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This document was prepared as an addendum to the Species Conservation Assessment published by the USDA Forest Service - Rocky Mountain Region (Region 2), available at:

<http://www.fs.fed.us/r2/projects/scp/assessments/index.shtml>

It is intended to accompany that assessment, and to provide the reader with scientific findings and conclusions derived since the assessment's publication.
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Summary of Addendum

Title of Assessment: Lincoln's sparrow (*Melospiza lincolni*): a technical conservation assessment

Publication Date: 8 May 2003

Original Author(s): R.M. Stephens and S.H. Anderson

Reviewer(s): Gary P. Beauvais

Date of Review: 1 July 2006 - 1 September 2006

Addendum Summary

Distribution: This review uncovered no substantial changes to Lincoln's sparrow distribution or abundance.

Taxonomic Status: Taxonomic status of Lincoln's sparrow appears to be unchanged.

Agency Status: Agency status of Lincoln's sparrow appears to be unchanged. The species was not selected as a priority in either the Colorado or Wyoming Comprehensive Wildlife Conservation Strategies.

Other: Most of the relevant references elucidate responses of passerines, including Lincoln's sparrows, to various forest disturbances (references 3, 4, 5, 6, 7, 8, 9, and 11). References seem to indicate that abundance of specialized species (including Lincoln's sparrow) declined with increasing pressure from human development and timber harvest, while abundance of generalists increased (e.g., references 3, 6). Studies specifically analyzing Lincoln's sparrow showed a preference for undisturbed habitat, where declines in abundance were noted as urban development increased (reference 3) and abundance was greater when harvest practices mimicked natural forest disturbance wherein some forest in harvest areas was left in tact (reference 4). The general preference of Lincoln's

sparrow for shrubby riparian habitat seemed to favor more open forest in general, regardless of disturbance type (references 4, 9).

Significance of Change relative to original assessment: There has been little change in our knowledge of Lincoln's sparrow. Annual monitoring data being developed by the Rocky Mountain Bird Observatory (reference 12) should be periodically reviewed for significant trends in the species' distribution and abundance.

Reference 1:

Benson, A.-M. and K. Winker. 2005. Fat-deposition strategies among high-latitude passerine migrants. *Auk* 122:544-557.

Summary of new information:

The body condition and fat reserves of migratory passerines, including Lincoln's sparrows, were studied near Fairbanks, Alaska. In general, adult birds had higher fat scores than immature birds, and fat stores upon spring arrival and prior to fall departure were rather low in most species. Low stores of pre-migration fat suggest that fall migration is fueled by foraging during the migration itself. Fat deposition in this group of birds appears to respond more to energetic needs on a daily scale, rather than "insurance" for future needs during migration. It is important to note that Lincoln's sparrows breeding in Region 2 migrate much shorter distances than those breeding in Alaska, and hence the energetic issues outlined here may not be directly relevant to Region 2 birds.

Sections in the Technical Conservation Assessment most affected by this new information (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

 Biology and Ecology

 Activity pattern and movement

 Habitat

Reference 2:

Butler, C.J. 2003. The disproportionate effect of global warming on the arrival dates of short-distance migratory birds in North America. *Ibis* 145:484-495.

Summary of new information:

The date of first arrival of migratory passerines in New York and Massachusetts averaged 13 days earlier between 1951-1993 than between 1903-1950. Lincoln's sparrow arrival dates were about 7 days earlier, on average, for the later period compared to the earlier period. It is suggested that global climate change is driving these earlier arrival dates, and that passerines such as Lincoln's sparrows that winter in the southern U.S. are sensing meteorological cues to the "earlier spring" phenomenon.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology

Distribution and abundance

Activity pattern and movement

Reference 3:

Fraterrigo, J.M. and J.A. Wiens. 2005. Bird communities of the Colorado Rocky Mountains along a gradient of exurban development. *Landscape and Urban Planning* 71:263–275.

Summary of new information:

This study compared communities of forest birds in human-developed sites (“exurban developments”) and undeveloped sites in northern Colorado. Overall bird abundance increased significantly with building density. Lincoln’s sparrows were generally associated with less developed forest with higher amounts of coarse woody debris. Insectivores in general (including Lincoln’s sparrows) declined with degree of development. Generally, results suggest that human development at low densities favors habitat generalists at the expense of habitat specialists. See reference 6.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology

Habitat

CONSERVATION

Threats

Management of Lincoln’s sparrows in Region2

Reference 4:

Harrison, R.B., F.K.A. Schmiegelow, and R. Naidoo. 2005. Stand-level response of breeding forest songbirds to multiple levels of partial-cut harvest in four boreal forest types. *Canadian Journal of Forest Resources* 35:1553–1567.

Summary of new information:

The effects of novel timber harvesting practices - designed to mimic natural forest disturbances by leaving more trees post-harvesting - on forest bird communities were studied in Alberta, Canada. Ground-nesting and ground-foraging birds, including Lincoln’s sparrows, increased in abundance in novel cuts relative to uncut forest. Species that declined or disappeared were typical of more mature, late-seral forest. This study investigated rather low levels of forest retention (10 - 20% of pre-harvest forest was retained in the cuts). Higher retention levels may conserve more birds associated with closed forest, but at the expense of species like Lincoln’s sparrows that favor more open forest. See reference 5.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology
Habitat

CONSERVATION

Threats
Management of Lincoln's sparrows in Region2

Reference 5:

Leupin, E.E., T.E. Dickinson, and K. Martin. 2004. Resistance of forest songbirds to habitat perforation in a high-elevation conifer forest. *Canadian Journal of Forest Resources* 34:1919–1928

Summary of new information:

Responses of birds breeding in subalpine forest to 4 different perforation timber harvest patterns were studied in British Columbia. Each pattern removed 30% of the timber volume (i.e., retention level of 70%) but varied the size of openings from 10 ha to individual tree gaps. Abundances of most birds present pre-harvest were unaffected by harvesting. Lincoln's sparrow, however, was so rare pre- and post-harvest as to support no species-specific conclusions. See reference 4.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology
Habitat

CONSERVATION

Threats
Management of Lincoln's sparrows in Region2

Reference 6:

Smith, C.M. and D.G. Wachob. 2006. Trends associated with residential development in riparian breeding bird habitat along the Snake River in Jackson Hole, WY, USA: implications for conservation planning. *Biological Conservation* 128:431-446.

Summary of new information:

Riparian bird communities changed significantly along a gradient of residential development on the Snake River, Wyoming. Overall species richness and diversity declined with increasing residential development. Neotropical migrant species were most negatively related to residential development. Food generalists, ground gleaners, and

avian nest predators all increased with increasing residential development. Although Lincoln's sparrows were observed during this study, it appears that observations of Lincoln's sparrows were not subject to species-specific analyses. Instead they were pooled with other species' observations as input to guild-level analyses. Conclusions specific to Lincoln's sparrows were not presented. See reference 3.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology

Habitat

CONSERVATION

Threats

Management of Lincoln's sparrows in Region 2

Reference 7:

Smucker, K.M., R.L. Hutto, and B.M. Steele. 2005. Changes in bird abundance after wildfire: importance of fire severity and time since fire. *Ecological Applications* 15:1535–1549.

Summary of new information:

Abundances of several forest bird species were quantified before and after forest fires on plots that burned, and also on plots that did not burn, in the Bitterroot Valley, Montana. Abundances of 9 species showed greater changes from before to after burning on burned plots than on unburned plots. When burned plots were stratified by fire severity, an additional 10 species showed significant changes from before to after burning, demonstrating that fire severity must be considered when evaluating bird responses. Also, some species' abundances changed significantly between 1 and 2 years after the fire, demonstrating that time-since-fire is another important consideration. Although these considerations may apply to Lincoln's sparrows at some level, Lincoln's sparrows did not show significant fire responses in this study.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology

Habitat

CONSERVATION

Threats

Management of Lincoln's sparrows in Region 2

Reference 8:

St. Clair, C.C. 2003. Comparative permeability of roads, rivers, and meadows to songbirds in Banff National Park. *Conservation Biology* 17:1151–1160.

Summary of new information:

The permeability of roads, rivers, and meadows to songbirds was studied in Alberta, Canada. Forest-dependent birds were reluctant to cross rivers but not roads or meadows. Sparrows - described in this study as forest generalists - were less likely to cross rivers than other bird groups. These results suggest that the response to barriers by montane birds is strongly dependent on their degree of forest dependence. The greater reluctance of forest birds to cross rivers as compared to roads suggests that birds do not perceive the mortality risk posed by motorized traffic. All of these conclusions apply only generally to Lincoln's sparrows, as they were observed too infrequently during the study to allow species-specific conclusions.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology

Habitat

CONSERVATION

Threats

Management of Lincoln's sparrows in Region 2

Reference 9:

Stambaugh, C.A. 2003. Community-level response of birds to burned and salvage-logged forests. MS thesis, University of Alberta. Edmonton, Alberta, Canada.

Summary of new information:

Bird communities were compared between unburned, burned-unlogged, and burned-salvage logged forest in Alberta. In general, the bird community was markedly different between the 2 post-burn habitats, with cavity-nesting species especially dependent on the unlogged condition. Lincoln's sparrows (present in all 3 study environments) and other ground nesting birds reached their highest abundances in the burned-salvage logged sites, as would be expected for a species that generally prefers non-forested environments with heavy shrub and understory layers. Lincoln's sparrows also achieved their highest estimated reproductive activity in the burned-salvage logged sites.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology

Habitat

CONSERVATION

Threats
Management of Lincoln's sparrows in Region 2

Reference 10:

Wilson, S. and K. Martin. 2005. Songbird use of high-elevation habitat during the fall post-breeding and migratory periods. *Ecoscience* 12:561-568.

Summary of new information:

Autumn surveys of songbirds at high-elevations were performed to provide insight into habitats used post-breeding, pre-migration, and in early migration. In general, species were found in the same habitats that they use for breeding; Lincoln's sparrows were found in the same high-elevation riparian situations that they are found in during the early and mid-summer periods.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology

Habitat

Reference 11:

Zwartjes, P.W., J.-L. Cartron, P.L. Stoleson, W.C. Haussamen, T.E. Crane. 2005. Assessment of native species and ungulate grazing in the Southwest: terrestrial wildlife. USDA Forest Service General Technical Report RMRS-GTR-142.

Summary of new information:

This document broadly outlines the known and possible effects of livestock grazing on native wildlife in the American southwest. Lincoln's sparrows are mentioned only infrequently, and always in the context of generally requiring high-elevation willow thickets and other dense streamside vegetation, cover types that are obviously affected by livestock grazing and management. This reference also mentions the existence of an available compact disc that presents numerous species accounts. It is assumed that if a species account was completed for Lincoln's sparrow it may contain some information relevant to the Region 2 Species Conservation Assessment, but is mostly redundant with that assessment.

Relevant sections in the Technical Conservation Assessment (following the original table of contents):

MANAGEMENT STATUS AND NATURAL HISTORY

Biology and Ecology

Habitat

CONSERVATION

Threats

Management of Lincoln's sparrows in Region 2

Reference 12:

Personal communications with individual biologists and land managers in Region 2 regarding Lincoln's sparrow ecology, management, and conservation.

Summary of new information:

Doug Keinath (Lead Zoologist, Wyoming Natural Diversity Database - University of Wyoming; dkeinath@uwyo.edu; 307 766-3023). The Wyoming Natural Diversity Database is currently monitoring Lincoln's sparrows in the Medicine Bow National Forest and compiling this information in its database. It is also working with the Wyoming Game and Fish Department and the Rocky Mountain Bird Observatory to compile a complete set of all known Lincoln's sparrow sightings in the state. Preliminary indications are that there has been no substantial range expansion or contraction in the state relative to previous distribution maps for this species. This dataset will be available upon request.

Victoria Drietz (Colorado Division of Wildlife; victoria.dreitz@state.co.us). Suggested contact with David Klute, Colorado Division of Wildlife "All-bird Coordinator".

Eric Odell (Colorado Division of Wildlife; eric.odell@state.co.us). Suggested contact with the Rocky Mountain Bird Observatory for annual transect survey data that should have some Lincoln's sparrow records.