MEMORANDUM OF AGREEMENT
Between
TEXAS PARKS AND WILDLIFE DEPARTMENT
and the
SALVANATURA

THIS MEMORANDUM OF AGREEMENT made and entered into by and between Texas Parks and Wildlife Department, hereinafter referred to as TPWD, and SALVANATURA, under the provisions of the Texas Parks and Wildlife Code, § 11.0171 and 12.0011

WITNESSETH:

WHEREAS, both parties are engaged in efforts to manage and conserve rare species and ecosystems. An outline of research designed to expand knowledge of winter distribution, and quantify relative abundance, and habitat use of Golden-cheeked Warblers at known and potential wintering sites across the entire winter range, from Mexico to Nicaragua, during one winter period.

WHEREAS, it is beneficial to work cooperatively to more efficiently manage and conserve rare species and Texas ecosystems. The proposed research will address the winter ecology, relative abundance and monitor populations of Golden-cheeked Warblers throughout the known and potential winter range.

WHEREAS, each party has identified a principal investigator which for TPWD is C. Craig Farquhar, and for SALVANATURA is Oliver Komar.

NOW, THEREFORE, in consideration of the above premises, the parties hereto agree as follows:

A. SALVANATURA SHALL:

1. During October and November 2006, Salvanatura shall establish six (6) teams of observers/researchers in each of the five (5) countries (Mexico, Guatemala, Honduras, Nicaragua, El Salvador) where the study will take place.

2. Basic research protocol shall consist of:
    a. Intensive evaluation of mixed species foraging flocks to determine density and relative abundance of Golden-cheeked Warblers.
    b. Vegetation descriptions of each habitat patch studied, using a standardized method such as tree and shrub surveys in plots of 0.1 ha for each patch.
    c. Field identification of sex and age classes.
    d. Methods for selecting study sites.
    e. Methods for mapping study sites (GIS).

3. During winter 2006-2007 the teams shall initiate data collection at known and potential wintering sites, for Golden-cheeked Warblers throughout the range and extent of the Central American pine-oak ecoregion. Site visits shall last for approximately six (6) days each (30 days of field work per team are planned each year).

4. Upon completion of field data collection the research team will review results, evaluate methodology and plan future field seasons and research needs for winter 2007-2008.

5. Prepare and submit reports. Upon receipt by TPWD, each report will be then submitted to U. S. Fish and Wildlife Service (USFWS, Austin) for full review. Should revision(s) be requested from said review then these will be sent by TPWD to Mr. Komar, Principal Investigator for Salvanatura NE, who shall respond to TPWD in writing within 60 days of receipt of revision request. Dates of submission of reports are as follows:

    a. *Interim Report:* due on or before May 31, 2007, following guidelines provided by Section 6 program, TPWD
    b. *Final Report*: due on or before May 31, 2008, following guidelines provided by Section 6 program, TPWD.

B. TPWD WILL

1. Provide up to One Hundred Two Thousand, Nine Hundred Twenty ($102,920.00), in US dollars, to fund year objectives specified above and described in Attachment A. Payments will be made by TPWD upon expenses incurred and submission of appropriate documentation for both federal request and match by SALVANATURA.

C. IT IS MUTUALLY AGREED AND UNDERSTOOD THAT

1. Either party may terminate the agreement in whole or in part, at any time before expiration date, whenever it is determined that the other party has materially failed to comply with the conditions of this agreement.

2. This agreement may be revised as necessary by mutual consent of both parties, by the issuance of a written amendment, signed and dated by both parties.

3. Any party may terminate the agreement for convenience by providing 60 days written notice. If agreement is terminated under this provision, then TPW shall only be liable for payment of services rendered prior to effective date of termination. Unless terminated by written notice, this agreement will remain in force until July 31, 2008.

4. This agreement is subject to cancellation, without penalty, either in whole or in part, if funds are not appropriated by the Texas Legislature, or otherwise made available, to the TPWD.

5. By signature hereon, SALVANATURA hereby certifies they have not given, offered to give, nor intends to give at anytime hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with this agreement

6. Pursuant to Texas Government Code, Title 10, Subtitle D, Section 2155.004 (a), SALVANATURA certifies they have not received compensation for participation in the preparation of specifications for this solicitation.

7. SALVANATURA shall defend, indemnify, and hold harmless the State of Texas, all of its officers, agents and employees from and against all claims, actions, suits, demands, proceedings costs, damages, and liabilities arising out of or connected with, or resulting from any acts or omissions of SALVANATURA or any agent, employee, subcontractor, or supplier of SALVANATURA in the execution or performance of this agreement.

8. Pursuant to Chapter 2260 of the Texas Government Code, any dispute arising under a contract for goods and services for which this chapter applies must be resolved under the provisions of this chapter.

9. Information, documentation, and other material in connection with this solicitation or any resulting contract may be subject to public disclosure in compliance with Texas Public Information Act and United States Freedom of Information Act.

10. SALVANATURA understands that acceptance of funds under this contract acts as acceptance of the authority of the State Auditor's Office, or any successor agency, to conduct an audit or investigation in connection with those funds. SALVANATURA further agrees to cooperate fully with the State Auditor's office or its successor in the conduct of the audit or investigation, including providing all records requested. SALVANATURA will ensure that this clause concerning the authority to audit funds received indirectly by subcontractors through SALVANATURA and the requirement to cooperate is included in any subcontract it awards.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the last date written below,

TEXAS PARKS AND WILDLIFE DEPARTMENT

BY Janet Hasty

Janet Hasty, CPPO, CTPM
Director of Purchasing Contracting
And Distribution Services

DATE 10-17-06

SALVANATURA

BY

TITLE Executive Director

DATE 13/Oct/06

Attachment A.

Winter ecology, relative abundance and population monitoring of Golden-cheeked Warblers throughout the known and potential winter range.

Principal Investigator Oliver Komar
Conservation Science Program, SalvaNATURA.
Colonia Flor Blanca
33 Ave. Sur, No. 640
San Salvador, El Salvador
Tel. 011 (503) 279-1515; Fax 011 (503) 279-0220;
Email okomar@salvanatura.org

Collaborating investigators

Claudia Macias
Pronatura Chiapas, A.C.
Av. Miguel Hidalgo No. 9
San Cristóbal de Las Casas, Chiapas 29250
Mexico
Tel/Fax (967) 678 5000; *Email* cmacias@pronatura-chiapas.org

Edgar Selvin Pérez,
Fundación Defensores de la Naturaleza
7ª avenida, 7-09 Zona 13. Villa deportiva Ramiro de León Carpio. (frente al domo).
Guatemala, C. A.
Tel: (502) 471-7994 / Fax: (502) 440-8138; *Email* dendroica@defensores.org.gt

Salvadora Morales
Programa de Investigación y Monitoreo
Alianza para las Áreas Silvestres (ALAS)
Del Jockey Club 1c al oeste, ½ c. Al sur
Calle Suárez, Granada, Nicaragua.
Tel:(505) 851-7081; *Email* salvadora@avesnicaragua.org

Rebecca Peak, Conservation Biologist
The Nature Conservancy
P.O. Box 5190
Fort Hood, Texas 76544-0190
Tel (254) 287-2885, fax (254) 288-5039; *Email* rpeak@tnc.org

Eduardo Morales
Director de Investigación
Instituto de Historia Natural y Ecología
Calzada de los Hombres Ilustres s/n
Antiguo Parque Madero
Tuxtla Gutiérrez, Chiapas
Tel/fax: 961-600-0254
Email investigacion@ihnechiapas.com

[Honduras investigator to be identified.]

Need.

The endangered Golden-cheeked Warbler winters almost exclusively in one ecoregion (Central American Pine-oak Forest) considered critically endangered by the World Wildlife Fund. Central American pine-oak forests are now heavily fragmented across an area of 111,000 km^2 from Chiapas east and south to Nicaragua, and including Guatemala, Honduras, and El Salvador; remaining forests may occupy as little as 6,750 km^2 (Rappole et al. 2003). **However, the winter range is not fully understood, and almost nothing is known about relative abundance among sites.** The winter range was recently thought to include only the central highlands of Chiapas, Guatemala, and Honduras (Rappole et al. 2003). However, observations in Chiapas, El Salvador, and Nicaragua suggest that the range may be broader, potentially including highlands in northern Chiapas and coastal highlands stretching from western Chiapas to central El Salvador (Vidal et al, 1994; Claudia Macias & Oliver Komar, unpublished data). Also, several recent sightings in Nicaragua suggest that there may be wintering areas in the northern mountains of that country (Salvadora Morales, unpublished data).

Despite efforts to evaluate overall density and population trends in Texas, where the entire species breeds, **there is still much doubt about both densities and population trends across the species' range** (C. Farquhar, in talk presented to Mesoamerican Society for Biology and Conservation, November 2003). Limited access to private property throughout the breeding range seriously impedes progress in population research in Texas. However, biologists have access to most important patches of pine-oak forests in the warbler's winter range. Thus, we have an important opportunity to undertake range-wide monitoring for the warbler during winter, and evaluate methods for estimating the species' overall population. Given the endangered status of the warbler, the protection provided by the Endangered Species Act in the United States, and conservation efforts by Texas Parks and Wildlife Department, The Nature Conservancy and Environmental Defense, **range-wide population monitoring is needed** to determine the effects of these conservation efforts and the need for additional efforts. The only monitoring data currently available, from Fort Hood, Texas, suggests that populations at that site have increased by 100% since 1991 (Jettj et al. 1998, R. Peak, The Nature Conservancy, unpublished data). However, that data may not reflect populations at many other sites that have no conservation activities.

There is also much uncertainty about the overall population of the Golden-cheeked Warbler. Based on breeding density at Fort Hood and remote sensing of the breeding habitat, the *potential* breeding population was estimated to be approximately 228,000 adult birds (Rappole et al. 2003). This is probably an overestimate as it does not take into account limiting factors, such as non-availability of appropriate nest sites, or high rates of nest parasitism or nest predation in areas that lack extensive conservation measures. The same authors (Rappole et al. 2003) estimated that the winter population was 35,500 individuals, but the upper limit of the 95% confidence interval was 83,000. Based on these data, those authors suggested that factors on the wintering grounds are limiting the species' population.

The winter range of the warbler is frequently cited as above 1200 m elevation (Ladd & Gass 1999, Rappole et al. 2003). However recent sightings in El Salvador were near 800 m. Also, some recent sightings have been in areas with no pine trees, suggesting that oak forests (rather than pine-oak) are acceptable habitats. Rappole et al. (2003) suggested the population is limited by winter habitat availability, since the presumed habitat of the warbler covers only 6750 km2, and is capable of supporting only 15% of the population that could be supported by available breeding habitat. **More exploration of potential Golden-cheeked Warbler habitat is needed, to determine the true extent of Golden-cheeked Warbler winter habitat.**

In Chiapas, Guatemala and Honduras, male Golden-cheeked Warblers have been reported more frequently than females, leading Vidal et al. (1994) to hypothesize that the sexes may display sexual segregation on the wintering grounds. However, data is inconclusive. **Because of the warbler's**

small winter range, we have a unique opportunity to evaluate Vidal et al.'s hypothesis, through a range-wide evaluation of sex ratios related to habitat.

The Golden-cheeked Warbler is considered a flagship and umbrella species for conserving the critically endangered Central American pine-oak forests. Twelve institutions signed a memorandum of understanding on 7 November 2003, in Tuxtla Gutierrez, Chiapas, to collaborate on conservation of these forests and their endangered birds, including the Golden-cheeked Warbler. This collaboration is known as the "Continental Alliance for the Conservation of Mesoamerican Pine-oak Forests and their Birds". At least 7 of these institutions will participate in the proposed project (TNC Texas, Pronatura Chiapas, IHNE (Chiapas), Defensores de la Naturaleza, SalvaNatura, EDUCA, and ALAS) (listed in order geographically from north to south). **The alliance needs funds to carry out joint projects across the Mesoamerican region.**

In summary, data on winter distribution, relative abundance and habitat use, and population trends are needed to determine conservation priorities on a range-wide scale for the Golden-cheeked Warbler, an endangered flagship species for an endangered habitat.

Objective.

Six teams of researchers in five countries will expand knowledge of winter distribution, and quantify relative abundance, and habitat use of Golden-cheeked Warblers at known and potential wintering sites across the entire winter range, from Mexico to Nicaragua, during one winter period.

Expected Results or Benefits.

1. Improved knowledge of winter range of Golden-cheeked Warbler, via a range-wide map of relative abundance measures.
2. Preliminary results obtained on habitat use.
3. Carrying out this project serves to carry out the goals of the Continental Alliance for Mesoamerican Pine Oak Forests and its Birds, formed in November 2003 in Tuxtla Gutierrez, Chiapas by the institutions participating in this project (as well as other institutions).
4. A test of Vidal et al's (1994) hypothesis that male and female Golden-cheeked Warblers segregate on the wintering grounds (this result depends on proper training of the observers in field identification of sex and age classes).
5. This study will provide basic information for the conservation of the endangered Golden-cheeked Warbler and its winter habitat, the endangered pine-oak ecoregion in Central America.

Approach.

1. During September 2005, we will establish 6 teams of observers/researchers in each of the 5 countries where the study will take place.
2. During a meeting of the co-investigators in October 2004 (held in Río Escondido, San Jerónimo, Guatemala), we developed a standard protocol for collecting data, that included:
    a. Intensive evaluation of mixed species foraging flocks to determine density and relative abundance of Golden-cheeked Warblers.
    b. Vegetation descriptions of each habitat patch studied, using a standardized method such as tree and shrub surveys in plots of 0.1 ha for each patch.
    c. Field identification of sex and age classes.
    d. Methods for selecting study sites.
    e. Methods for mapping study sites (GIS).

3. During December 2005 and January 2006, the teams will collect data at known and potential wintering sites for Golden-cheeked Warblers throughout the range and extent of the Central American pine-oak ecoregion. Site visits will last for approximately 6 days each (30 days of field work per team are planned each year.)

4. During a meeting in August 2006, the research team will review results of the first field season, evaluate methodology and plan future field seasons and research needs. This meeting will potentially be held in conjunction with the X Congress of the Mesoamerican Society for Biology and Conservation, in Guatemala.
5. Prepare and submit Final Report, as required.

Pending acceptable results, apply for funding to continue field work during December and January of the following year, by visiting the same study sites, in order to evaluate annual variation in relative abundance estimates.

During annual meetings in the summer or autumn, the team will review data from prior field seasons, evaluate methodologies and plan following seasons, and collaborate on writing manuscripts.

The field teams will be developed in collaboration with partner institutions in each of the Mesoamerican countries involved in this study, as follows:

El Salvador: SalvaNATURA
Guatemala: Fundación Defensores de la Naturaleza
Honduras: Fundación Educación, Ciencia y Tecnología (EDUCA; confirmation pending)
Mexico: Pronatura Chiapas and Instituto de Historia Natural y Ecología (IHNE)
Nicaragua: Alianza para las Áreas Silvestres (ALAS)

Each of these institutions are signers of the Alliance document mentioned above. The Nature Conservancy in Texas will collaborate by seeking team members with experience monitoring Golden-cheeked Warblers on their breeding grounds who will join teams to assist with various aspects of data collection.

The team of investigators will meet each year at a regional meeting for the following purposes: (1) share results with each other and with the bird conservation community in general; (2) plan the following field season, including reviewing methodologies for standardization; (3) work together on writing scientific reports and manuscripts. These meetings will last for one week and will potentially be held in conjunction with the annual meeting of the Mesoamerican Society for Biology and Conservation. This is the only scientific meeting held on an annual basis in the Central American region (it is occasionally held in Mexico as well).

Location.

Surveys will be carried out across the wintering range of the Golden-cheeked Warbler, at five sites each in Chiapas, Guatemala, Honduras, El Salvador, and Nicaragua. These sites will include approximately 18 sites considered potential wintering sites, and 9 sites considered known wintering sites. The 10 known wintering sites are located in Chiapas (2), Guatemala (2), El Salvador (1), and Honduras (5). The potential wintering sites are located in Chiapas (6), Guatemala (3), El Salvador (4), and Nicaragua (5).

The potential sites in Nicaragua and El Salvador will include approximately 4 sites close to the known range in Honduras and 5 sites further away, in isolated mountain ranges. The potential sites in Chiapas will include one site in the northern mountains of Chiapas, two sites in western Chiapas (Selva El Ocote y Laguna Belgica) and three sites in the southern mountains, for example in La Sepultura and in the El Triunfo Biosphere Reserve. In Guatemala, the three potential sites will be located in the southern volcanic range.

The location of the coordinating office is the SalvaNATURA Conservation Science Program, in San Salvador, El Salvador.

Literature cited.

Jettj, L.A., T. J. Hayden, & J. Cornelius. 1998. Demographics of the Golden-cheeked Warbler (*Dendroica chrysoparia*) on Fort Hood, Texas. U. S. Army Corps of Engineers, Champaign, IL.

Ladd, C., & L. Gass. 1999. Golden-cheeked Warbler (*Dendroica chrysoparia*). The Birds of North America, No 420. The American Ornithologists' Union. The birds of North America, Inc., Philadelphia, PA.

Rappole, J.H., D.I. King, & P. Leimgruber. 2000. Winter habitat and distribution of the endangered Golden-cheeked Warbler (*Dendroica chrysoparia*). Animal Conservation 2: 45-49.

Rappole, J.H., D. I. King, & J. Diez. 2003. Winter- vs. breeding-habitat limitation for an endangered avian migrant. Ecological Applications 13:735-742.

Vidal, R., C. Macias-Caballero, & C. Duncan. 1994. The occurrrence and ecology of the Golden-cheeked Warbler in the highlands of northern Chiapas, Mexico. Condor 96: 684-691.

Estimated Budget (in US Dollars)

Description	Cost per unit	Year 1 request	Year 1 match	Year 2 request	Year 2 match
FEDERAL FUNDS					
Salaries					
Team leaders (5)	$1200/mo., 2.5 mos each per year	15,000		15,000	
Field assistants (5)	$700/mo., 2 mos per year	7,000		7,000	
Principal investigator and coordinator	$2400/mo, 3 mos per year	7,200		7,200	
IHNE team	$900/mo, 1 month	900		900	
IHNE field assistant	$600/mo, 1 month	600		600	
Other expenses, field work					
Per diems (for 16 field workers)	$12/day per person, 30 days per year	5,760		5,760	
Vehicle rental (4)	$1200/mo, 1 mos per year	4,800		4,800	
Gas, oil, misc. vehicle maintenance (6 vehicles)	$500/year/vehicle	3,000		3,000	
Travel to regional meetings					
Travel expenses (8 persons)	$300/person/meeting	2,400		2,400	
Administration	$1600/mo, 3 mos per year	4,800		4,800	
Subtotal		51,460		51,460	
MATCHING FUNDS					
IHNE Laguna Belgica team			1500		1500
IHNE vehicle			1200		1200
TNC field collaborators (5)	$2000/mo, 1 mos		10,000		10,000
TNC international travel (5)	$1400 ea.		7,000		7,000
Vehicles (1)	$1200/mo, 1 mos per year		1,200		1,200
GPS units (7)	$150/ea		1050		
Topographic maps			600		
Use of computers and office equipment	$200/mo, 2 mos per year		400		400
Pronatura y Defensores de la Naturaleza: Use of GIS and GIS technicians	$500/mo, 4 mos per year		2,000		2,000
Local Golden-cheeked Warbler research projects, Honduras & Nicaragua			5,000		5,000
Pronatura Chiapas, salary supplement for local coordinator	$400/mo, 2 mos per year		800		800
Subtotal			30,750		29,100
GRAND TOTAL					162,770
Total matching funds					59,850
Total request					**102,920**