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Urs P. Kreuter
Texas A&M University

William E. Fox
Texas A&M University

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The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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Golden-cheeked Warbler Habitat conservation in Central Texas

Urs P. Kreuter, William E. Fox

Dept. Ecosystem Science & Management, Texas A&M University, College Station, Texas, USA

E-mail: urs@tamu.edu

Key words: Conservation credits, *Dendroica chrysoparia*, juniper, stakeholder participation

Introduction The Golden-cheeked Warbler (*Dendroica chrysoparia*) (GCW) is a neotropical songbird that migrates from Mexico and Central America to Texas in March and back in July. Its nesting range is confined to central Texas and consists of dense stands of mature Ashe juniper (*Juniperus ashei* Buchh) mixed with deciduous hardwoods that occur along steep-sided ravines and canyons and adjacent uplands. GCWs eat insects on these hardwoods and they use strips of bark from mature juniper trees to build their nests. The GCW was listed on 4 May 1990 as an endangered species under the Endangered Species Act (ESA). The ESA substantially restricts land use and management practices in areas with endangered species. Ft. Hood, the largest military training facility in the USA, contains large swaths of GCW nesting habitat that have impacted military training maneuvers. Further, Ft. Hood grazing rights for members of the Central Texas Cattlemen's Association (CTCA), relations to former owners of land condemned to create the installation, were affected by the presence of GCW because brown-headed cowbirds (*Molothrus ater*), which are associated with cattle, parasitize GCW nests. The combined concern of these two entities over the impact of GCW on land use options ultimately led to a win-win GCW conservation strategy that integrates the natural and human systems affecting GCW. This strategy is being considered by military training facilities across the USA.

Procedure The GCW conservation strategy is comprised of three key elements. (1) *GCW habitat improvement*: The outcry of politically connected CTCA members over pressure to reduce cowbird impacts on GCW by removing cattle led to limited cattle removal, increased efforts to trap cowbirds, and the Leon River Restoration Project (LRRP). A key objective of the LRRP was to improve GCW habitat on land adjacent to Ft. Hood by selectively removing Ashe juniper trees in GCW nesting habitat, which compete with hardwoods and invade interstitial spaces needed by GCW for flyways. (2) *ESA Section 7 consultations*: Section 7 of the ESA prohibits Federal Agencies from authorizing, funding or carrying out actions that may jeopardize endangered species and forbids any entity from taking such species without permission from the US Fish and Wildlife Service (USFWS). Because military activities on Ft. Hood affect GCW, the Army was required to hold a "Section 7" consultation with USFWS. These consultations were initiated in 1992, resulting in a non-jeopardy biological opinion a year later, with more restrictive amendments being made in 1999 and in 2000. Subsequent consultations resulted in reduced constraints on military training activities, in part due to the improvement of GCW habitat on adjacent private land. (3) *Contractual arrangements with landowners*: Owners of land in the Leon River watershed who wished to participate in public sharing programs for implementing land management that improves GCW habitat were required to enter into 5-10 year performance contracts with the funding agency. Subsequently, a GCW Conservation Credit program was developed whereby landowners could apply for credits based on the area and quality of GCW habitat on their land. These credits can be sold to any entity, notably Ft. Hood, to offset incidental loss of GCW habitat due to, for example, military training.

Results and discussion Four factors have led to the success of the LRRP and the subsequent GCW Conservation Credit program. First was the effective collaboration between important stakeholders including CTCA members, non-affiliated landowners, federal and state agencies and Non-government Organizations (NGOs). Second, was the effective and politically well connected project leadership. Third was the provision of technical and financial assistance to improve GCW habitat subject to the development of an approved Wildlife Management Plan or a Resource Management Systems Conservation Plan. Fourth, the credibility of these connected projects has been enhanced by the participation of Texas A&M University research scientists who have addressed questions about the effects of juniper removal on GCW habitat, herbaceous species composition, ground cover and the hydrologic cycle. These factors provide a clear example of the successful application of the ISEEC model developed to effectively address the linkage between the biophysical and human systems affecting natural resource sustainability (Fox et al. In Press)

Conclusion Integrated approaches to land management that address both the human and biophysical factors affecting the continued delivery of ecosystem goods and services are being increasingly recognized as being necessary for managing natural resources that cover large areas. The success of LRRP and the GCW Conservation Credit program has drawn national attention and is being considered for application in other areas where military training is being impacted by the existence of endangered species. This success also provides important lessons for many other multi-stakeholder natural resource management dilemmas.

Reference

Fox, W.E., and others. An Integrated Social, Economic, and Ecologic Conceptual (ISEEC) Framework for Considering Rangeland Sustainability. Society and Natural Resources (In Press).