- chaparral.

Our intent was to avoid rigorous definitions for these habitats, and to allow land managers flexibility to ascertain if the conditions we describe are ecologically appropriate for management on their lands within the broad context of these four habitat types. However, the following guidelines may help when considering the applicability of our objectives. We use the term grassland as encompassing both native prairie remnants and agricultural grasslands such as pasture, hayfields, and commercial grass fields. Savanna is generally referred to as grassland with singular widely scattered trees, usually oaks but in some cases ponderosa pine or Douglas-fir, or small open-canopy tree groves with <30% canopy cover. We use the term oak woodlands to encompass pure oak or oak-dominated woodlands (i.e., >70% canopy cover of oaks) where overall canopy cover is >50%. Our definition of riparian includes some features within open water, but primarily the vegetative structure adjacent to the body of water that is influenced by the hydrology of the aquatic system. Chaparral refers to medium to tall shrublands dominated by ceanothus and manzanita in southwestern Oregon. It includes both valley (<335 m [1,100 ft]) and montane chaparral.

1. Grassland-Savanna

For the purposes of this conservation strategy, we define grasslands as any habitat dominated by grasses and/or forbs. This includes both native and agricultural grasslands.

For the relatively simple grassland and savanna communities, we used a single "umbrella" species (i.e., western meadowlark) to describe coarse-level objectives for conservation. We describe the desired habitat conditions for conservation based upon the habitat relationships of this species which has relatively large area requirements (i.e., an area-sensitive species). We assumed many species that are less area sensitive but have similar habitat relationships will benefit, including other priority species. Finer-scale objectives are described as appropriate for other priority or less area-sensitive species and habitat conditions. This approach has been used in other landbird

conservation planning efforts within relatively simple habitats such as shrub-steppe (e.g., sage grouse in Idaho [S. Ritter pers. comm.]).

Landbird conservation in grassland and savanna habitats emphasizes maintaining healthy ecosystems through representative focal species for several habitat attributes in each habitat type (Table 4). In Grassland, these conditions include large patches of habitat, short grass with some bare ground, a scattered shrub component with a dominance of bunchgrasses, moderate to tall grasses with little to no bare ground or shrub cover, burrows, and mesic sites (wet prairie). In Savanna, these conditions include the presence of suitable cavities in large oak trees, and where appropriate, large conifer trees, especially ponderosa pine.

Table 4. Priority habitat features and associated focal bird species for conservation in grassland and savanna habitats in the Westside Lowlands and Valleys Landbird Conservation Planning Region.

Habitat	Conservation Focus	Focal Species by Subprovince	
		WillametteValley/ Puget Lowlands	Rogue Valley/ Umpqua Valley
Grassland	large patches of habitat	western meadowlark	western meadowlark
	short grass with areas of bare ground	streaked horned lark	common nighthawk
	moderate-tall grass, minimal bare ground or shrubs	grasshopper sparrow	grasshopper sparrow
	scattered shrubs and/or bunchgrass	Oregon vesper sparrow	Oregon vesper sparrow (UV); lark sparrow (RV)
	burrows	na	burrowing owl (RV only)
	wet prairie/grassland	northern harrier	northern harrier
Savanna	cavities in large savanna open-form oaks	American kestrel	Western screech owl
	large conifer savanna trees	Lewis' woodpecker	Lewis' woodpecker

na - not applicable

2. Oak Woodland

Landbird conservation in oak woodland habitats emphasizes maintaining healthy ecosystems through representative focal species for several habitat attributes (Table 5). These include large patches with

some large oak trees, the presence of cavities in oak trees, canopy edges and openings, young (subcanopy) regenerating oaks, herbaceous cover in the understory, and a native shrub understory.

Table 5. Priority habitat features and associated focal bird species for conservation in oak woodland habitats in the Westside Lowlands and Valleys Landbird Conservation Planning Region.

Habitat	Conservation Focus	Focal Species by Subprovince	
		Willamette Valley/ Puget Lowlands	Rogue Valley/ Umpqua Valley
Oak Woodland	large patches with large oaks	white-breasted nuthatch	white-breasted nuthatch
	large oaks with cavities	Acorn woodpecker (WV) Downy woodpecker (PL)	ash-throated flycatcher
	canopy edge and openings	western wood-pewee	western wood-pewee
	young (subcanopy) oaks	bushtit	bushtit
	herbaceous understory cover	chipping sparrow	chipping sparrow
	native shrub understory	Bewick's wren (WV) house wren (PL)	Nashville warbler

3. Riparian

Landbird conservation in riparian habitats emphasizes maintaining healthy ecosystems through representative focal species for three riparian/aquatic habitats: Open Water, Floodplain Shrub, and Deciduous Woodland; and several habitat attributes in each type (Table 6). In Open Water, the important condition for landbirds is the presence of snags. In Floodplain Shrub, which can be an early successional or permanent condition depending upon hydrology, the important condition for landbirds is a dense shrub layer. In Deciduous Woodland, important conditions include several parameters related to the presence and volume of foliage such as large canopy trees, a well developed subcanopy, and a dense understory shrub layer; the presence of snags; and the availability of large, structurally diverse patches of riparian deciduous woodland habitat.

4. Chaparral

Landbird conservation in chaparral habitats emphasizes maintaining healthy ecosystems through representative focal species for valley and montane chaparral, and three habitat conditions within oak chaparral; dense shrubs, a shrub/herbaceous interspersion, and cavities in oak trees (Table 7).

Table 6. Priority habitat features and associated focal bird species for conservation in riparian habitats of the Westside Lowlands and Valleys Landbird Conservation Planning Region.

Habitat	Conservation Focus	Focal Species by Subprovince	
		Willamette Valley/ Puget Lowlands	Rogue Valley/ Umpqua Valley
Open Water	snags - cavities	purple martin	tree swallow (RV) purple martin (UV)
Floodplain Shrub	dense shrub layer	willow flycatcher	yellow-breasted chat
Deciduous Woodland	large canopy trees	red-eyed vireo	bullock's oriole
	subcanopy, tall shrub foliage	yellow warbler	yellow warbler
	dense understory shrub layer	Swainson's thrush	wrentit
	snags	downy woodpecker	downy woodpecker
	large, structurally diverse patches	yellow-billed cuckoo	red-shouldered hawk (RV) cooper's hawk (UV)

Table 7. Priority habitat features and associated focal bird species for conservation in chaparral habitats in the Westside Lowlands and Valleys Landbird Conservation Planning Region.

Habitat	Conservation Focus	Focal Species by Subprovince	
		Willamette Valley/ Puget Lowlands	Rogue Valley/ Umpqua Valley
Chaparral	valley chaparral	na	Bewick's wren (RV) Nashville warbler (UV)
	montane chaparral (RV only)	na	green-tailed towhee
	oak chaparral - dense shrubs	na	blue-gray gnatcatcher (RV) wrentit (UV)
	oak chaparral - herbaceous interspersion	na	California towhee (RV) lesser goldfinch (UV)
	oak chaparral - cavities	na	oak titmouse (RV) black-capped chickadee (UV)

na - not applicable

CHAPTER 6. LANDBIRD CONSERVATION

Because of the diversity of habitats and landbird species in the Westside Lowlands and Valleys, conservation will require a complex array of conditions within variable landscape patterns. Management goals need to be carefully designed and integrated across several scales to meet the needs of multiple species. Landbird conservation will likely require areas that function as reserves, and areas that incorporate a wide range of management activities within various land uses. Thus, our conservation emphasis is three-fold:

- initiate conservation actions in accordance with the ecological potential of the site (i.e., within the framework of potential vegetation and natural ecosystem processes),
- emphasize conservation within high priority designated conservation areas and where opportunities exist (i.e., receptive land owners and land managers), and
- emphasize conservation at multiple scales such that habitat conditions for one or a few species are nested within a landscape that provides a mosaic of conditions for multiple species.

Meeting the goal of healthy landbird populations in the Westside Lowlands and Valleys begins with the maintenance and restoration of properly functioning grassland-savanna, oak woodland, riparian, and chaparral ecosystems. Currently, considerable emphasis is being placed on restoration of these habitats to some semblance of presettlement conditions (approximately 1850). It is important to recognize that habitat alterations during restoration activities may temporarily or permanently displace landbird species currently using those areas. However, most degraded habitats tend to support habitat generalist species that are usually widespread and fairly common and not of high conservation concern. Because of the degree of loss and degradation of most ecosystems in the Westside Lowlands and Valleys, restoration in many areas will be a long-term process. The vision and practical realities of this process are described in the following sections.

Each section begins with a brief overview of conservation issues, habitat goals, and general conservation strategies for each priority habitat. This is followed by a focal species account for each important habitat feature or condition, and biological objectives and conservation strategies to achieve the objectives. Assumptions upon which the biological objectives are based are stated, with suggestions for research or monitoring to provide data to refine and update biological objectives. Examples are given of other species expected to benefit from management for each focal species, although conservation of these species is not dependent upon or synonymous with conservation of focal species.

For each focal species, information on habitat relationships was generally limited to data from western Oregon and Washington because habitat types and management are unique relative to other areas. When little data were available from this region, occasional references were used from eastern Oregon and Washington, and elsewhere in western North America.

A. Grassland-Savanna

The conservation strategy for grassland and savanna habitat uses western meadowlark as an "umbrella" species for describing coarse-level desired habitat conditions and extent of the habitat. Western meadowlark was selected because it:

- historically occurred throughout grassland-savanna habitat in the planning unit,
- has significant long-term and short-term declining population trends,
- is a State Sensitive species in Oregon (Willamette Valley population),
- encompasses a range of habitat conditions within native and non-native (e.g., agricultural lands) grassland habitat,
- overlaps in habitat use with most other priority grassland species, and
- has relatively large area-requirements, thus there is the potential for establishing relatively large populations of most other focal species within the conservation framework for western meadowlark.

The umbrella species concept was used because limited structural layering in a grassland ecosystem results in many similarities among bird species-habitat relationships. Thus, managing for one species (i.e., western meadowlark) will meet some of the habitat requirements of most other focal species. However, it is also well known that grassland birds partition themselves based on relationships with microhabitat features (Cody 1985). Where specific habitat conditions are necessary for other focal species, these are described in each focal species account. This approach, using western meadowlark habitat and area-relationships as the default condition, with incorporation of management objectives for other species where ecologically appropriate and desirable, most approximates ecosystem management, and is most likely to achieve functional diversity for landbirds within the grassland ecosystem.

1. Conservation Issues (Grassland-Savanna):

T habitat loss from urban, residential, and agricultural development (particularly prevalent in Willamette Valley and Puget Lowlands)

T degradation of properly functioning ecosystems where there is encroachment of urban and residential development

T habitat loss from savanna oak and conifer tree removal (both living and snags)
T habitat conversion from altered fire regimes and intensities
T habitat conversion of agricultural grasslands (e.g., fields dominated by exotic grasses and usually managed for a crop or for grazing) to less suitable or non-suitable agricultural habitats (most prevalent in Oregon valleys, particularly Willamette)
T habitat degradation (including lack of recruitment of young oaks) from encroachment of conifer forest and non-native vegetation
T habitat fragmentation of remaining grasslands to sizes that may be insufficient to maintain healthy populations of birds
T land ownership is primarily private
T hostile landscapes, particularly those in proximity to agricultural and residential areas, may have high density of nest parasites (brown-headed cowbird), exotic nest competitors (European starling) and predators (opposums), and domestic predators (cats), and may be subject to high levels of human disturbance
T timing and extent of agricultural practices may be resulting in direct and indirect reproductive failures
T in savanna, high energetic costs associated with high rates of competitive interactions with European starlings for cavities may reduce reproductive success for species such as Acorn woodpecker, Lewis' woodpecker, and American kestrel, even when these species compete successfully

2. Biological Objectives (Grassland-Savanna):

- **Institutionalize a policy of "no net loss" of grassland and savanna habitat (i.e., mitigate habitat conversions and natural losses with equal or greater restoration efforts).**
- **Maintain existing moderate to high quality native grassland and savanna habitat, and actively manage to promote its sustainability.**
- **Improve quality of degraded native grassland and savanna habitat through appropriate management actions (see Conservation Strategies below).**
- **Retain all oak trees >56 cm (22 in) dbh, particularly wide-spreading canopy "open-form" oaks, wherever they occur.**
- **Initiate actions to enhance size and connectivity of existing grassland and savanna patches (i.e., reduce fragmentation) through restoration and acquisition.**
- **Maintain sites dominated by native vegetation and initiate actions to prevent infestations of exotic vegetation.**
- **Manage non-native grasslands (e.g. pastures, fallow fields, airports, highway right-of-ways, open spaces, and Conservation Reserve Program**

[CRP] lands) where biologically appropriate (i.e., where viable landbird populations can be maintained) as potential habitat for grassland bird species.

- **Initiate actions to maintain or provide native and/or agricultural grasslands in tracts >80 ha (200 ac) in a mosaic of habitat conditions to support populations of multiple grassland focal bird species.**
- **Where grassland-savanna is being managed for landbird conservation, maintain <10% of the landscape in hostile habitat (e.g., residences, populations of starlings and brown-headed cowbirds).**

Assumptions/Rationale: "No net loss" includes permanent conversion or degradation that compromises the ecological integrity of the habitat and/or reduces its suitability for our focal species. Natural events (e.g., wildfire) and some restoration activities (e.g., prescribed fire) that result in short-term "loss" are not considered here. Nearly all native grassland and savanna habitat has been lost, so efforts to maintain and restore native habitats are the highest priority where opportunities occur. Much of the current landscape is dominated by agriculture and there are limited opportunities for restoration of native grasslands, therefore, where lands are dedicated to agriculture, it will be important to create conditions suitable for focal bird species. Maintaining a mosaic of conditions will provide habitat for multiple species and options for breeding sites for each species within any year. Hostile habitat should not exceed 10% in order to minimize potential impacts of fragmentation and adverse human-related effects (disturbance from increased activity, residences where feral cats and dogs are an issue).

3. Conservation Strategies (Grassland-Savanna):

These general recommendations are presented to support conservation of landbirds in grassland and savanna habitats. Specific directives as described below for priority focal species should supercede those presented here if there is a direct conflict between recommendations.

- *Data Collection/Research:*
  - Conduct community and species research to test the biological objectives described below.
  - Establish permanent roadside and off-road censusing stations to monitor bird population and habitat changes.
  - Study the role of fire, mowing, grazing, and other management treatments to maintain/improve habitat quality.
  - Develop methods for reducing impacts of non-native competitors (e.g., European starling) and predators (e.g., cats).
- *Conservation Areas:*

- Seek to expand grassland and savanna focal species distribution and abundance throughout Westside Lowlands and Valleys by establishing Grassland Bird Conservation Areas (GBCAs) and promoting their proper management (see Appendix C).

- *Acquisition/Restoration:*
  - Identify opportunities (i.e., receptive land-owners and managers) for conservation and management actions.
  - Support partnerships such as the Willamette Valley Natural Area Network that seek to identify high priority sites for preservation through acquisition or management.
  - Seek opportunities to engage private landowners in restoration through entities such as watershed councils and agricultural organizations.
  - Seek to maximize contiguous area of grassland and thus minimize fragmentation. The larger the area, the greater the likelihood of maintaining populations of area-sensitive and large territory species such as western meadowlark, northern harrier, and short-eared owl.
  - In areas of poor productivity or accessibility, considering leaving fallow or planting medium height native bunch grasses for cover.
  - Where possible, connect different types of grassland habitat (e.g., fallow fields, pastures, hayfields) to create a continuous grassland. This could be achieved through "across the fence" conservation with neighbors.
  - Develop a prairie/grassland "scorecard" for government and non-government use in prioritizing and evaluating grassland habitat for landbirds. The scorecard should provide guidelines for rating the habitat at various scales (local, landscape).
  - All actions to acquire, maintain, enhance, or subsidize lands for grassland bird conservation should consider the following factors:
    - proximity to populations of target priority/focal species
    - proximity to a designated GBCA
    - benefit to multiple grassland species
    - risk of habitat loss to development or conversion to unsuitable habitat
    - quality of the habitat - existing and potential
    - compatibility of current and projected adjacent land uses
    - uniqueness of the site in a local and regional context
    - the likelihood of securing the land for conservation
  - Use native species and local seed sources in restoration.
  - Reestablish a prescribed fire regime where ecologically appropriate.

- *Timing of Activities:* Agricultural and recreational activities may cause disturbance to nesting birds and result in reproductive failure.

- Minimize or avoid agricultural field operations and recreational activities (e.g., ATV riding adjacent to fields) during the breeding season; April 15 - July 15.

º *Mowing/Haying/Harvesting*: Mowing/haying affects grassland birds directly and indirectly. It may reduce height and cover of herbaceous vegetation, destroy active nests, kill nestlings and fledglings, cause nest abandonment, and increase nest exposure and predation levels (Bollinger et al. 1990). Studies on grasshopper sparrow have indicated higher densities and nest success in areas not mowed until after July 15 (Shugaart and James 1973, Warner 1992).

- Delay mowing, haying, or harvesting of grass-dominated fields as long as possible, preferably until after July 15.
- Space mowing or haying frequency as widely as possible to increase the probability of successful nesting.
- Work with State Department of Transportation and County Highway Departments to alter timing of roadside mowing until after July 15.

º *Tilling*: Tilling (disking, planting, cultivation) of crop fields may destroy active nests and cause mortality to nestlings or fledglings, particularly if the initial tilling is in May and birds have already initiated nesting in the residue of the field from the previous year. Minimal or no-tilling will also increase foraging opportunities by providing habitat for insect prey.

- Where possible, use no-till practices or conduct tilling prior to April 15 or after July 15.

º *Grazing*: On lands dedicated as pasture, grazing can be beneficial to some landbird species by decreasing grass height, creating patchy areas of varying heights and densities of vegetation, and thinning dense vegetation. When grazing pressure is limited or spread out over large areas, it creates more heterogeneity in pastures with heavier grazing in some areas and limited grazing in others. The same effect can be achieved in small pastures with a rotation grazing system. Light or moderate grazing practices where grazing is non-uniform and grass height is variable and maintained in the range between 15-46 cm (6-18 in) high are likely to support most grassland bird species. Moderate grazing has been shown to reduce vegetative height, increase vegetative heterogeneity, and provide more suitable habitat than CRP fields in the midwest (Klute and Robel 1997).

- Eliminate grazing permanently or long-term (e.g., >25 years) on some agricultural grasslands to provide habitat for species intolerant of grazing or less abundant on grazed lands.
- On pasture-dominated landscapes, practice rotational grazing to create a more heterogeneous landscape mosaic similar to historic conditions.
- Eliminate continuous year-long grazing in pastures.

- Move livestock before grass height gets below 15 cm (6 in) for better growth and to discourage cowbird use in these shorter grass heights; do not regraze until at least 30 cm (12 in) tall.
- Where grazing is occurring, conduct light to moderate grazing such that grass height remains below 60 cm (24 in) with some areas less than 30 cm (12 in).

º *Burning*: Where appropriate, conduct prescribed burning of fields every 2-5 years during the non-breeding season (after July 1 in Rogue and Umpqua Valleys, July 15 in other subprovinces) to reduce litter coverage and vegetative density, and stimulate plant growth. Conduct burning on a staggered or rotational basis across the landscape to provide a mix of burned and non-burn habitat at any point in time. Several studies have reported positive response of grasshopper sparrows to fields 1-2 years post-burn. Fire also may be used conjunction with other techniques (e.g., grazing) that achieve similar objectives, but don't reduce litter residue for those species that use residue for cover and nesting, and also forage on arthropods produced in residue (e.g., vesper sparrow)

- Where ecologically appropriate, use low-intensity, prescribed burns as a short-term technique to control encroachment of woody vegetation, stimulate plant growth, and reduce vegetative density.
- Manage prescribed burning to include a mosaic of conditions (burned and unburned) within landscapes

º *Chemical Use:* Use of pesticides can reduce the insect food base for many grassland bird species. Use of herbicides can reduce cover and indirectly affect the insect food base.

- Practice procedures in Integrated Pest Management (ORS 634.122) for reduced destruction of target and non-target insects.
- Consider biological, cultural, or mechanical controls rather than chemical controls wherever possible.
- Where chemical applications are occurring, use spot rather than broadcast applications.
- Limit the application of herbicides to invasive non-native species, and use in conjunction with habitat enhancement projects which include long-term solutions to control future infestations.

º *Uncultivated Areas*: Uncultivated areas provide habitat diversity within large expanses of cultivation. Some species may use uncultivated areas as refugia or as nesting habitat if large enough.

- Provide uncultivated herbaceous areas within or adjacent to cultivated fields to provide habitat diversity and potential nesting habitat for grassland birds as long as those areas provide source habitats.
- Avoid spraying or mowing uncultivated herbaceous vegetation within or adjacent to cultivated fields (e.g., fence rows, roadsides, and untillable land such as rocky

soils). Where these actions are to occur, conduct them before April 15 or after July 15 to prevent nesting disturbance and destruction of nests.

• Increase bare ground/sparsely vegetated habitat within cultivated grass fields and other agricultural lands by creating or expanding low spots within fields that will retain surface water longer in spring and inhibit vegetative growth (particularly for horned lark).

- *Incentives/Programs:* Economic incentive-based programs (new and old) are likely to be most successful in reaching the greatest number of private landowners to increase the land base of suitable grassland bird habitat.
  - • Increase the amount of land under incentives programs for wildlife habitat, targeting land within GBCAs.
  - • Support existing programs and develop new economic incentive programs to solicit conservation and management agreements with private landowners to manage their land for natural values.
  - • Incorporate grassland bird objectives in public lands management plans.
- *Outreach:*
  - • Develop programs to provide technical assistance to landowners to create, manage, and maintain functional grassland habitats (see Chapter 10).
- *Savanna*:
  - • Oak plantings within savanna restoration sites should be protected until safe from disturbance.
  - • Promote oak tree planting in ecologically appropriate locations (i.e., where oak savanna was lost) through community volunteer organizations and tree-planting projects.

Focal Habitats and Species

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Conservation Focus: Large Patches of Grassland-Savanna Habitat
Focal Species: Western Meadowlark (*Sturnella neglecta*)

Populations:

- Anecdotal:
  - • at the time of European settlement (1850s) "very abundant in all prairies of the Puget Sound" (Suckley and Cooper 1860)
  - • in the 1870s "a constant resident in the northern Willamette Valley" Johnson (1880)
  - • in the late 1800s "common" in Washington, County, OR (Anthony 1886), and "an abundant resident around Portland" (Anthony 1902)
  - • in the late 1800s "abundant on the fields and pastures, where it is so common as to impress one with its numbers" around Seattle (Rathburn 1902)

in the early 1900s "common throughout the year" in the Bellingham Bay area (Edson 1908)
- in the early 1900s "common in cultivated country of western Oregon" (Hoffman 1927)
- around 1920 "resident, and plentiful, occurring wherever open fields were found" near Seattle and Tacoma (Burleigh 1929)
- in the 1930s "among the most abundant of permanent residents in all open country of the state (i.e., Oregon)" (Gabrielson and Jewett 1940)
- in the 1940s "very common permanent resident" in the southern Willamette Valley (Gullion 1951)
- in the early 1950s "common on the prairies of western Washington, and abundant throughout the valleys west of the Cascades in Washington" (Jewett et al. 1953)
- currently, rare in the northern Willamette Valley, and locally uncommon elsewhere in the Willamette Valley (Altman 1999)
- in western Washington, numbers have dropped substantially in recent years, and they are now absent from many areas where they formerly nested (Smith et al. 1997)

T Breeding Bird Survey (Sauer et al. 1999):
- Southern Pacific Rainforest BBS Region: highly significant ($p<.01$) long-term (1968-1998) declining trend of 6.8%/year, and significant ($p<.02$) short-term (1980-1998) declining trend of 5.0%/year
- Willamette Valley (n=11): highly significant ($p<.01$) long-term (1968-1998) declining trend of 19.3%/year, and significant ($p<.20$) short-term (1980-1998) declining trend of 19.0%/year
- Willamette Valley (n=11): abundance has declined from a mean of approximately 13.0 birds per route (bpr) in the early 1970s, to <1 bpr in the late 1990s
- Puget Lowlands (n=15): abundance has declined from a mean of approximately 1.0-1.5 bpr in the early 1970s, to approximately 0.5 bpr in the mid 1990s

T Christmas Bird Counts: (Note: these data may include individuals from breeding populations outside Westside Lowlands and Valleys)
- Willamette Valley: mean number of birds/CBC count (n=6-8) has declined from 100-110 birds in the late 1970s, to 85-100 birds in the mid 1980s, to 50-65 birds in the mid 1990s
- Rogue Valley: mean number of birds/CBC count (n=Medford) has declined from 600+ birds in the late 1970s to 500+ in the mid 1980s to <400 in the early 1990s
- Umpqua Valley: mean number of birds/CBC count (n=Roseburg) has declined from 150+ birds in the late 1970s to approximately 75 in the mid 1980s to <40 in the early 1990s

T Fort Lewis Military Installation, Puget Lowlands (Resources Northwest and Pentec Environmental 1995):
- second most abundant species in prairie habitat in 1994

T Current estimate of breeding population in the Willamette Valley is <300 pairs (B. Altman unpubl. data).

Habitat Relationships:

T Anecdotal:
- native and agricultural grass-dominated habitats

T Willamette Valley agricultural grasslands (Altman 1999):
- percent cover (means):

	nest (n=11)	territory (n=20)
grass/forb	84	94
bare ground	6	3
litter/residue	13	0
shrub/tree	0	3

- optimal habitat: grass-dominated fields such as remnant prairies, fallow agriculture fields (e.g., CRP land, abandoned fields), and light to moderately grazed pastures with the following conditions:
  - >40 ha (100 ac)
  - variable grass heights <60 cm (24 in) tall
  - shrub/tree cover <10%
  - natural (trees, shrubs) or artificial (fence lines, telephone poles) singing perches within the territory

• or the same conditions as above with hayfields or cultivated grass fields making up <40% of the territory (hayfields and grass-seed fields cut before July 1 do not qualify as habitat because they often abort nesting and reduce productivity)

• marginal habitat: Hayfields and cultivated grass fields (annual or perennial) with the following conditions:
  • >8 ha (20 ac)
  • grass height <90 cm (36 in) tall
  • shrub cover <25%
  • singing perches as described above present within the territory
  • habitat must occur within a landscape that includes some optimal habitat
  (NOTE: hayfields and grass-seed fields cut before July 1 do not qualify as habitat)
• mean territory size 5.8 ha (14.3 ac, n=21) with nearly 70% 4-8 ha (10-19 ac)

T South Puget Sound prairies (Rogers 1999):
• mean height of vegetation at foraging sites in South Puget Sound prairies was 10.2 in (26.9 cm)

T Fort Lewis Military Installation, Puget Lowlands (Resources Northwest and Pentec Environmental 1995):
• relatively abundant (second most abundant species) in prairie habitats characterized by mean cover in the following ranges: shrub 5-25% (closer to 5%); herbaceous 75-95 (approximately in the middle)

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys:*** **Where ecologically appropriate, initiate actions in native prairies, pastures, and fallow fields to maintain or provide the following conditions in areas >80 ha (200 ac):**
  • shrub-tree cover <10% (fencelines, powerlines may provide singing perches if shrubs or trees are absent)
  • variable grass heights <76 cm (30 in) tall

< ***Westside Lowlands and Valleys*****: Where opportunities exist that are <80 ha (200 ac), provide suitable habitat (optimal or marginal as described above) in tracts >10 ha (25 ac) with >50% of the area as optimal habitat.**

< ***Westside Lowlands and Valleys*****: At the landscape level, manage native and agricultural grasslands to provide a mosaic of habitat conditions. Minimum contiguous tract size should be 80 ha (200 ac), and at least one contiguous tract of >200 ha (500 ac) of suitable habitat should be a part of the landscape. No more than 10% of the landscape should be hostile habitat (e.g., developed urban and rural residential).**

Population:

< ***Southern Pacific Rainforest BBS Region*****: Reverse declining BBS trends to achieve stable populations (non-significant trends of <2%/year) or increasing trends in the next 10 years (by 2010).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The objective for cover and grass height was based on Altman (1999). Blocks of habitat >80 ha (200 ac) can maintain a small population of meadowlarks even if the area is not linked

with other meadowlark populations. The objective for suitable habitat in areas <80 ha (200 ac) is primarily to accommodate small landowners that are receptive to participating in grassland bird conservation. Depending on the landscape context and other site-specific factors, these small patches may not provide viable habitat for western meadowlark (see Information Needs below) or other grassland bird species.

At the landscape level, maintaining a mosaic of conditions will provide habitat for multiple species and options for breeding sites for each species within any year. Hostile habitat should not exceed 10% in order to minimize potential impacts of fragmentation and adverse human-related effects (disturbance from increased activity, residences where feral cats and dogs are an issue).

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of western meadowlark on randomly located BBS routes.

Conservation Strategies:

These are specific to western meadowlark; see pages 31-34 for general Conservation Strategies in grassland-savanna.

- Where grazing occurs, manage grass consumption to meet grass height habitat objectives described above.

Species to Benefit: All focal grassland species will benefit to some degree from large patches of grassland-savanna habitat (see species accounts below). The non-focal grassland species most likely to benefit is savanna sparrow. Other species to benefit depending upon the scattered presence of woody vegetation include western kingbird and lazuli bunting.

Information Needs:

1. An inventory of western meadowlark populations within potential habitat of the Rogue and Umpqua Valleys, Puget Lowlands, and coast valleys in both states.
2. Nesting studies similar to that of Altman (1999) within the Rogue and Umpqua Valleys and Puget Lowlands.
3. An examination of patch size thresholds for viable populations within various landscapes.
4. Origin of wintering populations, and habitat relationships during non-breeding season.

Conservation Focus: Short, Herbaceous Vegetation with Areas of Bare Ground

Focal Species: Common Nighthawk (*Chordeiles minor*) - Rogue, Umpqua Valleys

Streaked Horned Lark (*Eremophila alpestris strigata*) - Willamette Valley, Puget Lowlands

Populations:

T Anecdotal: Horned lark:

- at the time of European settlement "very abundant summer resident on gravelly prairies of Puget Sound" (Suckley and Cooper 1860)
- in the 1870s "an abundant summer visitor, nesting very commonly" in the northern Willamette Valley (Johnson 1880)
- in the late 1800s "a rather common summer resident" in Washington County, OR (Anthony 1886), and not uncommon in suitable localities around Portland" (Anthony 1902)
- in the early 1900s "common resident in western Oregon and southwestern Washington" (Hoffman 1927)
- around 1920 "plentiful during the summer months in the open prairie country south of Tacoma" (Burleigh 1929)
- in the 1930s "a common breeding bird of the open fields in western Oregon" (Gabrielson and Jewett 1940)

in the early 1940s regularly found in agriculture areas between Portland and Gresham, and in the Columbia River floodplain north of Portland (D. Marshall pers. comm.)

- in the 1940s "common permanent resident" in the southern Willamette Valley (Gullion 1951)
- in the early 1950s "occurs commonly in the prairie country south of Tacoma" (Jewett et al. (1953)
- in the early 1970s "fairly common permanent resident in the White City area" of the Rogue Valley (Browning 1975)
- currently, rare to locally uncommon with a few small populations in the Willamette Valley (Altman 1999)
- in Washington, extirpated from the San Juan Islands and much of the Puget Lowlands (Lewis and Sharpe 1987)

T Breeding Bird Survey (Sauer et al. 1999):

- Horned lark: insufficient sample size for BBS trend analysis in the Southern Pacific Rainforest region
- Horned lark: Willamette Valley (n=11): non-significant long-term (1968-1998) increasing trend of 3.0%/year, and non-significant short-term (1980-1998) increasing trend of 1.5%/year
- Horned lark: abundance in the Willamette Valley (n=11) has been erratic, and slightly reduced in the 1990s (mean 1-2 bpr) from the 1970s (mean 2-4 bpr)
- Common nighthawk: Southern Pacific Rainforest BBS Region: highly significant ($p<.01$) long-term (1980-1998) declining trend of 9.3%/year, and non-significant short-term (1980-1998) increasing trend of 1.5%/year

T Christmas Bird Counts: (Note: these data likely include individuals from other breeding populations)

- Horned lark: Willamette Valley: mean number of birds/CBC count (n=8) has declined from 10-12 birds throughout the 1980s to approximately 3 birds/count in the mid 1990s

T Current estimates of breeding populations are <200 pairs in the Willamette Valley (B. Altman unpubl. data), <100 pairs in the Puget Lowlands (R. Rogers pers. comm.), and breeding is not known to occur in the Rogue and Umpqua Valleys.

Habitat Relationships:

T Horned lark - Willamette Valley agricultural grasslands (Altman 1999):

• suitable habitat includes native prairie and a wide variety of agricultural lands (e.g., cultivated grass fields, row-crop agriculture, Christmas tree farms, plowed or burned fields), and non-agricultural habitats (e.g., roadsides, seasonal mudflats, airports) characterized by short herbaceous vegetation (<30 cm [1 ft]), a relatively high percent of bare ground, patches of sparsely vegetated and denser vegetated areas, and no woody vegetation

• percent cover (means):	nest (n=11)	territory (n=3)
grass/forb	62	83
bare ground	31	17
litter/residue	11	1
shrub/tree	0	0

• mean territory size 0.75 ha (1.9 ac) (n=3)

T Fort Lewis Military Installation, Puget Lowlands (Rogers 1999):

• mean height of vegetation at foraging plot centers and 1 meter away was 7.4 cm (3 in) and 12.5 cm (5 in) respectively

<u>Biological Objectives</u>:

<u>Habitat</u>:

< ***Westside Lowland Valleys:*** **Where ecologically appropriate, maintain or provide patches (<0.04 ha [11.3 m radius circle]) of suitable habitat throughout native and agricultural grasslands with the following conditions:**

- **20-50% bare or sparsely vegetated ground**
- **herbaceous vegetation <30 cm (12 in) tall**
- **located where minimal human or environmental disturbances occur**

<u>Population</u>:

< ***Willamette Valley*****: Horned Lark - Maintain or target for establishment >20 breeding populations (i.e., >10 pairs/population) in the next 10 years (by 2010).**

< ***Puget Lowlands*****: Horned Lark - Maintain or target for establishment >10 breeding populations (i.e., >10 pairs/population) in the next 10 years (by 2010).**

< ***Umpqua Valley and Rogue Valley:*** **Common Nighthawk - Establish as a regular breeding species in grassland habitats in each subprovince in the next 10 years (by 2010).**

Assumptions/Rationale: Horned larks benefit from natural events or agricultural activities that create barren or sparsely vegetated conditions (Owens and Myers 1973). Outside of native prairies that meet the habitat conditions described above, the type of agricultural or non-agricultural habitat does not seem to matter if specific microhabitat

conditions are available (Altman 1999). Despite this versatility in habitat use, horned lark populations are vulnerable because habitats used are often ephemeral (e.g., plowed fields, bare or sparsely vegetated ground within fields), subject to human disturbances (e.g., roads and roadside shoulders, mowing and/or field maintenance, recreational and military vehicle use), subject to inundation with changing water levels due to flooding or heavy rainfall (wetland mudflats), and subject to changing field types and potential non-suitability of habitat from year-to-year. Thus, horned lark nests are subject to several direct (nest destruction) and indirect (nest abandonment) consequences that likely adversely affect populations.

Horned lark populations are too small to analyze for regional BBS trend objectives. Common nighthawk populations, although historically in grasslands, are mostly if not entirely in forest habitats. Thus, population objectives are not set for BBS trends, but for establishment or maintenance of breeding populations. Establishing several populations assumes that this reduces the impact of catastrophic loss of habitat at one site. It also assists in maintaining some genetic diversity.

Conservation Strategies:

These are specific to horned lark and common nighthawk; see pages 31-34 for general Conservation Strategies in grassland-savanna.

- Use mechanical (e.g., creating depressed scrapes) or natural means (e.g., flooding regimes) to maintain or create bare ground/sparsely vegetated areas within or adjacent to areas of suitable foraging habitat.
- Creation of suitable nesting habitat should occur in areas secure from disturbance from vehicles, predators (e.g., away from edges of fields), and flooding events (upland hummocks, dikes, etc) to reduce the species vulnerability and potentially increase nest success and population size.
- For horned lark, use moist soil management to create seasonal mudflats where possible.

Species to Benefit: The principal species to benefit would be killdeer, which also favors bare ground and sparse vegetation.

Information Needs:

1. An inventory of potential habitat within the Rogue and Umpqua Valleys and Puget Lowlands for populations of horned lark and common nighthawk.
2. Horned lark nesting studies similar to that of Altman (1999) within the Puget Lowlands.
3. Origin of horned lark wintering populations, and habitat relationships during non-breeding season.

4. Inventory of gravel bars and other sparsely vegetated sites within or adjacent to river channels for populations of both species.

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Conservation Focus: Burrows

Focal Species: Burrowing Owl (*Athene cunicularia*)

Populations:

T Anecdotal:
- historically bred in the Rogue Valley (Gabrielson and Jewett 1940, Browning 1975)
- likely extirpated as a breeding species in Westside Lowlands and Valleys

T Breeding Bird Survey (Sauer et al. 1999):
- insufficient sample size for analysis of trends in the Southern Pacific Rainforest BBS Region

Habitat Relationships:

T Anecdotal:
- open, treeless cover types with moderate herbaceous cover, and minimal shrub cover; dependent on burrows and natural cavities in rocky areas for nests sites (Rich 1986), thus, linked to burrowing species such as ground squirrels and coyotes

T Columbia Basin, Oregon (Green and Anthony 1989):
- nest areas had higher perches, less shrub cover, and less ground cover than that around potential nest sites (unused burrows)

• nest areas	Mean % grass cover	mean % bare ground
cheatgrass	28	55
snakeweed	36	49
bitterbrush	-	49

T Throughout the west, a summary of grazing studies shows mixed responses to grazing in sagebrush and grassland habitats (Saab et al. 1995); will use well-grazed, early successional grasslands that emulate prairie dog towns (MacCracken et al. 1985).

Biological Objectives:

Habitat:

< *Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in grassland habitat to maintain or provide the following conditions:
- **mean open ground cover >40%**
- **mean grass cover <40%**

Population:

< *Rogue Valley*: Reestablish as a breeding species with >5 nesting pairs in the next 10 years (by 2010).

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. Objectives for grass and open ground cover were based on Green and Anthony (1989) and professional judgement.

Conservation Strategies:

These are specific to burrowing owl;see pages 31-34 for general Conservation Strategies in grassland.

- Eliminate or discourage burrowing mammal control programs and recreational shooting within nesting habitat.
- Where burrowing mammal control programs must occur, provide artificial burrows (Trulio 1995).
- Reduce or eliminate pesticide application programs near burrowing owl populations.
- Etablish buffer zones around known nesting burrows that limit human activity during the nesting season.
- Reduce grazing intensity and duration where burrowing owls occur.

Species to Benefit: The primary species to benefit from burrows are those that use as a prey base the species which create the burrows (e.g., ground squirrels) such as red-tailed hawk. Other species to benefit from open ground cover and limited or short grass cover include horned lark, common nighthawk, and killdeer.

Information Needs:

1. A complete inventory of potential habitat in the Rogue Valley.
2. Population estimates and habitat associations of ground squirrels in the Rogue Valley.

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Conservation Focus: Scattered Shrubs and/or Bunchgrass in Grassland-Savanna

Focal Species: Lark Sparrow (*Chondestes grammacus*) - Rogue Valley
Oregon Vesper Sparrow (*Pooecetes gramineus affinis*) - Willamette and Umpqua Valleys, Puget Lowlands

Populations:

T Anecdotal: Vesper sparrow

- at the time of European settlement "rather abundant on the Nisqually plains, Puget Sound" (Suckley and Cooper 1860)
- in the late 1800s "abundant summer resident, found everywhere in open country" in Washington County, OR (Anthony 1886), and "common in open fields" around Portland (Anthony 1902)
- in the 1870s "common during the summer" in the northern Willamette Valley (Johnson 1880)

- in the early 1900s "fairly common on the prairies and grassy fields of western Oregon and Washington" (Hoffman 1927)
- around 1930 "fairly plentiful in the open country south of Tacoma" (Burleigh 1929)
- in the 1930s "abundant in Willamette Valley native and agricultural grasslands" (Gabrielson and Jewett 1940)
- in the 1940s "common summer resident" in the southern Willamette Valley (Gullion 1951)
- in the early 1950s "numerous about pastures and prairies of the Puget Sound Region" (Jewett et al. 1953)
- currently, it is rare to locally uncommon in widely scattered areas of the Willamette Valley (Altman 1999) • in the Puget Lowlands, only regularly occurs in the San Juan Islands (Lewis and Sharpe 1987), and on prairies at Fort Lewis Military Installation (Rogers 1999)

T Anecdotal: Lark sparrow
- in the 1870s "sparingly common in the summer and breeding" in the northern Willamette Valley (Johnson 1880)
- around 1900 "an uncommon summer resident and breeder at Corvallis" (Woodcock 1902)
- in the 1940s "abundant in the Rogue River Valley, and noted frequently, but not commonly in the Umpqua Valley" (Gabrielson and Jewett et al. (1940)

T Breeding Bird Survey (Sauer et al. 1999):
- Vesper sparrow: insufficient sample size for BBS trend analysis in the Southern Pacific Rainforest BBS province
- Vesper sparrow: Willamette Valley (n=11): abundance has been erratic and slightly reduced in the 1990s (mean <0.5 bpr) from the 1970s (mean 0.5-1.0 bpr)
- Lark sparrow: Southern Pacific Rainforest BBS Region: significant ($p<.10$) long-term (1968-1998) declining trend of 4.9%/year, and non-significant short-term (1980-1998) declining trend of 6.0%/year

T Current estimate of vesper sparrow breeding population in the Willamette Valley is <200 pairs (B. Altman unpubl. data).

Habitat Relationships:

T Vesper sparrow - Willamette Valley agricultural grasslands (Altman 1999):

- occurs almost exclusively in two habitats:
  - light to moderately grazed pastures with scattered shrubs/trees (most abundant in <10% shrub/tree cover, but regularly occurs 10-25% shrub/tree cover), and grass height <60 cm (24 in) high and preferably <1 foot high; for example, 46% of territories (n=10) comprised of grass heights 15-30 cm (6-12 in)
  - Christmas tree farms in the valley foothills, particularly young farms 2-5 years post-planting, if weedy with mixture of grasses, forbs and bare ground

• percent cover (means):	nest (n=16)	territory (n=10)
grass/forb	49	88
bare ground	24	6
litter/residue	21	-
shrub/tree	11	6
rock	5	-

- woody vegetation present in most (79%) 5-meter plots associated with vesper sparrow nests (n=16); mean distance to nearest shrub/tree 6 meters; mean shrub height within 5-meter nest plots 92 cm (37 in)
- does not appear to be area-sensitive, since nesting pairs occurred in small blocks (<6 ha [15 ac])
- mean territory size 1.3 ha (3.1 ac; range 0.4-5.2 ha [1.1-13.0 ac], n=38), but only one territory >2.4 ha (6 ac)

T Vesper sparrow - Fort Lewis Military Installation, Puget Lowlands (Rogers 1999):

- mean height at foraging plot centers and 1 meter away was 15.5 cm and 15.0 cm (6 in), respectively

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys:*** **Where ecologically appropriate, initiate actions in native prairies, pastures, and fallow fields to maintain or provide the following conditions:**
  - **scattered shrub cover 5-15%**
  - **variable grass heights <46 cm (18 in) tall with some areas of bare or sparsely vegetated ground**
  - **patches of suitable habitat >8 ha (20 ac)**

Population:

< ***Willamette Valley, Umpqua Valley, and Puget Lowlands*: Vesper Sparrow - Maintain or target for establishment >10 breeding populations (i.e., >10 pairs) in grassland habitats (not Christmas tree farms) in each subprovince in the next 10 years (by 2010).**

< ***Southern Pacific Rainforest BBS Region*: Lark Sparrow - Reverse declining BBS trends to achieve stable populations (non-significant trends of <2%/year) or increasing trends in the next 10 years (by 2010).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. Biological objectives for shrub cover and grass height are based on Altman (1999).

Cultivated grass-seed fields are not suitable habitat for vesper sparrow (Altman 1999) or lark sparrow, so objectives are for native prairies, pasture, and fallow fields. Habitat patches >8 ha (20 ac) may be sufficient to maintain a small population even if the area is not linked with other vesper sparrow populations.

Vesper sparrow populations are too small to analyze for regional BBS trend objectives. Establishing several populations assumes that this reduces the impact of catastrophic loss of habitat at one site. It also assists in maintaining some genetic diversity.

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of vesper sparrow on randomly located BBS routes.

Conservation Strategies:

These are specific to vesper sparrow and lark sparrow; see pages 31-34 for general Conservation Strategies in grassland-savanna.

- Small areas of suitable habitat (e.g., >8 ha [20 ac]) may provide for a few pairs.
- Where grazing occurs, manage grass consumption to meet habitat objectives described above.

Species to Benefit: The principal species to benefit would be other shrub-associated species such as lazuli bunting, white-crowned sparrow, and western meadowlark. Where there is a scattered tree component for nesting (e.g., savanna), western kingbird would benefit from shrubs as foraging perches.

Information Needs:

1. An inventory of potential habitat within the Rogue and Umpqua Valleys and Puget Lowlands for populations of Oregon vesper sparrow.
2. Nesting studies similar to that of Altman (1999) within the Rogue and Umpqua Valleys and Puget Lowlands.

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<u>Conservation Focus</u>: Moderate-Tall Grass, Little or no Bare Ground and Shrubs

Focal Species: Grasshopper Sparrow (*Ammodramus savannarum*)

Populations:

T Anecdotal:

- first reported in Rogue Valley in 1963 (Richardson and Sturges 1964), Willamette Valley in the early 1970s (McQueen 1979), and Puget Lowlands in 1998 (R. Rogers pers. comm.)
- generally, 0-3 birds have been reported most years in the Willamette and Rogue Valleys, until an extensive study in 1996-97 reported 20-25 singing males in the Willamette Valley, most on private pasture lands (Altman 1999)

T Inconspicuous nature of the species and documented presence on mostly private lands indicates populations may have always been present but gone undetected (B. Altman pers. obs.).

T Too rare for BBS analysis.

T Current estimates of breeding populations are <40 pairs in the Willamette Valley (Altman 1999), and it is unknown if more than a few pairs occur in the Rogue and Umpqua Valleys.

Habitat Relationships:

T Willamette Valley agricultural grasslands (Altman 1999):

- occurs almost exclusively in two habitats, lightly grazed pastures and fallow fields dominated by grass <46 cm (18 in) high, little bare ground, and little to no shrub cover
- percent cover (means):

	nest (n=2)	territory (n=18)
grass/forb	89	96
bare ground	1	2
litter/residue	?	-
shrub/tree	1	2
rock	0	-

- 49% of territories (n=18) comprised of grass heights 30-46 cm (12-18 in)
- mean territory size 1.4 ha (3.5 ac; range 0.2-3.6 ha [0.5-9.0 ac], n=18), and over 70% of territories <2 ha (5 ac)
- occurred in moderately sized (i.e., 20-40 ha [50-100 ac]) tracts of suitable habitat, but is semi-colonial and densities tend to be high in larger tracts (>40 ha [100 ac]) of suitable habitat

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in native prairies, pastures, and fallow fields to maintain or provide the following:**

- **variable grass heights between 15-61 cm (6-24 in)**
- **>90% grass/forb cover (Willamette Valley) >70% (Rogue and Umpqua Valleys)**
- **<5% shrub cover**
- **patches of suitable habitat >20 ha (50 ac)**

Population:

< ***Willamette Valley:* Maintain or target for establishment > 5 sites with multiple breeding pairs and at least one site with >10 pairs in the next 10 years (by 2010).**

- ***Rogue and Umpqua Valleys*: Maintain or target for establishment > 5 sites with multiple breeding pairs in the next 10 years (by 2010).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. Biological objectives for grass height and cover are based on Altman (1999). Cultivated grass-seed fields are not suitable habitat (Altman 1999), so objectives are for native prairies, pasture, and fallow fields. Habitat patches >20 ha (50 ac) may be sufficient to maintain a small population even if the area is not linked with other grasshopper sparrow populations.

Population too small to analyze for regional BBS trend objectives. Establishing several populations assumes that this reduces the impact of catastrophic loss of habitat at one site. It also assists in maintaining some genetic diversity.

Conservation Strategies:

These are specific to grasshopper sparrow; see pages 31-34 for general Conservation Strategies in grassland-savanna.

- In the Willamette Valley, and other valleys if populations are present, develop partnerships with private and public landowners where grasshopper sparrows occur, and seek opportunities with other receptive landowners to enhance habitat and monitor populations.
- Seek to provide habitat in large blocks, even though pairs can occur in areas with limited suitable habitat. Most pairs in the Willamette Valley occurred semi-colonially where suitable habitat was extensive (Altman 1999), indicating that densities may be higher in larger tracts.
- Where grazing occurs, manage grass consumption to meet habitat objectives described above.

Species to Benefit: The principal species to benefit would be savanna sparrow and western meadowlark. Large areas of suitable habitat may also benefit short-eared owl and northern harrier.

Information Needs:

1. An inventory of potential habitat within the Rogue and Umpqua Valleys and Puget Lowlands for populations of grasshopper sparrow.
2. Nesting studies similar to that of Altman (1999) if populations are present within the Rogue and Umpqua Valleys or Puget Lowlands.

3. Is there a minimum patch size for a population to occur? Are abundance and nest success correlated with the size and type of grassland?

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Conservation Focus: Wet Prairie/Grassland
Focal Species: Northern Harrier (*Circus cyaneus*)

Populations:

T Anecdotal:
- in the 1870s "moderately common...breeding" in the northern Willamette Valley (Johnson 1880)
- in the late 1800s "rare" in the vicinity of Portland (Anthony 1902)
- in the 1930s "uncommon, but occasionally seen in all parts of the Willamette Valley...rare on the coast...and not reported in either the Rogue or Umpqua Valleys" (Gabrielson and Jewett 1940)
- in the 1940s " very common permanent resident" in the southern Willamette Valley (Gullion 1951)
- in the early 1950s "quite commonly seen on the tide flats of Puget Sound" (Jewett et al. 1953)
- currently in western Oregon, "locally uncommon breeding species in the Willamette Valley and along the coast from northern Lincoln County" (Gilligan et al. 1994)
- historic nesting status in western Washington not well documented (Thompson and McDermond (1985), but nesting reported near Seattle, Bellingham Bay and Port Angeles (Rathburn 1902, Edson 1908, Bent 1937, respectively)
- currently in Washington "considerable declines in grasslands of western Washington since mid 1900s" (Smith et al. 1997)

T Insufficient sample size for BBS analysis in the Southern Pacific Rainforest BBS Region.

T Current estimate of breeding population in the Willamette Valley is <100 pairs (B. Altman unpubl data).

Habitat Relationships:

T Anecdotal:
- suitable habitat includes dry agricultural grasslands where adjacent to wet prairie/grasslands (B. Altman pers. obs.)
- has a relatively large home range, thus needs large landscapes of suitable habitat to maintain populations

T Northern Whidbey Island and Kent Valley, Puget Lowlands (J. Bettesworth pers. comm.):
- nests in barley fields, also successful in reed canary grass, rushes, and cattails
- nest success:

	nests	success	%success
• dry sites (typically grass fields)	29	11	38
• wet sites (water present sporadically)	19	18	95
• very wet sites (standing water)	14	12	86

- wet sites and very wet sites provided better cover during nestling phase
- dry sites tended to be closer to human activity
- attempts to selectively harvest a perimeter around nest in cultivated fields resulted in failed nests

T Western Washington (Thompson and McDermond 1985):
- nests in marshes and upland habitats; nests surrounded by unmanipulated, residual (previous growing season) cover

T California (? and ? unpubl. data cited in PIF Bird Conservation Plan)
- Mayfield estimates of nest success from 4 areas across the state ranged from 16-28% (n = 231)

Biological Objectives:

Habitat:

- **< *Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in suitable habitat to maintain or provide the following conditions:**
  - **• where nests are located, provide a no activity buffer of >122 m (400 ft) radius around nest; and in one area, maintain contiguous suitable habitat out to a change in habitat type (Jack Bettsworth pers. comm.)**
- **< *Westside Lowlands and Valleys*: At the landscape level, where ecologically appropriate around wet prairie/grassland sites, provide the following conditions:**
  - **• a mosaic of other suitable grassland habitat (wetlands, dry prairie [i.e., non-managed fields]) in blocks >160 ha (400 ac) and >1/4 mile from human development or recreational activities**

Population:

- **< *Willamette Valley and Puget Lowlands*: Maintain and/or target for establishment a population of >150 pairs in each subprovince in the next 20 years (by 2020).**
- **< *Rogue and Umpqua Valleys*: Maintain and/or target for establishment a population of >20 pairs in each subprovince in the next 20 years (by 2020).**

Assumptions/Rationale: A mosaic of suitable habitat types will expand the acres of available habitat, and increase the likelihood of occupation by northern harriers. The objective for size, distance from human development, and non-managed fields is to increase the likelihood of multiple pairs and decrease the likelihood of human activities adversely affecting nesting. The objective for contiguous habitat out to a change in habitat type is to avoid isolating the patch of habitat where the nest occurs, thus potentially targeting it for predators.

Populations are too small to analyze for regional BBS trend objectives. Establishing the population target for subprovinces is a subjective determination based on the size of the area, current and potential habitat, and knowledge of current population.

Conservation Strategies:

These are specific to northern harrier; see pages 31-34 for general Conservation Strategies in grassland-savanna.

- º Seek opportunities to enhance or restore wet prairie within landscapes of dry prairie or wetlands to increase size of suitable habitat.

- Delay field mowing/haying until after July 15. Where birds have been observed or nesting is known, mowing/haying may occur earlier if data indicate nesting has been completed.
- Ensure adequate habitat components for mammalian prey base.
- Limit grazing during spring and early summer in areas where harriers are nesting to protect nests from trampling.

Species to Benefit: The primary species to benefit from wet prairie habitats include short-eared owl, savanna sparrow, common snipe, common yellowthroat, song sparrow, and western meadowlark.

Information Needs:

1. A complete inventory of potential habitat within all the subprovinces to determine the extent of the breeding distribution and habitat associations.
2. Data are needed on all aspects of nesting ecology and habitat relationships. For example, how large an area is required for a nesting territory? Can the territory include multiple habitat types, and in what proportions? What types of agricultural grasslands are suitable habitat?
3. What is the nesting phenology relative to timing of field mowing/haying?
4. Are there minimum patch sizes that determine habitat use and/or nesting success?

<u>Conservation Focus</u>: Large Open-Form Oaks with Cavities in Savanna Habitat

Focal Species: American Kestrel (*Falco sparverius*) - Willamette and Puget
Western Screech Owl (*Otus kennicottii*) - Rogue and Umpqua

Populations:

T Anecdotal: American Kestrel
- at the time of European settlement "extremely common during summer in prairies west of the Cascades" (Suckley and Cooper 1860)
- in the late 1800s "abundant summer resident" in Washington County, OR (Anthony 1886)
- in the early 1900s "common summer resident" in the Bellingham Bay area (Edson 1908), and "abundant from April-October" in the Seattle area (Rathburn 1902)
- in the 1940s "very common permanent resident" in the southern Willamette Valley (Gullion 1951)

T Breeding Bird Survey (Sauer et al. 1999):
- American kestrel: Southern Pacific Rainforest BBS Region: significant ($p<.10$) long-term (1968-1998) declining trend of 7.7%/year, and significant ($p<.05$) short-term (1980-1998) declining trend of 8.5%/year
- American kestrel: Willamette Valley: non-significant long-term (1968-1998) increasing trend of 2.4%/year, and non-significant short-term (1980-1998) increasing trend of 7.9%/year
- American kestrel: Willamette Valley, mean number of bpr has fluctuated from approximately 1.5-2 bpr in the early 1970s to 1-1.5 bpr in the 1990s
- American kestrel: insufficient sample size for BBS analysis in the Puget Lowlands, and Rogue and Umpqua Valleys; only 4 of 15 BBS routes in Puget Lowlands have recorded it; all in very southern part of Puget Lowlands
- Western screech owl: insufficient data for BBS trend analysis in all regions

T Current estimate of American kestrel breeding population in the Willamette Valley is <150 pairs (B. Altman pers. obs.)

Habitat Relationships:

T Anecdotal:
- American kestrel:
  - at the time of European settlement "on the Nisqually Plains, it principally inhabits the vicinity of small clusters of oaks (Suckley and Cooper 1860)
  - in the early 1950s "found during the summer season on the prairies south of Puget Sound" (Jewett et al. 1953)
  - favor Oregon oak savannas in the Willamette Valley (Roest 1954)
  - suitable habitat must include nest cavities or cavity-like structures (e.g., boxes, crevices/holes in buildings) within an open habitat for foraging
- Western screech owl:
  - mix of open and closed canopy with open grassy areas; also a cavity nester

T No quantitative habitat relationship data available for the Westside Lowlands and Valleys. Both species have relatively large home ranges, thus likely need large landscapes of suitable habitat to maintain populations.

Biological Objectives:

<u>Habitat</u>:

< *Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in savanna habitat to maintain or provide the following conditions:
- **oaks >61 cm (24 in) dbh with cavities**

- **tree canopy cover 10-30%**
- **shrub cover <30%**

Population:

< ***Southern Pacific Rainforest BBS Region*: American kestrel - Reverse declining BBS trends to achieve stable populations (non-significant trends of <2%/year) or increasing trends in the next 20 years (by 2020).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. Large oaks are necessary to provide sufficient size cavities for nesting. The objectives for relatively low tree and shrub cover ensures an open, grassland-dominated habitat near the nest site which is necessary for foraging.

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of American kestrel on randomly located BBS routes.

Conservation Strategies:

These are specific to American kestrel and western screech owl; see pages 31-34 for general Conservation Strategies in grassland-savanna.

- Where habitat is otherwise suitable, but cavities are limiting, initiate a nest-box program similar to that for western bluebirds as a short-term strategy to provide nesting cavities. This must be done in conjunction with long-term strategies for habitat enhancement and creation. To support the program, guidelines should be developed for issues such as placement of nest boxes, minimizing starling competition, and monitoring of nest boxes.
- Where appropriate, use artificial creation of cavities, e.g., fungal inoculation.
- Ensure adequate habitat components for insect and mammalian prey base.

Species to Benefit: The principal species to benefit would be open-country, lowland species associated with cavities, particularly western bluebird and Lewis' woodpecker. Others to benefit to a lesser degree might include Acorn woodpecker, western screech owl, northern pygmy owl in the foothills, and ash-throated flycatcher in southwestern Oregon.

Information Needs:

1. An inventory for nesting American kestrels within the Willamette, Rogue, and Umpqua Valleys and Puget Lowlands.
2. Data are needed on cavity and habitat requirements for nest sites.
3. What are the nest box placement parameters for successful nesting? For example, orientation, degree of openness in vicinity, landscape factors?
4. What are the effects of pesticide use on prey base?
5. What are effective ways to reduce competition from starlings for cavities?

–

Conservation Focus: Large Conifer Trees in Savanna
Focal Species: Lewis' Woodpecker (*Melanerpes lewis*)

Populations:

T Anecdotal:

- in the 1830s "common in this vicinity and breeds here (i.e., along the Columbia River near Vancouver, WA)" (J.K. Townsend in Jobanek and Marshall 1992)
- at the time of European settlement "very abundant throughout the more open portions of the timbered region of the northwest coast, preferring oak openings and groves" (Suckley and Cooper (1860)
- in the 1870s "common along the Columbia River in winter, a few remaining to breed" (Johnson 1880)
- in the late 1800s "common resident, particularly in oak timber" in Washington County, OR (Anthony 1886), and "common summer resident" in the vicinity of Portland (Anthony 1902)
- in the early 1900s "moderately common resident in Seattle" (Rathburn 1902), "common summer resident in the Puyallup Valley" (Bowles 1906), and "summer resident and frequent in certain localities near Bellingham (Edson 1908)
- in the 1920s "fairly plentiful summer resident" in northwestern WA (Burleigh 1929)
- in the 1940s not recorded as a breeding species near Eugene (Gullion 1951)
- in the early 1960s "an occasional summer resident on San Juan Island" (Bakus 1965)
- currently, a rare species with no known recent breeding records in western Washington (Smith et al. 1997) • prior to 1965 "fairly common resident on Sauvie Island and Columbia River bottomlands near Portland" (Galen 1989); major reduction in population after 1965 which coincided with substantial increase in European starling abundance (H. Nehls pers. comm. in Galen 1989)
- last nesting record in Willamette Valley was 1977 near Scapoose along the Columbia River (Gilligan et al. 1994)
- breeding hasn't been confirmed in recent years in the Rogue and Umpqua Valleys

T Too rare for BBS analysis.

Habitat Relationships:

T Anecdotal:

- common characteristic of all suitable habitat is openness due to foraging method of hawking for insects; in some instances, brushy undergrowth is necessary to support insect populations (Sousa 1983)
- populations can be unstable due to food supply fluctuations (e.g., insect hatches and acorn crops) (Bock 1970)

T Oak-Pine habitat on east-slope Cascades, Oregon (Galen 1989):

- mean nest tree height in oaks 32 ft (range10-50)
- mean dbh nest tree 22 in (range 13-39)

- canopy cover around oak nest trees mostly <30%

T Optimum habitat (range-wide) defined by the following factors (Sousa 1983):
- tree canopy closure ≤ 30%
- shrub crown cover ≥ 50%
- crown cover of mast-producing shrubs ≥ 70%
- % canopy of hard mast trees ≥ 70%
- corn crop left standing throughout winter
- distance to potential mast storage sites ≤0.8 km (0.5 mi)

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in savanna habitat (oak or conifer) to maintain or provide the following conditions:**
- **trees >61 cm (24 in) dbh**
- **2.5 snags/ha (1/ac) >30 cm (12 in) dbh**
- **tree canopy cover 10-40%**

Population:

< ***Puget Lowlands and Willamette Valley*: Reestablish as a breeding species with small populations (>5 pairs/population) in at least two areas in each province in the next 25 years (by 2025).**

< ***Rogue and Umpqua Valleys*: Maintain or establish breeding populations (>5 pairs/population) in at least 2 areas in each province in the next 10 years (by 2010).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. Biological objectives for tree size, snags, and canopy cover are slightly modified from Galen (1989) and Sousa (1983).

Populations are too small to analyze for regional BBS trends. Suitable breeding habitat remains in Puget Lowlands and Willamette Valley, and restoration efforts could increase availability of habitat. Species protection and habitat restoration efforts throughout the Westside Lowlands and Valleys may increase population levels to a point that encourages dispersal of birds.

Conservation Strategies:

These are specific to Lewis' woodpecker; see pages 31-34 for general Conservation Strategies in grassland-savanna.

º Eliminate or minimize pesticide spraying near nesting pairs which may reduce insect prey base.

- Prohibit salvage logging of fire-burned trees wherever they occur.
- Retain standing dead or diseased trees where they occur.
- If nest cavities are limiting, initiate fungal inoculations to provide nest cavity sites.
- Encourage reintroduction of native stock of ponderosa pine.

Species to Benefit: The principal species to benefit would be open-country, lowland species associated with cavities, particularly western bluebird and American kestrel. Others to benefit to a lesser degree might include Acorn woodpecker, western screech owl, pygmy owl in the foothills, and ash-throated flycatcher in southwestern Oregon.

Information Needs:

1. An inventory of potential habitat within the Rogue and Umpqua Valleys for populations of Lewis' woodpecker.
2. Is a shrubby understory important in low elevation oak savannah habitat?
3. What are effective ways to reduce competition from starlings for cavities?

–

B. Oak Woodland

1. Conservation Issues (Oak Woodland):

- habitat loss from rural, residential, and urban development, particularly the loss of individual large oaks which proportionately have more cavities than smaller oaks
- habitat loss and degradation from succession to conifer-dominated forests due to fire suppression
- degradation of properly functioning ecosystems where there is encroachment of urban and residential development
- habitat degradation, particularly the lack of recruitment of young oaks, from encroachment of Douglas-fir and non-native shrubs (e.g., Himalayan blackberry, Scot's broom) due to fire suppression
- conversion of oak stands to faster growing conifers for timber production
- impacts from intensive grazing on regeneration of oak sprouts
- land ownership is primarily private
- hostile landscapes, particularly those in proximity to agricultural and residential areas, may have high density of nest parasites (brown-headed cowbird), exotic nest competitors (European starling), and domestic predators (cats), and be subject to high levels of human disturbance

T high energetic costs associated with high rates of competitive interactions with European starlings for cavities may reduce reproductive success of species such as acorn woodpecker, Lewis' woodpecker, white-breasted nuthatch, western bluebird, and American kestrel, even when outcome of the competition is successful for these species
T hazard reduction/brush removal of understory shrubs and trees (including oaks) is being extensively used despite no information on landbird response and problematic timing of the actions (i.e., breeding season)

2. Biological Objectives (Oak Woodland):

- **Institutionalize a policy of "no net loss" of oak woodland habitat (i.e., mitigate habitat conversions and natural losses with equal or greater restoration efforts).**
- **Maintain existing moderate to high quality oak woodland stands, and actively manage to promote their sustainability, regardless of size.**
- **Emphasize conservation of large patches of oak woodland with large-diameter and open-form oaks.**
- **Retain all oak trees >56 cm (22 in) dbh, regardless of landscape context.**
- **Maintain or initiate actions to ensure <10% canopy cover of non-oaks in oak woodland stands.**
- **Maintain or initiate actions to provide young, subcanopy oaks (i.e., recruitment trees) and native shrubs and herbaceous vegetation in the understory.**
- **Improve quality of degraded oak woodland habitat through appropriate management actions (see Conservation Strategies below).**
- **Initiate actions to enhance size and connectivity of existing oak woodland patches (i.e., reduce fragmentation) through restoration and acquisition efforts.**
- **Seek conservation of oak woodlands that is spatially distributed across the planning unit, including identification of opportunities where current conservation is poor (e.g., northern Willamette Valley).**
- **At the landscape-level, initiate actions to maintain or provide high quality oak woodlands in tracts >40 ha (100 ac) in a mosaic of habitat conditions to support viable populations of oak woodland focal bird species.**

Assumptions/Rationale: "No net loss" includes permanent conversion or degradation that compromises the ecological integrity of the habitat and/or reduces its suitability for our focal species. Natural events (e.g., wildfire) and some restoration activities (e.g., prescribed fire) that result in short-term "loss" are not considered here. The objectives

are based on the following two premises in order of importance: 1) prevent further loss of oak woodlands, and 2) improve condition of degraded oak woodlands. Large patches of oak woodland may be less susceptible to competition from starlings and parasitism from cowbirds. Open-form oaks have more cavities (Farrier-Gumtow) and produce more acorns for regeneration and wildlife consumption (Larsen and Morgan 1998). Maintaining <10% conifer cover in the canopy ensures dominance of oak in the stand. At the landscape level, maintaining a mosaic of conditions will provide habitat for multiple species and options for breeding sites for each species within any year. Hostile habitat should not exceed 10% in order to minimize potential impacts of fragmentation and adverse human-related effects (disturbance from increased activity, residences where feral cats and dogs are an issue).

3. Conservation Strategies (Oak Woodland):

These general recommendations are presented to support conservation of landbirds in oak woodland habitats. Specific directives as described below for priority focal species should supercede those presented here if there is a direct conflict between recommendations.

- *Data Collection/Research:*
  - Conduct community and species research to test the biological objectives described below.
  - Establish permanent roadside and off-road censusing stations to monitor bird population and habitat changes.
  - Study the role of fire, mowing, and other management treatments to maintain/improve habitat quality.
  - Study natural regeneration of oaks in both open and closed canopies, and the ability of oak regeneration to occur with conifer removal and thinning.
- *Conservation Areas*:
  - Seek to expand oak woodland focal species distribution and abundance throughout Westside Lowlands and Valleys by establishing Oak Woodland Bird Conservation Areas (OWBCAs) and promoting their proper management (see Appendix C).
- *Acquisition/Restoration*:
  - Identify opportunities (i.e., receptive land-owners and managers) for conservation and management actions.
  - Develop an oak woodland "scorecard" for government and non-government use in prioritizing and evaluating oak woodland tracts for landbirds. This could be used not only for landbird conservation or acquisition, but also for assessing the

impacts of proposed development. The scorecard should provide guidelines for rating the habitat at various scales (local, landscape).

• Restoration and protection should emphasize conservation and management of large patches of oak woodland with large diameter oaks outside hostile landscapes (see conservation issues above). The highest priority for protection is oak woodland stands already in reasonably good condition.

• Use mechanical removal (e.g., girdling of large trees, manual removal of small trees) and/or fire to remove and inhibit development of conifer trees and create/maintain appropriate species composition and growth form cover amounts.

• All actions to acquire, maintain, enhance, or subsidize lands for grassland bird conservation should consider the following factors:

- proximity to populations of target priority/focal species
- proximity to a designated OWBCA
- benefit to multiple oak woodland species
- risk of habitat loss to development or conversion to unsuitable habitat
- quality of the habitat - existing and potential
- compatibility of current and projected adjacent land uses
- uniqueness of the site in a local and regional context
- the likelihood of securing the land for conservation

- *Burning*:

  • Encourage judicious use of low-intensity prescribed burns to exclude Douglas-fir encroachment, stimulate oak sprouting, and contribute to multi-aged stands (Larsen and Morgan 1998).

- *Exotics*:

  • Conduct control or eradication programs for exotic plant species (e.g., reed canary grass, blackberry) that threaten biodiversity of native species; conduct during bird non-breeding season.

- *Grazing*:

  • Eliminate grazing or limit grazing periods and reduce density of grazing animals (i.e., less impact) (Larsen and Morgan 1998).

- *Recreation*:

  • Allow but monitor low impact recreational activities in oak woodland if oak regeneration is not compromised and activities are not likely to adversely affect wildlife.

- *Incentives/Programs*:

  • Support existing incentive programs and develop new programs through city, county, state, and or federal agencies for enhancement of oak woodlands for landbirds.

• Incorporate oak woodland bird objectives in public lands management plans.

- *Outreach*:
  - Discourage clearing of large tracts of oak woodlands.
  - Develop educational materials (e.g., brochure, videos) to foster an appreciation of oak woodlands and assist landowners in oak woodland restoration.

Focal Habitats and Species

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Conservation Focus: Large Patches of Oak Woodlands with Large Oak Trees

Focal Species: White-Breasted Nuthatch (*Sitta carolinensis*)

Populations:

- Anecdotal:
  - at the time of European settlement "quite abundant in Puget Sound" (Suckley and Cooper 1860)
  - in the 1870s "quite common during the summer, and not rare during winter" in the northern Willamette Valley (Johnson 1880)
  - in the 1880s "a not uncommon resident" in Washington County, OR (Anthony 1886), and "common" in the vicinity of Portland (Anthony 1902)
  in the late 1800s "not very common" in the vicinity of Seattle (Rathburn 1902)
  - in the early 1920s "common in the oak region of the prairies of western Washington" (Hoffman 1927)
  - declined substantially in western Washington to uncommon by mid-century, and are currently nearly extirpated (one pair at one site is all that remains) (C. Chappell pers. comm.)
  - in the 1930s "regular resident in the Willamette, Umpqua, and Rogue Valleys...not a common bird throughout most of its territory" (Gabrielson and Jewett 1940)
  - in the 1940s "common permanent resident" in the southern Willamette Valley (Gullion 1951)
  in the early 1950s "common in the oak region of the prairies of western Washington" (Jewett et al. 1953)
- Breeding Bird Survey (Sauer et al. 1999):
  - Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) declining trend of 0.2%/year, and non-significant short-term (1980-1998) declining trend of 0.9%/year
  - Willamette Valley (n=11): highly significant ($p<.01$) long-term (1968-1998) declining trend of 9.9%/year, and highly significant ($p<.01$) short-term (1980-1998) declining trend of 19.9%/year
  - Willamette Valley (n=11): abundance has declined from a mean of approximately 2-3 bpr throughout the 1970s to <1 bpr in the early 1990s
- Christmas Bird Counts:
  - substantial decline in relative abundance on Christmas Bird Counts in the Willamette Valley from mean of 45-50 birds/100 party hours 1968-1970 to means of 13-20 birds/100 party hours since 1984 (C. Chappell, pers. comm)

Habitat Relationships:

- Willamette Valley oak woodlands (n=9 stands) (Hagar and Stern 1997):
  - positive correlation with large diameter oaks
  - negative correlation with subcanopy cover of oaks and percent Douglas-fir cover
  - abundance generally higher in stands with larger mean dbh of oaks; highest abundance (1.8 birds/count) in stand with largest stand-level mean dbh of oaks (76 cm [30 in]); stand-level mean dbh of oaks in 3

stands with highest abundance was 60 cm (24 in); stand-level mean dbh of oaks in 5 stands with highest abundance was 57 cm (22 in); overall stand mean dbh was 55 cm (22 in) (range 39-77 cm [15-30 in])
• highest abundance in largest stands; stands >36 ha (90 ac, n=5) had $0.8 birds/count, stands <36 ha (90 ac, n=3) had #0.6 birds/count
• mean canopy closure in stands with moderate and high abundance was 44-69% (n=5); extremes of canopy closure (29% and 83%) had relatively low abundance

T Umpqua Valley (n=6 hardwood stands dominated by oak and madrone) (Cross and Simmons 1983):
• most abundant in stand with largest madrone trees and highest dominance of oak in the canopy
• least abundant in stand with lowest density and importance of oaks

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in oak woodlands to maintain or provide the following conditions:**
- **contiguous patches of oak woodlands in stands >40 ha (100 ac)**
- **mean stand-level dbh of oaks >55 cm (22 in) with >20% of oaks with >70 cm (28 in) dbh**
- **mean stand-level canopy closure within 40-80% range**
- **mean stand-level non-oak cover in canopy and subcanopy <10%**

< ***Westside Lowlands and Valleys*: Where ecologically appropriate at the landscape-level, manage habitat to provide a mosaic of habitat conditions. Minimum contiguous tract size managed for birds should be 40 ha (100 ac), and at least one contiguous tract of >120 ha (300 ac) should be a part of the landscape. No more than 10% of the landscape should be hostile habitat (i.e., urban, residential, high density rural).**

Population:

< ***Southern Pacific Rainforest BBS Region*: Maintain stable or increasing population trends over the next 10 years (by 2010).**

< ***Puget Lowlands*: Establish 5 breeding populations (>10 pairs at each site) in the next 25 years (by 2025).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. Biological objectives were based on a Willamette Valley study (Hagar and Stern 1997) using means to set minimum habitat objectives. Objective for >20% of oak trees in stand with >70 cm (28 in) dbh based on stand with highest abundance (optimal habitat?). Objective for block size >40 ha (100 ac) based on slight upward adjustment for size of block in which higher levels of abundance occur.

Maintaining a mosaic of conditions across the landscape will provide habitat for multiple species and options for breeding sites for each species within any year. Hostile habitat should not exceed 10% in order to minimize potential impacts of fragmentation

and adverse human-related effects (e.g., disturbance from increased activity, residences where feral cats and dogs are an issue, competition from European starling).

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for stable or increasing BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of white-breasted nuthatch on randomly located BBS routes.

Populations are too small in the Puget Lowlands for analysis of BBS trend or abundance objectives. They are nearly extirpated in the Puget Lowlands (C. Chappell pers. comm.). Some suitable breeding habitat remains in the Puget Lowlands, and restoration efforts could increase availability of habitat. Species protection and habitat restoration efforts throughout the Westside Lowlands and Valleys may increase population levels to a point that encourages dispersal of birds into the Puget Lowlands.

Prioritization: Highest priority in western Oregon valleys is to establish viable populations in large areas where habitat is available for genetic mixing and recruitment into adjacent habitats. Highest priority in Puget Lowlands is to establish some populations. Maintaining a mosaic of conditions will provide habitat for multiple species and options for breeding sites for each species within any year.

Conservation Strategies:

These are specific to white-breasted nuthatch; see pages 53-54 for general Conservation Strategies in oak woodland.

- Consider the potential for reintroductions in the Puget Lowlands, using birds from Willamette Valley populations. Reintroductions would have to consider land owner/manager commitment to habitat preservation and enhancement to achieve desired conditions.
- Nest boxes placed on trunks of largest oaks in suitable habitat as described above could be used as short-term management to establish populations until stand provides adequate natural nesting opportunities.

Species to Benefit: The primary species to benefit from large oak trees would be species associated with cavities such as acorn woodpecker, Lewis' woodpecker, Bewick's wren, house wren, western bluebird, and ash-throated flycatcher and oak titmouse in southwestern Oregon.

Information Needs:

1. Data are needed on all aspects of white-breasted nuthatch ecology, particularly breeding ecology.
2. Is there a minimum patch size to maintain viable populations? Does that vary according to the quality of the habitat?
3. What is the feasibility of relocation of birds to the Puget Lowlands?

–

<u>Conservation Focus</u>: Large Oaks with Cavities in Oak Woodlands

Focal Species: Acorn Woodpecker (*Melanerpes formicivorus*) - Willamette Valley

Downy Woodpecker (*Picoides pubescens*) - Puget Lowlands

Ash-throated Flycatcher (*Myiarchus cinerascens*) - Rogue and Umpqua Valleys

Populations:

- Anecdotal: Acorn woodpecker
  - in the 1940s "common permanent resident" in the southern Willamette Valley (Gullion 1951)
- Anecdotal: Downy woodpecker:
  - in the 1930s "exceedingly common bird in the Willamette Valley, and a less common but regular resident of the coast" (Gabrielson and Jewett 1940)
  - in the early 1950s "fairly common permanent resident in western Washington" (Jewett et al. 1953)
- Anecdotal: Ash-throated flycatcher:
  - in the 1930s "locally most abundant in the timbered foothills of the eastern Rogue River Valley" (Gabrielson and Jewett 1940)
- Breeding Bird Survey (Sauer et al. 1999):
  - Acorn woodpecker: Southern Pacific Rainforest BBS Region: significant ($p<.20$) long-term (1968-1998) declining trend of 2.3%/year, and significant ($p<.05$) short-term (1980-1998) declining trend of 1.7%/year
  - Downy woodpecker: Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) declining trend of 0.2%/year, and non-significant short-term (1980-1998) increasing of 1.8%/year
  - Downy woodpecker: Willamette Valley ($n=11$): non-significant long-term (1968-1998) declining trend of 5.0%/year, and highly significant ($p<.01$) short-term (1980-1998) declining trend of 9.4%/year
  - Ash-throated flycatcher: Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) increasing trend of 0.6%/year, and significant ($p<.05$) short-term (1980-1998) declining trend of 2.6%/year
- Christmas Bird Counts:
  - Acorn woodpecker: Willamette Valley: mean number of birds/CBC count ($n=6$-8) has ranged from 21-26 in the late 1970s, to 15-17 throughout the 1980s, to approximately 13 in the mid 1990s (B. Altman unpubl. data)

Habitat Relationships:

- Anecdotal: Acorn woodpecker
  - optimal habitat is relatively open woodlands with large diameter oaks for granaries
- Anecdotal: Ash-throated flycatcher
  - secondary cavity nester in live oak trees in mature oak woodlands (Manuwal 1997)

- needs large oaks with natural or created cavities

T Cottonwood riparian forest, South Fork Snake River, Idaho (Saab 1999):
- Downy woodpecker:
  - positive association with increasing agricultural landscape and decreasing natural landscape, and increasing bare ground and decreasing willow subcanopy

T Oak and pine woodlands, south-central Washington, Klickitat County, Columbia Foothills (Manuwal 1997):
- Ash-throated flycatcher:
  - most abundant in large pine-large oak habitats

T Oak woodlands, south-central Washington, Klickitat County, Columbia Foothills (Seavey 1997):
- Ash-throated flycatcher:
  - most nests in live trees (74%, n = 23) and in Oregon white oak (90%, n = 28)
  - mean nest tree diameter 36 cm; mean nest tree height 6.5 m
  - mean grass cover around nest tree plot 58%
  - mean shrub cover around nest tree plot 10.5%
  - mean canopy cover around nest tree plot 80%
  - nest success 86% (n = 31)
  - nesting landscape habitats characterized by tall, wide oak trees

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in oak woodlands to maintain or provide the following conditions:**
  - **mean stand dbh >38 cm (15 in) with >20% of the trees >55 cm (22 in) dbh**
  - **<5% Douglas-fir canopy cover**
  - **<50% cover in the subcanopy and <75% cover in the canopy**

< ***Westside Lowlands and Valleys*: At the landscape-level, prioritize conservation where European starling presence is minimal or absent.**

Population:

< ***Southern Pacific Rainforest BBS Region*: Acorn woodpecker: Reverse declining BBS trends to achieve stable populations (non-significant trends of <2%/year) or increasing populations in the next 10 years (by 2010).**

< ***Southern Pacific Rainforest BBS Region*: Downy woodpecker, Ash-throated flycatcher: Maintain stable or increasing population trends over the next 10 years (by 2010).**

< ***Willamette Valley*: Acorn woodpecker: Maintain or establish at least 10 populations (i.e., >10 breeding pairs/population) in the next 10 years (by 2010).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The objective for little to no Douglas-fir in the canopy is based on the obligate or near-obligate association of these species with oak or hardwood trees. The objectives for tree size,

patch size, and subcanopy cover were subjectively developed based on the collective experience of several individuals. The objective to avoid European starlings is to minimize competitive interactions for cavities which have the potential to reduce reproductive success for our focal species.

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining trends or maintain stable or increasing trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of acorn woodpecker on randomly located BBS routes. Establishing 10 populations in the Willamette Valley provides genetic variability and reduces vulnerability of the species if some populations are lost.

Conservation Strategies:

These are specific to acorn woodpecker, downy woodpecker, ash-throated flycatcher; see pages 53-54 for general Conservation Strategies in oak woodland.

- Consider fungal inoculations to enhance cavity opportunities if stand is relatively young and excavation opportunities are limited.
- Ash-throated flycatcher only: Where habitat is suitable, and cavities are a limiting factor, initiate a nest-box program similar to that for western bluebirds as a short-term strategy to provide nesting cavities. This must be done in conjunction with long-term strategies for habitat enhancement and creation. To support the program, guidelines should be developed for issues such as placement of nest boxes, minimizing starling competition, and monitoring of nest boxes.

Species to Benefit: The primary species to benefit from cavities in oak woodlands include white-breasted nuthatch, Lewis' woodpecker, Bewick's wren, house wren, black-capped chickadee, western bluebird, and oak titmouse in southwest Oregon.

Information Needs:

1. What habitat features are associated with the establishment and health of acorn woodpecker colonies?
2. Is patch size a determinant of occurrence or nest success for any of the three species.
3. What landscapes and adjacent land uses result in the least competitive interactions with European starling for cavities?

Conservation Focus: Canopy Edge and Openings in Oak Woodlands
Focal Species: Western Wood-Pewee (*Contopus sordidulus*)

Populations:

- Anecdotal:
  - in the 1870s "very common in summer" in the northern Willamette Valley (Johnson 1880)
  - in the 1880s "very common summer resident" in Washington County, OR (Anthony 1886), and "very common everywhere" in the vicinity of Portland (Anthony 1902)
  - in the early 1900s " a common summer resident" in the vicinity of Seattle (Rathburn 1902), and "a "frequent summer resident" in the Bellingham Bay area of Washington (Edson 1908)
  - in the 1920s "fairly plentiful summer resident" in northwestern Washington (Burleigh 1929)
  - in the 1930s "common summer resident throughout timbered sections" of Oregon (Gabrielson and Jewett 1940)
  - in the early 1950s "common summer resident in western Washington" (Jewett et al. 1953)
- Willamette Valley oak woodlands (n = 9 stands) (Hagar and Stern 1997):
  - second most abundant species 1994-1996
- Breeding Bird Survey (Sauer et al, 1999):
  - Southern Pacific Rainforests BBS Region: highly significant ($p<.01$) long-term (1968-1998) declining trend of 3.0%/year, and non-significant short-term (1980-1998) declining trend of 0.9%/year
  - Willamette Valley (n=11): non-significant long-term (1968-1998) declining trend of 0.9%/year, and non-significant short-term (1980-1998) increasing trend of 2.4%/year

Habitat Relationships:

- Willamette Valley oak woodlands (n=9 stands) (Hagar and Stern 1997):
  - significant negative relationship with canopy cover of Douglas fir
  - no patterns of abundance relative to size of stand, tree density, or average stand-level diameter of oaks
  - in three stands where most abundant, mean canopy cover of oaks was 68% (range 50-84); in 3 stands where least abundant, mean canopy cover of oaks was 54% (range 30-74)
- Willamette Valley oak woodlands (n=5 stands) (Anderson 1970):
  - most abundant in stand with least canopy closure (44%) and fewest trees/ha (18) (44/ac)
  - also relatively abundant in stand with 82% canopy closure and 48 trees/ha (120/ac), of which 45% were >60 ft. tall
- McChord Air Force Base oak habitat, Puget Lowlands (Rolph 1998):
  - positive relationship with basal area of oak, including basal area of oaks >30cm (12 in) dbh; oak cover and snowberry cover; and density of serviceberry, crabapple, and Indian-plum
  - negative relationships with tree basal area and basal area of Douglas-fir

Biological Objectives:

Habitat:

- ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in oak woodland stands to maintain or provide the following conditions:**
  - **within stand canopy closure 40-85% of which >80% is oak cover and <5% Douglas-fir cover**

• native understory of shrubs such as snowberry and serviceberry interspersed with native herbaceous grasses and forbs where neither is >80% of understory

• high edge to opening ratios

Population:

< *Southern Pacific Rainforest BBS Region*: Reverse declining BBS trends to achieve stable populations (non-significant trends of <2%/year) or increasing populations in the next 20 years (by 2020).

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The objective for limited or no Douglas-fir in the canopy is based on two studies (Hagar and Stern 1997, Rolph 1998). The objective for canopy closure is based on moderate abundance in a wide range of canopy cover, although most abundant when canopy is fairly open. The objective for interspersion of diverse shrub and herbaceous layers is to enhance the diversity of insect productivity.

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of western wood-pewee on randomly located BBS routes.

Conservation Strategies:

These are specific to western wood-pewee; see pages 53-54 for general Conservation Strategies in oak woodland.

- Optimal sites for western wood-pewee conservation in oak woodlands should emphasize places where oak woodland borders or grades into relatively open habitats such as savanna or grasslands rather than bordering on closed forest.

Species to Benefit: The primary species to benefit from canopy edges and openings in oak woodlands would be western tanager and purple finch. Others to benefit might include black-headed grosbeak and northern oriole.

Information Needs:

1. Data are needed on all aspects of nesting ecology and habitat relationships.
2. Are there thresholds of canopy closure or stem densities that preclude pewee occurrence?

3. Is cowbird parasitism a significant problem in agricultural landscapes?

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<u>Conservation Focus</u>: Young (Subcanopy) Recruitment Oaks in Oak Woodlands

Focal Species: Bushtit (*Psaltriparus minimus*)

Populations:

T Anecdotal:
- in the 1880s "common resident" in Washington County, Or (Anthony 1886), and "abundant resident" in the vicinity of Portland (Anthony 1902)
- in the early 1900s "common from March to November" in the vicinity of Seattle (Rathburn 1902), but "rare summer resident" in the Bellingham Bay area (Edson 1908)
- around 1920 "resident, and plentiful throughout the year" in northwestern Washington (Burleigh 1929)
- in the 1930s "common resident of the Rogue River Valley (Gabrielson 1931), and fairly common resident of the Willamette Valley" (Gabrielson and Jewett 1940)
- in the early 1950s "not common, but found locally in western Washington" (Jewett et al. 1953)

T Breeding Bird Survey (Sauer et al. 1999):
- Southern Pacific Rainforest BBS Region: highly significant ($p<.01$) long-term (1968-1998) declining trend of 12.0%/year, and highly significant ($p<.01$) short-term (1980-1998) declining trend of 9.8%/year
- Willamette Valley (n=11): non-significant long-term (1968-1998) increasing trend of 4.1%/year, and non-significant short-term (1980-1998) increasing trend of 2.1%/year
- Abundance on BBS routes in the Willamette Valley (n=11) has fluctuated from a mean of approximately 3-4 bpr in the early 1970s to 8-10 bpr in the mid 1980s to 3-4 bpr in the mid 1990s
- Abundance on BBS routes in the Puget Lowlands (n=15) has fluctuated from a mean of approximately 1-2 bpr in the early 1970s to 2-3 bpr in the mid 1980s to 1-2 bpr in the mid 1990s

T Pigeon Butte, Finley National Wildlife Refuge, Willamette Valley (Hagar and Stern 1997):
- drastic change in abundance: in 1968 (Anderson 1970), one of the more common breeding species with a 100% occurrence; but only 30% occurrence (low abundance) during three years of censusing from 1994-96 (J. Hagar pers. comm.)

Habitat Relationships:

T Willamette Valley oak woodlands (n=9 stands) (Hagar and Stern 1997):
- presence significantly greater in stands with less subcanopy cover of Douglas-fir (i.e., more pure oak)
- highest abundance occurred in stand with lowest canopy cover (40%) and highest subcanopy cover (37%)
- mean shrub cover in only 3 stands where it occurred was 56% (range 50-65%)

T Willamette Valley oak woodlands (n=5 stands) (Anderson 1970):
- most abundant in stand of pure oak with high canopy cover (82%), dense shrub understory, and little to no conifer encroachment
- least abundant in stand with least canopy closure (44%) and fewest trees/ha (18) (44/ac)

T Umpqua Valley (n= 6 hardwood stands dominated by oak and madrone) (Cross and Simmons 1983):
- absent or incidental from all stands except moderately abundant breeding species in the stand characterized by relatively large madrone trees in the canopy, and relatively abundant, but generally smaller oaks in the subcanopy, and substantial poison oak (27% cover) in the understory

<u>Biological Objectives</u>:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in oak woodland stands to maintain or provide the following conditions:**

- **interspersion of woodland patches dominated by canopy oaks and subcanopy oaks with >90% composition of oak**
- **30-70% cover in the canopy and >30% cover in the subcanopy**
- **a dense shrub understory (30-70% cover) of native species such as snowberry, California hazel, and poison oak**
- **<10% blackberry cover in the shrub layer**

Population:

< ***Southern Pacific Rainforest BBS Region*: Reverse declining BBS trends to achieve stable populations (non-significant trends of <2%/year) or increasing trends in the next 20 years (by 2020).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. Stands of oak with conifer encroachment are less suitable than pure stands of oak, thus >90% composition of oak is desirable. Minimums of canopy and subcanopy cover are desirable to achieve multi-layered status.

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of common bushtit on randomly located BBS routes.

Conservation Strategies:

These are specific to common bushtit; see pages 53-54 for general Conservation Strategies in oak woodland.

- Optimal sites for bushtit conservation in oak woodlands should emphasize subtle edges and small gaps for increasing structural diversity.
- Encourage recruitment of young oak trees through thinning and creating gaps by removing conifers.

Species to Benefit: The primary species to benefit from subcanopy oak layering would be western scrub jay, Hutton's vireo, black-capped chickadee, orange-crowned warbler, black-

throated gray warbler, black-headed grosbeak, American robin, and Nashville warbler and oak titmouse in southwestern Oregon.

Information Needs:

1. Data are needed on all aspects of nesting ecology and habitat relationships.
2. Is size of the stand correlated with bushtit presence or abundance?
3. How to encourage natural regeneration of oaks under canopies.

–

Conservation Focus: Herbaceous Understory Cover in Oak Woodlands
Focal Species: Chipping Sparrow (*Spizella passerina*)

Populations:

T Anecdotal:

- at the time of European settlement "extremely abundant upon the gravelly prairies of the Puget Sound" (Suckley and Cooper 1860)
- in the 1870s "a common summer resident" in the northern Willamette Valley (Johnson 1880)
- in the late 1800s "common summer resident" in Washington County, OR (Anthony 1886), and "abundant summer resident" inthe vicinity of Portland (Anthony 1902)
- in the early 1900s "frequent summer resident" in the Bellingham Bay area (Edson 1908), and "rather common summer resident" in the vicinity of Seattle (Rathburn 1902)
- around 1920 "a fairly plentiful summer resident" in northwestern Washington (Burleigh 1929)
- in the 1930s "one of the most abundant summer resident birds in valley towns throughout Oregon" (presumably this includes the Willamette Valley) (Gabrielson and Jewett (1940)
- in the 1940s "very common summer resident" in the southern Willamette Valley (Gullion 1951)
- in the early 1950s "common on prairies in western Washington" (Jewett et al. 1953)

T Breeding Bird Survey (Sauer et al. 1999):

- Southern Pacific Rainforest BBS Region: highly significant ($p<.01$) long-term (1968-1998) declining trend of 8.2%/year, and highly significant ($p<.01$) short-term (1980-1998) declining trend of 4.4%/year. These data include early successional coniferous forest habitats
- Willamette Valley (n=11): non-significant long-term (1968-1998) declining trend of 6.2%/year, and non-significant short-term (1980-1998) increasing trend of 4.3%/year
- Abundance on BBS routes in the Willamette Valley (n=11) has steadily declined from a mean of 10-12 bpr in the early 1970s to 2-3 bpr in 1990s
- Abundance on BBS routes in the Puget Lowlands (n=15) is similar to that of the early 1970s (mean of approximately 1 bpr), but down from a mean of 1.5-2.0 bpr throughout the 1980s

T Pigeon Butte, Finley National Wildlife Refuge, Willamette Valley (Hagar and Stern 1997):

- drastic change in abundance: in 1968 (Anderson 1970), one of the more common breeding species with a 100% occurrence; three years of censusing from 1994-96 failed to record a single chipping sparrow (J. Hagar pers. comm.)

T Fort Lewis Military Installation, Puget Lowlands (Resources Northwest and Pentec Environmental 1995):

- most abundant species in oak woodland in 1994

Habitat Relationships:

T Anecdotal:

• Willamette Valley of the 1940s: occurred mostly in a combination of open, grassy areas with some brush (Evenden 1949)

T Willamette Valley (n=5 oak stands) (Anderson 1970):
• most abundant in stand with sparse understory vegetation and ground layer dominated by grasses

T Umpqua Valley (n=6 hardwood stands dominated by oak and madrone) (Cross and Simmons 1983):
• incidental in most stands except most abundant breeding species in stand with least canopy cover, least overall understory cover which included most herbaceous ground cover and least shrub cover, and no Douglas-fir; this stand had the following cover values:

herbaceous	37%	
	grass	26%
	forbs	9%
	mosses/ferns	2%
shrubs	14% (all poison oak)	
canopy trees	89% (oak and madrone)	

• present in low abundance in stands with 21-32% shrub cover and 30-45% herbaceous cover
• absent from stand with only incidental shrub cover

T McChord Air Force Base, Puget Lowlands (n=9 stands) (Rolph 1998):
• found primarily in open, grassy habitats with Scotch broom and small Douglas-fir
• avoided areas with dense shrub cover
• significant habitat relationships included the following:
  • positive: percent cover kinnikinnick, Scotch broom, and Douglas-fir
  • negative: mean stand canopy cover and down log cover; percent cover of western sword fern, blackberry, rose, ocean spray, and Indian-plum

T Fort Lewis Military Installation, Puget Lowlands (Resources Northwest and Pentec Environmental 1995):
• relatively abundant (most abundant species) in oak woodland stands characterized by mean cover in the following ranges: tree 25-50% (closer to 50%); shrub 50-75% (closer to 50%); herbaceous 50-75% (closer to 50%)

T Oak and pine woodlands, south-central Washington, Klickitat County (Manuwal 1997):
• most abundant species in small pine-small oak habitats
• abundance negatively correlated with height of oak and height of other tree species, dbh of oak, and number of non-oak and pine
• abundance positively correlated with number of oak and number of pine

Biological Objectives:

Habitat:

< *Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in savanna or oak woodland to maintain or provide the following conditions:

• interspersion of multiple patches of native shrub cover (e.g., snowberry, posion oak) and herbaceous openings such that shrub cover occurs in 10-40% range and herbaceous cover in the 30-70% range

• <10% blackberry cover in the shrub layer

Population:

< *Southern Pacific Rainforest BBS Region*: Reverse declining BBS trends to achieve stable populations (non-significant trends of <2%/year) or increasing trends in the next 20 years (by 2020).

< ***Southern Pacific Rainforests BBS Region*: Maintain cowbird parasitism rates below 5% within specific study sites.**

Assumptions/Rationale: "Ecologically appropriate" conditions refer to relatively dry sites where density of understory growth is more limited, and fire is more appropriate as a management tool. Shrub cover is necessary for nesting sites, and herbaceous cover for foraging. The objective for multiple shrub patches and interspersion of herbaceous openings was subjectively determined based on the collective experience of several individuals, and data from Cross and Simmons (1983).

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of chipping sparrow on randomly located BBS routes.

This species is highly susceptible to cowbird parasitism, and cowbird parasitism has been suggested as a principal contributing factor for declining populations in western Washington (Lewis and Shape 1987). Therefore, it is appropriate to maintain cowbird parasitism at low levels (<5%).

Conservation Strategies:
These are specific to chipping sparrow; see pages 53-54 for general Conservation Strategies in oak woodland.

º Optimal sites for chipping sparrow conservation in oak woodland habitats should be 1) relatively drier sites, for reasons described above, 2) where oak woodland borders or grades into oak savanna or grasslands rather than bordering on closed forest, and 3) distant from agricultural lands where cowbirds forage (e.g., pasture, grain and grass-seed fields) and the potential for parasitism is high.

Species to Benefit: The primary species to benefit would be shrub and herbaceous associates that use savanna or open, oak woodland habitat such as vesper sparrow, western meadowlark, western kingbird, white-crowned sparrow, and lazuli bunting. Others to benefit might include American goldfinch, dark-eyed junco, and spotted towhee.

Information Needs:
1. Data are needed on all aspects of chipping sparrow nesting ecology within savanna and oak woodland habitat, particularly habitat relationships.

2. What is the level of cowbird parasitism? What are the site and landscape-level factors associated with higher levels of parasitism?

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<u>Conservation Focus</u>: Native Understory Shrub Cover in Oak Woodlands
Focal Species: Nashville Warbler (*Vermivora ruficapilla*) - Rogue and Umpqua
Bewick's Wren (*Thryomanes bewickii*) - Willamette Valley
House Wren (*Troglodytes aedon*) - Puget Lowlands

Populations:

T Anecdotal:
- Nashville warbler: formerly bred in the Puget Lowlands (Dawson and Bowles 1909), but now extirpated (R. Rogers pers. comm.)

T Breeding Bird Survey (Sauer et al. 1999):
- Nashville warbler: Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) increasing trend of 0.2%/year, and non-significant short-term (1980-1998) declining trend of 0.7%/year
- Bewick's wren: Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) declining trend of 0.5%/year, and non-significant short-term (1980-1998) increasing trend of 1.4%/year
- Bewick's wren: Willamette Valley: significant ($p<.10$) long-term (1968-1998) increasing trend of 6.1%/year, and non-significant short-term (1980-1998) increasing trend of 5.2%/year
- House wren: Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) declining trend of 3.0%/year, and significant ($p<.20$) short-term (1980-1998) declining trend of 5.0%/year
- House wren: Willamette Valley: non-significant long-term (1968-1998) declining trend of 1.0%/year, and non-significant short-term (1980-1998) increasing trend of 2.1%/year

T Pigeon Butte, Finley National Wildlife Refuge, Willamette Valley (Hagar and Stern 1997):
- House wren: drastic change in abundance: absent in 1968 (Anderson 1970), but from 1994-1996 ninth most abundant breeding species with 85% occurrence (J. Hagar pers. comm.)

T Willamette Valley oak woodlands near Corvallis (n = 5 oak stands) (Anderson 1970):
- House wren: not present during breeding season in 1968

T Willamette Valley oak woodlands (n = 9 stands) (Hagar and Stern 1997):
- House wren: sixth most abundant species during 3 years of censusing (1994-1996)

Habitat Relationships:

T Umpqua Valley (n=6 hardwood stands dominated by oak and madrone) (Cross and Simmons 1983):
- Nashville warbler: most abundant in the most structural diverse stands with highest shrub cover and vertical density (especially poison oak), and least abundant where shrub cover in understory was least
- Nashville warbler: two stands where most abundant, highest importance value rank was presence of madrone
- Nashville warbler: two stands where least abundant, highest importance value rank was presence of oaks
- Nashville warbler: abundance

	high	low	moderate
mean shrub cover	23-32%	1-14%	28-29%
mean dead and down	17-30%	41-69%	36-47%
mean grass cover	7-11%	18-26%	3-9%

- House wren: absent as a breeding species from 3 stands, but moderately abundant in stand characterized by relatively large madrone trees in the canopy, and relatively abundant, but generally smaller oaks in the subcanopy, and substantial posion oak (26% cover) in the understory; this stand had the following cover values:

- herbaceous 29%
  - grass 9%
  - forbs 16%
  - mosses/ferns 4%
- shrubs 27% (26% poison oak)
- canopy trees 92%

T Willamette Valley oak woodlands (n=9 stands) (Hagar and Stern 1997):
- Bewick's wren:
  - no habitat variables significantly associated with abundance
- House wren:
  - abundance negatively associated with canopy cover (both Douglas-fir and oak), but positively correlated with snowberry cover and mean dbh of oaks, indicating a preference for stands characterized by larger, more widely-spaced oaks with a snowberry understory
- House wren:
  - most abundant in site with highest snowberry cover; least abundant at three sites with least snowberry cover

T McChord Air Force Base, Puget Lowlands (Rolph 1998):
- Bewick's wren:
  - no habitat variables significantly associated with abundance
- House wren:
  - restricted to habitats with large oak trees, and a mostly grass and snowberry understory
- House wren: significant habitat relationships included the following:
  - positive: basal area of oak, including basal area of oaks >30cm (12 in) dbh; percent cover grasses and snowberry
  - negative: percent cover mosses

T Oak and pine woodlands, south-central Washington, Klickitat County, Columbia Foothills (Manuwal 1997):
- Nashville warbler:
  - very abundant in small pine-small oak and large fir-large oak habitats
  - abundance negatively correlated with height of ponderosa pine
  - abundance positively correlated with height of non-oak, non-pine species

Biological Objectives:

Habitat:

< *Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in oak woodlands to maintain or provide the following conditions:
- **shrub understory cover >40% with >50% of that cover in native species such as snowberry, poison oak, etc.**
- **<10% blackberry cover in the shrub layer**
- **herbaceous openings in the shrub layer should account for <15% of the understory**

Population:

< *Southern Pacific Rainforest BBS Region*: Nashville warbler, Bewick's wren, and house wren: Maintain stable or increasing population trends over the next 10 years (by 2010).

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. It is most ecologically appropriate to encourage a dense shrub understory in moist oak woodlands. Preference for snowberry, poison oak, etc. is desirable because it supports native component of historic conditions.

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for stable or increasing BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of Nashville warbler on randomly located BBS routes.

Conservation Strategies:
These are specific to Nashville warbler, Bewick's wren, and house wren; see pages 53-54 for general Conservation Strategies in oak woodland.

- Eliminate or actively manage livestock grazing to ensure well developed shrub layer comprised primarily of native species.

Species to Benefit: The primary species to benefit from understory shrub cover include orange-crowned warbler, spotted towhee, and Swainson's thrush.

Information Needs:
1. Data are needed on all aspects of nesting ecology and habitat relationships for all three species.

–

C. Riparian

1. Conservation Issues (Riparian):

- habitat loss due to clearing for farmland, riverine recreational developments, inundation from impoundments, cutting and spraying for ease of access to water courses, gravel mining, etc.
- habitat alteration from 1) hydrological diversions and control of natural flooding regimes (e.g., dams) resulting in reduction of overall area of riparian habitat, loss of vertical stratification in riparian vegetation, and lack of recruitment of young

cottonwoods, ash, willows, etc., and 2) stream bank stabilization (e.g., riprap) which narrows stream channel, reduces the flood zone, and reduces extent of riparian vegetation

T habitat degradation from conversion of native riparian shrub and herbaceous vegetation to invasive exotics such as reed canary grass and blackberry

T habitat degradation from overgrazing which can widen channels, raise water temperatures, reduce understory cover, etc.

T fragmentation and loss of large tracts necessary for area-sensitive species such as yellow-billed cuckoo

T reductions in riparian corridor width which decreases suitability of the habitat for some species and may increase encroachment of nest predators and nest parasites to the interior of the stand

T hostile landscapes, particularly those in proximity to agricultural and residential areas, may have high density of nest parasites (brown-headed cowbird), exotic nest competitors (European starling), and domestic predators (cats), and be subject to high levels of human disturbance

T high energetic costs associated with high rates of competitive interactions with European starlings for cavities may reduce reproductive success of species such as Lewis' woodpecker, downy woodpecker, and tree swallow, even when outcome of the competition is successful for these species

T recreational disturbances, particularly during nesting season, and particularly in high-use recreation areas

T increased use of pesticide and herbicides associated with agricultural practices which may reduce insect food base for many landbirds

2. Biological Objectives (Riparian):

- **< Institutionalize a policy of "no net loss" of riparian habitat (i.e., discourage loss and conversion of habitat, but when unavoidable, mitigate habitat conversions and natural losses with equal or greater restoration efforts).**
- **< Maintain existing high quality riparian habitat comprised of native species in naturally occurring diversity.**
- **< Improve quality of degraded riparian habitat through appropriate management actions (see Conservation Strategies below).**
- **< Initiate actions (e.g., restoration, acquisition) to enhance size and connectivity of existing riparian patches (i.e., reduce fragmentation).**
- **< Maintain all tracts of contiguous cottonwood or floodplain woodlands or tall shrublands >20 ha (50 ac), regardless of understory composition.**
- **< Retain all cottonwood trees > 56 cm (22 in) dbh, regardless of landscape context.**

< **At the landscape level, seek to maintain or restore >30% of the historical extent of riparian habitat in the lowlands and valleys of each of the major watersheds to conditions that support healthy (source) populations of appropriate focal species.**

Assumptions/Rationale: "No net loss" includes permanent conversion or degradation that compromises the ecological integrity of the habitat and/or reduces its suitability for our focal species. Natural events (e.g., flooding) and some restoration activities that result in short-term "loss" are not considered here. The objective for restoration of >30% of each riparian system is intended to stimulate restoration actions at various locations within watersheds.

3. Conservation Strategies (Riparian):

- *Data Collection/Research:*
  - Conduct community and species research to test the biological objectives described below.
  - Establish permanent roadside and off-road censusing stations to monitor bird population and habitat changes.
  - Study the role of flooding and various hydrological regimes to maintain/improve habitat quality.
- *Conservation Areas*:
  - Seek to expand riparian focal species distribution and abundance throughout Westside Lowlands and Valleys by establishing Riparian Bird Conservation Areas (RBCAs) and promoting their proper management (see Appendix C).
- *Restoration/Management*:
  - Restore natural hydrological processes where possible or initiate actions to mimic natural flood events (e.g., dam releases to flood according to biological time frames).
  - Where restoration of natural hydrologic processes is not possible, establish restoration projects (plantings) of multiple species of shrubs and trees to mimic natural plant diversity and structure.
  - Where riparian restoration projects (e.g., salmon habitat restoration) require alteration of existing vegetation and/or extensive human presence in riparian habitat, conduct projects outside the nesting season (i.e., April 15 - July 31) to avoid or minimize adverse impacts on nesting birds.
  - Maintain vegetative riparian buffer zone >30 m (100 ft) along streams.

• Manage at the landscape level to discourage cowbird use of riparian areas through habitat modifications (i.e., discourage short-grass areas, maintain higher grass heights).

• In general, the highest priority for restoration is to expand habitat where most proximate to existing high quality, productive sites. This is appropriate because landbird species expansion and recolonization into new or restored sites is most likely to occur from surplus production near existing source populations. Prioritization should also consider adjacent and landscape-level land uses.

• Develop a riparian "scorecard" for government and non-government use in prioritizing and evaluating riparian habitat for landbirds. The scorecard should provide guidelines for rating the habitat at various scales (local, landscape).

• All actions to acquire, maintain, enhance, or subsidize lands for riparian bird conservation should consider the following factors:

- proximity to populations of target priority/focal species
- proximity to a designated RBCA
- benefit to multiple riparian species
- risk of habitat loss to development or conversion to unsuitable habitat
- quality of the habitat - existing and potential
- compatibility of current and projected adjacent land uses
- uniqueness of the site in a local and regional context
- the likelihood of securing the land for conservation

º *Exotics*:

• Conduct control or eradication programs for exotic plant species (e.g., reed canary grass, blackberry) that threaten biodiversity of native species; conduct during bird non-breeding season.

º *Chemical Use*: Use of pesticides can reduce the insect food base for many grassland bird species. Use of herbicides can reduce cover and indirectly affect the insect food base.

• Practice procedures in Integrated Pest Management (ORS 634.122) including non-spraying in low human use areas (e.g., mosquito spraying).

• Limit the application of fertilizers, pesticides and herbicides in the riparian zone to invasive non-native species (e.g., reed canary grass) in conjunction with habitat enhancement projects which include long-term solutions such as planting trees and shrubs to eventually shade-out future infestations.

º *Grazing*:

• Eliminate grazing access to riparian zones (e.g., fencing).

º *Incentives/Programs:* Economic incentive-based programs (new and old) are likely to be most successful in reaching the greatest number of private landowners to increase the land base of quality riparian habitat.

• Increase the amount of land under incentives programs for wildlife habitat, targeting land within RBCAs.

• Support existing programs and develop new economic incentive programs to solicit conservation and management agreements with private landowners to manage riparian habitats for natural values.

• Incorporate riparian landbird objectives in public lands management plans.

- *Outreach:*

  • Develop programs to provide technical assistance to landowners to create, manage, and maintain functional riparian habitats (see Chapter 10).

  • Develop educational materials (e.g., brochure, videos) to foster an appreciation of riparian habitat and assist landowners in riparian restoration.

Focal Habitats and Species

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<u>Conservation Focus</u>: Snags with Cavities in or Adjacent to Open Water
Focal Species: Purple Martin (*Progne subis*) - Puget, Willamette, Umpqua
Tree Swallow (*Tachycineta bicolor*) - Rogue Valley

Populations:

- Anecdotal: Purple martin
  • at the time of European settlement "not a common bird in Washington" (Suckley and Cooper 1860)
  • in the 1930s "rather uncommon summer resident and breeding species of western Oregon, most common in coastal counties" (Gabrielson and Jewett 1940)
  • in the early 1950s "fairly common summer resident in western Washington " (Jewett et al. 1953)
- Breeding Bird Survey (Sauer et al. 1999):
  • Purple martin: Insufficient sample size for trend analysis in the Southern Pacific Rainforest BBS Region or the states of Oregon and Washington
  • Tree swallow: Southern Pacific Rainforests BBS Region, non-significant long-term (1968-1998) declining trend of 2.0%/year, and non-significant short-term (1980-1998) declining trend of 0.3%/year
  • Tree swallow: Willamette Valley (n=11), significant ($p<.20$) long-term (1968-1998) declining trend of 2.6%/year, and non-significant short-term (1980-1998) increasing trend of 1.0%/year

Habitat Relationships:

- Anecdotal: Purple martin
  • at the time of European settlement, found in groves of scrub oaks on the Nisqually plains (Suckley and Cooper 1860)
  • aerial insectivore that nests in cavities, often near water
- Portland riparian habitats (Poracsky et al. 1992):
  • Tree swallow: abundance positively associated with absence of mature conifer forest and a weaker positive association with human disturbance and riparian corridors

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate and where European starling and house sparrow presence is minimal, initiate actions within or adjacent to open water to maintain or provide the following conditions:**

- **retain old pilings for potential use as nest sites**
- **retain or create >1.2 snags/ha (3/ac) >30 cm (12 in) dbh and >6 m (20 ft) high (above water)**
- **use nest boxes as short-term management until natural cavities are available**
- **open air space and easy access to cavities (i.e., no physical obstructions within 10 m)**

Population:

< ***Southern Pacific Rainforest BBS Region*: Tree swallow: Maintain stable or increasing population trends over the next 10 years (by 2010).**

< ***Western Oregon*: Increase population of purple martins to >1,000 pairs (includes non-water nesting birds) in the next 10 years (by 2010) through expansion of existing colonies and establishment of new colonies.**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The objectives are based on USFWS (1985), Rodrick and Milner (1991), Horvath (1999), and professional knowledge of several individuals.

Monitoring of BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of purple martin or tree swallow on randomly located BBS routes. The population objective for western Oregon is based on a current known population of 784 pairs (Horvath 1999). The population objective for western Washington is based on...

Conservation Strategies:

These are specific to purple martin and tree swallow; see pages 70-71 for general Conservation Strategies in riparian habitat.

- Highest priorities using the objectives described above would be to increase abundance at existing colonies and expand distribution to establish new colonies where suitable habitat exists within one mile of existing colonies.
- All attempts to establish colonies must consider the European starling population in the area.
- Avoid applying insecticides within 12 km (7.5 m) of nesting colonies (Rodrick and Milner 1991).
- Information on nest box design and placement, especially to preclude starlings, is available in Rodrick and Milner (1991) and Horvath (1999).

Species to Benefit: The primary species to benefit from the presence of snags in open water include belted kingfisher, osprey, and double-crested cormorant (perch sites), and house wren, black-capped chickadee, Lewis woodpecker, wood duck, and northern flicker (potential nest cavities) if snags are near the edge of woodland.

Information Needs:

1. Data are needed on all aspects of nesting ecology and habitat relationships for both species.

–

<u>Conservation Focus</u>: Shrub Density in Floodplain Shrub Habitat
Focal Species: Willow Flycatcher (*Empidonax brewsterii*) - Puget, Willamette
Yellow-Breasted Chat (*Icteria virens*) - Rogue, Umpqua Valleys

Populations:

- Anecdotal: Yellow-breasted chat:
  - in the 1870s "inhabits the dense thickets of Spirea during the summer" in the northern Willamete Valley (Johnson 1880)
  - in the late 1880s "a rare summer visitor" in Washington County, OR (Anthony 1886), and "rare, seen only a few times" in the vicinity of Portland (Anthony 1902)
  - in the 1930s "common breeding species in the Rogue, Umpqua, and throughout the Willamette Valley (Gabrielson and Jewett 1940)
  - in the 1940s "very common summer resident" in the southern Willamette Valley (Gullion 1951)
  - not reported in any of the early accounts from the Puget Lowlands
- Anecdotal: Willow flycatcher:
  - in the 1870s "quite common in summer" in the northern Willamette Valley (Johnson 1880)
  - in the late 1800s "the most common of our flycatchers" in Washington County, OR (Anthony 1886), and "very common in alder and vine maple thickets" in the vicinty of Portland (Anthony 1902)
  - in the early 1900s "the most common of our flycatchers…an abundant summer resident" in the vicinity of Seattle (Rathburn 1902), and "common summer resident" in the Bellingham Bay area ((Edson 1908)
  - around 1920 "a plentiful summer resident" in northwestern Washington (Burleigh 1929)
- Breeding Bird Survey (Sauer et al. 1999):

• Willow flycatcher: Southern Pacific Rainforest BBS Region: significant ($p < .05$) long-term (1968-1998) declining trend of 3.8%/year, and significant ($p < .02$) short-term (1980-1998) declining trend of 2.1%/year
• Willow flycatcher: Willamette Valley: non-significant long-term declining trend of 3.5%/year (n=10)
• Willow flycatcher: abundance on BBS routes in the Willamette Valley (n=11) has steadily declined from a mean of 13 bpr in 1970 to 4 bpr in 1995
• Yellow-breasted chat: Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) declining trend of 0.7%/year, and significant ($p < .20$) increasing trend of 2.2%/year
• Yellow-breasted chat: Willamette Valley (n=11): abundance has declined from a mean of approximately 0.9-1.0 bpr in the early 1970s to 0.2-0.3 bpr in the late 1980s and early 1990s

Habitat Relationships:

T Anecdotal:

T Willamette Valley (B. Altman unpubl. data):

• mean cover nests (5 m plot) herb shrub tree
willow flycatcher (n=90)

• mean cover territories herb shrub tree
willow flycatcher (n=?)
yellow-breasted chat (n=?)

T Riparian habitats near Portland (Poracsky et al. 1992):

• Willow flycatcher - abundance positively associated with dense mature deciduous forest and a weaker positive relationship with the absence of human disturbance and riparian corridors

T McChord Air Force Base, Puget Lowlands (Rolph 1998):

• Willow flycatcher - abundance positively associated with grasses, bare ground, and Scot's broom
• Willow flycatcher - abundance negatively associated with Douglas-fir, mean canopy cover, total snag density, total log density, and cover of Oregon grape, litter, mosses, and swordfern

T Cottonwood riparian forest, South Fork Snake River, Idaho (Saab 1999):

• Yellow-breasted chat - among all riparian species, the most significant positive relationship with increasing residential areas and high edge contrast; nearest cottonwood patch neighbor versus distant cottonwoods; increasing shrub cover and density versus and open subcanopy; and increasing herbaceous ground cover versus more litter ground cover

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in floodplain riparian shrub to maintain or provide the following conditions:**

- **patchy shrub layer (i.e. woody vegetation 1-4 m [3-12 ft] tall) with 30-80% cover and several scattered herbaceous openings**
- **canopy tree (i.e., woody vegetation >4 m [12 ft] tall) cover <20%**

< ***Westside Lowlands and Valleys*: At the landscape-level, provide the aforementioned habitat conditions at sites that are:**

- **>1 km (0.6 mi) from urban/residential areas**
- **>5 km (3 mi) from high-use cowbird areas**

Population:

- < ***Southern Pacific Rainforest BBS Region*: Willow flycatcher: Reverse long-term declining trends to achieve stable populations (non-significant trends of <2%/year) or increasing trends in the next 10 years (by 2010).**
- < ***Southern Pacific Rainforests BBS Region*: Yellow-breasted chat: Maintain stable or increasing population trends over the next 10 years (by 2010).**
- < ***Westside Lowlands and Valleys*: Willow flycatcher, Yellow-breasted chat: Maintain cowbird parasitism rates below 10% within specific areas.**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. Biological objectives for shrub and tree cover are based on one field season of data in the Willamette Valley (B. Altman unpubl. data). The landscape-level objectives are provided to minimize the negative impact of predation from feral and other predators associated with human habitation (e.g., cats, scrub jays), and parasitism from brown-headed cowbirds. They were subjectively derived based on the opinions of several people. Both these species are highly susceptible to cowbird parasitism, therefore, it is appropriate to maintain cowbird parasitism at low levels (<10%).

Monitoring of BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of willow flycatcher on randomly located BBS routes.

Conservation Strategies:

These are specific to willow flycatcher and yellow-breasted chat; see pages 70-71 for general Conservation Strategies in riparian habitat.

- º Optimal sites for conservation would be where the hydrological regime is ecologically appropriate for persistent early successional shrub habitats dominated by willow, spirea, etc. and within the landscape context described above (i.e., distant from urban/residential and cowbird areas).
- º Create riparian shrub habitat and increase width of existing riparian shrub zones through alteration of hydrological regimes, plantings, etc.
- º Discourage channelization of streams, creeks, and rivers, which reduces extent of riparian floodplain shrub habitat.

- Reduce potential impacts of cowbird parasitism by discouraging activities and management that results in attracting cowbirds near riparian areas (e.g., aggregations of livestock).
- Eliminate willow cutting and herbicide spraying in riparian zone (Taylor and Littlefield 1986).

Species to Benefit: The primary species to benefit from a dense shrub layer in floodplain riparian shrub habitat are song sparrow, common yellowthroat, yellow warbler, Wilson's warbler, orange-crowned warbler, and Swainson's thrush.

Information Needs:

1. Data are needed on all aspects of nesting ecology and habitat relationships for both species.
2. Can riparian shrub habitat within an agricultural landscape (i.e., a landscape with suitable cowbird habitat) support reproductively viable populations? If so, what habitat or anthropogenic factors are important?

–

Conservation Focus: Large Canopy Trees in Riparian Deciduous Woodland

Focal Species: Red-Eyed Vireo (*Vireo olivaceus*) - Puget, Willamette
Bullock's Oriole (*Icterus galbula*) - Rogue, Umpqua

Populations:

- Anecdotal: Bullock's oriole
  - at the time of European settlement "not very common" in the Puget Sound area (Suckley and Cooper 1860)
  - in the 1870s "common in summer, breeding extensively" in the northern Willamette Valley (Johnson 1880)
  - in the early 1900s "rather common in cottonwoods and oaks along the river" in the vicinity of Portland (Anthony 1902)
- Breeding Bird Survey (Sauer et al. 1999):
  - Red-eyed vireo: insufficient sample size for trend analysis in the Southern Pacific Rainforest BBS Region
  - Bullock's oriole: Southern Pacific Rainforests BBS Region: significant ($p<.05$) long-term (1968-1998) declining trend of 3.1%/year, and non-significant short-term (1980-1998) declining trend of 2.9%/year
  - Bullock's oriole: Willamette Valley ($n=11$): non-significant long-term (1968-1998) increasing trend of 1.9%/year, and non-significant short-term (1980-1998) declining trend of 4.3%/year

Habitat Relationships:

- Anecdotal: Red-eyed vireo
  - tall, somewhat extensive, closed canopy forests of cottonwood, maple, or alder in the Puget Lowlands (C. Chappell pers. comm.)
- Bullock's oriole: Riparian habitats near Portland (Poracsky et al. 1992):
  - most numerous in association with the presence of human disturbance and altered stream corridors

T Bullock's oriole: Cottonwood riparian forest along the Snake River in Idaho (Saab 1999):
  • significant positive relationships with simple landscapes of cottonwood forest and agriculture versus landscape heterogeneity; smaller patch sizes with increasing edge habitat versus large patches; and an agricultural landscape versus a natural landscape

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in deciduous riparian woodland to maintain or provide the following conditions:**

- **mean canopy tree height >15 m (50 ft)**
- **mean canopy closure 30-60% (Bullock's oriole) and >60% (red-eyed vireo)**
- **young (recruitment) sapling trees >10% cover in the understory**
- **riparian woodland >50 m (164 ft) wide (red-eyed vireo only)**

Populations:

< *Southern Pacific Rainforests BBS Region*: Bullock's oriole: Reverse long-term declining BBS trends to achieve stable populations (non-significant trends of <2%/year) or increasing trends in the next 10 years (by 2010).

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The objective for tree height is modified from Bullock's oriole (Schaefer 1976). The objective for canopy closure was subjectively determined based on the collective experience of several people. It assumes that relatively dense foliage in the canopy is required for nesting and foraging, especially for red-eyed vireo. The objective for riparian woodland width is based on Bullock's oriole and modified from Stauffer and Best (1980). It is assumed that if large canopy trees, especially cottonwood, are available for nesting and cover, food resources are not limiting.

Monitoring of BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of Bullock's oriole on randomly located BBS routes.

Conservation Strategies:
These are specific to red-eyed vireo and Bullock's oriole; see pages 70-71 for general Conservation Strategies in riparian habitat.

- Optimal sites for conservation would be where cottonwood gallery trees are dominant or ecologically appropriate.
- Retain all large cottonwood trees.
- Use mechanical or other means to remove invasive plants in the understory (e.g., Himalayan blackberry) that inhibit growth and development of young (recruitment) trees.

Species to Benefit: The primary species to benefit from large canopy trees, especially cottonwood, in riparian deciduous woodland include yellow warbler, cedar waxwing, black-headed grosbeak, and western wood-pewee. Others to benefit to a lesser degree include Pacific-slope flycatcher, brown creeper, purple finch, and house finch.

Information Needs:
1. Data are needed on all aspects of Bullock's oriole and red-eyed vireo nesting ecology and habitat relationships.
2. Does patch size affect abundance or reproductive success?
3. What are the thresholds of canopy cover that determine abundance and reproductive success?

–

<u>Conservation Focus</u>: Subcanopy, Tall Shrub Foliage in Riparian Woodland
Focal Species: Yellow Warbler (*Dendroica petechia*)

Populations:
T Anecdotal:
- at the time of European settlement "abundant in this Territory (Oregon and Washington)" (Suckley and Cooper 1860)

T Breeding Bird Survey (Sauer et al. 1999):
- Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) declining trend of 5.0%/year, and non-significant short-term (1980-1998) declining trend of 2.4%/year
- Willamette Valley (n=11): non-significant long-term (1968-1998) declining trend of 4.7%/year, and non-significant short-term (1980-1998) increasing trend of 8.0%/year

Habitat Relationships:
T Anecdotal:
- riparian obligate or near-obligate

T McChord Air Force Base, Puget Lowlands (Rolph 1998):
- most strongly associated with wetland habitats that contain Douglas' spirea and deciduous tree cover)
- abundance positively associated with deciduous tree basal are, bare ground, and cover of Scot's broom and spirea

• abundance negatively associated with mean canopy cover, and cover of Douglas-fir, Oregon grape, mosses, swordfern, blackberry, hazel, and oceanspray

T Riparian habitats near Portland (Poracsky et al. 1992):

• abundance positively related to the presence of human disturbance and altered stream corridors and wetlands

T Cottonwood riparian forest along the Snake River in Idaho (Saab 1999):

• significant positive relationships with agricultural landscapes versus natural landscapes; increasing distance to nearest cottonwood patch neighbor versus close cottonwood neighbors; and a dense shrub layer versus an open subcanopy

• among all riparian species, the most significant positive relationships with increasing landscape heterogeneity with rivers and wetlands versus relatively simple landscapes; and decreasing patch size with increasing edge (edge associate), including residential areas

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in floodplain riparian shrub to maintain or provide the following conditions:**

• >70% cover in shrub layer (<3 m [10 ft]) and subcanopy layer (>3 m and below the canopy foliage) with subcanopy layer contributing >40% of the total

• shrub layer cover 30-60% (includes shrubs and small saplings)

• shrub layer height >2m (6.6 ft)

< ***Westside Lowlands and Valleys*: At the landscape-level, provide the aforementioned habitat conditions at sites that contain:**

• high degree of deciduous riparian heterogeneity within or among wetland, shrub, and woodland patches

• low percent agricultural land use

Population:

< ***Southern Pacific Rainforest BBS Region*: Maintain stable or increasing population trends over the next 10 years (by 2010).**

< ***Westside Lowlands and Valleys*: Maintain cowbird parasitism rates below 5% within specific areas.**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The objectives for cover and shrub height were slightly modified from Schroeder (1982). The landscape objective for multiple habitats supports their association with edges and heterogeneity of habitats. The objective for limited agriculture in the landscape is to minimize the potential for cowbird parasitism. This species is highly susceptible to

cowbird parasitism, therefore, it is appropriate to maintain cowbird parasitism at low levels (<5%).

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for stable or increasing BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of yellow warbler on randomly located BBS routes.

Conservation Strategies:

These are specific to yellow warbler; see pages 70-71 for general Conservation Strategies in riparian habitat.

- Target areas for conservation can include residential or urban areas that provide suitable habitat if it can be documented that levels of predation from domestic or human associated predators are not excessive.
- Eliminate or manage livestock grazing in riparian areas to ensure complete development of all vegetation layers.
- Manage at the landscape level to discourage cowbird use of riparian areas (i.e., discourage short-grass areas, maintain taller grass heights).

Species to Benefit: The primary species to benefit from subcanopy foliage in riparian deciduous woodland include warbling vireo, black-headed grosbeak, and to a lesser extent Swainson's thrush and Wilson's warbler.

Information Needs:

1. Data are needed on all aspects of yellow warbler nesting ecology and habitat relationships.
2. Are there source populations in agricultural landscapes? If so, under what parameters?

–

<u>Conservation Focus:</u> Dense Understory Shrub Layer in Deciduous Woodland

Focal Species: Swainson's Thrush (*Catharus ustulatus*) - Puget, Willamette
Wrentit (*Chamaea fasciata*) - Rogue, Umpqua Valleys

Populations:

- Anecdotal:
- Breeding Bird Survey (Sauer et al. 1999):

• Swainson's thrush: Southern Pacific Rainforests BBS Region: significant (p<.20) long-term (1968-1998) declining trend of 0.8%/year, and non-significant short-term (1980-1998) declining trend of 0.5%/year
• Swainson's thrush: Willamette Valley (n=11): non-significant long-term (1968-1998) declining trend of 3.2%/year, and non-significant short-term (1980-1998) declining trend of 1.5%/year
• Wrentit: Southern Pacific Rainforests BBS Region: non-significant long-term (1968-1998) declining trend of 0.8%/year, and significant (p<.10) short-term (1980-1998) declining trend of 1.4%/year

Habitat Relationships:

T Anecdotal: Swainson's thrush
- dense thickets, often in the understory of riparian woodland

T Cottonwood riparian forest, South Fork Snake River, southeastern Idaho (Saab 1999):
- Swainson's thrush - among all riparian species, had the strongest positive relationship with natural landscapes and increasing willow densities and decreasing bare ground

T McChord Air Force Base, Puget Lowlands (Rolph 1998):
- Swainson's thrush:
  - abundance positively associated with mean canopy cover, tree basal area and deciduous tree basal area, total logs, and cover of salal, twinflower, sword fern, spirea, blackberry, ocean spray, and willow
  - abundance negatively associated with cover of manzanita, Scot's broom, and grasses

T Coastal Marin County, California (PRBO unpubl data, n = 61 nests):
- Swainson's thrush:
  - nest site selection positive association with all sizes tree stems, canopy cover, fern cover, and water ground cover
  - nest site selection negatively associated with down log cover and grass-sedge ground cover
  - nest success positively associated with concealment below, total cover, and cover western sword fern
  - nest success negatively associated with willow shrub cover
  - nest site cover (means): canopy 71%, shrub 41%, forb 41%, leaf litter 33%, bare ground 14%, fern 9%,

T Swainson's thrush - nests within 152 m (500 ft) of an edge had higher predation rates than those >152 m (500 ft) (Andren and Anglestam 1988)

T Swainson's thrush - recreational disturbance and riparian restoration activities if conducted during the breeding season may reduce reproductive success (Stefani 1996)

T Swainson's thrush - high site fidelity may thwart annual reproduction when habitat alteration has occurred

Biological Objectives:

Habitat:

< *Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in riparian deciduous woodland to maintain or provide the following conditions:
- **shrub layer cover >50% with >60% of that native shrubs**
- **canopy closure >50%**

Population:

< *Southern Pacific Rainforests BBS Region*: Maintain stable or increasing population trends over the next 10 years (by 2010).

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The objective for shrub cover is based on the collective experience of several people. It assumes that relatively dense foliage is required for nesting and foraging. The objective for canopy closure is modified from Timossi (1990).

Monitoring of BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of Swainson's thrush on randomly located BBS routes.

Conservation Strategies:

These are specific to Swainson's thrush and wrentit; see pages 70-71 for general Conservation Strategies in riparian habitat.

- Eliminate or actively manage livestock grazing in riparian zone to ensure well developed understory shrub layer comprised primarily of native species.

Species to Benefit: The primary species to benefit from a relatively dense understory of native vegetation in riparian deciduous woodland are Wilson's warbler, Bewick's wren, song sparrow, orange-crowned warbler, and spotted towhee.

Information Needs:

1. Data are needed on all aspects of Swainson's thrush nesting ecology and habitat relationships.
2. Are there differences in abundance or productivity in understories dominated by native species versus those dominated by exotic species?

–

<u>Conservation Focus</u>: Snags in Riparian Deciduous Woodland
Focal Species: Downy Woodpecker (*Picoides pubescens*)

Populations:

- Anecdotal:
  - at the time of European settlement "extremely common on the lower Columbia River" (Suckley and Cooper 1860)
- Breeding Bird Survey (Sauer et al. 1999):
  - Southern Pacific Rainforests BBS Region: non-significant long-term (1968-1998) declining trend of 0.2%/year, and non-significant short-term (1980-1998) increasing trend of 1.8%/year

• Willamette Valley (n=11): non-significant long-term (1968-1998) declining trend of 5.0%/year, and highly significant (p<.01) short-term (1980-1998) declining trend of 9.4%/year

Habitat Relationships:

T Anecdotal:

T Cottonwood riparian forest, South Fork Snake River, Idaho (Saab 1999):

• positive association with increasing agricultural landscape and decreasing natural landscape, and increasing bare ground and decreasing willow subcanopy

Biological Objectives:

Habitat:

< *Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in deciduous riparian forest to maintain or provide the following conditions:

• >12 snags/ha (5/ac) >15 cm (6 in) dbh and >1.8 m (6 ft) tall; of these >5/ha (2/ac) should be >25 cm (10 in) dbh

Population:

< *Southern Pacific Rainforests BBS Region*: Maintain stable or increasing population trends over the next 10 years (by 2010).

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The objective for snags is modified from Schroeder (1983). Snags are required for nesting and it is assumed that snags are the limiting factor for habitat suitability.

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for stable or increasing BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of downy woodpecker on randomly located BBS routes.

Conservation Strategies:

These are specific to downy woodpecker; see pages 70-71 for general Conservation Strategies in riparian habitat.

- Retain all snags >25 cm (10 in) for potential nesting habitat.
- If snags are limiting, consider snag creation activities (e.g., topping, girdling, fungal inoculations).

Species to Benefit: The primary species to benefit from snags in riparian deciduous woodland are black-capped chickadee, house wren, Bewick's wren, wood duck, pileated woodpecker, and potentially Lewis' woodpecker.

Information Needs:

1. Data are needed on all aspects of downy woodpecker nesting ecology and habitat relationships.
2. Is patch size a determinant in the presence of nest success?

–

Conservation Focus: Large Structurally Diverse Patches, Deciduous Woodland

Focal Species: Yellow-Billed Cuckoo (*Coccyzus americanus*)
Red-shouldered Hawk (*Buteo lineatus*) - Rogue
Cooper's Hawk (*Accipiter cooperii*) - Umpqua

Populations:

T Anecdotal: Yellow-billed cuckoo
- in the 1830s "abundant during the summer" along the Columbia River near Vancouver, WA (J.K. Townsend in Jobanek and Marshall 1992)
- in the 1920s "fairly plentiful in scattered thick woods about Lake Washington on Puget Sound" (Burleigh 1929)
- in the 1920s "fairly common along the Columbia River" (Gabrielson and Jewett 1940)
- once occurred throughout the Willamette Valley from Eugene (Shelton 1917), Sweet Home (Prill 1891), Salem and Dayton (Woodcock 1902), and Portland (Anthony 1902)
- has not been reported from Westside Lowlands and Valleys in Oregon since 1977 (Gilligan et al. 1994), and last confirmed breeding in Oregon was in the 1940s (Littlefield 1988)
- last sighting record from western Washington was ??, and the last confirmed breeding was in the 1930s (Littlefield 1988)

T Yellow-billed cuckoo and red-shouldered hawk too rare and Cooper's hawk insufficient sample size for Breeding Bird Survey trend estimates.

Habitat Relationships:

T Anecdotal: Yellow-billed cuckoo
- in Oregon, the few records indicate it prefers dense cottonwoods and willows along major watercourses (Gilligan et al. 1994)
- most nests in California in willows, most foraging in cottonwood (Laymon and Halterman 1985)

T South Fork Kern River, California (Laymon et al. 1997):
- Yellow-billed cuckoo:
  - best nesting habitat is large sites with high canopy cover and foliage volume and moderately large and tall trees
  - mean canopy cover: <40% unsuitable; 40-65% marginal to suitable; >65% optimal
  - mean canopy height: optimal 7-10 m (23-33 ft); suitable 4-7 m(13-23 ft) and 10-15 m (33-49 ft)

T California (Laymon and Halterman 1989, Halterman 1991):

- Yellow-billed cuckoo:
    - territory size 8-40 ha (20-100 ac)
    - canopy cover at nest 74%
    - patch size most important variable in determining occupancy of site
        - 20-40 ha = 9% occupied (n = 21)
        - 40-80 ha = 59% occupied (n = 11)
        - >80 ha = 100% occupied (n = 7)

T Habitat model, California (Gaines and Laymon 1984, Laymon and Halterman 1989):

- Yellow-billed cuckoo:
    - willow-cottonwood habitat in the following size and width:
        - optimal = >80 ha (200 ac) in extent and wider than 600 m (1,950 ft)
        - suitable = 41-80 ha (100-200 ac) in extent and wider than 200 m (650 ft)
        - marginal = 20-40ha (50-100 ac) in extent and 100-200 m (325-600 ft) wide

Biological Objectives:

Habitat:

< ***Westside Lowlands and Valleys*: Where ecologically appropriate, initiate actions in deciduous riparian woodland to maintain or provide the following conditions:**

- **structurally diverse patches of habitat that include at least 3 distinct layers (e.g., canopy, subcanopy, understory) with >25% cover in each layer or juxtaposition of early successional (e.g., willow) with older forest (e.g., cottonwood)**
- **mature canopy layer dominated by cottonwood with >50% canopy closure and >6 ha (15 ac)**
- **patches of habitat (includes cottonwood canopy and adjacent riparian shrub if appropriate) >40 ha (100 ac) in size or >0.8 km (0.5 mi) in length • width of riparian woodland and shrub vegetation zone >100 m (330 ft)**

Population:

< ***Westside Lowlands and Valleys*: Yellow-billed cuckoo: Establish a breeding population (>10 pairs) along the Lower Columbia River in the next 25 years (by 2025), and one other population in both the Willamette Valley and Puget Lowlands in the next 35 years (by 2030).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The objective for patch size is based on Gaines and Laymon (1984) and Laymon and Halterman (1989). The objective for riparian zone width was based on work in California which indicated cuckoos rarely occurred in areas less the 90 meters wide (Gaines and Laymon 1984). The objective for canopy closure is based on Laymon et al. (1997).

Some suitable habitat remains along the Lower Columbia River and elsewhere in the Willamette Valley and Puget Lowlands, and restoration efforts could increase availability of habitat. Species protection and habitat restoration efforts elsewhere in the west (e.g., California and Idaho) may increase population levels to a point that encourages dispersal of birds.

Conservation Strategies:
These are specific to yellow-billed cuckoo; see pages 70-71 for general Conservation Strategies in riparian habitat.

- Consider reintroductions of the species along the Lower Columbia River if natural recolonization does not occur in the next 15-20 years.
- Maintain existing large tracts of riparian woodland and shrub and seek to restore adjacent areas to enhance size of tracts.
- Where large tracts (e.g., >40 ha [100 ac]) of riparian woodland occur, eliminate livestock grazing from within the riparian zone to maintain structural diversity in the understory.
- Initiate actions to remove invasive exotic species (e.g., Himalayan blackberry) that dominate understory and inhibit strucural diversity and layering of understory and subcanopy vegetation.
- Avoid activities in the riparian zone that alter natural plant succession such as channelization or bank stablization.
- Prohibit insecticide application between June 15 and August 15 in riparian woodland and agricultural areas adjacent to suitable riparian woodland if these areas support yellow-billed cuckoo populations or have been identified as potential for restoration of yellow-billed cuckoo populations.

Species to Benefit: The primary species to benefit from large patches of structurally diverse riparian deciduous woodland include red-eyed vireo, black-headed grosbeak, yellow warbler and red-shouldered hawk

Information Needs:
1. Determine the extent of suitable habitat along the Lower Columbia River and at appropriate locations along the Willamette River and around Puget Sound.
2. Conduct a thorough inventory of potential habitat along the Lower Columbia River, Willamette River, and around Puget Sound for nesting birds.

D. Chaparral

1. Conservation Issues (Chaparral):

T habitat loss through residential and rural development, grazing land, and hazard reduction (i.e., removal of shrubs)

T habitat loss from oak tree removal

T habitat degradation from exotic vegetation invasion due to fire suppression

T land ownership is primarily private

T exotic and feral predators at interface with residential development

T hostile landscapes, particularly those in proximity to agricultural and residential areas, may have high density of nest parasites (brown-headed cowbird), exotic nest competitors (European starling), and domestic predators (cats), and be subject to high levels of human disturbance

T in oak chaparral, high energetic costs associated with high rates of competitive interactions with European starlings for cavities may reduce reproductive success of species such as acorn woodpecker, Lewis' woodpecker, ash-throated flycatcher, and American kestrel, even when outcome of the competition is successful for these species

T hazard reduction/brush removal is being extensively used despite no information on landbird response and problematic timing of the actions (i.e., breeding season)

2. Biological Objectives (Chaparral):

- **Institutionalize a policy of "no net loss" of chaparral habitat (i.e., discourage loss and conversion of habitat, but when unavoidable, mitigate habitat conversions and natural losses with equal or greater restoration efforts). NOTE: Natural events (e.g., wildfire) and some restoration activities (e.g., prescribed fire) that result in short-term "loss" are not considered here.**
- **Maintain existing moderate to high quality chaparral habitat, and actively manage to promote its sustainability.**
- **Improve habitat quality of degraded chaparral habitat through appropriate management actions (see Conservation Strategies below).**
- **Initiate actions to enhance size and connectivity of existing chaparral patches (i.e., reduce fragmentation) through restoration and acquisition efforts.**
- **Retain all oak trees >56 cm (22 in) dbh within chaparral habitats.**

Assumptions/Rationale: "No net loss" includes permanent conversion or degradation that compromises the ecological integrity of the habitat and/or reduces its suitability for

our focal species. Natural events (e.g., wildfire) and some restoration activities (e.g., prescribed fire) that result in short-term "loss" are not considered here. The objectives are based on the following two premises in order of importance: 1) prevent further loss of chaparral, and 2) improve condition of degraded chaparral. Large patches of chaparral and oak-chaparral may be less susceptible to competition from starlings and parasitism from cowbirds. Open-form oaks have more cavities (Farrier-Gumtow) and produce more acorns for regeneration and wildlife consumption (Larsen and Morgan 1998).

3. Conservation Strategies (Chaparral):

These general recommendations are presented to support conservation of landbirds in chaparral habitats. Specific directives as described below for priority focal species should supercede those presented here if there is a direct conflict between recommendations.

- *Data Collection/Research*:
  - Conduct community and species research to test the biological objectives described below.
  - Establish permanent roadside and off-road censusing stations to monitor bird population and habitat changes.
  - Study the role of fire and other management treatments to maintain/improve habitat quality.
- *Conservation Areas*:
  - Seek to expand chaparral focal species distribution and abundance throughout Westside Lowlands and Valleys by establishing Chaparral Bird Conservation Areas (CBCAs) and promoting their proper management (see Appendix C).
- *Acquisition/Restoration*:
  - Identify opportunities (i.e., receptive land-owners and managers) for conservation and management actions.
  - Seek opportunities to engage private landowners in restoration through entities such as watershed councils and agricultural organizations.
  - Seek to maximize contiguous area of chaparral and thus minimize fragmentation. Where possible, connect different types of chaparral habitat through "across the fence" conservation with neighbors.
  - Develop a chaparral "scorecard" for government and non-government use in prioritizing and evaluating chaparral habitat for landbirds. The scorecard should provide guidelines for rating the habitat at various scales (local, landscape).
  - All actions to acquire, maintain, enhance, or subsidize lands for chaparral bird conservation should consider the following factors:
    - proximity to populations of target priority/focal species
    - proximity to a designated CBCA

- benefit to multiple chaparral species
- risk of habitat loss to development or conversion to unsuitable habitat
- quality of the habitat - existing and potential
- compatibility of current and projected adjacent land uses
- uniqueness of the site in a local and regional context
- the likelihood of securing the land for conservation

- Use native species and local seed sources in restoration.
- Reestablish a natural fire regime where ecologically appropriate.
- Discourage home building and subsequent brush removal in chaparral
- Where chaparral removal is occurring, conduct outside breeding season (April 15-July 15)

º *Timing of Activities:* Recreational and other human activities may cause disturbance to nesting birds and result in reproductive failure.

- Minimize or avoid human activities during the breeding season; April 15 - July 15.

º *Incentives/Programs:* Economic incentive-based programs (new and old) are likely to be most successful in reaching the greatest number of private landowners to increase the land base of suitable chaparral bird habitat.

- Increase the amount of chaparral habitat under incentives programs for wildlife habitat, targeting land within CBCAs.
- Support existing programs and develop new economic incentive programs to solicit conservation and management agreements with private landowners to manage their land for natural values.
- Incorporate chaparral landbird objectives in public lands management plans.

º *Outreach:*

- Develop programs to provide technical assistance to landowners to create, manage, and maintain functional chaparral habitats (see Chapter 10).

Focal Habitats and Species

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<u>Conservation Focus</u>: Valley Chaparral
Focal Species: Nashville Warbler (*Vermivora ruficapilla*) - Umpqua Valley
Bewick's Wren (*Thryomanes bewickii*) - Rogue Valley

Populations:

T Breeding Bird Survey (Sauer et al. 1999):

• Nashville warbler: Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) increasing trend of 0.2%/year, and non-significant short-term (1980-1998) declining trend of 0.7%/year
• Bewick's wren: Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) declining trend of 0.5%/year, and non-significant short-term (1980-1998) increasing trend of 1.4%/year
• Bewick's wren: Willamette Valley: significant ($p<.10$) long-term (1968-1998) increasing trend of 6.1%/year, and non-significant short-term (1980-1998) increasing trend of 5.2%/year

Habitat Relationships:

T Anecdotal:

T Umpqua Valley (n=6 hardwood stands dominated by oak and madrone) (Cross and Simmons 1983):
• Nashville warbler: most abundant in the most structural diverse stands with highest shrub cover and vertical density (especially poison oak), and least abundant where shrub cover in understory was least
• Nashville warbler: two stands where most abundant, highest importance value rank was presence of madrone
• Nashville warbler: two stands where least abundant, highest importance value rank was presence of oaks
• Nashville warbler: abundance

	high	low	moderate
mean shrub cover	23-32%	1-14%	28-29%
mean dead and down	17-30%	41-69%	36-47%
mean grass cover	7-11%	18-26%	3-9%

T Oak and pine woodlands, south-central Washington, Klickitat County, Columbia Foothills (Manuwal 1997):
• Nashville warbler:
• very abundant in small pine-small oak and large fir-large oak habitats
• abundance negatively correlated with height of ponderosa pine
• abundance positively correlated with height of non-oak, non-pine species

Biological Objectives:

Habitat:

- ***Rogue and Umpqua Valleys*: Where ecologically appropriate, initiate actions in chaparral to maintain or provide the following conditions:**
  - **>40% native shrub cover (e.g., ceanothus, manzanita) interspersed with grassy openings and with or without scattered trees that comprise <30% canopy cover**

Population:

- ***Southern Pacific Rainforest BBS Region*: Nashville warbler, Bewick's wren - Maintain stable or increasing trends over the next 10 years (by 2010).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The biological objectives were subjectively developed based on the collective experience of several individuals.

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for maintaining stable BBS trends assumes that

actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of Bewick's wren and Nashville warbler on randomly located BBS routes.

Conservation Strategies:
These are specific to Bewick's wren and Nashville warbler; see pages 86-87 for general Conservation Strategies in chaparral.

- Avoid road building and development that fragments existing chaparral patches.
- Wherever possible, restore a fire regime to maintain existing chaparral and inhibit encroachment of conifer trees and infestations of invasive exotic plants.

Species to Benefit: The primary species to benefit from conservation of valley chaparral include spotted towhee, house finch, wrentit, Anna's hummingbird, and blue-gray gnatcatcher.

Information Needs:
1. Data are needed on all aspects of Bewick's wren and Nashville warbler nesting ecology and habitat relationships.

–

<u>Conservation Focus</u>: Montane Chaparral
Focal Species: Green-tailed Towhee (*Pipilo chlorurus*)

Populations:
- Anecdotal:
  - "fairly common summer resident in Siskyou Mountains" (Browning 1975)
  - "locally fairly common on brushy slopes in higher elevations of Siskyou Mountains" (Gilligan et al. 1994)
- Insufficient sample size for population trend analysis in the Southern Pacific Rainforest BBS Region.

Habitat Relationships:
- Anecdotal:
  - "occurs on brushy slopes" in southwestern Oregon (Gilligan et al. 1994)

<u>Biological Objectives</u>:

<u>Habitat</u>:

- ***Rogue Valley*: Where ecologically appropriate in montane habitats, initiate actions in chaparral to maintain or provide the following conditions:**
  - **>60% native shrub cover (e.g., ceanothus, manzanita)**
  - **<30% tree canopy cover**

Population:

- ***Rogue Valley*: None**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The biological objectives were subjectively developed based on the collective experience of several individuals. Populations within this habitat type are too small for BBS trend or abundance objectives.

Conservation Strategies:

These are specific to green-tailed towhee; see pages 86-87 for general Conservation Strategies in chaparral.

- Retain to the extent possible, shrubby brushfields during logging operations.
- Maintain brushfield habitat in large patches (i.e., reduce fragmentation).
- Where brush removal is necessary, conduct outside the breeding season (April 15-July 15).

Species to Benefit: The primary species to benefit from conservation of montane chaparral include fox sparrow, wrentit, and dusky flycatcher. Others to benefit include mountain quail, spotted towhee, Nashville warbler, and lesser goldfinch.

Information Needs:

1. Data are needed on all aspects of green-tailed towhee breeding ecology.
2. What is the most suitable ratio of cover between dense native shrubs and herbaceous openings?

–

Conservation Focus: Dense Shrubs in Oak Chaparral

Focal Species: Blue-Gray Gnatcatcher (*Polioptila caerulea*) - Rogue Valley
Wrentit (*Chamaea fasciata*) - Umpqua Valley

Populations:

- Anecdotal: Blue-gray gnatcatcher
  - "local uncommon summer resident in the hills of the Rogue Valley" (Gilligan et al. 1994)
- Breeding Bird Survey (Sauer et al. 1999):
  - Blue-gray gnatcatcher - insufficient sample size for population trend analysis in the Southern Pacific Rainforest BBS Region.
  - Wrentit - Southern Pacific Rainforests BBS Region: non-significant long-term (1968-1998) declining trend of 0.8%/year, and significant ($p<.10$) short-term (1980-1998) declining trend of 1.4%/year

Habitat Relationships:

- Anecdotal: Blue-gray gnatcatcher
  - occurs in vegetation zone where oaks and chaparral shrubs coexist" (S. Janes pers. comm.)
  - occurs in dense stands of buckbrush" (Gilligan et al. 1994)
- Rogue Valley, Lower Table Rock Preserve (Speer and Felker 1991):
  - Blue-gray gnatcatcher:
    - preferred habitat buckbrush shrubs, until oaks leafed out, then both
    - three of seven pairs fledged cowbirds

Biological Objectives:

Habitat:

- ***Rogue Valley*: Where ecologically appropriate, initiate actions in chaparral to maintain or provide the following conditions:**
  - **20-50% tree cover (mostly oaks, some pine also)**
  - **>80% native shrub cover (e.g., ceanothus, manzanita)**

Population:

- ***Rogue Valley*: Maintain cowbird parasitism levels <10% within specific study sites.**
- ***Rogue Valley*: Maintain and/or target for establishment 5 areas with small breeding populations (i.e., >10 pairs) in the next 10 years (by 2010).**
- ***Rogue and Umpqua Valleys*: Wrentit - Reverse declining trends to achieve stable populations (non-significant trends of <2%/year) or increasing trends in the next 10 years (by 2010).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The biological objectives were subjectively developed based on the collective experience of several individuals.

Blue-gray gnatcatcher population too small to analyze for regional trend objectives. This species appears to be highly susceptible to cowbird parasitism (Speer and Felker 1991), therefore, the need to maintain low levels of cowbird parasitism.

Conservation Strategies:

These are specific to blue-gray gnatcatcher and wrentit; see pages 86-87 for general Conservation Strategies in chaparral.

- Optimal areas for blue-gray gnatcatcher conservation should be distant from agricultural lands and the presence of cowbirds, and away from residential areas or other areas that support populations of western scrub jays (high predation levels).
- Avoid road building and development that fragments existing chaparral patches.

Species to Benefit: The primary species to benefit from conservation of dense shrubs in oak chaparral include lesser goldfinch, spotted towhee, Bewick's wren, house finch, and Anna's hummingbird.

Information Needs:

1. Data are needed on all aspects of blue-gray gnatcatcher and wrentit breeding ecology.
2. What is the most suitable ratio of cover between oak trees, dense native shrubs, and herbaceous openings?
3. What is territory size and habitat features that determine occupancy?

–

Conservation Focus: Herbaceous Interspersion in Oak Chaparral

Focal Species: California Towhee (*Pipilo crissalis*) - Rogue Valley

Lesser Goldfinch (*Carduelis psaltria*) - Umpqua Valley

Populations:

- Anecdotal: California towhee
  - "fairly common to uncommon permanent resident in chaparral-oak community" in Jackson County, Oregon (Browning 1975)
  - "uncommon to fairly common permanent resident of the Rogue Valley...very local resident in the Umpqua Valley" (Gilligan et al. 1994)
- Anecdotal: Lesser goldfinch
  - "common summer resident in the western valleys of Oregon" (Gabrielson and Jewett 1940)
  - "common in the Rogue and Umpqua Valleys, fairly common in the southern Willamette Valley, and more scarce northward in that valley" (Gilligan et al. 1994)
- Breeding Bird Survey (Sauer et al. 1999):
  - California towhee: Southern Pacific Rainforest BBS Region: significant ($p<.05$) long-term (1968-1998) increasing trend of 1.7%/year, and highly significant ($p<.01$) short-term (1980-1998) increasing trend of 2.0%/year
  - Lesser goldfinch: Southern Pacific Rainforest BBS Region: significant ($p<.20$) long-term (1968-1998) declining trend of 3.1%/year, and non-significant short-term (1980-1998) increasing trend of 1.2%/year

Habitat Relationships:

- Anecdotal:
  - California towhee: "characteristic of brushy hillsides in the Rogue and Umpqua valleys" (Gabrielson and Jewett 1940)
  - Lesser goldfinch: "found in chaparral comprised mainly of buckbrush interspersed with oaks" (Gilligan et al. 1994)

Biological Objectives:

Habitat:

- ***Rogue and Umpqua Valleys*: Where ecologically appropriate, initiate actions in chaparral to maintain or provide the following conditions:**

- **mix of shrub and herbaceous cover with each 30-60%**
- **<20% tree cover**

Population:

- ***Southern Pacific Rainforest BBS Region*: Maintain stable or increasing population trends over the next 10 years (by 2010).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The biological objectives were subjectively developed based on the collective experience of several individuals.

Monitoring of BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for stable or increasing BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of California towhee and lesser goldfinch on randomly located BBS routes.

Conservation Strategies:

These are specific to California towhee and lesser goldfinch; see pages 86-87 for general Conservation Strategies in chaparral.

- Where grazing is occurring, manage to ensure appropriate ratio of shrub and herbaceous cover.
- Wherever possible, restore a fire regime to maintain existing chaparral patches with herbaceous openings and inhibit encroachment of conifer trees and infestations of invasive exotic plants.

Species to Benefit: The primary species to benefit from conservation of herbaceous interspersion in oak chaparral include California quail, mourning dove, western kingbird, western meadowlark, chipping sparrow, and lark sparrow.

Information Needs:

1. Data are needed on all aspects of California towhee and lesser goldfinch ecology, particularly breeding ecology.
2. What are the ranges of percent herbaceous cover in oak chaparral for California towhee presence and abundance?

<u>Conservation Focus</u>: Cavities in Oak Chaparral

Focal Species: Oak Titmouse (*Parus inornatus*) - Rogue Valley

Black-capped Chickadee (*Parus atricapillus*) - Umpqua Valley

Populations:

T Anecdotal: Oak titmouse

- "common permanent resident in the Rogue Valley" (Gilligan et al. 1994)

T Breeding Bird Survey (Sauer et al. 1999):

- Oak titmouse: Southern Pacific Rainforest BBS Region: significant ($p<.05$) long-term (1968-1998) declining trend of 4.6%/year, and non-significant short-term (1980-1998) declining trend of 6.3%/year
- Black-capped chickadee: Southern Pacific Rainforest BBS Region: non-significant long-term (1968-1998) declining trend of 1.3%/year, and significant ($p<0.5$) short-term (1980-1998) declining trend of 2.5%/year
- Black-capped chickadee: Willamette Valley ($n=11$): non-significant long-term (1968-1998) increasing trend of 0.6%/year, and non-significant short-term (1980-1998) increasing trend of 0.1%/year

Habitat Relationships:

T Anecdotal: Oak titmouse

- "common in chaparral thickets of southern Oregon" (Gabrielson and Jewett (1940)
- "primarily found in oak and associated chaparral habitats in Rogue Valley" (Gilligan et al. 1994)

<u>Biological Objectives</u>:

<u>Habitat</u>:

- ***Rogue Valley*: Where ecologically appropriate, initiate actions in oak-chaparral to maintain or provide the following conditions:**
  - **>5 snags/ha (2/ac) >10 cm (4 in) dbh**
  - **30-70% canopy tree cover (oaks, madrone)**
  - **>5 trees/ha (2/ac) >40 cm (16 in) dbh**

<u>Population</u>:

- ***Rogue Valley*: Oak titmouse and black-capped chickadee: Reverse declining BBS trends to achieve stable populations (non-significant trends of <2%/year) or increasing trends in the next 10 years (by 2010).**

Assumptions/Rationale: "Ecologically appropriate" refers to the potential vegetation of the site, considering hydrology, soils, topography, and natural ecosystem processes. The biological objectives were modified from Schroeder (1983). The objective for canopy cover assumes a closed canopy will have less value due to lack of foliage in middle and lower canopy layers (Schroeder 1983). The objective for size of oak trees is to increase the likelihood of natural cavities.

Monitoring BBS trends provides a coarse means of assessing progress of conservation actions relative to populations with a known baseline. This is not intended

to replace monitoring that should occur to track progress at specific locations where conservation actions occur. The objective for reversing declining BBS trends assumes that actions to improve habitat will occur throughout the planning area, and the success of those actions will be reflected through increased abundance of oak titmouse and black-capped chickadee on randomly located BBS routes.

Conservation Strategies:
These are specific to oak titmouse and black-capped chickadee; see pages 86-87 for general Conservation Strategies in chaparral.

- Retain all standing dead oak trees for potential nesting habitat.
- In designated high priority sites, seek to develop large oak trees through thinning where necessary.
- Consider fungal inoculations to advance the decay process for cavity creation.
- Where habitat is otherwise suitable, but cavities are limiting, initiate a nest-box program as a short-term strategy to provide nesting cavities. This must be done in conjunction with long-term strategies for habitat enhancement and creation. To support the program, guidelines should be developed for issues such as placement of nest boxes, minimizing starling competition, and monitoring of nest boxes.

Species to Benefit: The primary species to benefit from cavities in oak chaparral include ash-throated flycatcher, white-breasted nuthatch, western bluebird, violet-green swallow, western screech owl, Vaux's swift, and house wren.

Information Needs:
1. Data are needed on all aspects of oak titmouse and black-capped chickadee ecology, particularly breeding ecology.
2. What are the parameters of oak tree size and density associated with oak titmouse presence and abundance?
3. What understory conditions are most suitable (i.e., what is preferred ratio of shrub and herbaceous cover)?

CHAPTER 7. STRATEGY OVERVIEW AND SYNTHESIS

Our goal for the ecosystem-driven landbird conservation strategy described in this document is to provide habitat to maintain healthy populations of focal species and other landbirds. To meet this goal, conservation actions must be:

- designed to meet habitat requirements of multiple species,
- implemented at several geographic and ecological scales, and
- coordinated among various landowners and land management agencies.

All of this will require careful consideration of implementation options to maximize conservation efforts and to integrate the diverse values and goals of land owners with that of bird conservation. Additionally, contributing partners must be committed to obtaining information needs as described previously to enhance and refine the conservation strategy over time.

Implementation of ecosystem management as described in this document can be achieved through integration of management actions for groups of focal species at various geographic scales (e.g., regional, sub-regional, watershed, management units). The biological objectives described earlier are intended to be the foundation for developing these comprehensive, integrated strategies. To facilitate that process, we have prioritized where management is most appropriate for each focal species and associated habitat feature (Appendix D).

Biological objectives for one focal species or habitat condition can be in direct conflict with those for another. Indeed, actions designed to manage for one species are often detrimental to other species; i.e., there may be "winners" and "losers" for any management action. For example, the objective to provide edge and openings within oak woodland for western wood-pewee is in direct opposition for the objective to maintain large tracts of contiguous oak woodland for white-breasted nuthatch. Thus, management actions must be employed in an integrated complementary design across the landscape. Depending upon the scale of the habitat management block, there also needs to be guidelines on the proportion and spatial distribution of the area desired in a particular condition or containing particular habitat attributes.

With the exception of large areas of public lands, it is impractical to attempt conservation for the entire landbird community on any one piece of property. At these smaller scales, management decisions should be based on how a parcel of land can contribute to conservation by emphasizing the most appropriate habitat conditions and focal species based on site-specific factors unique to that area. At larger scales, some biological objectives can be achieved simultaneously across a landscape through a combination of management actions.

It also will be important to consider where habitat conservation networks are necessary to conserve landbird populations. This is likely to include a coordinated network of several land uses to connect areas of suitable habitat for area-sensitive species such as western meadowlark.

A. Prioritization

The strategy emphasizes conservation efforts in areas where each species' abundance is greatest and presumably habitat is most suitable. To facilitate this, decisions on appropriate management actions need to be prioritized through several scales. These include, in order of size, a geographic scale (physiographic province), a plant community scale (habitat type), a vegetative condition scale (habitat condition), and a site-specific scale (micro-habitat features). Information on prioritization for the first two scales is presented in Appendix D, for the latter two scales in species accounts and Appendix E.

B. Future Versions

This is the first version of what is intended to be a "working document" with continual revisions and expansions as new information becomes available. Future versions will likely include an expansion of the number of species addressed and additional habitat and population objectives. As additional species are added and biological objectives are revised and updated, a more complete ecosystem management plan will be continually formulated. Ultimately, we envision a regional landscape where integrated conservation for multiple species is being implemented as part of ecosystem management.

CHAPTER 8. MONITORING/RESEARCH

When conservation actions are undertaken as described in this document, monitoring and/or research programs should be designed and implemented to:

- test the effectiveness of management actions,
- evaluate assumptions built into biological objectives, and
- direct adaptive management to achieve desired results.

Monitoring will be essential to evaluate the success of actions implemented. In conjunction with research, monitoring also will be important for providing data to revise and update biological objectives. Research is particularly essential since most biological objectives are based on limited data and assumptions.

A. Integration

The strategy offers numerous opportunities for integration of monitoring and research activities. In addition to the need for validation of the biological objectives, two recurrent themes for research integration with the strategy are:

- species or community reproductive success under various environmental conditions, and
- landscape assessments of species habitat needs.

Data are especially needed on reproductive success of focal and other species to provide the best measure of population health, and determine where source and sink habitats are occurring. Examples of studies which have used reproductive data to identify suitable nesting habitat are McCoy et al. (1999) and Altman (in prep).

B. Methods

The Handbook of Field Methods for Monitoring Landbirds (Ralph et al. 1993) has done much to promote the standardization of monitoring methods, allowing for comparisons across space and time. The handbook is available from the Pacific Southwest Research Station (PO Box 245, Berkeley, CA 9470, 510-559-6300). In addition, The U.S. Fish and Wildlife Service recently published a Statistical Guide to Data Analysis of Avian Monitoring Programs (Nur et al. 1999), which is available from the authors, and should be considered essential to anyone designing a monitoring program.

Nest-finding for many ground, shrub, and riparian canopy nesting species (e.g., western meadowlark, willow flycatcher, warbling vireo, respectively) can be problematic due to their secretive behavior, dense undergrowth, or high canopy. However, there are several alternatives not detailed in the aforementioned publications for assessing reproductive success for species in which nest-finding and/or monitoring is difficult. One is an observational approach that uses breeding behaviors indicative of various stages in the reproductive cycle to categorize nesting status (Vickery et al. 1992), similar to that used in Breeding Bird Atlases. The highest level of reproductive behavior observed is ranked, and this reproductive index can then be used as a measure of fitness. It can also be used for species that are rare or where there are concerns about nest disturbance during breeding. Another alternative is use of song types to indicate mated status of singing males. This doesn't indicate nest success, but it can indicate pairing success and distinguish habitats of nesting birds from habitats supporting non-nesting adults or floaters in the population. Another alternative is use of constant-effort mist-netting to calculate indices of productivity through determination of adults in breeding condition and ratios of young/adult captures. This method may only be appropriate for ground and shrub associated species that are most likely to be captured in mist-nets, and for some species does not necessarily track local productivity (Silkey et al. 1999).

Owing to environmental heterogeneity, indicators often vary more among monitoring sites than within monitoring sites over time. For this reason, permanent plots (as opposed to plots that shift annually) are a valuable way to control for among-site variability (Gibbs et al. 1999). The establishment of multiple, long-term monitoring programs is an integral part of this strategy.

C. Implementation

Suggestions for general research topics were presented in the Information Needs section of each species/habitat attribute sections that described biological objectives. Additionally, the following topics are common themes of research needs to support landbird conservation in Westside Lowlands and Valleys:

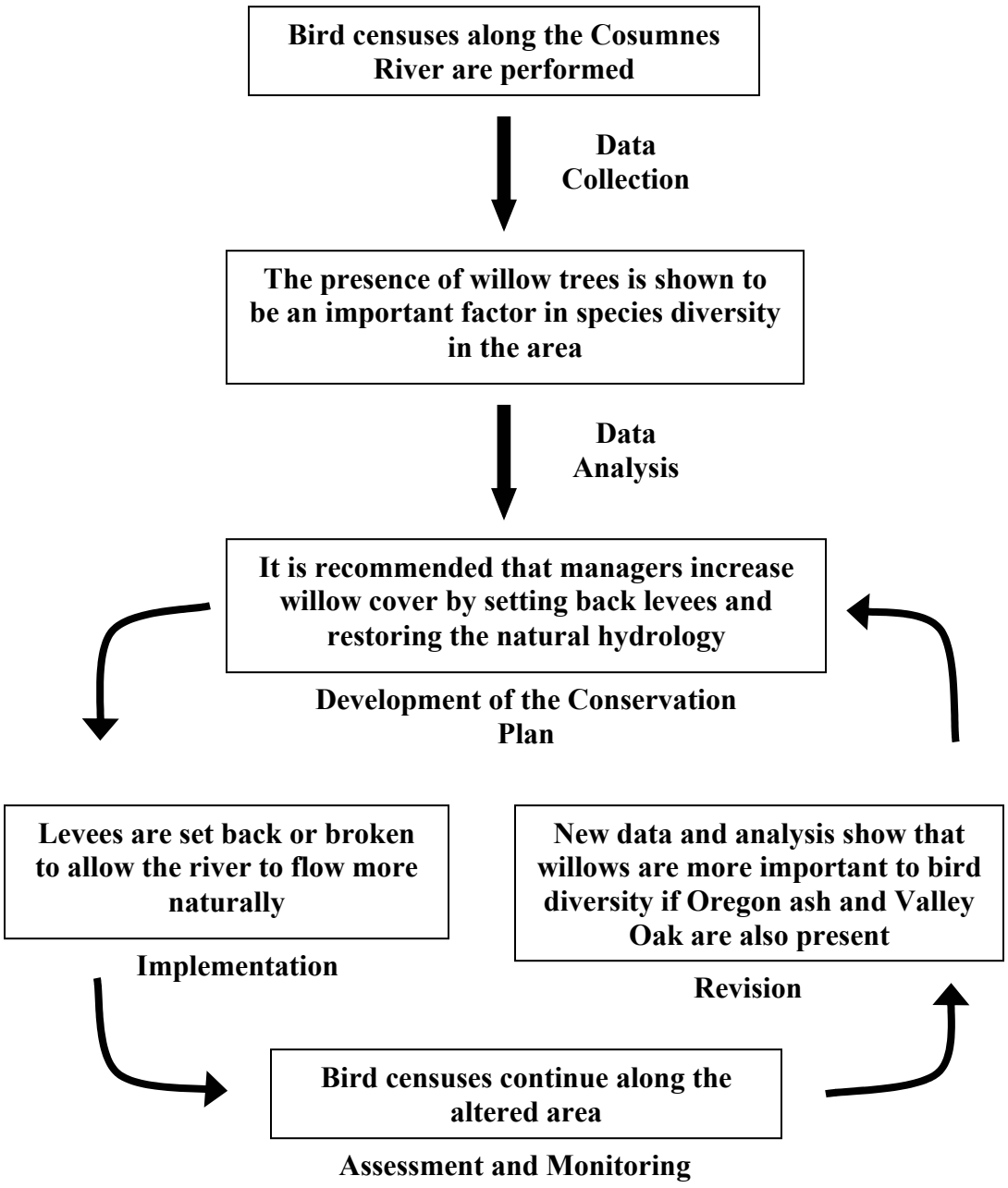
- Population viability of species in unmanaged and managed habitats, and native and non-native habitats.
- Parameters (e.g., extent, type, distribution) associated with successful nesting of species associated with deciduous riparian vegetation.
- Response of landbirds to various types of agricultural practices.
- Area requirements and landscape patterns for populations of species considered area sensitive (e.g., western meadowlark).

- Threshold levels of habitat and landscape parameters necessary to provide for self-sustaining populations of landbirds.
- Effects of predation and parasitism in riparian forest and oak woodlands relative to adjacent land uses.
- Means to avoid, eliminate, or minimize impacts of non-native competitors and predators.
- Large, multi-species studies on effects of fragmentation on bird populations.
- Species fitness measures (reproduction and survival) should be incorporated in all future studies.

D. Adaptive Management

The direct outgrowth of monitoring and research conducted as part of this strategy should be adaptive management. Monitoring and research are part of the adaptive management loop that provides a framework to increase our knowledge base and revise biological objectives with updated information. One example of an adaptive management feedback loop, adapted from ongoing monitoring by the Point Reyes Bird Observatory, is illustrated in Figure 3.

Figure 3. Example of an adaptive management feedback loop using monitoring to define and modify management prescriptions



CHAPTER 9. IMPLEMENTATION

A. Key Partners

Implementation of landbird conservation will require a broad range of partnerships, an extensive amount of cooperation, and considerable financial resources. Participation will be necessary from federal and state natural resource agencies, agricultural organizations, academia, private environmental organizations, and particularly private landowners. One successful framework for bringing together diverse interests and groups is that of the Joint Venture.

Conservation of landbirds will require not only strategies and management actions by land managers, but also increased public awareness, commitment, and political support. This means information must be communicated to the public about the benefits of conservation. The United States Department of Agriculture maintains service centers throughout the region that house both NRCS and Conservation District personnel who can work with private landowners to accomplish common goals.

B. Interface with Other Planning/Conservation Efforts

This conservation strategy has broad applicability to many other conservation planning efforts. Information supplied in this document should be integrated into existing habitat restoration programs and, used in development of site-specific conservation plans such as State and private Habitat Conservation Plans, agency and inter-agency Management Plans, and local land-use planning strategies. Areas designated for conservation or management in other conservation plans (e.g. TNC Ecoregion Plans, Willamette Restoration Initiative) may provide for conservation as directed in this document. These areas should be evaluated a priori to ascertain their role in conservation as directed in this document.

There are several programs administered by the USDA that provide resources, financial and otherwise, for individual land owners wishing to manage for wildlife. Several of these are outlined in the following section.

C. Opportunities for Participation

Opportunities for participation in landbird conservation as described in this document are numerous. This could occur at any level from a small landowner providing habitat for one species to detailed, complex multi-agency/organization multi-species conservation within large

scale management units (e.g., Willamette Valley). Below we list some resources available to individual land-owners who would like to improve wildlife habitat on their property.

1. Resources for individual landowners

There are numerous voluntary programs sponsored under the 1996 Farm Bill that provide financial and technical assistance to landowners wishing to establish or improve fish and wildlife habitat. The U.S. Department of Agriculture (USDA) administers these programs through the Farm Services Agency (FSA) and they are implemented by the Natural Resources Conservation Service (NRCS). Brief descriptions of several USDA programs, as well as other sources of financial assistance are listed below.

- Wildlife Habitat Incentives Program (WHIP) provides technical assistance and pays up to 75% of the cost for wildlife habitat development. Cost-share agreements are for a minimum of 10 years. The program objectives are to connect upper and lower watershed habitats, enhance native plant communities, improve salmon habitat, increase biodiversity, and improve habitat for threatened and endangered species.

- The Conservation Reserve Program (CRP) provides technical assistance, cost-share, and rental payments to prevent soil erosion, improve water quality, and enhance wildlife habitat. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as native grasses, wildlife plantings, or riparian buffers. Farmers receive an annual rental payment for the term of the contract, and cost sharing is provided for vegetative improvements. Contracts can be for 10 years or more.

- The Environmental Quality Incentives Program (EQIP) offers farmers and ranchers technical support, cost-share payments, and incentive payments for ranchers and farmers who face serious threats to soil, water, and related natural resources. Contracts are for 5-10 years and are based on a conservation plan to improve environmental quality. Persons engaged in livestock or agricultural production with less than 1,000 head of cattle are eligible.

- Conservation Farm Option (CFO) is a USDA pilot program for among others, producers of wheat and grain feeds. The programs scope is non-restrictive as to what measures may be included in the conservation plan, so long as they provide environmental

benefits. The program is limited to landowners who have contract acreage enrolled in the Agricultural Market Transition Act program, i.e. production flexibility contracts.

■ The Conservation Reserve Enhancement Program (CREP) is a joint agreement between participatory states and the USDA that focuses on long-term, voluntary protection of environmentally sensitive cropland through filter strips, forested riparian areas, establishment or restoration of wetlands, and ground cover for threatened wildlife species. Agreements were signed in Oregon and Washington in October 1998 that provide 250 million dollars per state. The project areas include private agricultural lands along all streams in Oregon and Washington that provide current or historical habitat for 19 species of salmon and trout listed under the Act. In each state up to 40,325 ha (100,000 ac) of private cropland and grazing land will be eligible for inclusion in this program. Up to 38,300 ha (95,000 ac) will be planted to riparian buffers and up to 2,015 ha (5,000 ac) of wetlands will be restored. A total of up to 4,000 miles of important freshwater streams will be enhanced or restored under this program. While this program is designed to create and improve habitat for fish, riparian birds will benefit tremendously from restoration efforts.

■ Wildlife Habitat Conservation and Management Program is administered by the Oregon Department of Fish and Wildlife and provides a property tax incentive to encourage landowners to protect and enhance wildlife habitat on private land. Property enrolled is assessed for farm use, even if the property is not farmed. Only property zoned for exclusive farm use or mixed farm and forest use is eligible. County participation is voluntary and not all counties allow this program. Currently, Marion, Polk, and Deschutes counties use this tax incentive program.

■ The National Fish and Wildlife Foundation maintains several initiatives that help private landowners manage for fish and wildlife by providing matching funds. The Pacific Northwest Region is administered under the direction of Jerry Clark, 1120 Connecticut Avenue, NW, Suite 900, Washington, D.C. 20036.

2. Bird-friendly agriculture

Written primarily for orchards, this white paper is available through the Point Reyes Bird Observatory (4990 Shoreline Hwy. Stinson Beach, CA 94970, www.prbo.org)

3. Bird-friendly backyards

Especially in suburban areas, even small residential landowners can provide habitat for birds. Concepts of backyard habitat have traditionally focused on bird feeders, nectar providing plants and nest boxes. More recently information about planting design have been incorporated with an eye towards providing quality nesting or wintering habitat. Several organizations that provide information and assistance can be accessed via the world wide web.

- The National Wildlife Federation Backyard Wildlife Habitat Program: www.nfwf.org/habitats

- The Point Reyes Bird Observatory has an informational brochure on landscaping for birds (4990 Shoreline Hwy. Stinson Beach, CA, www.prbo.org)

CHAPTER 10. OUTREACH

In order for bird conservation to be successful, the message must reach a broad audience outside of the scientific and land management community including educators, government officials, planners, school children, and the general public. Efforts to monitor and draw conclusions about wildlife populations and make recommendations on how to meet biological objectives will prove in vain without the support of affected local communities. The best way to gain this support is to ensure that information from research and management programs is shared in a manner that provides the opportunity for interested people to become involved at all levels of the conservation effort.

A. Public and Agency Outreach

Outreach may be accomplished in many ways including newspaper articles, radio/TV features, workshops, conferences to convey technical assistance concerning best management practices, bird festivals, demonstration sites, volunteer restoration and monitoring programs, and school activities. As emphasized throughout this document, this will be most effective if it is coordinated with partners, especially public outreach personnel affiliated with the agencies and non-governmental organizations within PIF.

B. Conservation Education

Creating an understanding of the issues results in the public support needed to further conservation goals for birds. Educational programs tend to be most engaging and therefore most effective if they involve hands-on, participatory activities. There are numerous resources available for educators. The Point Reyes Bird Observatory has prepared teacher resource packets for various ages. These are available for no charge through the Point Reyes Bird Observatory (www.prbo.org).

C. Key Concepts about Bird Conservation

The following is a list of key concepts for bird conservation that should be communicated through education and outreach programs. These concepts are important to include in any program concerning conservation, and they are indispensable in programs focusing on birds.

- Productivity (the number birds produced per adult each year) directly affects whether or not the population increases or decreases. Productivity may be the single most

important factor influencing population health. Productivity is influenced by a number of factors such as habitat quality, predation, parasitism, nest site availability, and food availability.

■ Birds nest everywhere from directly on the ground to the tops of trees, but generally most birds nest within five meters of the ground. Different species nest in different areas. To help protect birds while they are nesting it is important to consider that habitat needs for different species vary. This means leaving herbaceous areas for ground nesters; shrubs and plants for open cup nesters; dead trees and snags for cavity nesters (birds that nest in holes in trees); and trees for canopy nesters (birds that build their nests in the tops of trees).

■ Birds nest during the spring and early summer of each year and raise their young in a rather short period: peak breeding season covers about three months; most eggs are incubated approximately 1-2 weeks; young develop from hatchling to fledgling in as little as 10 days. Nestling birds are particularly sensitive to changes in the environment and thus are sensitive indicators of ecosystem health. Mowing or clearing vegetation during breeding season may remove potential nest sites, directly destroy nests, expose nests to predators, and decrease food sources such as insects. Smart predators, such as cats, crows and jays, can decimate breeding populations by learning to find and prey on nests.

■ The understory (weedy and shrubby growth underneath trees) is crucial to birds when nesting. A healthy and diverse understory with lots of ground cover offers many well-concealed nest sites. Not only does the understory provide a site for ground and open cup nesters to build their nests, but it is also the area where many birds find food for their young. Manicured parks and mowed lawns provide poor nesting conditions for all but a few bird species.

■ Plants and vegetation native to the area provide birds with the natural habitats with which they have evolved. Introduced species may not provide the same nutrition. They are also more invasive and can quickly take over an area as the dominant plant type reducing the diversity of vegetation that is important to bird populations.

■ Interactions with predators are a natural and essential part of an ecosystem. However, introduced non-native predators or increased numbers of natural predators can severely affect the health and persistence of bird populations. Feeding wildlife, especially foxes, raccoons, and skunks, should be discouraged. Feeders that are frequented by jays and crows and cowbirds should not be maintained during the breeding season (most songbirds

feed their young insects). The domestic cat is also having a severe impact on bird populations. Pet cats as well as feral cat populations (groups of cats that have escaped from their owners that are now living "wild") are responsible for an estimated 4.4 million birds killed each day by cats (Stallcup 1991). Well fed outdoor house cats are better hunters and feral cat populations supplemented by food in parks and other areas are subsidized predators. It is not true that a well-fed cat will not hunt. Generally, the healthier the cat the better the hunter.

■ Natural processes, such as flood and fire, are integral components of a healthy ecosystem. They provide the natural disturbance needed in an area to keep the diversity of the plant community high, which is of utmost importance to many birds.

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Appendix A1. Characteristics of Level IV Ecoregions in the Puget Lowlands of western Washington

Ecoregion	Area (sq mi)	Physiography	Elevation (ft)	Potential Natural Vegetation	Land Use and Land Cover
Fraser Lowland	344	Undulating glacial drift plains, terraces, and floodplains with low gradient, meandering streams and rivers.	0-400	Western hemlock, western red cedar; some red alder, bigleaf maple, black cottonwood, Douglas-fir.	Pastureland, dairy farms, hay farming, urban/rural residential development. Some riparian deciduous forests.
Eastern Puget Riverine Lowlands	677	Floodplains and terraces with meandering rivers, oxbow lakes, and meander scars. Freshwater and estuarine wetlands occur but were more common in the past.	0-800	Western red cedar, western hemlock; some red alder, black cottonwood, bigleaf maple, Sitka spruce.	Crop and pastureland (e.g., reclaimed wetland); some riparian deciduous woodland, coniferous forests, wetlands;rural/residential/suburban /urban/ industrial activity.
San Juan Islands	218	Glacial scoured islands with small intermittent streams and limited surface water.	0-2400	Douglas fir, grand fir; some oak woodlands, grasslands, red cedar.	Coniferous forests, some oak woodlands. Crop and pastureland, recreation, rural residential development, towns.
Olympic Rainshadow	758	Rolling glacial till plains with small, low to medium gradient streams. Drainage patterns often deranged or internal. Fresh water supplies limited in the east.	0-1800	Western hemlock, western red cedar, Douglas-fir; some grasslands, grand fir.	Pasture and cropland, woodland dominated by Douglas-fir. Forestry, rural residential development.
Eastern Puget Uplands	1142	Rolling moraines and foothills with lakes and sinuous streams and rivers.	0-2677	Western hemlock western red cedar; some Douglas-fir.	Douglas-fir/western hemlock forests. Forestry, pasture and cropland, rural residential/suburban/urban development.

Central Puget Lowland	1698	Undulating glacial drift plains with lakes and small, sinuous streams. Coastline is irregularly shaped. Characterized by many bays and some cliffs.	0-1000	Western hemlock western red cedar, Douglas-fir; some red alder, bigleaf maple.	Urban/suburban/industrial, especially in east. Elsewhere, Douglas-fir/western hemlock forests, forestry, limited agricultures, rural residential development.
Southern Puget Prairies	809	Nearly level to rolling glacial outwash and till plains with low gradient streams and lakes.	0-900	Douglas-fir, prairies; some oak woodland, western hemlock, red cedar.	Douglas-fir/western hemlock forests, prairies, oak woodlands. Forestry, hay farming, pastureland. Mix of military and private land ownership.
Cowlitz/Chehalis Foothills	437	Low rolling to steeply sloping hills with medium to high gradient streams. Unaffected by continental Vashon glaciation.	300-1200	Western hemlock, western red cedar; some Douglas-fir, bigleaf maple.	Douglas-fir and western hemlock forests. Forestry, rural residential development, hay farming, pastureland.
Cowlitz/Newaukum Prairie Floodplains	357	Rolling terraces and floodplains with meandering streams and oxbow lakes. Unaffected by continental Vashon glaciation.	150-800	Western hemlock, western red cedar; some Douglas-fir, bigleaf maple, oak woodlands, prairies.	Pastureland, cropland, rural residential development, some coniferous and deciduous forests, forestry.

Appendix A2. Characteristics of Level IV Ecoregions in the Rogue and Umpqua Valleys of western Oregon.

Ecoregion	Area (sq mi)	Physiography	Elevation (ft)	Potential Natural Vegetation	Land Use and Land Cover
Rogue/Illinois Valleys	285	Terraces and floodplains in mountain valleys; perennial streams	100-600	Oregon white oak, madrone, California black oak, ponderosa pine, grasslands	mix of orchards, croplands, pastureland, oak and pine woodland, towns, rural residential development

Siskiyou Foothills	818	Moderatley sloping mountain foothills with reservoirs and perennial and intermittent streams and rivers	600-2,000	Ponderosa pine, Douglas-fir, Oregon white oak, California black oak, madrone	Drier areas dominated by oak woodlands and ponderosa pine. Wetter areas mostly Douglas-fir and incense cedar. Mix of grazing, rural residential development, orchards, cropland, and forestry
Umpqua Interior Foothills	921	Narrow interior valleys, terraces, and foothills	400-1,500	Oregon white oak, Douglas-fir, ponderosa pine, madrone	Mix of oak woodlands and coniferous forest with pastureland, vineyards, orchards, row crops, rural residential development and towns.

Appendix A3. Characteristics of Level IV Ecoregions in the Willamette Valley of western Oregon.

Ecoregion	Area (sq mi)	Physiography	Elevation (ft)	Potential Natural Vegetation	Land Use and Land Cover
Portland/ Vancouver Basin	574	Undulating terraces and floodplains with low gradient, meandering streams. Numerous wetlands, oxbow lakes and ponds.	0-300	Prairies (maintained by Native American burning), Oregon white oak, Douglas-fir, Oregon ash, alder, western red cedar.	Urban/suburban/rural residential/ industrial activity, pastureland, nursery crops.
Willamette River and Tributaries Gallery Forest	675	Floodplains with low gradient, incised, strongly meandering rivers and associated oxbow lakes/meander scars.	400-500	Cottonwood, alder, Oregon ash, bigleaf maple, Douglas-fir.	Vegetable and fruit farming, pastureland, urban/suburban/rural residential development, forested riparian areas, flood control.

Prairie Terraces	**1971**	**Nearly level to undulating fluvial terraces with sluggish, meandering streams and rivers. Historically, seasonal wetlands and ponds common. Many streams now channelized.**	**160-500**	**Oregon white oak, prairies (maintained by Native American burning). In wetter areas: Oregon ash, Douglas-fir.**	**Grass seed, grain farming (often on reclaimed wetland). Also urban/rural residential development and some forested riparian zones.**
Valley Foothills	**2527**	**Rolling foothills with medium gradient, sinous streams**	**10-1500**	**On drier sites: Oregon white oak and madrone. In moister areas: Douglas-fir more common. Some western red cedar.**	**Rural residential development, pastureland, coniferous and deciduous forests, forestry, vineyards, Christmas tree farms, orchards.**

Appendix B. Considerations for prioritizing conservation of breeding native landbird species highly associated with grassland-savannah, oak woodland, riparian, and chaparral habitats in the Westside Lowlands and Valleys Landbird Conservation Planning Region.

Species	PIF 93 Score[a]	AI[b]	PT[c]	%Pop PIF 93[d]	BBS Trend WVL[e]	BBS Trend 93L[f]	BBS Trend 93S	OR Mgt Index[g]	WA Mgt Index	Habitats[h]			
										RP	GS	OW	CH
White-tailed kite										x	x		
Northern harrier	17	2	3	<1				5	5		X		
Red-tailed hawk	13	4	2		3.4	1.0	3.1*	3	5	x	x	x	x
Red-shouldered hawk										X			
Sharp-shinned hawk	16	3	3					3	6	x			
Cooper's hawk	16	3	3					4.4	6	x			
American kestrel	14	2	5	<1	2.4	-7.7**	-8.5***	11	3		x		x
Western screech owl	19	4	3	10.9							x	x	x
Burrowing owl	19	2	3					8	12		X		
Short-eared owl	18	1	3	<1				5	4.6		X		
Mountain quail	23	3	2	32.3		1.0	1.5						x
California quail	22	3	4	8.6	-1.6	-0.9*	-1.5				x		x
Killdeer	18	3	5		-0.7	-2.3*	-0.7	9	7.6		x		
Band-tailed pigeon	23	5	5	36.5		-2.5**	-4.4*	10	12			x	
Mourning dove	12	2	5		-1.8	-3.7****	-4.5****	7	4.7		x	x	x

Species	PIF 93 Score[a]	AI[b]	PT[c]	%Pop PIF 93[d]	BBS Trend WVL[e]	BBS Trend 93L[f]	BBS Trend 93S	OR Mgt Index[g]	WA Mgt Index	Habitats [h]			
										RP	GS	OW	CH
Yellow-billed cuckoo	19	2	3							X	x		
Common snipe	14	2	4	<1							x		
Common nighthawk	17	2	5	<1		-9.3****	1.5	5	5.3		x		x
Common poorwill	19	3	3					7	7.4				x
Vaux's swift	22	5	2	32.9	13.7	-4.6**	4.0	12.3	12		x		x
Anna's hummingbird	16	2	2	10.2		0.4	2.4	10.5	8.7				x
Rufous hummingbird	25	5	5	9.8	-2.0	-3.2****	-1.6**	11	12	x		x	
Belted kingfisher	18	4	5	1.9		-1.9*	-1.5			X			
Acorn woodpecker	15	2	3	6.5		-2.3*	-1.7***				x	X	x
Downy woodpecker	15	3	4	1.1		-0.2	1.8			x		x	
Lewis' woodpecker	23	2	3	<1				11	9	x	x	X	x
Northern flicker	13	4	2		0.9	-1.0	0.2	4.2	5	x	x	x	x
Pileated woodpecker	15	3	3	2.4		-2.8	0.1			x			
Red-breasted sapsucker	21	3	2	5.5	0.1	2.4	4.7**	5	8	x			
Pacific-slope flycatcher	25	5	5	47.4	1.0	-1.9**	-1.9***	9	9	X		x	
Western wood-pewee	19	4	5	5.1	-0.9	-3.0****	-0.9	7	5	X	x	X	x
Willow flycatcher	23	5	5	15.2	-3.7	-3.8***	-2.1*	9	8	X			
Western kingbird	16	2	3	<1		-1.4	-6.9**	10	9		X		x

Species	PIF 93 Score[a]	AI[b]	PT[c]	%Pop PIF 93[d]	BBS Trend WVL[e]	BBS Trend 93L[f]	BBS Trend 93S	OR Mgt Index[g]	WA Mgt Index	Habitats[h]			
										RP	GS	OW	CH
Ash-throated flycatcher	18	2	3	1.3		0.6	-2.6***	5	8		x	X	x
Black phoebe	17	3	2	9.5		3.5***	2.9*			X			
Say's phoebe	16	2	3					9	9		x		
Streaked horned lark	13	1	4	100					7		X		
Purple martin	16	2	3	<1		-1.8	2.8	5.2	5.3	X			
Tree swallow	17	3	5	1.9	-2.6	-2.0	-0.3	4.5	6	X	x		
Violet-green swallow	18	5	2	10.6	0.3	-0.5	0.2	9	7		x		x
Rough-winged swallow	16	3	3		0.4	-1.8	0.8	9	8	x			
Cliff swallow	13	3	4		0.1	-1.8**	-2.9**	5	5		x		
Barn swallow	16	5	5	2.2	-2.3***	-3.2****	-2.8****	7	9		x		
Western scrub-jay	16	3	1	12.2	0.7	1.1*	0.9				x	X	x
Oak titmouse	24	2	3	2.7		-4.6***	-6.3					X	x
American crow	11	4	2		0.2	4.6	0.8			x	x	x	
Black-capped chickadee	13	3	2	2.6	0.6	-1.3	-2.5***			x		x	
Bushtit	16	3	3	10.6	4.1	-12.0****	-9.8****			x		X	x
White-breasted nuthatch	16	1	5	<1	-9.9****	-0.2	-0.9			x	x	X	x
Brown creeper	17	4	3	12.7	6.6	1.6	-0.6			x		x	
Bewick's wren	18	3	3		6.1**	-0.5	1.4			x		x	x

Species	PIF 93 Score[a]	AI[b]	PT[c]	%Pop PIF 93[d]	BBS Trend WVL[e]	BBS Trend 93L[f]	BBS Trend 93S	OR Mgt Index[g]	WA Mgt Index	Habitats [h]			
										RP	GS	OW	CH
House wren	11	2	3	<1	-1.8	-3.0	-5.0*	3	2	x		X	x
Blue-gray gnatcatcher	14	2	3	<1				11					X
Swainson's thrush	20	5	5	2.7	-3.2	-0.8*	-0.5	8	6	X		x	
American robin	12	5	2		-1.1	-0.2	0.7*	3	4	x		x	x
Western bluebird	20	2	5	3.7		-3.5***	-4.3*	7	6.6		x	x	x
Wrentit	25	4	3	24.2		-0.8	-1.4**			x			x
Cedar waxwing	14	4	2		-1.6	1.2	1.5	4	5	X		x	
Cassins' vireo	22	4	2	11.6	-4.2	0.0	2.1*	5	10	x		x	
Hutton's vireo	21	5	2	45.2		1.2	0.2					X	
Warbling vireo	18	4	2	5.0	6.4*	0.0	-0.8	10	3	X		x	
Red-eyed vireo	14	2	3	<1				13	8	X			
Yellow warbler	15	2	5	<1	-4.7	-5.0	-2.4	12	11	X			
Orange-crowned warbler	16	3	5	1.3	0.0	-2.8****	-4.2****	13	9	x		x	
Black-throated gray warbler	24	5	3	39.4	19.8*	0.8	-0.6	9	8	x		x	
MacGillivary's warbler	22	4	5	9.2	-5.9	-3.0****	-1.9*	6	9	x		x	
Nashville warbler	18	3	3	2.0		0.2	-0.7	5	8			X	
Wilson's warbler	17	5	2	3.1	-1.5	-0.1	-2.1****	10	11	x		x	

Species	PIF 93 Score[a]	AI[b]	PT[c]	%Pop PIF 93[d]	BBS Trend WVL[e]	BBS Trend 93L[f]	BBS Trend 93S	OR Mgt Index[g]	WA Mgt Index	Habitats [h]			
										RP	GS	OW	CH
Common yellowthroat	12	3	1		-1.0	7.8****	5.7****	8	5	X	x		
Yellow-breasted chat	16	2	3	1.5		-0.7	2.2*	13	11	X			
Black-headed grosbeak	20	5	2	17.9	-1.6	0.9**	2.3****	5.2	8	x		x	
Western tanager	20	4	4	9.7	-2.7	-0.1	2.4**	9	7			x	
Lazuli bunting	21	5	3	10.7	1.8	-4.3***	-0.4	9	6		X	x	x
Spotted towhee	18	5	2	12.2	0.8	0.9	1.5		3	x		x	x
Green-tailed towhee	17	1	3	<1				10					X
California towhee	19	2	3	9.6		1.7***	2.0****						x
Chipping sparrow	15	2	5	<1	-6.2	-8.2****	-4.4****	8.2	9		x	X	x
Oregon vesper sparrow	13	1	3	100				7	10		X		
Lark sparrow						-4.9**	-6.0	8.5	9		x		x
Savannah sparrow	12	3	2		-2.6*	2.0*	0.0	5	6		X		
Grasshopper sparrow	15	1	3	<1				8.5	11		X		
Song sparrow	14	4	5	3.3	-1.0	-1.1****	-1.0***	7.5		x	x	x	
White-crowned sparrow	16	4	5		2.3	-3.3****	-2.1***	11	4		x	x	
Dark-eyed junco	15	5	5	11.5	3.4***	-2.7***	-2.1***	7	4.1			x	
Western meadowlark	16	1	5	<1	-19.3****	-6.8****	-5.0*	11	8		X		x
Brewer's blackbird	15	3	5		-4.9****	-3.4*	-2.7***	6.6	7		x		x

Species	PIF 93 Score[a]	AI[b]	PT[c]	%Pop PIF 93[d]	BBS Trend WVL[e]	BBS Trend 93L[f]	BBS Trend 93S	OR Mgt Index[g]	WA Mgt Index	Habitats[h]			
										RP	GS	OW	CH
Brown-headed cowbird	13	3	5		-3.3	-2.8****	-1.8**	3	3	x	x	x	x
Bullock's oriole	20	3	5	2.7	1.9	-3.1***	-2.9	6.5	7	X		x	x
Purple finch	18	5	2	9.0	-2.7	-1.2	-3.6****	5.3		X		X	
House finch	10	3	2		1.2	-0.9	2.6			x		x	x
Lesser goldfinch	18	3	5	7.8		-3.1*	1.2				x		x
American goldfinch	17	5	5		-5.2****	-2.4***	-1.7**	7	3.3	x	x	x	x

PIF 93 is a Partners in Flight Planning Region based on the Breeding Bird Survey Physiographic Strata 93 - Southern Pacific Rainforests. It includes everything west of the Cascade Mts from the Washington/British Columbia border south to northwestern California north of San Francisco. Shaded cells indicate values that suggest some conservation concern.

[a] Priority scores were generated by the Colorado Bird Observatory (1/28/98) and include quantitative and qualitative factors such as population trend, breeding distribution, and threats on wintering grounds. 93=Southern Pacific Rainforests. Only priority scores $ 20 are shaded.

[b] AI = Importance of Area; scores were generated by the Colorado Bird Observatory (1/28/98) and modified by local expert opinion. 93=Southern Pacific Rainforests. This score uses BBS data to evaluate the abundance of a species within a physiographic area relative to its abundance throughout its range. It attempts to identify areas of high importance to a species, and is used to indicate the responsibility of those areas to that species conservation. Only scores of 5 (highest importance) are shaded; these indicate the species reaches its maximum abundance in this physiographic province.

[c] PT = Population Trend; PT uses BBS data to rate the magnitude and direction of the BBS population trend, 1 = significant increase, 2 = stable, no trend, or possible increase, 3 = no data, insufficient data, or trend unknown, 4 = possible decrease, 5 = significant decrease.

[d] Rosenberg and Wells (in press); percent of population within physiographic area calculated from percent of species range within the physiographic area weighted by BBS relative abundance; 93=Southern Pacific Rainforests; only percent population amounts >10% are shaded.

[e] Sauer et al. (1999); Willamette Valley long-term (1968-1998) trends; only significant trends or trends for species that occurred on at least 6 of the 11 routes.

[f] Sauer et al. (1999); **** P<.01, *** P<.05, ** P<.10, * P<.20; Blank cells indicate no BBS trend is available for that species. This is most often due to inadequate sample sizes for analysis. 93L = long term, 1966-1998; 93S = short term 1980-1998; trends only presented for species that occurred on >14 routes.

[g] Management index scores were generated by OR/WA PIF, and include many of the same factors as the Colorado Bird Observatory process (see Andelman and Stock 1994). Scores for resident birds were not included in this process. Only management index scores $10 are shaded.

[h] RP = riparian forest and shrub; GS = grassland-savanna; OW = oak woodland; CH = chaparral; X = species reaches greatest abundance in this habitat; x = species highly associated with this habitat, but not necessarily most abundant in this habitat

Appendix C Bird Conservation Areas in the Westside Lowlands and Valleys Landbird Conservation Planning Region.

The following areas have been identified as potential Bird Conservation Areas (BCAs). The list is not intended to be a complete or final list of the best sites for landbird conservation, but does represent some examples of areas we feel would benefit from immediate consideration for incorporation of landbird conservation actions as described in this document. See Chapter 4 for a discussion of the purpose and potential value of BCAs.

<u>Disclaimer</u>: There are no legal responsibilities for landowners within the BCAs to participate in bird conservation, nor is it implied that our bird conservation objectives should supercede those for other ongoing activities within BCA boundaries. However, it is strongly encouraged that landowners and land-managers attempt to incorporate bird conservation objectives where possible with other practices.

Grassland Bird Conservation Areas (GBCAs)

- ***Willamette Valley*:**
    1. **Baskett Slough NWR and areas to the north and west**
    2. **Waldo Hills, east of Salem between Sunnyside Road and Sublimity**
    3. **Indian Head Hills between Brownsville, Coburg, and Interstate 5.**
    4. **Ward, Peterson, and Washburn Butte Complex southwest of Lebanon**
    5. **Kingston Prairie and area south of Stayton**
    6. **William Finley NWR north to Llewellyn Road**
    7. **Cheshire, west and north to Ferguson Road**
    8. **Camas Swale, south of Eugene and north and west of Creswell**
    9. **Harrisburg, Tulsa Area**
    10. **Richardson Gap, southeast of Scio between Thomas and Crabtree Creeks**
    11. **Fern Ridge/Applegate??**
- ***Puget Lowlands*:**
    1. **Sammish and Skagit Flats west of I-5**
    2. **Smith Prairie on Whidbey Island east of Coupeville**
    3. **Sequim-Dungeness Flats**
    4. **Black River - Mima Prairie - Glacial Heritage Park**
    5. **Scatter Creek Wildlife Area and adjcent lands to the east**
    6. **Rocky Prairie - includes preserve, proposed preserve, and adjacent lands**
    7. **Weir Prairie and private lands to the south and east**
    8. **13th Division Prairie and adjacent lands**

9. **91st Division Prairie on Fort Lewis**
10. **Olympia Airport**
11. **Shelton Airport**
12. **McCord Air Base Airport**
13. **Chehalis Valley**
14. **Yelm Prairie**
15. **Cowlitz-Newakum Prairie floodplain**
16. **Clark County - Brush Prairie- Lacamas**

- ***San Juan Islands:***
    1. **San Juan Island including American Camp**
- ***Umpqua Valley:***
    1. **North Bank Habitat Management Area - BLM**
    2. **Kanipe Ranch - county**
    3. **Ramp Canyon - private**
    4. **Sutherlin Airport and areas to south (incldes TNC property)**
    5. **Carol Whipple ranch near Elkton**
    6. **Del Rio - north of Roseburg (100 ac)**
    7. **Heavens Gate and Richey CRP - I-5**
    8. **Alan Hash ranch near Oakland**
    9. **Roseburg Forest products by Riddle (Cathy Panner long-term lease??)**
    10. **Hatfields property along Deer Creek**
    11. **Bare - K-Bar Ranch - Roberts Mt Road, N of Myrtle Creek**
- ***Rogue Valley*:**
    1. **Denman Wildlife Area**
    2. **Dry Creek - 200 acre ranch surrounded by BLM**
    3. **Eagle Point to Butte Falls turnoff - private - 35 1W Sec 27 (entire section)**
    4. **Agate Desert - 140SW to Antelope Creek Road**
    5. **Prescott Park**
    6. **Grizzly Peak and slopes**
    7. **Cascade and C2 Ranch off Hwy 140 - both north and south**
    8. **Holland Loop Road - Illinois Valley**
    9. **Round Top**

Oak Woodland Bird Conservation Areas (OWBCAs)

- ***Willamette Valley*:**
    1. **Coast Range foothills west of McMinnville - includes Peavine Creek, Youngberg Hill**
    2. **corridor west of Salem and north of Hwy 22 - Eola Hills - include Baskett Butte**

3. **between Dallas and Monmouth**
4. **Coast Range foothills north and west of Fern Ridge**
5. **south and west of Eugene - Oak Hill east edge of Fern Ridge**
6. **Corvallis Woodlands - OSU, Bald Hill, Chip Hill, Walnut Park**
7. **Mt Pisgah**
8. **NW of intersection of Highway 213 and 211 - near Molalla**
9. **Finley - Bald Top and adjacent areas**

- ***Puget Lowlands*:**
  1. **Lakewood**
  2. **Fort Lewis**
  3. **Scatter Creek corridor**
  4. **Rocky Prairie**
  5. **Lewis County - Lacamas and Mill Creek, south of Lewis and Clark SP**
  6. **Cowlitz Prairie - NE of Toledo in Lewis County**
  7. **Ridgefield NWR**
  8. **East of Washougal, Clark and Skamania County**
  9. **Kalama - Carrolls Bluff**
- ***Umpqua Valley:***
  1. **Dawson-Sandberg-Kahn (private) in Clover Creek drainage**
  2. **Mill Town Dam - county**
  3. **Hanna Nickel Mine - near Riddle**
  4. **Weyerhaeuser lands near Sutherlin**
  5. **Dave Jackson Ranch - North Bank road**
  6. **Paul Herberling/Love ranch in Roseburg**
- ***Rogue Valley*:**
  1. **Table Rocks**
  2. **Sams Valley**
  3. **Applegate (Varney?? Gulch)**
  4. **Emigrant Lake**
  5. **Colestine Valley**
  6. **Touvelle State Park**

Riparian Bird Conservation Areas (RBCAs)

- ***Willamette Valley*:**
  1. **Sandy River Delta, Multnomah County - Cottonwood, Willow**
  2. **Government Island, Multnomah County - Cottonwood, Willow**
  3. **Reed Island - Multnomah County - Cottonwood, Willow**
  4. **Sauvie Island, Multnomah County - Cottonwood, Willow**

5. **Muddy Creek, Benton County - Oregon ash**
6. **Molalla River State Park, Clackamas County - Cottonwood, Oregon ash**
7. **Bowers Rock State Park, Linn County - Bigleaf maple, Cottonwood, Oregon ash**
8. **North Santiam River (Stayton Island), Linn and Marion Counties - Cottonwood**
9. **Willamette Mission State Park (Grand Island-Mission Bottom area), Marion County - big-leaf maple, Oregon ash, Pacific willow**
10. **Luckiamute River and Santiam Bar, Polk County - Big-leaf maple, Oregon ash, Cottonwood**
11. **Tualatin National Wildlife Refuge and Tualatin River -**

•***Puget Lowlands*:**

1. **Chehalis River between Rochester, Thurston County and Montesano, Grays Harbor County.**
2. **Skagit and Sauk Rivers from Darrington, Snohomish County and Marblemount, Skagit County downstream to mouth.**
3. **Nisqually River**
4. **Black River, Thurston County**

• ***Umpqua Valley:***

1. **T.J. Lindbloom Ranch - east Roseburg**
2. **Mitchaletties Mitigation site - Wilbur**
3. **South Umpqua River around Myrtle Creek**
4. **South Umpqua River between Canyonville and Dave Creek**

•***Rogue Valley*:**

1. **White Horse Park**
2. **Bear Creek Greenway**
3. **Flanagans Slough**
4. **Kelly Slough**
5. **Rogue River**
6. **Provolt Orchard**
7. **Jenny Creek**
8. **Illinois at Cave Junction**

Chaparral Bird Conservation Areas (CBCAs)

•***Rogue Valley*:**

1. **Upper Little Applegate near Cabin Ridge**
2. **Salt Creek off Hwy 140 - 35S 2E Sec33**
3. **Roxy Ann Butte**
4. **Rocky Dale Road out of Cave Junction**

5. **Merlin Rest Stop**
6. **Table Rock**
7. **Middle Applegate - Ruch to Missouri Flat**
8. **Scotch Creek RNA, Hutton Creek**
9. **Wagner Butte (montane)**
10. **Siskiyou Crest (montane)**
11. **Soda Mountain area (montane)**
12. **Prescott Park (montane?)**

• ***Umpqua Valley*:**

1. **Tick Farm - BLM Canyonville**
2. **Myrtle Creek Transfer Site - private**
3. **Glendale-Riddle Creek Road**

Appendix D1. Prioritization of habitat types and physiographic subprovinces for conservation of focal species in grassland-savanna habitats in the Westside Lowlands and Valleys Landbird Conservation Planning Region.[a]

Conservation Focus	Focal Species	Habitat Types[b]							Physiographic Subprovinces[c]					
		WP	DP	PT	FF	GS	RC	VC	SJ	PL	WV	UV	RV	CV
large patches of grassland	western meadowlark	2	1	1	2	2	no	2	1	1	1	1	1	
short grass - areas of bare ground	streaked horned lark	1[d]	1[d]	2[d]	2[d]	2[d]	2	2[d]	1	1	1	no	no	
short grass - areas of bare ground	common nighthawk	no	1	2[d]	2[d]	no	no	2[d]	2	2	2	1	1	
moderate-tall grass; little bare ground	grasshopper sparrow	no	1	1	1	no	no	no	no	no	1	1	1	
burrows	burrowing owl	no	1[e]	1[e]	no	no	no	no	no	no	2	1	1	
scattered shrubs and/or bunchgrass	Oregon vesper sparrow	no	1	1	2	no	no	2	1	1	1	1	2	
scattered shrubs and/or bunchgrass	lark sparrow	no	1	1	2	no	no	2?	no	no	no	2	1	
wet prairie/grassland	northern harrier	1	2	2	1	2	no	no	1	1	1	1	1	
large savanna oaks with cavities	American kestrel	no	1	1	2	no	no	no	2?	1	1	2	2	
large savanna oaks with cavities	western screech owl	no	1	1	2	no	no	no	no ?	2	2	1	1	
large conifer savanna trees	Lewis' woodpecker	no	1	1	2	no	no	no	no	2	2	1	1	

[a] Priority importance is subjectively quantified to focus conservation efforts within core habitats and geographic areas of a species breeding distribution; 1= highest priority for conservation; 2 = lower priority for conservation; no= conservation not recommended.

[b] WP= wet prairie, DP= dry prairie, PT= pasture, FF= fallow field, GS= grass-seed field. RC= vegetable row crop agriculture. VC= vine/orchard crop agriculture (e.g., vineyards, berries, nuts, fruits)

[c] Physiographic subprovinces are modified from Franklin and Dyrness (1973); SJ= San Juan Islands, PL= Puget Lowlands, WV= Willamette Valley, UV= Umpqua Valley, RV= Rogue Valley, CV= Coastal Valleys.

[d] If bare or sparsely vegetated patches exist, otherwise no.

[f] Needs burrows, short grass, patches of open ground, otherwise no.

Appendix D2. Prioritization of habitat types and physiographic subprovinces for conservation of focal species in oak woodland habitats of the Westside Lowlands and Valleys Landbird Conservation Planning Region.[a]

Conservation Focus	Focal Species	Habitat Types[b]					Physiographic Subprovinces[c]					
		PO	OC	OO	YO	MC	SJ	PL	WV	UV	RV	CV
large patches with large oaks	white-breasted nuthatch	1	2	1	2		1	1	1	1	1	
large oaks with cavities	acorn woodpecker	1	1	1	no		no	no	2	2	2	
large oaks with cavities	downy woodpecker	1	1	1	2		1	1	2	2	2	
large oaks with cavities	ash-throated flycatcher	1	2	1	2		no	no	no	1	1	
canopy edges and openings	western wood-pewee	1	1	1	2		1	1	1	1	1	
young (subcanopy) oaks	bushtit	1	1	1	1		1	1	1	1	1	
herbaceous cover	chipping sparrow	1	1	1	2		1	1	1	1	1	
native shrub understory	Bewick's wren	1	1	1	1		2	2	1	2	2	
native shrub understory	house wren	1	1	1	1		1	1	2	2	2	
native shrub understory	Nashville warbler	1	1	1	1		no	no	no	1	1	
large pines	acorn woodpecker	1	1	1	no		no	no	no	1	1	

[a] Priority importance is subjectively quantified to focus conservation efforts within core habitats and geographic areas of a species breeding distribution; 1= highest priority for conservation; 2 = lower priority for conservation; no= conservation not recommended.

[b] PO= pure oak (includes madrone in southwest Oregon); OC= oak conifer; OO= old oak; YO= young oak.

[c] Physiographic provinces are modified from Franklin and Dyrness (1973); SJ= San Juan Islands, PL= Puget Lowlands, WV= Willamette Valley; UV= Umpqua Valley; RV= Rogue Valley, CV= Coastal Valleys.

Appendix D3. Prioritization of habitat types and physiographic subprovinces for conservation of focal species in riparian habitats of the Westside Lowlands and Valleys Landbird Conservation Planning Region.[a]

Conservation Focus	Focal Species	Habitat Types[b]					Physiographic Subprovinces[c]					
		RS	RW	CT	MD	WI	SJ	PL	WV	UV	RV	CV
open water - snags with cavities	purple martin	no	no	1[d]	no	no	2?	1	1	1	no	1
open water - snags with cavities	tree swallow	no	no	1[d]	no	no	1?	2	2	2	1	
shrub density	willow flycatcher	1	2	2	2	1	1	1	1	1	1	
shrub density	yellow-breasted chat	1	2	2	2	1	no	1	1	1	1	
large canopy trees	red-eyed vireo	no	1	1	2	no	no	1	1	no	no	
large canopy trees	bullock's oriole	no	1	1	1	no	2	2	2	1	1	
subcanopy, tall shrub foliage	yellow warbler	1	1	1	1	1	1	1	1	1	1	
dense shrub understory	Swainson's thrush	2	1	1	1	2	1	1	1	2	2	
dense shrub understory	wrentit	2	1	2	2	1	no	no	no	1	1	
snags	downy woodpecker	2	1	1	1	2	1	1	1	1	1	
large, structurally diverse patches	yellow-billed cuckoo	no	1	1	2	1	no	1	1	no	no	
large, structurally diverse patches	red-shouldered hawk	no	1	1	1	no	no	no	2	2	1	
large, structurally diverse patches	Cooper's hawk	no	1	1	1	no	2	2	2	1	2	

[a] Priority importance is subjectively quantified to focus conservation efforts within core habitat and geographic areas of a species breeding distribution; 1 = highest priority for conservation; 2 = lower priority for conservation; no= conservation not recommended.
[b] RS = riparian shrub, RW = riparian woodland, CT = cottonwood, MD = mixed deciduous, WI = willow.
[c] Physiographic subprovinces are modified from Franklin and Dyrness (1973); SJ= San Juan Islands, PL= Puget Lowlands, WV= Willamette Valley; UV= Umpqua Valley; RV= Rogue Valley, CV= Coastal Valleys.
[d] When snags in open water, otherwise no.

Appendix D4. Prioritization of habitat types and physiographic subprovinces for conservation of focal species in chaparral habitats of the Westside Lowlands and Valleys Landbird Conservation Planning Region.[a]

Conservation Focus	Focal Species	Habitat Types[b]			Subprovince	
		CD	MD	OD	UV	RV
valley chaparral	Bewick's wren	1	1	2	2	1
valley chaparral	Nashville warbler	1	1	2	1	2
montane chaparral	green-tailed towhee	2	1	2	no	1
oak chaparral- dense shrubs	blue-gray gnatcatcher	1	2	1	2	1
oak chaparral- dense shrubs	wrentit	1	1	2	1	2
oak chaparral - herbaceous interspersion	California towhee	1	1	2	2	1
oak chaparral - herbaceous interspersion	lesser goldfinch	2	2	1	1	2
oak chaparral - cavities	oak titmouse	2	2	1	2	1
oak chaparral - cavities	black-capped chickadee	2	2	1	1	2

[a] **Priority importance is subjectively quantified to focus conservation efforts within core habitat and geographic areas of a species breeding distribution; 1 = highest priority for conservation; 2 = lower priority for conservation; no= conservation not recommended.**

[b] **CD= ceanothus dominated, MD= manzanita dominated, OD= oak dominated (includes madrone).**

[c] **Physiographic subprovinces are modified from Franklin and Dyrness (1973); UV= Umpqua Valley; RV= Rogue Valley.**

Appendix E1. Summary of habitat relationships and biological objectives for focal species in grassland and savanna habitats of the Westside Lowlands and Valleys Landbird Conservation Planning Region.

Conservation Focus	Focal Species	Key Habitat Relationships			
		Vegetative Composition	Vegetation Structure	Patch size/ Landscape	Special Considerations
large patches of grassland	western meadowlark	herbaceous, shrubs, saplings, oaks,	shrub-tree cover <10%; variable grass heights up to 76 cm	>80 ha; <10% hostile habitat	fencelines or powerlines may provide singing perches in absence of shrub-trees
short grass, bare or sparsely vegetated ground	streaked horned lark, common nighthawk	herbaceous	20-50% bare or sparsely vegetated; herbaceous vegetation <30 cm tall		can use very small patches of suitable habitat, but must be free from disturbance
burrows	burrowing owl		>40% open ground; <40% grass cover		populations of burrow providers and prey populations
scattered shrubs or bunchgrass	Oregon vesper sparrow, lark sparrow (RV)	grasses, shrubs, saplings, oaks	scattered shrub cover 5-15%; variable grass heights <46 cm;	>8 ha	vesper sparrow also uses Christmas tree farms
moderate grass height, little to no bare ground or shrubs	grasshopper sparrow	herbaceous	variable grass heights 15-61 cm; >90% herb cover (70% RV,UV); <5% shrub cover	>20 ha	semi-colonial
wet prairie/ grassland	northern harrier	herbaceous	no activity buffer within 122 m radius around nest; contiguous habitat to change in habitat type	>160 ha; >1/4 from human use	adjacency of wetlands and/or dry prairie to expand suitable habitat
large oaks with cavities	American kestrel (WV,PL), western screech owl (RV,UV)	herbaceous, oaks	oaks >61 cm with cavities; tree canopy cover 10-30%; snrub cover <30%		can use nest boxes for short-term management, but must consider starling presence

large conifer trees	Lewis' woodpecker	herbaceous, shrubs, ponderosa pine	trees >61 cm; 2.5 snags/ha >30 cm; tree canopy cover 10-40%		pine-oak sites may be most suitable

Appendix E2. Summary of habitat relationships and biological objectives for focal species in oak woodland habitats of the Westside Lowlands and Valleys Landbird Conservation Planning Region.

Conservation Focus	Focal Species	Key Habitat Relationships			
		Vegetative Composition	Vegetation Structure	Patch Size/ Landscape	Special Considerations
large patches with large oaks	white-breasted nuthatch	oaks	>55 cm dbh oaks with 20% >70 cm; canopy closure 40-80%; Douglas-fir canopy <10% cover	>40 ha; <10% hostile habitat	
cavities	acorn woodpecker (WV), downy woodpecker (PL), ash-throated flycatcher (RV, UV)	oaks	mean stand dbh >38 cm with >20% >55 cm; <10% Douglas-fir canopy; <50% cover in subcanopy		ash-throated flycatchers will use nest boxes
canopy edges and openings	western wood-pewee	oaks	canopy closure 40-85% with >80% oaks and <10% Douglas-fir; shrub-herbaceous understory each <80% cover		high edge to openings ratio
young (subcanopy) oaks	bushtit	oaks	multi-layered with >90% oak; >40% canopy cover; >30% subcanopy cover; 30-70% cover in shrub layer		
herbaceous cover	chipping sparrow	herbaceous, snowberry, rose, poison oak	interspersion of patches of shrubs and herbaceous; shrub cover 10-40%; herbaceous cover 30-70%; <10% himalayan blackberry		relatively dry sites; sites with least likely potential for cowbird parasitism
native shrub understory	house wren (PL), Nashville warbler (RV, UV), Bewick's wren (WV)	snowberry, rose, poison oak	shrub cover >40% with >50% of that native species		

Appendix E3. Summary of habitat relationships and biological objectives for focal species in riparian habitats of the Westside Lowlands and Valleys Landbird Conservation Planning Region.

Habitat	Conservation Focus	Focal Species	Key Habitat Relationships			
			Vegetative Composition	Vegetation Structure	Patch Size/ Landscape	Special Considerations
Open Water	snags	purple martin (WV,PL,RV), tree swallow (RV)		>1.2 snags/ha >30 cm dbh >6 m high; no physical obstructions within 10 m of cavities		retain old pilings; nest boxes for short-term management
Floodplain Shrub	shrub density	willow flycatcher (PL,WV), yellow-breasted chat (RV,UV)	willow, spirea, red-osier dogwood	shrub layer cover 30-80%; canopy tree (>4m tall) cover <20%	>1 km urban-residential; >5 km from cowbird areas	patchy shrub layer; herbaceous openings; <5% cowbird parasitism
Deciduous Woodland	large trees	Bullock's oriole (RV,UV), red-eyed vireo (PL,WV)	cottonwood, ash, alder	canopy tree height >11m; canopy closure 30-60 or >50%; sapling trees >10% cover; woodland patch >50 m wide		
Deciduous Woodland	subcanopy, tall shrub foliage	yellow warbler	cottonwood, ash, willow	>70% cover shrub-subcanopy with subcanopy >50% of that; shrub layer cover 30-60%; shrub layer height >2m	high degree of heterogeneity; low percent agriculture	<5% cowbird parasitism
Deciduous woodland	dense shrub layer	Swainson's thrush (PL,WV), wrentit (RV,UV)	spirea, willow, ocean spray, elderberry	>50% shrub layer cover with >60% of that native species; >50% canopy closure		berry producing shrubs

Habitat	Conservation Focus	Focal Species	Key Habitat Relationships			
			Vegetative Composition	Vegetation Structure	Patch Size/ Landscape	Special Considerations
Deciduous Woodland	snags	downy woodpecker		12 snags/ha >15 cm dbh and >1.8 m tall; of these 5 snags/ha >25 cm dbh		
Deciduous Woodland	large patches, structurally diverse	yellow-billed cuckoo (PL,WV), red-shouldered hawk (RV), Cooper's hawk (UV)	cottonwood, ash, willow	3 distinct layers or juxtaposition of early successional with older woodland	patches >40 ha; riparian zone >200 m wide	

Appendix E4. Summary of habitat relationships and biological objectives for focal species in chaparral habitats of the Westside Lowlands and Valleys Landbird Conservation Planning Region.

Habitat	Focal Species	Key Habitat Relationships			
		Vegetative Composition	Vegetation Structure	Patch size/ Landscape	Special Considerations
Valley Chaparral	Bewick's wren (RV), Nashville warbler (UV)	ceanothus, manzanita	20-60% native shrub coiver; <30% tree cavoer		interspersion of shrub patches with a few small herbaceous openings
Montane Chaparral	green-tailed towhee	ceanothus, manzanita	>60% native shrub cover, <30% tree canopy cover		dense large patches preferred with occasional small openings
Oak Chaparral - Dense Shrubs	blue-gray gnatcatcher (RV), wrentit (UV)	ceanothus, oaks, madrone	>80% native shrub cover; 20-50% tree cover		cowbird parasitism <10%
Oak Chaparral - Herbaceous Interspersion	California towhee (RV), lesser goldfinch (UV)	ceanothus, herbaceous, oaks	mix of shrub and herbaceous cover with each 30-60%; <20% tree cover		
Oak Chaparral-Cavities	oak titmouse (RV), black-capped chickadee (UV)	oaks, madrone	30-70% canopy tree cover; 2 trees/ha >40 cm dbh		can use nest boxes for short-term management