

INTEGRATED GULF COASTAL PLAIN ECOSYSTEM PARTNERSHIP

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PREFACE

This report is intended as a summary of the Gulf Coastal Plain Ecosystem Partnership (GCPEP) from May 1998-May 2000. We have directed our style to those with technical expertise in natural resources, forest, wildlife and fire management. We have written this report in chapters that focus on the completion of the conservation planning process and the implementation of projects. This report focuses on the conservation of biological diversity in the context of the GCPEP.

The body of the report contains nine chapters that summarize the planning and project process to date and then offers lessons learned and conclusions. Chapter one ("Introduction") provides a brief overview and background of the GCPEP and the planning process. Chapter two ("Conservation from an ecoregional perspective") provides an analysis of the conservation significance of the partnership, both individually and collectively. Chapter three ("Socioeconomic assessment") provides an overview of the regional human context. Chapter four ("Sustaining biodiversity at sites") provides an overview of site conservation planning to date, including conservation target selection and threats to the targets. Chapters five and six ("GCPEP planning") summarize the results of the initial planning process, including the initial conservation targets selected. Chapters seven and eight ("GCPEP planning") summarize the finalization of operational guidelines and the implementation of projects. Chapter nine ("Conclusions") provides a brief overview of project accomplishments and lessons learned.

CHAPTER 1. INTRODUCTION

The Gulf Coastal Plain Ecosystem Partnership

The purpose of this final report is to summarize the project entitled, “The Gulf Coastal Plain Ecosystem Partnership: Development of Strategies and Projects,” supported in part by the Legacy Natural Resource Program of the Department of Defense. The sponsoring Air Force installation is Eglin Air Force Base (“Eglin”) located in the western Florida Panhandle approximately 20 km east of Pensacola, Florida. Eglin is a key member of the Gulf Coastal Plain Ecosystem Partnership, under which this project is organized.

The Gulf Coastal Plain Ecosystem Partnership (“GCPEP” or “Partnership”) is a unique collaboration among Eglin, The Nature Conservancy (“TNC”), Champion International Corporation (“Champion”), Blackwater River State Forest (“Blackwater”), Northwest Florida Water Management District (“NFWMD”) and National Forests in Alabama and Florida (“Conecuh” and “Apalachicola”), who cooperate under the auspices of a 1996 multi-party Memorandum of Understanding. Together, these partners manage more than 840,000 acres in one of the most important conservation landscapes in the Southeast. In 1998-2000, The Nature Conservancy, as a member of GCPEP, hired a local Project Director, Vernon Compton, a Project Administrator, Perrin Penniman, an Aquatic Specialist, Stephanie Davis and a Project Conservation Ecologist to facilitate planning and project implementation under the direction of a Steering Committee made up of representatives from each GCPEP organization.

Conservation planning at the ecoregional scale

One of the most important goals of this project is to develop a common set of voluntary conservation strategies consistent with each partner's individual legal mandates, mission and objectives. Cooperative conservation strategies, when developed, will explicitly recognize that collectively the Partners share interconnected ecosystems that stretch across their legal boundaries. One of the most important early challenges faced by the Partnership was to develop a regional perspective, based on the best available information, of the conservation value of each individual ownership and all GCPEP lands and waters in total.

The GCPEP members asked The Nature Conservancy (“TNC”) to develop a regional assessment of biodiversity that the GCPEP could use to shape their collective conservation strategies. The partners adopted a set of conservation targets (that is, species and natural communities that become the target of conservation effort), that were selected by consensus of the partners. An initial selection of eight conservation targets was increased to a final selection of 16 targets after review by the GCPEP staff and Steering Committee. The Nature Conservancy used a planning process termed *ecoregional planning* to determine which sites in the U.S. have the greatest conservation value (The Nature Conservancy 1996). The ecoregional planning process consists of 1) subdividing the U.S. into *ecoregions* based on Bailey (1995), 2) using the ecoregion as the basic planning unit, 3) reviewing all available information on the status of species, ecological groups and natural communities to choose *ecoregional conservation targets*¹,

¹ Ecoregional conservation targets consist of G1-G2, declining, imperiled, or keystone species and all representative natural communities or ecological groups. This methodology encompasses the so-called *fine filter-coarse filter* approach, where rare and imperiled species act as the fine filter and where natural communities or ecological groups

4) setting numeric *ecoregional conservation goals*² for targets and 5) assessing all known occurrences of targets across the ecoregion to choose a suite of *conservation sites*³ sufficient to meet the ecoregional target goals.

The GCPEP ownerships are located within the East Gulf Coastal Plain ecoregion (Fig. 1-1). The collective lands and waters contained within the Partnership (Fig. 1-2) were identified as one of the two most important conservation landscapes (e.g., large-scale sites) in the ecoregion based on the high concentration of target species, the landscape-level diversity of natural communities and the high quality of many of the occurrences (Table 1-1). A detailed summary of this information is found in Chapter 2.

Conservation planning at the site scale

Once a site is determined to be important from an ecoregional perspective, then the known conservation needs of the ecoregional targets (e.g., life history requirements for individual species or groups of species) that occur at the site can be used to determine site boundaries and local threats to long-term persistence. The Nature Conservancy terms this process *site conservation planning* (The Nature Conservancy 1998a). Site conservation planning is undertaken from the perspective of the species and natural community targets occurring at a given site. Site conservation planning has the following components: 1) identifying the ecoregional target species and natural communities that are present at a given site that serve as the *site conservation targets*; 2) assembling and assessing all available ecological information pertinent to the targets and the site; 3) assembling and assessing pertinent socioeconomic information (Chapter 3); and 4) using this information to assess the *threats*⁴ to the targets at the site. An assessment of targets and threats is included in Chapter 4. Once agreement on the targets and threats has been reached, then conservation *strategies* and *measures of success* can be developed.

Conservation planning process

Within GCPEP, the conservation planning process has consisted of the following elements: 1) documentation of individual partner objectives; 2) identification of common challenges and conservation issues; 3) agreement on conservation targets; 4) identification and implementation of short-term joint projects; and 5) completion of two issues workshops (see below). The results of planning to-date are summarized in Chapter 5, 6, 7 and 8.

Issue workshops: Red-cockaded woodpeckers and prescribed fire

One of the most important ecoregional and site target species is the red-cockaded woodpecker (*Picoides borealis*) (RCW). The RCW is a small cooperative breeding woodpecker

act as the coarse filters to pick up common species and important ecological processes, interactions and gradients occurring at larger spatial scales and higher levels of biological organization.

² For example, a goal might be 15 populations of bird species X, each population with at least 200 breeding pairs.

³ A site is a mappable, defined place in the ecoregion that is sufficiently large enough to protect viable populations of species targets and/or functional examples of natural communities or ecological groups.

⁴ A threat is defined as a stress and its source. For example, large-scale habitat fragmentation causes demographic isolation in red-cockaded woodpecker's populations (stress) as a direct result of traditional even-aged forestry practices (source of stress).

inhabits fire-dependent old-growth pine forests of the Southeast. The RCW was one of the first species listed as endangered under the Endangered Species Act of 1973. The RCW has declined throughout its range primarily due to massive habitat loss. More recently, the RCW has become threatened by habitat degradation resulting from logging practices and fire suppression. In the GCPEP landscape, past logging practices have isolated many RCW breeding groups. While these destructive logging practices have largely been halted on partner lands, RCWs continue to decline. This issue was the topic of an issues workshop held at Eglin July 21–23, 1998 and is summarized in the attached report entitled “Adaptive management of red-cockaded woodpeckers in northwest Florida: Progress and perspectives” (Moranz and Hardesty 1998).

Fire is perhaps the single most important ecological process in longleaf pine-dominated uplands in the Southeast. Without fire, the many fire-adapted plant and animal species, and the longleaf pine itself, will decline. Because of past logging and fire management practices many longleaf pine-dominated GCPEP areas and embedded communities are considered degraded. Reintroduction of fire is not a simple task, nor is maintaining and staffing the necessary large-scale prescribed fire program. Prescribed fire was addressed in a number of workshops. Summaries, in the form of Powerpoint™ presentations developed at the request of managers, were submitted to Eglin and Blackwater River State Forest managers immediately following the most recent workshops on February 22–25, 1999.

TABLE 1-1. Summary of conservation value of lands and waters included in the Gulf Coastal Plain Ecosystem Partnership.

Conservation Value of GCPEP

- Despite being only 2% of the 42 million acre East Gulf Coastal Plain Ecoregion area, lands and waters included in the 840,000 acre Gulf Coastal Plain Ecosystem Partnership feature viable examples of 37% of 308 species targets and 38% of 297 natural community targets identified for the ecoregion as a whole
- Protects >163 rare or imperiled plant, lichen, vertebrate and invertebrate species, including at least 40 G1-G2 species
- Encompasses 20–25% of the world’s remaining large tracts of longleaf pine, including the largest public ownerships and more than 50% of the remaining old growth stands
- Features the highest quality barrier island complex on Florida’s Gulf Coast
- The Choctawhatchee, Escambia-Conecuh and Yellow River watersheds and estuaries were identified as critical U.S. watershed hotspots (The Nature Conservancy 1998b) including at least 59 globally rare or imperiled species, and the Escambia River contains the richest and most imperiled fish assemblage in Florida
- Includes >900,000 acres of public land, including Eglin AFB (463K ac), Blackwater River State Forest (191K ac), Northwest Florida Water Management District (98K ac) and Conecuh National Forest (83K ac)

FIGURE 1-1. Ecoregions of the U.S. as defined by Bailey (1995) and The Nature Conservancy. The project is located in the East Gulf Coastal Plain (see #53 on following page).

FIGURE 1-2. Gulf Coastal Plain Ecosystem Partnership lands and surrounding landscape in the far western Florida Panhandle and southern Alabama, U.S.A. Lands marked in green are included in the seven member, public-private partnership that comprises nearly 840,000 acres.

CHAPTER 2. CONSERVATION FROM AN ECOREGIONAL PERSPECTIVE: THE BIODIVERSITY SIGNIFICANCE OF THE GULF COASTAL PLAIN ECOSYSTEM PARTNERSHIP

Report purpose

The purposes of this chapter are to provide:

- A summary of the overall significance of the 840,000 acre ownership of GCPEP in the context of the entire 42 million acre East Gulf Coastal Plain ecoregion;
- A list of suggested “conservation targets” (species only) that occur on GCPEP lands and waters that may benefit from individual and cooperative conservation efforts.

Ecoregional conservation & The Nature Conservancy

During the 1990s, The Nature Conservancy (“TNC”) began planning and working at larger geographic scales to conserve biodiversity. Toward this end, The Nature Conservancy adopted an “ecoregional conservation approach” (The Nature Conservancy 1997). Ecoregions are land areas that are large enough to encompass processes and multiple occurrences of rare and imperiled species and natural communities, yet small enough within which to plan, identify partners and take action. The U.S. ecoregional classification adopted by TNC is a modification of that adopted by the U.S. Forest Service (Bailey 1995).

The Nature Conservancy’s conservation goal in each U.S. ecoregion is to work with willing partners to conserve multiple examples of all native community types and all native species in functioning landscapes. The Nature Conservancy clearly recognizes, as does the GCPEP, that this ambitious conservation goal will be achieved only to the extent that it is able to engage public and private partners in successful conservation initiatives. “Partnership” means finding common ground, seeking socially acceptable and scientifically credible solutions, and respecting the sometimes very different missions and goals of partners, including private landowners.

Conservation targets: Species and natural communities

As a way of helping to focus the efforts of GCPEP, TNC staff and partners developed a list of “conservation targets” for the East Gulf Coastal Plain ecoregion consistent with the methods used in other ecoregional planning efforts. Defining conservation targets is a critical first step in identifying the sites, goals and projects necessary for successful biodiversity conservation.

Conservation targets include:

1. All native plant communities and identifiable ecological complexes;
2. Species that are globally rare, imperiled or declining across their range or in the ecoregion; and
3. Other species or ecological features of conservation interest (e.g., species requiring large areas, keystone species, important breeding aggregations, etc.).

This emphasis on conservation targets reflects the “coarse filter–fine filter” (communities as coarse filter–species as fine filters) approach adopted by TNC and scientists in an effort to ensure that all species, not just those singled out for conservation action, are conserved within functioning ecological complexes in the landscapes where they occur. The resulting targets are derived from all available sources of biodiversity information including data from the Natural Heritage Network, published records, museum records and consultation with biologists from public and private organizations and agencies. Development of conservation targets is considered by the Conservancy to be an iterative process and as new information is obtained, conservation targets and objectives will change.

Suggested species-level conservation targets for GCPEP

The East Gulf Coastal Plain ecoregion (EGCP) covers 42,439,000 acres, stretching from northeastern Louisiana across the southern portions of Mississippi, Alabama, Georgia and western Florida (Figure 1-1; ecoregion number 53). The exceptional biological diversity in this ecoregion ranks it among the two or three richest in North America. Unfortunately, historical and current rates of habitat loss and alteration also make its biological resources among the most threatened. At the scale of the East Gulf Coastal Plain ecoregion, TNC identified 310 target species (148 vascular plants, 1 lichen, 73 invertebrates, 28 fishes, 12 amphibians, 20 reptiles, 15 birds and 13 mammals) and 297 target natural communities that are considered to be rare, imperiled or of conservation concern (The Nature Conservancy 1999).

The Gulf Coastal Plain Ecosystem Partnership⁵ (GCPEP) consists of seven public and private partners that manage land in the south-central portion of the East Gulf Coastal Plain (Figure 1-2). In this report, we present lists of EGCP target species that have been recorded on each of the partnership lands (Blackwater River State Forest, Conecuh National Forest, the Champion International Corporation connector parcel, Choctawhatchee River Delta Preserve, Choctawhatchee River Water Management Area, Eglin Air Force Base, Garcon Point Water Management Area, Lower Escambia River Water Management Area and Yellow River Water Management Area). Please note that this chapter focuses on species-level targets, and does not analyze or present findings on natural communities. Later chapters will examine natural communities.

This list of suggested conservation targets represents TNC’s initial attempt to provide the GCPEP with a biodiversity perspective larger than any one ownership. The individual members of the GCPEP may have species-level targets that differ from the Conservancy’s or none at all. These lists represent conservation objectives for The Nature Conservancy staff only and in no way represent the conservation objectives of GCPEP. If adopted whole or in part, this list may help GCPEP members collectively and individually focus their limited conservation resources on the highest conservation priorities from an ecoregional, national and global perspective.

⁵ In 1995, the GCPEP was formalized by means of a MOU signed by each of the following partners: Eglin Air Force Base (463,441 acres), Florida Division of Forestry (189,374 acres), Northwest Florida Water Management District (97,781 acres), National Forests in Alabama (83,790 acres), Champion International Corporation (7,550 acres), The Nature Conservancy (2,750 acres), and National Forests in Florida (1,114 acres).

Methods

To determine which EGCP target species have been recorded on each natural area managed by GCPEP, TNC staff and partners examined lists of rare and imperiled species recorded by the Florida Natural Areas Inventory, the Alabama Natural Heritage Program and TNC's East Gulf Coastal Plain Ecoregional Planning Team. Additional occurrence data were obtained from other private, state and federal cooperators. The completeness of these lists may be limited by several factors. Species distributions presented here may understate the real distribution; it is probable that some species have escaped detection, especially in areas where little sampling has been performed. Additionally, due to a backlog of work at the natural heritage agencies, some natural occurrences of target species that have been observed in the field have yet to be documented in the computerized databases that we used. In contrast, some species recorded in the GCPEP landscape may no longer occur on some ownerships. However limited, these lists represent the most comprehensive data available at this writing.

Summary of findings

Species-level targets. The GCPEP landscape is considered by The Nature Conservancy to be one of the two most important landscapes in the ecoregion and a critical link in conserving the biodiversity of the Southeastern U.S. While its area comprises less than 2% of the 47 million acre East Gulf Coastal Plain ecoregion, the GCPEP landscape includes 37% of the target species and 38% of the natural communities of the ecoregion. Of the 310 species of plants, animals and lichens that are considered EGCP target species by The Nature Conservancy, at least 115 have been recorded as occurring on GCPEP lands, including 51 vascular plants, one lichen, 26 invertebrates, 10 fishes, six amphibians, nine reptiles, five birds and seven mammals (Tables 2-1a,b,c). Eleven are listed as federally endangered or threatened, with many more that may be considered for future listing unless immediate conservation action is taken.

Tables 2.3–2.11 list the target species that are found at each managed area, including those that are unique or nearly unique to each. Many of the managed areas host endemic or near endemic species and communities, and thus have a unique role to play in conservation at landscape and ecoregional scales. Sixty-one of the target species occurring on GCPEP lands have Natural Heritage ranks of G1, G2, T1, or T2, meaning that they have extremely limited distributions from a global perspective. Forty-five do not occur outside of the East Gulf Coastal Plain ecoregion.

Of these, at least 20 occur only within the GCPEP managed areas, and nowhere else. For example, a small area overlapping Eglin Air Force Base and Champion International properties contains the entire known range of the Florida bog frog (*Rana okaloosae*), an endemic species and one of the rarest vertebrates in North America. Eglin is home to another endemic vertebrate, the Okaloosa darter (*Etheostoma okaloosae*). Blackwater River State Forest, Eglin and Choctawhatchee River Water Management Area all host endemic invertebrates. Global conservation of these species depends on conservation of their habitat on GCPEP managed areas.

The GCPEP lands include significant portions of the watersheds of the Escambia-Conecuh, Blackwater, Yellow-Shoal and Choctawhatchee rivers. A recent assessment of North American freshwater systems identified these four watersheds as important hotspots for protecting at-risk fish and mussels and critical for conserving freshwater biodiversity in the U.S (The Nature Conservancy 1998). For example, of the nine freshwater mollusks target species

found in GCPEP managed areas, eight are G1 or G2 species, and five are endemic to the watersheds of the GCPEP landscape. All five occur in the Choctawhatchee River; two of them (*Ptychobranthus jonesi* and *Quincuncuna burkei*) exclusively so, but three with disjunct distributions (*Pleurobema strodeanum* is also found within the Lower Escambia Water Management Area, while *Villosa australis* and *Villosa choctawensis* have also been found at Conecuh National Forest). There have been relatively few studies of these freshwater systems. Surveys currently underway are expected to reveal significant new findings, especially on the Alabama portions of each watershed.

The Gulf Coastal Plain Ecosystem Partnership also hosts numerous targets that are non-endemic yet of great conservation concern. Some of the more imperiled non-endemics include the federally endangered red-cockaded woodpecker (*Picoides borealis*), which occurs on three of the partner lands; the federally threatened gulf sturgeon (*Acipenser oxyrinchus desotoi*), found in five rivers managed by GCPEP partners; and the white-top pitcherplant (*Sarracenia leucophylla*), which has been found at eight partner lands. The presence of these species on multiple partner landholdings, including in some cases the movement of individuals among them (e.g., red-cockaded woodpeckers), suggests that many opportunities for cooperative conservation exists among GCPEP land managers, and in some cases, may be essential for the long-term persistence of a number of important species.

Natural community-level targets. In all, at least 115 natural communities are represented on GCPEP lands, representing at least 38% of the 297 types described for the ecoregion. Gulf Coastal Plain Ecosystem Partnership ownerships comprise perhaps the most important and largest ownerships of the remaining vestiges of the once vast longleaf pine ecosystem, ranging from xeric sandhills to coastal flatwoods and including the largest remaining old growth stands. The former longleaf pine ecosystem has declined by as much as 98% across its former range. Gulf Coastal Plain Ecosystem Partnership lands and waters include perhaps as much as 20–25% of the remaining large ownerships. But the GCPEP landscape includes far more than just longleaf pine-dominated ecological complexes. For example, GCPEP ownerships include some of the largest remaining and best examples of barrier island-beach complexes on the U.S. Gulf coast, and some very rare plant associations, such as *Chrysoma/Conradina* dwarf-shrubland and *Hypericum chapmanii* dome swamp. The importance of these lands in protecting natural communities and ecological complexes will become better understood with further documentation.

TABLE 2-1a. ECGP Target plant and lichen species recorded on GCPEP lands. A single asterisk follows names of species that are endemic to the GCPEP landscape, while two asterisks follow those endemic to a single GCPEP site.

Scientific Name	Common Name	G-rank	Federal listing	Partner Lands
PLANTS				
<i>Agalinis filicaulis</i>	Jackson false foxglove	G3G4	N	EAFB
<i>Aristida simpliciflora</i>	southern three-awned grass	G2	N	EAFB
<i>Arnoglossum diversifolium</i>	variable-leaved indian plantain	G2	N	CRWMA, EAFB
<i>Arnoglossum sulcatum</i>	indian plantain	G3G4	N	CONNf, EAFB
<i>Asclepias viridula</i>	southern milkweed	G2	N	EAFB
<i>Aster chapmanii</i>	Shinner's aster	G2G3	N	EAFB
<i>Aster eryngiifolius</i>	coyote-thistle aster	G3?	N	CONNf, EAFB
<i>Baptisia calycosa</i> var <i>villosa</i> *	hairy wild indigo	G2T1T2	N	EAFB, CHAMP
<i>Calamintha dentata</i>	toothed savory	G3	N	EAFB
<i>Calamovilfa curtissii</i>	Curtiss' sandgrass	G2	N	CHONf, EAFB, Garcon Point W.M.A.,
<i>Carex baltzellii</i>	Baltzell's sedge	G2	N	EAFB
<i>Chrysopsis godfreyi</i>	Godfrey's golden aster	G2	N	EAFB
<i>Chrysopsis gossypina cruiseana</i>	Cruise's golden aster	G5T2	N	EAFB
<i>Cladium mariscoides</i>	pond rush	G5	N	EAFB, GPWMA
<i>Coelorachis tuberculosa</i>	piedmont jointgrass	G3	N	BRSF, EAFB
<i>Eleocharis rostellata</i>	beaked spikerush	G5	N	EAFB
<i>Helianthemum arenicola</i> *	Gulf rockrose	G3	N	EAFB
<i>Hymenocallis henryae</i> *	panhandle spiderlily	G1Q	N	EAFB
<i>Juncus gymnocarpus</i>	naked-fruited rush	G4	N	CONNf, EAFB
<i>Lilium iridollae</i>	panhandle lily	G1G2	N	BRSF, CHAMP, CONNF, EAFB, YRWMA
<i>Lindera subcoriacea</i>	bog spicebush	G2	N	EAFB, CONNF
<i>Linum westii</i>	West's flax	G2	N	EAFB
<i>Ludwigia spathulata</i>	spatulate seedbox	G2G3	N	CONNf
<i>Lupinus westianus</i> var <i>westianus</i> *	Gulf Coast lupine	G2	N	EAFB, CHONf
<i>Macranthera flammea</i>	hummingbird flower	G3	N	BRSF, CONNF, EAFB
<i>Magnolia ashei</i>	Ashe's magnolia	G3	N	CRWMA, EAFB
<i>Matelea alabamensis</i>	Alabama spiny-pod	G1	N	EAFB
<i>Monotropa hypopithys</i>	pinemap	G5	N	EAFB

Scientific Name	Common Name	G-rank	Federal listing	Partner Lands
<i>Nuphar lutea</i> spp. <i>ulvacea</i>	west Florida cowlily	G5T2	N	CRWMA, EAFB, YRWMA
<i>Panicum nudicaule</i>	naked-stemmed panic grass	G3	N	CONNF, EAFB
<i>Pinguicula planifolia</i>	Chapman's butterwort	G3?	N	BRSF, CHONF, CONNF, EAFB, GPWMA, YRWMA
<i>Pinguicula primuliflora</i>	primrose-flowered butterwort	G3G4	N	EAFB, CONNF
<i>Pityopsis oligantha</i>	coastal-plain golden-aster	G1G3	N	CONNF, EAFB
<i>Polygonella macrophylla</i>	large-leaved jointweed	G2	N	CHONF, EAFB
<i>Quercus arkansana</i>	Arkansas oak	G3	N	CHONF, EAFB
<i>Rhexia parviflora</i>	small-flowered meadowbeauty	G2	N	BRSF, EAFB
<i>Rhexia salicifolia</i>	panhandle meadowbeauty	G2	N	CONNF, EAFB
<i>Rhododendron austrinum</i>	orange azalea	G3	N	CHONF, CRWMA, CONNF, EAFB
<i>Rhynchospora crinipes</i>	hairy-peduncled beakrush	G1	N	EAFB
<i>Ruellia noctiflora</i>	night-flowering ruellia	G2G3	N	CONNF
<i>Sarracenia leucophylla</i>	white-top pitcherplant	G3	N	BRSF, CHAMP, CHONF, CONNF, EAFB, GPWMA, YRWMA
<i>Sarracenia purpurea</i>	purple pitcherplant	G5	N	EAFB
<i>Sarracenia rubra</i> ssp. <i>wherryi</i>	Wherry's sweet pitcher-plant	G3T3	N	CONNF, BRSF
<i>Schwalbea americana</i>	chaffseed	G2	LE	BRSF
<i>Selaginella ludoviciana</i>	Gulf spike moss	G3G4	N	EAFB
<i>Sideroxylon thornei</i>	Thorne's buckthorn	G2	N	EAFB
<i>Tephrosia mohrii</i>	pineland hoary-pea	G2?Q	N	EAFB
<i>Verbesina chapmanii</i>	Chapman's crownbeard	G2G3	N	EAFB
<i>Xyris chapmanii</i>	Chapman's yellow-eyed grass	G3	N	BRSF, CONNF
<i>Xyris isoetifolia</i> *	quillwort yellow-eyed grass	G2?	N	CONNF
<i>Xyris longisepala</i>	Kral's yellow-eyed-grass	G2	N	CONNF
LICHENS				
<i>Cladonia perforata</i> *	perforate reindeer lichen	G1	LE	EAFB

PARTNER LAND ABBREVIATIONS EXPLAINED:

BRSF = Blackwater River State Forest

CHAMP = Champion International Corporation Connector Parcel

CONNF = Conecuh National Forest

CRWMA = Choctawhatchee River Water Management Area

CHONF = Choctawhatchee National Forest

CRDP = Choctawhatchee River Delta Preserve

EAFB = Eglin Air Force Base

GPWMA = Garcon Point Water Management Area

LERWMA = Lower Escambia River Water Management Area

YRWMA = Yellow River Water Management Area

TABLE 2-1b. ECGP Target invertebrate species recorded on GCPEP lands. A single asterisk follows names of species that are endemic to the GCPEP landscape, while two asterisks follow those endemic to a single GCPEP site.

Scientific Name	Common Name	G-rank	Federal Listing	Partner Lands
INSECTS				
<i>Agarodes ziczac</i> **	Zigzag Blackwater River caddisfly	G1	N	BRSF
<i>Baetisca escambiensis</i> **	a mayfly	G1	N	BRSF
<i>Cernotina truncona</i>	Florida cernotinan caddisfly	G4G5	N	CONNf
<i>Cheumatopsyche gordonae</i> **	Gordon's little sister sedge (a caddisfly)	G1	N	EAFB
<i>Cheumatopsyche petersi</i> **	Peter's little sister sedge (a caddisfly)	G1	N	EAFB
<i>Cordulegaster sayi</i>	Say's spiketail	G1G2	N	BRSF, CONNF
<i>Gomphus westfalli</i>	diminutive clubtail	G1G2	N	BRSF
<i>Hydroptila latosa</i> **	broad varicolored microcaddisfly	G1	N	EAFB
<i>Ochrotrichia okaloosa</i> **	Okaloosa somber microcaddisfly	G1	N	EAFB
<i>Oxyethira kelleyi</i> **	Kelley's cream brown microcaddisfly	G1	N	EAFB
<i>Polyamina pubescens</i> **	panhandle beach scarab	G2	N	EAFB
MOLLUSKS				
<i>Elimia clenchi</i> **	Clench's goniobasis	G1G2	N	CRWMA
<i>Elliptio mcMichaeli</i>	fluted elephantear	G3Q	N	CRWMA
<i>Fusconaia escambia</i>	narrow pigtoe	G2	N	LERWMA
<i>Lampsilis ornata</i>	southern pocketbook	G1?	N	LERWMA
<i>Lampsilis straminea claibornensis</i>	southern fatmucket	G5T5	N	CONNf
<i>Lepidostoma morsei</i>	Morse's little plain brown sedge	G1	N	EAFB
<i>Margaritifera marrianae</i>	Alabama pearlshell	G1	N	CONNf
<i>Oecetis morsei</i>	a caddisfly	G1	N	CONNf
<i>Pleurobema strodeanum</i>	fuzzy pigtoe	G2	N	CRWMA, LERWMA
<i>Polycentropus floridensis</i>	Florida brown checkered summer sedge	G2	N	EAFB
<i>Ptychobranchnus jonesi</i>	southern kidney shell	G2	N	CRWMA, CONNF
<i>Quincuncina burkei</i> *	tapered pigtoe	G2	N	CRWMA
<i>Strophitus subvexus</i>	southern creekshell	G3	N	CONNf
<i>Villosa australis</i> *	southern sandshell	G2	N	CONNf, CRWMA
<i>Villosa choctawensis</i> *	choctaw bean	G2	N	CONNf, CRWMA

TABLE 2-1c. ECGP Target vertebrate species recorded on GCPEP lands. A single asterisk follows names of species that are endemic to the GCPEP landscape, while two asterisks follow those endemic to a single GCPEP site.

Scientific Name	Common Name	G-rank	FED listing	Partner Lands
FISHES				
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	G3T2	LT	CONNF, CRWMA, CRDP, EAFB, LERWMA, YRWMA
<i>Alosa alabamae</i>	Alabama shad	G4	N	CRWMA, LEWMA, YRWMA
<i>Etheostoma bifascia</i>	Florida sand darter	G3	N	CONNF
<i>Etheostoma davisoni</i>	Choctawhatchee darter	G3	N	CONNF
<i>Etheostoma okaloosae</i> **	Okaloosa darter	G2	LE	EAFB
<i>Etheostoma proleiare</i>	cypress darter	G5	N	LERWMA
<i>Fundulus escambiae</i>	russetfin topminnow	G4	N	CONNF
<i>Fundulus jenkinsi</i>	saltmarsh topminnow	G3	N	GPWMA
<i>Macrhybopsis sp. 2</i>	Florida chub	G3	N	CRWMA, LERWMA
<i>Percina austroperca</i>	southern logperch	G3	N	LERWMA
AMPHIBIANS				
<i>Ambystoma cingulatum</i>	flatwoods salamander	G2G3	LT	EAFB, CHAMP, CONNF
<i>Ambystoma tigrinum</i>	tiger salamander	G5	N	BRSF
<i>Amphiuma pholeter</i>	one-toed amphiuma	G3	N	EAFB
<i>Hyla andersonii</i>	pine barrens treefrog	G4	N	BRSF, CONNF, EAFB
<i>Rana capito sevosa</i>	dusky gopher frog	G4T2	N	BRSF, CONNF, EAFB
<i>Rana okaloosae</i>	Florida bog frog	G2	N	CHAMP, EAFB
REPTILES				
<i>Caretta caretta</i>	loggerhead sea turtle	G3	LT	EAFB
<i>Chelonia mydas</i>	green sea turtle	G3	LE	EAFB
<i>Crotalus adamanteus</i>	eastern diamondback rattlesnake	G5	N	BRSF, CRWMA, EAFB, CONNF
<i>Drymarchon corais couperi</i>	eastern indigo snake	G4T3	LT	BRSF, EAFB, CONNF
<i>Gopherus polyphemus</i>	gopher tortoise	G3	LT	BRSF, CONNF, EAFB
<i>Graptemys ernsti</i>	Escambia map turtle	G2	N	EAFB, LERWMA, YRWMA
<i>Heterodon simus</i>	southern hognose snake	G2	N	CONNF, EAFB

Scientific Name	Common Name	G-rank	FED listing	Partner Lands
<i>Macrolemys temminckii</i>	alligator snapping turtle	G3G4	N	BRSF, CRWMA, CONNF, EAFB, LERWMA, YRWMA
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	G5T3?	N	BRSF, CHAMP, CONNF, EAFB
BIRDS				
<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	N	EAFB, CONNF, BRSF
<i>Charadrius alexandrinus</i>	snowy plover	G4	N	EAFB
<i>Falco sparverius paulus</i>	southeastern American kestrel	G5T3T4	N	EAFB
<i>Picoides borealis</i>	red-cockaded woodpecker	G3	LE	BRSF, CONNF, EAFB
<i>Speotyto cunicularia floridana</i> *	Florida burrowing owl	G4T3	N	EAFB
MAMMALS				
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared bat	G3G4	N	CONNF
<i>Myotis austroriparius</i>	southeastern myotis	G3G4	N	CONNF
<i>Neofiber allenii</i>	round-tailed muskrat	G3	N	EAFB
<i>Peromyscus polionotus leucocephalus</i> *	Santa Rosa beach mouse	G5T1	N	EAFB
<i>Peromyscus polionotus peninsularis</i>	St. Andrews beach mouse	G5T1	N	EAFB
<i>Trichechus manatus</i>	manatee	G2?	LE	CRDP, CRWMA, EAFB, GPWMA, YRWMA
<i>Ursus americanus floridanus</i>	Florida black bear	G5T2	N	CHAMP, CONNF, EAFB

TABLE 2-2. ECGP Target species recorded at Blackwater River State Forest, Florida (as of April 1999). A single asterisk follows names of species that are endemic to the GCPEP landscape, while two asterisks follow those endemic to a single GCPEP site.

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
PLANTS							
<i>Coelorachis tuberculosa</i>	piedmont jointgrass	G3	N	S3	N	2	FNAI, 1999
<i>Lilium iridollae</i>	panhandle lily	G1G2	N	S1S2	LE	3	FNAI, 1999
<i>Macranthera flammea</i>	hummingbird flower	G3	N	S2	LE	4	FNAI, 1999
<i>Pinguicula planifolia</i>	Chapman's butterwort	G3?	N	S2	LE	2	FNAI, 1999
<i>Rhexia parviflora</i>	small-flowered meadowbeauty	G2	N	S2	LE	2	FNAI, 1999
<i>Sarracenia leucophylla</i>	white-top pitcherplant	G3	N	S3	LE	38	FNAI, 1999
<i>Sarracenia rubra</i> spp. wherryi	Wherry's sweet pitcher plant	G3T3	?	?	?	?	Compton, pers. comm
<i>Schwalbea americana</i>	chaffseed	G2	LE	S1	LE	1	Obersholster, pers. comm.
<i>Xyris chapmanii</i>	Chapman's yellow-eyed grass	G3	N	S1	N	1	FNAI, 1999
INSECTS							
<i>Agarodes ziczac</i> **	zigzag Blackwater River caddisfly	G1	N	S?	N	?	Deyrup and Franz, 1994
<i>Baetisca escambiensis</i>	a mayfly	G1G2	N	S?	N		EGCP Team, 1999
<i>Cordulegaster sayi</i>	Say's spiketail	G1G2	N	S1S2	N	1	FNAI, 1999
<i>Gomphus westfalli</i>	diminutive clubtail	G1G2	N	S?	N	?	Deyrup & Franz, 1994
AMPHIBIANS							
<i>Ambystoma tigrinum</i>	tiger salamander	G5	N	S3	N	3	FNAI, 1999
<i>Hyla andersonii</i>	pine barrens treefrog	G4	N	S3	LS	31	FNAI, 1999
<i>Rana capito sevosia</i>	dusky gopher frog	G3	N	S3	LS	2	FNAI, 1999
BIRDS							
<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	N	S3	N	?	Sheehan

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Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
<i>Picoides borealis</i>	red-cockaded Woodpecker	G3	LE	S2	LT	20	FNAI, 1999
REPTILES							
<i>Crotalus adamanteus</i>	eastern diamondback rattlesnake	G5	N	S3	N	2	FNAI, 1999
<i>Drymarchon corais couperi</i>	eastern indigo snake	G4T3	LT	S3	LT	2	FNAI, 1999
<i>Gopherus polyphemus</i>	gopher tortoise	G3	LT	S3	LS	10	FNAI, 1999
<i>Macrolemys temminckii</i>	alligator snapping turtle	G3G4	N	S3	LS	1	FNAI, 1999
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	G5T3?	N	S3	LS	2	FNAI, 1999

TABLE 2-3. ECGP Target species recorded at the Champion International connector parcel, Florida (as of April 1999). A single asterisk follows names of species that are endemic to the GCPEP landscape, while two asterisks follow those endemic to a single GCPEP site.

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
PLANTS							
<i>Baptisia calycosa</i> var <i>villosa</i> *	hairy wild indigo	G2T3	N	S3	LT	2	FNAI, 1999
<i>Lilium iridollae</i>	panhandle lily	G1G2	N	S1S2	LE	1	FNAI, 1999
<i>Sarracenia leucophylla</i>	white-top pitcherplant	G3	N	S3	LE	1	FNAI, 1999
AMPHIBIANS							
<i>Ambystoma cingulatum</i>	flatwoods salamander	G2G3	LT	S2S3	N	1	FNAI, 1999
<i>Rana okaloosae</i> *	Florida bog frog	G2	N	S2	LS	2	FNAI, 1999
REPTILES							
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	G5T3?	N	S3	LS	1	FNAI, 1999
MAMMALS							
<i>Ursus americanus floridanus</i>	Florida black bear	G5T2	N	S2	LT	?	LAAC and FNAI, 1992.

TABLE 2-4. EGCP Target species recorded at Choctawhatchee National Forest, Florida (as of April 1999). A single asterisk follows names of species that are endemic to the GCPEP landscape, while two asterisks follow those endemic to a single GCPEP site.

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
PLANTS							
<i>Calamovilfa curtissii</i>	Curtiss' sandgrass	G2	N	S3	LT	1	FNAI, 1999
<i>Lupinus westianus</i> var <i>westianus</i> *	Gulf Coast lupine	G2	N	S2	LT	1	FNAI, 1999
<i>Pinguicula planifolia</i>	Chapman's butterwort	G3?	N	S2	LT	1	FNAI, 1999
<i>Polygonella macrophylla</i>	large-leaved jointweed	G2	N	S2	LT	3	FNAI, 1999
<i>Quercus arkansana</i>	Arkansas oak	G3	N	S3	N	2	FNAI, 1999
<i>Rhododendron austrinum</i>	orange azalea	G3G4	N	S3	LE	1	FNAI, 1999
<i>Sarracenia leucophylla</i>	white-top pitcherplant	G3	N	S3	LE	2	FNAI, 1999

TABLE 2-5. EGCP Target species recorded at TNC's Choctawhatchee River Delta Preserve, Florida (as of April 1999)

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	References
FISHES							
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	G3T2	LT	S2	LS	1	FNAI, 1999
MAMMALS							
<i>Trichechus manatus</i>	manatee	G2	LE	S2	LE	1	FNAI, 1999

TABLE 2-6. ECGP Target species recorded at the Choctawhatchee River Water Management Area, Florida (as of April 1999). A single asterisk follows names of species that are endemic to the GCPEP landscape, while two asterisks follow those endemic to a single GCPEP site.

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	References
PLANTS							
<i>Arnoglossum diversifolium</i>	variable-leaved indian plantain	G2	N	S2	LT	2	FNAI, 1999
<i>Magnolia ashei</i>	Ashe's magnolia	G3	N	S2	LE	4	FNAI, 1999
<i>Nuphar lutea</i> spp. <i>ulvacea</i>	west Florida cowlily	G5T2	N	S2	N	1	FNAI, 1999
<i>Rhododendron austrinum</i>	orange azalea	G3G4	N	S3	LE	2	FNAI, 1999
BIVALVE MOLLUSKS							
<i>Elimia clenchi</i> **	Clench's goniobasis	G1G2	N	S1	N	7	FNAI, 1999
<i>Elliptio mcMichaeli</i>	fluted elephantear	G3Q	N	S1S2	N	9	FNAI, 1999
<i>Pleurobema strodeanum</i>	fuzzy pigtoe	G2	N	S?	N	1	FNAI, 1999
<i>Ptychobranchus jonesi</i>	southern kidney shell	G2	N	S1	N	3	FNAI, 1999
<i>Quincuncina burkei</i> **	tapered pigtoe	G2	N	S?	N	5	FNAI, 1999
<i>Villosa australis</i> *	southern sandshell	G2	N	S?	N	1	FNAI, 1999
<i>Villosa choctawensis</i> *	choctaw bean	G2	N	S1	N	7	FNAI, 1999
FISHES							
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	G3T2	LT	S?	LS	1	FNAI, 1999
<i>Alosa alabamae</i>	Alabama shad	G4	N	S?	N	1	EGCP Team, 1999
<i>Macrhybopsis</i> sp. 2	Florida chub	G3	N	S2	N	2	FNAI, 1999
REPTILES							
<i>Crotalus adamanteus</i>	eastern diamondback rattlesnake	G5	N	S3	N	1	FNAI, 1999
<i>Macrolemys temminckii</i>	alligator snapping turtle	G3G4	N	S3	LS	1	FNAI, 1999
MAMMALS							
<i>Trichechus manatus</i>	manatee	G2?	LE	S2?	LE	1	FNAI, 1999

TABLE 2-7. EGCP Target species recorded at Conecuh National Forest, Alabama (as of April 1999). A single asterisk follows names of species that are endemic to the GCPEP landscape, while two asterisks follow those endemic to a single GCPEP site.

Scientific Name	Common Name	G-rank	FED Status	State Rank	State Status	# FNAI Recorded Locations	Reference
PLANTS							
<i>Arnoglossum sulcatum</i>	indian plantain	G3G4	N	S2S3	N	6	ALNHP, 1999
<i>Aster eryngiifolius</i>	coyote-thistle aster	G3?	N	S2	N	1	ALNHP, 1999
<i>Juncus gymnocarpus</i>	naked-fruited rush	G4	N	S1	N	2	ALNHP, 1999
<i>Lilium iridollae</i>	panhandle lily	G1G2	N	S1	N	4	ALNHP, 1999
<i>Lindera subcoriacea</i>	bog spicebush	G2	N	S1	N	2	ALNHP, 1999
<i>Ludwigia spathulata</i>	spatulate seedbox	G2G3	N	S1S2	N	1	ALNHP, 1999
<i>Macranthera flammea</i>	flame flower	G3	N	S2S3	N	4	ALNHP, 1999
<i>Panicum nudicaule</i>	naked-stemmed panic grass	G3	N	S2	N	8	ALNHP, 1999
<i>Pinguicula planifolia</i>	Chapman's butterwort	G3?	N	S1S2	N	?	CONNf, 1999
<i>Pinguicula primuliflora</i>	primrose-flowered butterwort	G3G4	N	S3S4	N	1	ALNHP, 1999
<i>Pityopsis oligantha</i>	coastal-plain golden aster	G2G4	N	S?	N	7	ALNHP, 1999
<i>Rhexia salicifolia</i>	panhandle meadowbeauty	G2	N	S1	N	2	ALNHP, 1999
<i>Rhododendron austrinum</i>	orange azalea	G3	N	S2S3	N	4	ALNHP, 1999
<i>Ruellia noctiflora</i>	night-flowering ruellia	G2	N	S1	N	5	ALNHP, 1999
<i>Sarracenia leucophylla</i>	whitewort pitcher-plant	G3	N	S3	N	11	ALNHP, 1999
<i>Sarracenia rubra ssp wherryi</i>	Wherry's sweet pitcher-plant	G3T3		S3	N	1	ALNHP, 1999
<i>Xyris chapmanii</i>	Chapman's yellow-eyed grass	G3	N	S?	N	3	ALNHP, 1999
<i>Xyris isoetifolia*</i>	quillwort yellow-eyed grass	G2?	N	SR	N	?	CONNf, 1999
<i>Xyris longisepala</i>	Kral's yellow-eyed-grass	G2	N	S1	N	2	ALNHP, 1999
BIVALVES							
<i>Lampsilis straminea claibornensis</i>	southern fatmucket	G5T5	N	S3	N	3	ALNHP, 1999
<i>Margaritifera marrianae</i>	Alabama pearlshell	G1	N	S1S2	N	5	ALNHP, 1999
<i>Ptychobranhus jonesi</i>	southern kidneyshell	G2	N	S2	N	?	CONNf, 1999
<i>Strophitus subvexus</i>	southern creekshell	G3	N	S1	N	1	ALNHP, 1999
<i>Villosa australis</i>	Southern sandshell	G2	N	S1S2	N	2	ALNHP, 1999
<i>Villosa choctawensis</i>	Choctaw bean	G2	N	S2	N	2	ALNHP, 1999

Scientific Name	Common Name	G-rank	FED Status	State Rank	State Status	# FNAI Recorded Locations	Reference
INSECTS							
<i>Cernotina truncona</i>	Florida cernotinan caddisfly	G4G5	N	S1	N	1	ALNHP, 1999
<i>Cordulegaster sayi</i>	Say's spiketail	G1G2	N	S?	N	?	CONNf, 1999
FISHES							
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	G3T2	N	S1	N	1	ALNHP, 1999
<i>Alosa alabamae</i>	Alabama shad	G4	N	S2	N	1	ALNHP, 1999
<i>Etheostoma bifascia</i>	Florida sand darter	G3	N	S3	N	1	ALNHP, 1999
<i>Etheostoma davisoni</i>	Choctawhatchee darter	G3	N	S3	N	1	ALNHP, 1999
<i>Fundulus escambiae</i>	russetfin topminnow	G4	N	S3	N	1	ALNHP, 1999
AMPHIBIANS							
<i>Ambystoma cingulatum</i>	flatwoods salamander	G2G3	LT	S1	SP	???	CONNf, 1999
<i>Hyla andersonii</i>	pine barrens treefrog	G4	N	S2	SP	11	ALNHP, 1999
<i>Rana capito sevosa</i>	dusky gopher frog	G4T2	N	S2	SP	3	ALNHP, 1999
BIRDS							
<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	N	S3	N		CONNf, 1999
<i>Picoides borealis</i>	red-cockaded woodpecker	G3	LE	S2	SP	1	ALNHP, 1999
REPTILES							
<i>Crotalus adamanteus</i>	diamondback rattlesnake	G4	N	S3	N	?	CONNf, 1999
<i>Drymarchon corais couperi</i>	eastern indigo snake	G4T3	LT	S1	SP	?	CONNf, 1999
<i>Gopherus polyphemus</i>	gopher tortoise	G3	LT	S2	SP	?	CONNf, 1999
<i>Graptemys ernsti</i>	Escambia map turtle	G2	N	S2	N	2	ALNHP, 1999
<i>Heterodon simus</i>	southern hognose snake	G2	N	SH	SP	2	ALNHP, 1999
<i>Macrocllemys temminckii</i>	alligator snapping turtle	G3G4	N	S3	SP	1	ALNHP, 1999
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	G5T3?	N	S2	SP	3	ALNHP, 1999
MAMMALS							
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	G3G4	N	S2	SP	?	CONNf, 1999
<i>Myotis austroriparius</i>	southeastern myotis	G3G4	N	S2	SP	1	ALNHP, 1999
<i>Ursus americanus floridanus</i>	Florida black bear	G5T2	N	S2	N	1	ALNHP, 1999

Scientific Name	Common Name	G-rank	FED Status	State Rank	State Status	# FNAI Recorded Locations	Reference

TABLE 2-8. EGCP Target species recorded at Eglin Air Force Base (as of April 1999). A single asterisk follows names of species that are endemic to the GCPEP landscape, while two asterisks follow those endemic to a single GCPEP site.

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
PLANTS							
<i>Agalinis filicaulis</i>	Jackson false foxglove	G3G4	N	S3	N	?	EGCP Team, 1999
<i>Arnoglossum diversifolium</i>	variable-leaved indian plantain	G2	N	S2	LT	?	Kindell et al., 1997
<i>Arnoglossum sulcatum</i>	indian plantain	G3G4	N	S?	N	?	EGCP Team, 1999
<i>Aristida simpliciflora</i>	southern three-awned grass	G2	N	S2	N	2	FNAI, 1999
<i>Asclepias viridula</i>	southern milkweed	G2	N	S2	LT	2	FNAI, 1999
<i>Aster chapmanii</i>	Shinner's aster	G2G3	N	S2S3	?	2	FNAI, 1999
<i>Aster eryngiifolius</i>	snakeroot	G3?	N	S2S3	?	15	FNAI, 1999
<i>Baptisia calycosa</i> var <i>villosa</i> *	hairy wild indigo	G2T3	N	S1S2	LT	195	FNAI, 1999
<i>Calamintha dentata</i>	toothed savory	G3	N	S3	N	14	FNAI, 1999
<i>Calamovilfa curtissii</i>	Curtiss' sandgrass	G2	N	S3	LT	61	FNAI, 1999
<i>Carex baltzellii</i>	Baltzell's sedge	G2	N	S2	LT	90	FNAI, 1999
<i>Chrysopsis godfreyi</i>	Godfrey's golden aster	G2	N	S2	N	11	FNAI, 1999
<i>Chrysopsis gossypina cruiseana</i>	Cruise's golden aster	G5T2	N	S2	LE	33	FNAI, 1999
<i>Cladium mariscoides</i>	pond rush	G5	N	S1	N	3	FNAI, 1999
<i>Coelorachis tuberculosa</i>	piedmont jointgrass	G3	N	S3	N	5	FNAI, 1999
<i>Eleocharis rostellata</i>	beaked spikerush	G5	N	S1	LE	1	FNAI, 1999
<i>Helianthemum arenicola</i> *	Gulf rockrose	G3	N	S3	?	19	FNAI, 1999
<i>Hymenocallis henryae</i> *	panhandle spiderlily	G1Q	N	S1	LE	1	FNAI, 1999
<i>Juncus gymnocarpus</i>	naked-fruited rush	G4	N	S1	N	3	FNAI, 1999
<i>Lilium iridollae</i>	panhandle lily	G1G2	N	S1S2	LE	39	FNAI, 1999
<i>Lindera subcoriacea</i>	bog spicebush	G2	N	S1	LE	3	FNAI, 1999
<i>Linum westii</i>	West's flax	G2	N	S2	LE	2	FNAI, 1999
<i>Lupinus westianus</i> var <i>westianus</i> *	Gulf Coast lupine	G2	N	S2	LT	1	FNAI, 1999
<i>Macranthera flammea</i>	hummingbird flower	G3	N	S2	LE	5	FNAI, 1999
<i>Magnolia ashei</i>	Ashe's magnolia	G3	N	S2	LE	31	FNAI, 1999
<i>Matelea alabamensis</i>	Alabama spiny-pod	G1	N	S1	LE	20	FNAI, 1999
<i>Monotropa hypopithys</i>	pinemap	G5	N	S1	LE	3	FNAI, 1999
<i>Nuphar lutea</i> ssp <i>ulvacea</i>	west Florida cowlily	G5T2	N	S2	N	26	FNAI, 1999

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
<i>Panicum nudicaule</i>	naked-stemmed panic grass	G3?	N	S2?	N	69	FNAI, 1999
<i>Pinguicula planifolia</i>	Chapman's butterwort	G3?	N	S2	LT	53	FNAI, 1999
<i>Pinguicula primuliflora</i>	primrose-flowered butterwort	G3G4	N	S3	LE	2	FNAI, 1999
<i>Pityopsis oligantha</i>	coastal plain golden aster	G1G3	N	S?	N	?	Kindell et al., 1997
<i>Polygonella macrophylla</i>	large-leaved jointweed	G2	N	S2	LT	23	FNAI, 1999
<i>Quercus arkansana</i>	Arkansas oak	G3	N	S3	N	144	FNAI, 1999
<i>Rhexia parviflora</i>	small-flowered meadowbeauty	G2	N	S2	LE	10	FNAI, 1999
<i>Rhexia salicifolia</i>	panhandle meadowbeauty	G2	N	S2	N	23	FNAI, 1999
<i>Rhododendron austrinum</i>	orange azalea	G3G4	N	S3	LE	23	FNAI, 1999
<i>Rhynchospora crinipes</i>	hairy-peduncled beakrush	G1	N	S1	N	12	FNAI, 1999
<i>Sarracenia leucophylla</i>	white-top pitcherplant	G3	N	S3	LE	131	FNAI, 1999
<i>Sarracenia purpurea</i>	purple pitcherplant	G5	N	S3	LT	2	FNAI, 1999
<i>Selaginella ludoviciana</i>	Gulf spike moss	G3G4	N	S?	N	?	EGCP Team, 1999
<i>Sideroxylon thornei</i>	Thorne's buckthorn	G2	N	S1	LE	1	FNAI, 1999
<i>Tephrosia mohrii</i>	pineland hoary-pea	G2?Q	N	S1	N	160	FNAI, 1999
<i>Verbesina chapmanii</i>	Chapman's crownbeard	G2G3	N	S2S3	LT	209	EGCP Team, 1999
<i>Xyris longisepala</i>	karst pond xyris	G2	N	S2	LE	15	FNAI, 1999
LICHEN							
<i>Cladonia perforata*</i>	perforate reindeer lichen	G1	LE	S1	LE	7	FNAI, 1999
INSECTS							
<i>Cheumatopsyche gordonae**</i>	Gordon's little sister sedge	G1	N	S?	N	?	Deyrup and Franz, 1994
<i>Cheumatopsyche petersi**</i>	Peter's little sister sedge	G2	N	S1	N	?	Flowers, 1997
<i>Hydroptila latosa**</i>	broad varicolored microcaddisfly	G1	N	S?	N	?	Deyrup and Franz, 1994
<i>Lepidostoma morse**i</i>	Morse's little plain brown sedge	G1	N	S?	N	?	EGCP Team, 1999
<i>Ochrotrichia okaloosa**</i>	Okaloosa somber microcaddisfly	G1	N	S?	N	?	Deyrup and Franz, 1994
<i>Oecietis morsei</i>	a caddisfly	G1	N	S?	N	?	EGCP Team, 1999

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
<i>Oxyrethira kelleyi</i> **	Kelly's cream and brown microcaddisfly	G1	N	S?	N	?	Deyrup and Franz, 1994
<i>Polycentropus floridensis</i>	Florida brown checkered summer sedge	G2	N	S?	N	?	EGCP Team, 1999
<i>Polylamina pubescens</i> **	panhandle beach scarab	G2	N	S?	N	?	Flowers, 1997
FISHES							
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	G3T2	LT	S2	LS	2	FNAI, 1999
<i>Etheostoma okaloosae</i> **	Okaloosa darter	G2	LE	S2	LE	6	FNAI, 1999
AMPHIBIANS							
<i>Ambystoma cingulatum</i>	flatwoods salamander	G2G3	LT	S2S3	N	3	FNAI, 1999
<i>Amphiuma pholeter</i>	one-toed amphiuma	G3	N	S3	N	3	FNAI, 1999
<i>Hyla andersonii</i>	pine barrens treefrog	G4	N	S3	LS	53	FNAI, 1999
<i>Rana capito sevosa</i>	dusky gopher frog	G3	N	S3	LS	13	FNAI, 1999
<i>Rana okaloosae</i> *	Florida bog frog	G2	N	S2	LS	17	FNAI, 1999
REPTILES							
<i>Caretta caretta</i>	loggerhead	G3	LT	S3	LT	1	FNAI, 1999
<i>Chelonia mydas</i>	green turtle	G3	LT	S2	LE	1	FNAI, 1999
<i>Crotalus adamanteus</i>	eastern diamondback rattlesnake	G5	N	S3	N	24	FNAI, 1999
<i>Drymarchon corais couperi</i>	eastern indigo snake	G4T3	LT	S3	LT	16	FNAI, 1999
<i>Gopherus polyphemus</i>	gopher tortoise	G3	LT	S3	LS	26	FNAI, 1999
<i>Graptemys ernsti</i>	Escambia map turtle	G2	N	S2	N	1	FNAI, 1999
<i>Heterodon simus</i>	southern hognose snake	G2	N	S?	N	4	FNAI, 1999
<i>Macroclmys temminckii</i>	alligator snapping turtle	G3G4	N	S3	LS	3	FNAI, 1999
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	G5T3?	N	S3	LS	14	FNAI, 1999
BIRDS							
<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	N	S3	N	10	FNAI, 1999
<i>Charadrius alexandrinus</i>	snowy plover	G4	N	S2	LT	1	FNAI, 1999
<i>Falco sparverius paulus</i>	southeastern American kestrel	G5T3T4	N	S3?	LT	3	FNAI, 1999

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Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
<i>Picoides borealis</i>	red-cockaded woodpecker	G3	LE	S2	LT	22	FNAI, 1999
<i>Speotyto cunicularia floridana</i>	Florida burrowing owl	G4T3	N	S3	LS	3	FNAI, 1999
MAMMALS							
<i>Neofiber alleni</i>	round-tailed muskrat	G3	N	S3	N	27	EGCP Team, 1999
<i>Peromyscus polionotus leucocephalus</i> *	Santa Rosa beach mouse	G5T1	N	S1	N	2	FNAI, 1999
<i>Peromyscus polionotus peninsularis</i>	St. Andrews beach mouse	G5T1	N	S1	LE	?	FNAI, 1999
<i>Trichechus manatus</i>	manatee	G2?	LE	S2?	LE	1	FNAI, 1999
<i>Ursus americanus floridanus</i>	Florida black bear	G5T2	N	S2	LT	2	FNAI, 1999

TABLE 2-9. EGCP Target species recorded at Garcon Point Water Management Area, Florida (as of April 1999)

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
PLANTS							
<i>Calamovilfa curtissii</i>	Curtiss's sandgrass	G2	N	S2	LE	5	FNAI, 1999
<i>Cladium mariscoides</i>	pond rush	G5	N	S1	N	1	FNAI, 1999
<i>Pinguicula planifolia</i>	Chapman's butterwort	G3?	N	S2	LE	2	FNAI, 1999
<i>Sarracenia leucophylla</i>	white-top pitcher plant	G3	N	S3	LE	2	FNAI, 1999
FISHES							
<i>Fundulus jenkinsi</i>	saltmarsh topminnow	G3	N	S2	LS	1	FNAI, 1999
MAMMALS							
<i>Trichechus manatus</i>	manatee	G2?	LE	S2?	LE	1	FNAI, 1999

TABLE 2-10. EGCP Target species recorded at Lower Escambia Water Management Area (as of April 1999)

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	# FNAI Recorded Locations	Reference
BIVALVE MOLLUSKS						
<i>Fusconaia escambia</i>	narrow pigtoe	G2	N	S?	4	FNAI, 1999
<i>Lampsilis ornata</i>	southern pocketbook	G1?	N	S1	2	FNAI, 1999
<i>Pleurobema strodeanum</i>	fuzzy pigtoe	G2	N	S?	1	FNAI, 1999
FISHES						
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	G3T2	LT	S?	1	FNAI, 1999
<i>Alosa alabamae</i>	Alabama shad	G4	N	S?	1	EGCP Team, 1999
<i>Etheostoma proeliare</i>	cypress darter	G5	N	S2	4	FNAI, 1999
<i>Macrhybopsis sp. 2</i>	Florida chub	G3	N	S2	3	FNAI, 1999
<i>Percina austroperca</i>	southern logperch	G3	N	S2	1	FNAI, 1999
REPTILES						
<i>Graptemys ernsti</i>	Escambia map turtle	G2	N	S2	1	FNAI, 1999
<i>Macroclmys temminckii</i>	alligator snapping turtle	G3G4	N	S3	1	FNAI, 1999

TABLE 2-11. EGCP Target species recorded at Yellow River Water Management Area, Florida (as of April 1999)

Scientific Name	Common Name	G-rank	FED Status	FNAI State Rank	State Status	# FNAI Recorded Locations	Reference
PLANTS							
<i>Lilium iridollae</i>	panhandle lily	G1G2	N	S1S2	LE	1	FNAI, 1999
<i>Nuphar lutea</i> spp. <i>ulvacea</i>	west Florida cowlily	G5T2	N	S2	N	2	FNAI, 1999
<i>Pinguicula planifolia</i>	Chapman's butterwort	G3?	N	S2	LT	1	FNAI, 1999
<i>Sarracenia leucophylla</i>	white-top pitcherplant	G3	N	S3	LE	1	FNAI, 1999
FISHES							
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	G3T1T3	LE	S?	LE	1	FNAI, 1999
<i>Alosa alabamae</i>	Alabama Shad	G4	N	S?	N	0	EGCP Team, 1999
REPTILES							
<i>Graptemys ernsti</i>	Escambia map turtle	G2	N	S2	N	1	FNAI, 1999
<i>Macrocllemys temminckii</i>	alligator snapping turtle	G3G4	N	S3	LS	1	FNAI, 1999
MAMMALS							
<i>Trichechus manatus</i>	manatee	G2?	LE	S2?	LE	1	FNAI, 1999

Explanation of global and state ranks

Explanations and definitions of FNAI global rank, FNAI state rank, federal status and state status (taken from Marois, 1998, with the permission of the author). The Nature Conservancy and the Natural Heritage Program network (of which FNAI is a part) define an *element* as any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave or other ecological feature. An *element occurrence* (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The *global rank* is based on an element's worldwide status; the *state rank* is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

Federal and State Status information is from the following sources:

- Federal animals and plants - U.S. Fish and Wildlife Service, October 31, 1997, *Endangered and Threatened Wildlife and Plants*, 50 CFR 17.11 and 17.12,
- State animals - Florida Game and Fresh Water Fish Commission, August 1, 1997, *Florida's Endangered Species and Species of Special Concern, Official Lists*
- State plants - Coile, N. C. 1998. Notes on the Florida's Regulated Plant Index, Rule 5B-40. Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, FL.

FNAI global rank definitions

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

G4 = Apparently secure globally (may be rare in parts of range)

G5 = Demonstrably secure globally

GH= Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)

GX= Believed to be extinct throughout range

GXC= Extirpated from the wild but still known from captivity or cultivation

G#? = Tentative rank (e.g., G2?)

G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3)

- G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)
- G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
- G#T#Q= Same as above, but validity as subspecies or variety is questioned.
- GU= Due to lack of information, no rank or range can be assigned (e.g., GUT2).
- G? = Not yet ranked (temporary)

FNAI state rank definitions

- S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- S3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
- S4 = Apparently secure in Florida (may be rare in parts of range)
- S5 = Demonstrably secure in Florida
- SH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- SX = Believed to be extinct throughout range
- SA = Accidental in Florida, i.e., not part of the established biota
- SE = An exotic species established in Florida may be native elsewhere in North America
- SN = Regularly occurring, but widely and unreliably distributed; sites for conservation hard to determine

Federal legal status (Listed by the U. S. Fish and Wildlife Service - USFWS)

- LE = Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species which is in danger of extinction throughout all or a significant portion of its range.
- PE = Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
- LT = Listed as Threatened Species. Defined as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- PT = Proposed for listing as Threatened Species.
- C = Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.

- E(S/A) = Endangered due to similarity of appearance.
T(S/A) = Threatened due to similarity of appearance.
N = Not currently listed, nor currently being considered for addition to the List of endangered and Threatened Wildlife and Plants.

State Legal Status

- *Animals* (Listed by the Florida Game and Fresh Water Fish Commission - FGFWFC)
 - LE = Listed as Endangered Species by the FGFWFC. Defined as a species, subspecies, or isolated population which is so rare or depleted in number or so restricted in range of habitat due to any man-made or natural factors that it is in immediate danger of extinction or extirpation from the state, or which may attain such a status within the immediate future.
 - LT = Listed as Threatened Species by the FGFWFC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
 - LS = Listed as Species of Special Concern by the FGFWFC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.
 - N = Not currently listed, nor currently being considered for listing.

- *Plants* (Listed by the Florida Department of Agriculture and Consumer Services - FDACS)
 - LE = Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.
 - LT = Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.
 - N = Not currently listed, nor currently being considered for listing.

- *Special animal listings - state and federal status*
 - *Grus americana* (whooping crane) - Federally listed as XN (nonessential experimental population) which refers to the Florida experimental population only; Federal listing elsewhere is LE.

- *Pandion haliaetus* (osprey) - State listed as LS (Species of Special Concern) in Monroe county only; not listed in rest of state.
- *Mustela vison mink* pop (southern mink, S. Florida population) - State listed as LT (Threatened) which refers to the Everglades population only; species formerly listed as *Mustela vison evergladensis*.
- *Ursus americanus floridanus* (Florida black bear) - State listed as LT but not applicable in Baker and Columbia counties or the Apalachicola National Forest.

CHAPTER 3. SOCIOECONOMIC ASSESSMENT OF THE GULF COASTAL PLAIN ECOSYSTEM PARTNERSHIP LANDSCAPE

Introduction

The partner institutions of the Gulf Coastal Plain Ecosystem Partnership (“GCPEP”) are responsible for the management of 840,000 acres in western Florida and southern Alabama. Approximately 97% of this acreage occurs in three Alabama counties (Conecuh, Covington and Escambia) and four Florida counties (Escambia, Okaloosa, Santa Rosa and Walton). A socioeconomic analysis of this seven-county region was performed by reviewing statistical abstracts, public documents and internet sites that provide socioeconomic data. Socioeconomic conditions of the region as a whole, and also important intra-regional differences, are discussed in the following summary.

Major differences among counties and groups of counties exist. Knowledge of differences and similarities among counties will:

- Assist the GCPEP in understanding the socioeconomic forces shaping the region;
- Offer insight into future trends;
- Identify viable opportunities for cooperation among cities, towns and local governments, as well as identify divisive issues.

Regional analysis

Population & demographics. Between 1990 and 1997, the population of this seven county region increased by 88,519 or 14.7%; a rate greater than 1980s growth (U.S. Bureau of the Census 1998). Population growth occurred primarily in the four Florida counties. The populations of Santa Rosa, Walton and Okaloosa counties grew at faster rates than the state and the nation during those years. Santa Rosa and Walton counties were two of the fastest growing counties in the nation, with growth rates of 40.3 % and 36.6%, respectively. Escambia County, FL grew by 7.5%, slower than the state of Florida rate of 13.3%, and experienced a negative net migration. Populations of the region’s three Alabama counties grew much more slowly than Alabama as a whole and the nation.

During the 1990s, people moved into the region at an unprecedented rate. Nearly half of the population growth (47%) in this region between 1990 and 1995 was due to immigration. However, Conecuh County, AL and Escambia County, FL actually experienced negative net migrations during those years (U.S. Bureau of the Census 1997).

Ethnic background of the region’s residents in 1990 was 82% white, 15% African-American, 1.8% Hispanic, and smaller percentages for Native Americans/Eskimos/Aleutians, and Asians/Pacific Islanders. These data are virtually unchanged from those of 1980, and fairly closely match national figures, except for the small percentage of persons of Hispanic origin.

Land use. The seven county region consists mainly of forested land. In 1995, 72% of the 2.4 million acres of the four Florida counties were classified as timberland and 1% were woodland (forest too low in quality for economical production). Although increasing human population in the area sometimes leads to reduction of forested land, the amount of timberland in

the Florida sub-region increased by 2% between 1987 and 1995 (Brown 1988, 1996). The most recent publications show that the Alabama sub-region had similar percentages of timberland (Vissage & Miller 1991) as of 1990. Patterns of ownership differed between the Alabama and Florida counties as of 1990. Forestry corporations own 45% of the timber in the Alabama counties, but only 25% in the Florida counties (Vissage & Miller 1991).

Farmland in the region, comprising 15% of the land, is being converted to other uses at a high rate. Between 1978 and 1992, the number of farms and farm acreage decreased by 25% and 29%, respectively (U.S. Bureau of Census 1996)

In the four Florida counties, the rate of residential development increased greatly between the late 1980s and the mid-1990s. For example, 377 housing units were constructed in Escambia County, FL in 1989 and 1990, while 3391 were constructed there in 1994 and 1995, a nine-fold increase. Okaloosa, Santa Rosa, and Walton counties all experienced two-fold increases in annual housing unit construction over the same period (Bureau of Economic and Business Research 1991, 1997). With this increase in construction, there has been a large increase in the acreage of residential land (from 9.38% of land area to 12.06%). For example, between 1990 and 1998, Santa Rosa County experienced a 28% increase in residential property, so that by 1998, 12% of the county's land was residential. Other land uses showing increases were commercial acreage (14% increase) and industrial acreage (11% increase), while the acreage of vacant lands and agricultural property have decreased (Santa Rosa County Community Planning 1998).

The rate of residential development in the three Alabama counties was slow as of the mid-1990s (Center for Business and Economic Research 1997). In 1994 and 1995, permits were issued for the construction of 126 new residential buildings, with 234 housing units, in all three Alabama counties combined. This figure is small compared to the permits issued for 15,000 units in the four Florida counties during those years.

Employment & economic performance. The counties of western Florida have had a very robust job market during the last two decades:

- The employed labor force increased by 66,000 between 1980 and 1990, and job growth occurred in every major employment sector except mining (U.S. Bureau of the Census 1996).
- Rapid growth in the number of jobs has continued in the 1990s. The county with the greatest increase was Okaloosa, with a 19.4% increase between 1992 and 1998 (Haas Center for Business Research and Economic Development 1999).
- The unemployment rate declined from 6.7% in 1990, to 5.2% in 1994, to 4.8% in 1998, and to less than 4% in March 1999 (Haas Center for Business Research and Economic Development 1999).
- The unemployment rate in the Florida counties has been consistently lower than state and national averages between 1991 and 1999 (U.S. Bureau of Labor Statistics 1999).

Employment problems do exist in the Florida sub-region. Industrial sector, moderate-income jobs are fewer in western Florida relative to the rest of Florida and the nation. The number of industrial jobs has declined in this region faster than the rate for the nation and is below the national figure. Many of the newly created jobs are low paying, which has long been

characteristic of jobs in these counties (as well as for the Alabama counties) (Hawkins and Kastro 1999). Significant job growth did not occur in the three Alabama counties between 1980 and 1990 (U.S. Bureau of the Census 1996). Slight growth has occurred during the 1990s, and March 1999 unemployment rates in these counties were down to ~6.5% (Bureau of Labor Statistics 1999).

The three most important employment sectors in the region as of 1990 were technical, sales and administrative support (31%), wholesale/retail trade (23%), manufacturing (13%) and the military (9%) (U.S. Bureau of the Census 1996). The military is an extremely important employer in Florida's three westernmost counties, the economies of which would be seriously hurt by substantial military downsizing in the area. The military is not a major source of employment in Walton County, Florida or in the three Alabama counties.

Only 2.3% of the employed civilian labor force worked in agriculture, forestry or fisheries in 1990. This percentage is relatively unchanged since 1980 (2.4%). Four employment sectors that grew especially quickly during the 1980s and 1990s were technical, sales and administrative support (nearly 25,000 jobs), wholesale/retail trade (17,000 jobs), tourism and construction (5,000 jobs) (U.S. Bureau of the Census 1996; Haas Center for Business Research and Economic Development 1999).

The tourism industry in the four Florida counties is extremely important and continues to grow, as indicated by a 4.9% increase in bed tax revenues over last year. The funds from the bed tax revenues are used for local development projects, thereby benefiting the tourism industry (CBRED 1999). An increase in bridge traffic to the beaches of nearly 10% over last year also points to a rise in tourism. Tourism is a relative non-factor in the three Alabama counties.

As of 1993, per capita incomes in the Alabama counties and Walton County, Florida was low (approximately \$14,000) compared to average per capita income for Alabama, Florida and the nation. Per capita incomes in Escambia, Santa Rosa and Okaloosa counties in Florida (\$16,899, \$16,556 and \$18,202, respectively) were substantially higher than those in the three Alabama counties and Walton Co., FL, but were lower than the average figures for Alabama, Florida and the nation.

Compared to national standards, cost of living is relatively low, in large part due to inexpensive housing (Haas Center for Business Research and Economic Development 1999). Although incomes are about 20% lower than the national average, prices of housing and commodities are only slightly lower in the western Florida counties than in the nation as a whole. (Hawkins and Kastro 1999). Recent data on cost of living in the Alabama counties was not available.

Social conditions. In 1995, 57.6% of Alabama county residents were high school graduates and 8.1% were college graduates. In 1989 the poverty rate was 26%, having increased from 22% in 1979. In 1995, 78% of Florida county residents were high school graduates and 18.7% were college graduates. In 1989, the poverty rate was 15%, having increased from 16% in 1979 (U.S. Bureau of the Census 1997).

Significant economic differences were present in the region in 1990. The year 2000 Census is likely to show evidence of the same conditions. The poverty rate for

African- Americans is 39.7% and 12.0% for whites. The poverty rate for children, at 23.5%, is higher than that for adults (U.S. Bureau of the Census 1997).

Citizen conservation attitudes. Data regarding the attitudes of the citizens of this region toward conservation issues is scarce. However, one indicator is the voting record for the citizens of the four Florida counties on Constitutional Revision No. 5 (Conservation of Natural Resources and Creation of Fish and Wildlife Conservation Commission). Seventy-two (72%) percent of the voters in Florida voted in favor of Revision No. 5. The percent of voters in the four Florida counties in this region that voted to pass it was lower, but still constituted a majority in three of the counties. In Escambia 62.2% voted yes, in Santa Rosa 57.1%, in Okaloosa 50.9% and in Walton only 47.3% voted yes.

Intra-county variation. Land-use and socioeconomic patterns vary among and within counties in the region. The Florida counties of the GCPEP region have local variation that is likely to have consequences for implementation of conservation and planning efforts. The southern portions of the four Florida counties are coastal or near the coast. The population and economic power of coastal Florida is much greater than that of the rural northern portions, leading to differences in personal income, unemployment rate (Hawkins and Kastro 1999) and property values. Such differences have led to strife in county commission politics, and may hinder community planning and conservation efforts at the county level.

Summary of findings

Between 1990-1997, the seven county area in Florida and Alabama increased by nearly 15%. The majority of the growth occurred in the four Florida counties. Santa Rosa (40.3%) and Okaloosa (36.6%) were among the fastest growing counties in the country, while the three Alabama counties experienced little growth. Most of the growth (nearly half) was due to immigration. The region is predominately white (82%), but Escambia and Conecuh counties in Alabama have large black populations (28.1% and 42.2%, respectively).

Timberland is the predominant land use (72%) and between 1987 and 1995, timberland remained relatively stable, increasing by 2%. Forestry corporations own 45% of the timber in the Alabama counties, but only 25% in the Florida counties. Farmland, decreased by 29% during the same period. Much of this decrease was due to residential development, especially in the fast growing Okaloosa, Santa Rosa and Walton counties of Florida. By 1998, 12% of the land area was classified as residential. Alabama counties showed relatively slow residential growth during a similar period.

Employment and job growth increased significantly in the Florida counties during the 1980s and 1990s, with job growth particularly strong in the technical, sales, administrative support, wholesale/retail trade and manufacturing. The majority of the new jobs are in the low paying service sector. Alabama experienced job growth, but at slower rates. In all cases, unemployment rates have generally declined over the past five to eight years (<4% in Florida and ~6.5% in Alabama). Employment in tourism is a growing and important economic force in the Florida counties, owing to their outstanding coastal beaches and bays.

Living expenses in the region were lower than the national average, but so was per capita income. Per capita incomes were substantially higher in Florida than in Alabama, with the three westernmost Florida counties having significantly higher average incomes.

CHAPTER 4. SUSTAINING BIODIVERSITY AT SITES

Site conservation planning

Developing a readily accessible, reasonably fast and cost-effective means of conservation planning focused on conserving biological diversity at particular sites has proven to be an elusive goal for scientists and land managers. Conservation planning has to overcome many challenges, not the least of which is the need or desire to simultaneously accommodate many different, often competing goals, only one of which may be conserving biodiversity. The Nature Conservancy has developed a relatively simple, iterative and biodiversity-centered approach termed *site conservation planning* (The Nature Conservancy 1998a, 1998c). The goal of site conservation planning is to develop a set of workable conservation strategies that will allow the biological targets of conservation to persist over the long-term with as little input from humans as possible. In order for this to happen, the landscapes (of various scales) within which the species and ecosystems of concern exist, have to be protected or managed in a way that is hospitable to long-term persistence, while allowing for change and random perturbations.

This approach explicitly recognizes that ecosystems are complex moving targets, that ecosystem structure and composition are controlled by processes operating at many different spatiotemporal scales simultaneously, and that biologists have little understanding of the structure and function or life history needs of most of the ecosystems and species that they seek to conserve. Thus, all knowledge is treated as provisional, and the planning *process* becomes as important as the *information* used in planning.

Biological diversity and functional landscapes

Biodiversity is often defined as simply the number of species occupying a given area (e.g., species richness). However, this definition vastly oversimplifies nature. Scientists now recognize that biodiversity exists at several levels of biological organization. These levels are typically defined as genes, species/populations, communities/ecosystems, landscapes and more recently, also include the dynamic, multi-scale processes that sustain structure and function (reviewed in Poiani et al. 2000). Although all levels are important, The Nature Conservancy focuses planning efforts at the population/species (hereafter “species”) and community/ecosystem (hereafter “community”) levels, primarily because this choice offers a relatively unambiguous starting point and some hope that success can be evaluated over time. We term these choices *site conservation targets*, which are a subset of the *ecoregional targets*, that occur in a given geographic area or site discussed in Chapter 2. In the GCPEP region, 115 species-level and 115 community-level ecoregional targets were identified.

Ecosystems, and to some extent, natural communities, can be defined as “...dynamic assemblages or complexes of plant and/or animal species... that (1) occur together on the landscape; (2) are tied together by similar ecological processes..., underlying environmental features..., or environmental gradients..., and (3) form a cohesive and distinguishable unit on the ground” (Poiani et al. 2000). Similarly, ecosystems also occur at a variety of spatial and temporal scales, from very localized occurrences (e.g., a rare plant occurring on an unusual geographic formation) to regional ecosystems stretching over tens of millions of acres (e.g., longleaf pine-dominated plant communities). Combining biological levels *and* spatial scales

provides a relatively simple and useful framework for thinking about conservation planning (Figure 4-1).

In addition to the choice of species and communities as the focus of conservation efforts, TNC also currently defines four overlapping geographic scales—*local, intermediate, coarse and regional*—to be used in defining functional conservation areas capable of sustaining biodiversity over the long-term (Figure 4-1). For example, a viable population of 200 adult black bears will require an area of several million acres in northwest Florida, encompassing many different natural community types, large relatively undisturbed areas, and with abundant safe movement corridors between home ranges. Black bears would be termed a “coarse scale species” because home ranges typically include several different vegetation communities or patches throughout the year, including agricultural areas. A “local scale species” would be a rare plant that inhabits only a certain limited soil type. Similarly, developing definitions of vegetation communities as “small patch” (local) “large patch” (intermediate) or “matrix” (coarse or regional) is very useful in determining conservation goals for plant communities at the landscape-scale (Figure 4-1).

A landscape capable of conserving the targets over time is termed *functional* if it meets two key criteria (Poiani et al. 2000);

- 1) Conserves clearly defined site conservation targets (species and communities);
- 2) Protects the multi-scale ecological processes that sustain the conservation targets over time.

Further, functional landscapes have several important characteristics: 1) their size, shape or other characteristics are defined by the needs of selected conservation targets at a given site; 2) key natural processes and appropriate structure exist within natural ranges of variation as defined by what is required to sustain the conservation targets over long time horizons (>100 years); 3) conflicts over human uses are inevitable; and 4) ecological management and restoration likely will be required at all scales (Poiani et al. 2000). An important consequence of this approach is that the boundaries of a given conservation landscape will vary with the ecological needs of different targets; any one landscape can consist of a number of different sized and shaped “sites” nested within the larger landscape. Thus, the choice of targets will define the threats to the targets, the site boundaries, and in large part, the choice of conservation partners.

Choosing site planning targets

Once conservation targets have been chosen for a site through ecoregional planning (Chapter 2) then managers should choose for planning purposes a smaller subset of the targets that occur at a site. As stated previously, both ecoregional and site targets are defined as 1) populations of species and 2) definable and mappable natural communities or 3) some other ecological unit (e.g., ecological complex, species guilds, etc.). Nature Conservancy practitioners refer to these as *site planning targets*. Attempting to use all *conservation* targets for planning purposes is often impossible because many species-level targets have little known life histories and/or because in large sites with many targets, analysis would be too unwieldy or complex. At the site level, appropriate choice of planning targets is the single most important step. All other conservation-related analyses and resulting management strategies are directed at abating the

threats to persistence of these planning targets, and indirectly, the entire suite of conservation targets.

The goal is to choose a set of conservation targets that represent multiple levels of biological organization, have different life history requirements, depend on different ecological processes and encompass a variety of different spatial scales. In effect, planning targets act as conservation umbrellas or surrogates, however imperfectly, for all other similar target species and natural communities occurring in the geographic area. Thus, planning targets, whether community or species-level, are used to cumulatively address the ecological requirements for all species and communities occurring at a site.

Multiple species targets may be grouped together by functional guilds (e.g., shorebirds) or a single keystone species may act as a surrogate for a host of functionally related species (e.g., gopher tortoises as surrogates for all species using gopher tortoise burrows). At a higher level, groups of communities that occur together can be grouped as ecological complexes (e.g., coastal swale and ridge communities), or where one community type forms the dominant vegetation type in the landscape, within which many other communities and species are embedded, then matrix communities or mosaics can be defined (e.g., longleaf pine-turkey oak-bluestem matrix).

Defining site planning targets for GCPEP

Specific site planning targets for GCPEP were derived from a set of simple analyses that examined the distribution of the 115 species-level ecoregional targets across the GCPEP landscape. In all, 16 primary planning targets have been identified to date (Table 4-1). This list may change, as new information becomes available. For example, the choice of “seepage stream/slope complex” was based on an analysis of the distribution of approximately 65 rare plant and animal species occurrences on Eglin, the majority of which cluster around the steephead creek (seepage creek) complexes. Expert opinion suggested that protection of the seepage stream complexes would protect the conservation targets, including the associated slope forests and aquatic communities. Thus, conservation strategies will center on restoration of linear fragmentation, repair of road crossings, and restoration of ecological gradients. Fire will be used to establish and maintain ecotones.

Stresses and sources of stress to planning targets

Once planning targets have been identified, then *threats* can be articulated (Table 4-2). Threats are anything that compromises the long-term viability of the target at the site. A threat is defined as a *stress* and its *source*. For example, large-scale habitat fragmentation causes demographic isolation in red-cockaded woodpeckers’ populations (a stress) as a direct result of traditional even-aged forestry practices applied at the landscape-scale (a source of stress).

The combination of targets, goals and threats define the boundaries of the site. For example, black bears probably occur on all individual ownerships within GCPEP, but a viable population (estimated at 200 bears) requires all of the GCPEP ownerships collectively, plus adjacent private lands not included in GCPEP. Table 4-3 combines targets and threats (in this case, sources of stress) by site. Rankings in all of the following tables are based on expert opinions about the relative severity and immediacy of the threat to the target and act as a filter for prioritizing key threats for the purpose of developing *conservation strategies*. (For an

explanation of ranking criteria, see Tables 4-4 and 4-5.) Conservation strategies are designed to abate threats to conservation targets at sites and will be addressed in a future technical report. In the tables that follow, we identify particular GCPEP sites, the planning targets and an assessment of the stresses and sources of stress to targets at sites.

Summary of findings

Of the 115 species-level ecoregional targets that occur in the GCPEP landscape, seven (red-cockaded woodpeckers, black bears, flatwood salamanders, Okaloosa darter, Florida bog frog, Gulf sturgeon, game birds) were chosen as planning targets. These seven species-level targets were chosen because they are declining across their range, each of them has large area requirements (relative to their body sizes), they are found on the majority of GCPEP acres and/or they would not necessarily be well protected through habitat management alone. Of the 297 ecoregional community/ecosystem-level targets, nine matrix-forming community types were chosen (longleaf pine sandhill matrix, longleaf pine flatwoods matrix, seepage stream/slope complex, blackwater rivers/streams, alluvial rivers/streams, barrier island complex, estuarine systems, depression marshes, sand pine scrub) as planning targets. Each of these matrix community types protects many rare, threatened and endangered species. The assumption is that if these systems are managed within appropriate ranges of variation, allowing or mimicking natural disturbance processes and restoring structure and function where seriously impaired, then the majority of species-level targets would be protected.

Overall, the most significant threats (as defined by sources of stress in this case) to non-riverine/estuarine targets were incompatible adjacent development, incompatible fire management, roads, and incompatible forestry practices, followed by unstable/inadequate funding, groundwater pumping, invasive species, and recreation. The most significant threats to riverine/estuarine targets were incompatible residential, industrial and municipal development, roads, culverts and bridges, incompatible agricultural practices, recreation, and inadequate/unstable funding.

TABLE 4-1. Conservation planning targets at Gulf Coastal Plain Ecosystem Partnership sites.

Conservation Planning Targets	Site
Longleaf pine sandhill matrix	Eglin, Champion, Blackwater, NW FL Water Management District
Longleaf pine flatwoods/uplands matrix	Eglin, Champion, Blackwater, Conecuh, NW FL Water Management District
Sand pine scrub	Eglin
Barrier island complex	Eglin
Depression marsh	Eglin, Champion, Blackwater, Conecuh, NW FL Water Management District, TNC
Seepage stream/slope complex	Eglin, Champion, Blackwater
Blackwater rivers/streams	Eglin, Champion, Blackwater, Conecuh, NW FL Water Management District
Alluvial rivers/streams	Eglin, Champion, Blackwater, Conecuh, NW FL Water Management District, TNC
Estuarine systems	Eglin, NW FL Water Management District, TNC
Red-cockaded woodpecker	Eglin, Blackwater, Conecuh
Florida black bear	Eglin, Champion, Blackwater, Conecuh, NW FL Water Management District, TNC
Upland game birds	Eglin, Champion, Blackwater, Conecuh, NW FL Water Management District
Flatwoods salamander	Eglin, Champion, Blackwater, Conecuh, NW FL Water Management District
Florida bog frog	Eglin, Champion
Okaloosa darter	Eglin
Gulf sturgeon	Eglin, Champion, Blackwater, Conecuh, NW FL Water Management District, TNC

TABLE 4-2. Stresses and sources of stress to targets at sites within the Gulf Coastal Plain Ecosystem Partnership.

SITE: Eglin Air Force Base and buffer lands

Name of Target: Longleaf pine sandhill and flatwood/upland matrix and associated communities-Eglin

Description: At 463,000 acres, Eglin Air Force Base is the largest and least fragmented, single longleaf pine ownership in the region of interest, and as such, is treated as a separate site. However, a number of Eglin conservation targets also occur on adjacent lands (e.g., Florida black bear). Eglin contains approximately 350,000 acres of longleaf pine sandhill, about 50% of which is considered to be in good or excellent condition. Eglin has the largest remaining stands of old-growth longleaf pine in existence. Upland-related conservation, planning and management targets on Eglin include the longleaf pine community matrix (sandhills, flatwoods, scrubby flatwoods, upland hardwood forest, upland mixed forest, sand pine scrub) described here, as well as seepage stream complexes, Florida black bears, red-cockaded woodpeckers and flatwoods salamanders (see below). An additional 85 ecoregional conservation targets occur on the site. Historically, longleaf pine was the dominant tree species on any site exposed to frequent, low intensity lightning or human-caused (interval of 2–7 years). Longleaf ecosystems have a simple structure comprised of open stands of large longleaf, few midstory hardwoods, and a diverse understory dominated by fire adapted forbs and grasses, especially bluestems. In addition to fire, major disturbance processes include lightning, occasional stand-replacing fires, droughts (once a decade on average), hurricanes or tropical storms (every 2–3 years on average), tornadoes, microbursts associated with convection storms, and intensive, small-scale, animal-caused soil disturbance. The greater longleaf pine ecosystem has declined by more than 95% across its range in the Southeast. Major sources of decline have been conversion, development, over-harvest and fire suppression.

Stresses: Longleaf pine sandhill & flatwood/upland matrix and associated communities-Eglin

Stress	Stress Rank
Sand pine invasion	H
Hardwood encroachment	M
Habitat conversion	H
Soil disturbance	L
Loss of biological buffers	H
Habitat fragmentation	M

Sources of Stress: Longleaf pine sandhill and flatwood/upland matrix and associated communities-Eglin

Sources of Stress	Stresses						Overall Threat Rank
	Sand pine invasion	Hardwood encroachment	Soil disturbance	Loss of biological buffers	Habitat conversion	Habitat fragmentation	
Incompatible forestry practices (Eglin/buffer)	M	M	M	M	L	L	M
Primary home development (buffer)		H		VH	VH	VH	VH
Military mission activities	M	M	L		M	L	M
Roads and utility corridors (Eglin/buffer)	H	M			H	H	H
Unstable funding	H	M					H
Smoke containment (Eglin/buffer)	M	H	L	M			M

SITE: Blackwater River State Forest, Conecuh National Forest, Champion International, Eglin Air Force Base, Northwest Florida Water Management District

Name of Target: Longleaf pine sandhill and flatwood/upland matrix and associated communities

Description: Same as for Eglin Air Force Base above, except that this landscape has highly fragmented public-private ownership; 286,000 acres of public lands are interdigitated by non-industrial and industrial timber holdings, small towns, housing developments, second homes, rural homesteads, pasture, cotton and tobacco fields, all of various sizes and shapes. Also, the longleaf pine dominated matrix is comprised primarily of flatwoods, scrubby flatwoods, mixed upland forest and mixed hardwood forest. While the longleaf community matrix is the primary conservation, planning and management target, at least 50 ecoregional targets also occur here.

Stresses: Longleaf pine sandhill and flatwood/upland matrix and associated communities

Stress	Stress Rank
Hardwood encroachment	H
Habitat conversion	H
Soil disturbance	H
Loss of biological buffers	H
Habitat fragmentation	VH
Herbicides	H

Sources of Stress: Longleaf pine sandhill and flatwood/upland matrix and associated communities

Sources of Stress	Stresses						Overall Threat Rank
	Hardwood encroachment	Habitat conversion	Soil disturbance	Loss of biological buffers	Habitat fragmentation	Herbicides	
Incompatible forestry practices (buffer)	M	H	H	L		H	H
Development/roads/utility corridors (sites & buffers)	VH	VH		VH	VH		VH
Public attitudes	H		H				H
Unstable funding	VH		H				VH
Off-road vehicle use			H				H
Smoke management	H		H	H			H

SITE: Eglin Air Force Base

Name of Target: Sand pine scrub

Description: Sand pine scrub communities have an overstory of sand pine and thickets of scrub oaks and other shrubs in the understory. Ground cover is generally dominated by ground lichens. This community occurs on sand ridges along former shorelines. These sands drain rapidly and the plants that live on them appear to have evolved water conservation strategies. Sand pine scrub is found close to the coast, usually located between the coast and the pine flatwoods where it is better sheltered from salt spray and heavy winds. Hot, fast burning fires naturally run through sand pine scrub every 20 to 80 years, burning catastrophically.

Stresses: Sand pine scrub

Stress	Stress Rank
Soil disturbance	H
Slash pine invasion	M
Habitat conversion	H

Sources of Stress: Sand pine scrub

Sources of Stress	STRESSES			Overall Threat Rank
	Soil disturbance	Slash pine invasion	Habitat conversion	
Incompatible fire management		H		H
Vehicular traffic	M			M
Foot traffic	M			M
Incompatible development	H		H	H

SITE: Eglin Air Force Base and buffer lands

Name of Target: Barrier island complex

Description: Eglin Air Force Base is responsible for management on Okaloosa Island and parts of Santa Rosa Island, two of the highest quality barrier islands in northwest Florida and south Alabama. The beach, dune, and coastal scrub are restricted to high-energy shorelines along the seaward boundary of these islands. Dune and beach vegetation has three main zones: (1) the shifting beach sands, which have no living vegetation; (2) the predune vegetation, which can tolerate salt spray, shifting sands, and intense heat; and (3) the scrub zone, characterized by stunted, wind and salt spray-pruned scrubby oaks and sand pine with a ground cover of lichens. The rare Santa Rosa beach mouse and green and loggerhead sea turtles utilize these barrier islands. Santa Rosa Island is closed to public recreation, but Okaloosa Island is open. Problems on the barrier islands include feral cats and disturbance of nesting birds, sea turtles, and dune vegetation by recreational users.

Stresses: Barrier island complex

Stress	Stress Rank
Light pollution	M
Exotic species competition/predation	H
Habitat conversion	H
Impeded sediment movement	VH
Soil disturbance	H

Sources of Stress: Barrier island complex

Sources of Stress	STRESSES					Overall
	Light pollution	Exotic species competition/ predation	Habitat conversion	Impeded sediment movement	Soil disturbance	Threat Rank
Foot traffic					H	H
Vehicle traffic	L				H	M
Sea walls/ docks				H		H
Exotic species		H				H
Incompatible development	H		VH	VH	VH	VH
Incompatible fire management			M			M

SITE: Eglin Air Force Base, Champion International, Blackwater River State Forest, Conecuh National Forest, NW FL Water Management District, The Nature Conservancy

Name of Target: Depression marsh

Description: Depression marshes, or ephemeral ponds, are shallow, small (less than 1 acre), rounded depressions in sand substrate and are usually characterized by a distinct margin of St. John’s wort. These ponds are maintained by a subsurface hardpan. Ephemeral ponds dry up most years, with hydroperiods ranging from around 50 to 200 days per year. Because there are rarely fish predators in ephemeral ponds, many species of invertebrates and vertebrates use them to complete their life cycles. Depression marshes are important breeding areas for salamanders, turtles, and frogs such as the flatwoods salamander, cricket frog, striped newt, and gopher frog. Many animals, including raccoons, opossum, and wood storks, feed on amphibian larvae and invertebrates when the ponds are drying up. Fire helps to maintain this community type by restricting invasion of shrubs and trees. Depression marshes are threatened by drainage, fire suppression, exotic species invasion, and fish stocking.

Stresses: Depression marsh

Stress	Stress Rank
Habitat conversion	H
Hardwood encroachment	H
Soil disturbance	VH
Altered hydrology	H

Sources of Stress: Depression marsh

Sources of Stress	STRESSES				Overall
	Habitat conversion	Hardwood encroachment	Soil disturbance	Altered hydrology	Threat Rank
Incompatible fire management	H	H		H	H
Incompatible development	VH		VH	VH	VH
Vehicle/equipment impacts	VH		VH	H	VH
Groundwater pumping	H			H	H
Roads and utility corridors	H			H	H
Incompatible forestry practices	H		H	H	H

SITE: Eglin Air Force Base, Blackwater River State Forest, Champion International

Name of Target: Seepage stream/slope complex

Description: Unique streams, known locally as "steepheads" or seepage streams, occur in deep sand soils with rapid percolation of rainwater. Water is stored in the sand aquifer and slowly released as springs or seeps. Seepage streams have relatively invariant flows of clear water of nearly constant temperature running over shifting sand bottoms. Seepage streams form steep headwalls, slopes and ravines as they cut uphill into sand ridges, creating exceptional vertical complexity in an otherwise topographically challenged landscape. The seepage stream complex includes seepage streams, seepage slopes, baygalls, slope forest, upland hardwood forest and upland mixed forest. These systems probably burn every 50-100 years, but the precise fire regime is not well understood. These are arguably the most species-rich systems on GCPEP lands and are extremely important for a host of G1-G2 plant and animal species, including many pitcher plants, the endemic Okaloosa darter and several species of undescribed salamanders. Because sandhill and seepage systems have received such extensive disturbance elsewhere in the Southeast, Eglin's seepage stream complex is among the largest and most important remaining examples.

Stresses: Seepage stream/slope complex

Stress	Stress Rank
Altered hydrology	H
Sedimentation	H
Habitat succession	H
Habitat fragmentation	H
Loss of canopy cover	H
Exotic species competition	M
Soil disturbance	H

Sources of Stress: Seepage stream/slope complex

Sources of Stress	Stresses							Overall Threat Rank
	Altered hydrology	Sedimentation	Habitat succession	Habitat fragmentation (riparian corridors & fish movement)	Loss of canopy cover	Soil disturbance	Exotic species competition	
Clay mining	VH	VH		H	H	VH		VH
Roads and road crossings	VH	VH		H	H			VH
Military test ranges	H	M		M	M			M
Dams and impoundments	H	H		H	H			H
Fire plowlines	H			L		L		L
Groundwater pumping	VH							VH
Invasive/exotic species	H	H				H	M	H
Incompatible forestry	M	VH			H	H		H
Incompatible fire management			H					H

SITE: Gulf Coastal Plain Ecosystem Partnership

Name of Target: Blackwater rivers/streams and associated floodplain

Description: Blackwater streams originate in sandy lowlands and drain extensive wetlands of organic soils. The tea-colored water of these streams is colored by tannins, particulates, and dissolved organic matter and iron derived from drainage through wetlands. Blackwater streams have sandy bottoms and are continually shifting. Although these streams are widely distributed in the southeastern coastal plain, many have had major disturbances or alterations and are less biologically productive. Many alluvial rivers are fed by blackwater stream tributaries. The Blackwater River system harbors a high diversity of rare aquatic insects. Main water quality threats are excessive sedimentation from roads, gully erosion from agricultural fields, increased biological oxygen demand from agricultural runoff and growth/development. As of 1998 in northern Santa Rosa County alone, the federal government has spent \$2.65 million to attempt to stop 27 gullies.

Stresses: Blackwater rivers/streams and associated floodplain

Stress	Stress Rank
Sedimentation	VH
Nutrient Enrichment	H
Contaminants/Toxins	M
Habitat Destruction	H

Sources of Stress: Blackwater rivers/streams and associated floodplain

Sources of Stress	Stresses				Overall Threat Rank
	Sediment	Nutrient Enrichment	Contaminants/ toxins	Habitat Destruction	
Roads, bridges, culverts	VH			VH	VH
Incompatible development (residential, commercial)	VH	H	M	M	H
Incompatible farming practices	VH	VH	H	VH	VH
Off-road vehicle use	VH			H	VH
Inadequate Funding	VH	H		H	H
Recreation	H	M		H	H
Incompatible forestry practices	M			M	M

SITE: Gulf Coastal Plain Ecosystem Partnership

Name of Target: Alluvial rivers/streams and associated floodplain

Description: Alluvial rivers originate in high uplands primarily composed of sandy clays and clayey-silty sands. These rivers are typically turbid due to a high content of suspended particulates and have a large range of flow rates and sediment loads. Flooding which generally occurs once or twice a year, is a controlling factor in the reproductive cycle of many organisms and is also important in providing woody debris, minerals and nutrients to floodplain communities. Portions of three watersheds found in the GCPEP, the Conecuh/Escambia, Choctawhatchee, and Yellow/Shoal are identified as critical systems for protecting at-risk fish and mussels (15, 14, 12, respectively). Of nine freshwater mollusk target species found in GCPEP waters, eight are G1 or G2 species and five are endemic to the Conecuh /Escambia and Choctawhatchee rivers. Main water quality threats are associated with dairy, agricultural and woodland runoff, as well as road runoff, wastewater discharges, and urbanization.

Stresses: Alluvial rivers/streams and associate floodplain

Stress	Stress Rank
Sedimentation	H
Nutrient Enrichment	H
Habitat Destruction	H
Contaminants/Toxins	H

Sources of Stress: Alluvial rivers/streams and associated floodplain

Sources of Stress	Stresses				Overall Threat Rank
	Sedimentation	Nutrient enrichment	Contaminants/ toxins	Habitat destruction	
Incompatible farming practices	VH	H	H	H	H
Incompatible wastewater discharge		H	H	M	H
Incompatible residential development	M	M		H	M
Roads, bridges, culverts	H			H	H
Off-road vehicle use	M			M	M
Inadequate funding	H	H	H	H	H
Incompatible forestry practices	M			M	M

SITE: Eglin Air Force Base, NW FL Water Management District, The Nature Conservancy

Name of Target: Estuarine systems

Description: The Pensacola Bay system includes five interconnected estuarine embayments (Blackwater Bay, Escambia Bay, East Bay, Pensacola Bay, and Santa Rosa Sound) and is fed by three major rivers (Yellow, Blackwater, and Escambia rivers). The estuary empties into the Gulf of Mexico through a narrow pass at the mouth of Pensacola Bay. The Choctawhatchee River and numerous small streams drain into the Choctawhatchee Bay, which empties into the Gulf of Mexico through a small pass and a man-made canal. Both estuaries historically had high fish and shellfish diversity, but they been experiencing decreases in seafood landings (crabs, shrimp, fish, and oysters) and seagrass beds have virtually disappeared. The estuaries are low energy systems with sluggish currents and are normally stratified, with the upper layer having a lower salinity than the lower layer. Estuarine habitats include seagrass beds, oyster beds, benthic microalgae communities, tidal marshes, tidal flats, and planktonic and pelagic communities. Gulf sturgeon and manatees both utilize the estuaries. Dredging of the mouth of Pensacola Bay and the canal of Choctawhatchee Bay have allowed increased salt water inputs into the two bays and has led to increases in species tolerant of higher salinities.

Stresses: Estuarine systems

Stress	Stress Rank
Sedimentation/turbidity	VH
Nutrient enrichment	VH
Contaminants/toxins	VH
Habitat destruction	VH
Altered circulation	H
Altered salinity	VH

Sources of Stress: Estuarine systems

Sources of Stress	STRESSES						Overall
	Sedimentation	Nutrient enrichment	Contaminants/ toxins	Habitat destruction	Altered circulation	Altered salinity	Threat Rank
Roads and bridges	VH			VH	H		VH
Incompatible development (residential, industrial, municipal)	VH	H	VH	VH	H	H	VH
Incompatible farming practices	VH	VH	H	VH			VH
Incompatible forestry practices	M			M			M
Canals					H	VH	VH

SITE: Eglin Air Force Base, Blackwater River State Forest, Conecuh National Forest

Name of Target: Red-cockaded woodpeckers

Description: Red-cockaded woodpeckers (RCWs) were federally listed as endangered in 1970 under the Endangered Species Act and have seen dramatic decreases across their range. Declines are due to habitat loss, demographic isolation, fire exclusion/suppression of open pine habitats, and loss of old trees (>100 years) required for cavity excavation. RCWs excavate cavities in living pine trees and have evolved a cooperative breeding behavior that limits habitat occupation to sites that have existing RCW cavities; hence, natural population expansion is slow even when otherwise excellent habitat is available. RCW family groups defend large home ranges (150–500 acres) and viable populations (>100 years) require relatively high densities (300 to 500 breeding pairs) in order to survive expected fluctuations in key habitat and demographic variables. Evidence suggests that RCW productivity is directly related to the diversity and quality of the understory plant-insect community, which is mediated by frequent fire. Because of the large area required to establish and maintain a viable population, RCW recovery is a politically charged issue. On GCPEP lands, Eglin Air Force Base has a large population, which has grown from an estimated population of 217 active clusters in 1994 to 285 in 1998, reversing what appears to have been sharp declines over several decades. Population increases were the result of extensive reintroduction of prescribed fire beginning in 1992, and secondly, due to creation of artificial cavities in suitable unoccupied habitat. Blackwater River State Forest and Conecuh National Forest, on the other hand, have had historically documented declines attributed to loss of cavity trees and suitable foraging habitat. Currently Blackwater has 18 active clusters and Conecuh has 17. Specific population goals have not yet been set for each of the GCPEP lands containing RCWs. RCW population changes (natural rates of increase/decrease) can serve as one indicator of the integrity of fire-maintained longleaf pine ecosystems, and the many species that depend on the open pine habitats preferred by RCWs.

Stresses: Red-cockaded woodpeckers

Stress	Stress Rank
Alteration of natural fire regime	H
Habitat loss and fragmentation	H
Habitat degradation	H
Demographic isolation	H
Cavity tree mortality	M

Sources of Stress: Red-cockaded woodpeckers

Sources of Stress	Stresses					Overall Threat Rank
	Altered fire regime	Habitat loss and fragmentation	Habitat degradation	Demographic isolation	Cavity tree mortality	
Incompatible forestry (plantations, off-site species)	H	H	H	VH		H
Incompatible fire management	H	H	H	H	M	H
Incompatible land mgt. (site prep, herbicides)	H		M			H
Catastrophic events (hurricane, wildfire)				M	M	M

SITE: Gulf Coastal Plain Ecosystem Partnership

Name of Target: Florida black bear

Description: Black bears once ranged throughout most of North America in forested habitats. However, black bears now occupy from 5-10% of their historic range in the southeastern United States, mainly in large forested tracts and wetlands in public ownership. Viable populations can exist in highly modified agricultural landscapes, so long as adequate cover remains along rivers and swamps and hunting, poaching and vehicle mortality is kept to a minimum. On Eglin, bears typically spend 95% of their time within 300 meters of creek bottoms. Palmetto berries, insects, acorns and fruits are primary foods. Females have relatively small home ranges, and female offspring are likely to occupy adjacent territories. Males typically have very large home ranges, often overlapping with other males, and encompassing the home ranges of one or more females. Home range sizes vary considerably from population to population. Females give birth to 1–2 cubs every 2–3 years, depending on habitat quality and productivity. The Florida black bear (*Ursus americanus floridanus*) is listed as a threatened species in Florida. Eglin Air Force Base has one of the few apparently stable bear populations in Florida. Population estimates range from 50-75 bears in the immediate area. These bears also use other Gulf Coastal Plain Ecosystem Partnership (GCPEP) lands including Champion International, Northwest Florida Water Management District and possibly Blackwater River State Forest. GCPEP appears to have enough acreage to secure a moderately large population of black bears, and was identified by the Florida Game and Fresh Water Fish Commission as a "strategic habitat conservation area" for the black bear in Florida. This large area of suitable habitat may be critical to the long-term survival of black bears in the western coastal plain. Major threats to long-term persistence include increased mortality due to vehicle collisions and poaching, habitat loss due to urban development and demographic isolation due to habitat fragmentation. A specific population goal has not yet been set, but a minimally viable population is estimated to be 200 adults.

Stresses: Florida black bear

Stress	Stress Rank
Habitat destruction	H
Habitat fragmentation	H
Exotic species invasion of habitat	H
Increased mortality	VH

Sources of Stress: Florida black bear

Sources of Stress	Stresses				Overall Threat Rank
	Habitat destruction	Habitat fragmentation	Exotic species	Increased mortality	
Conversion to agriculture/forestry	H	H	H		H
Incompatible development (residential, commercial)	VH	H			VH
Roads and utility corridors	H	H		VH	H
Exotic/invasive species	L		H		M
Poaching				VH	VH

SITE: Eglin Air Force Base, Conecuh National Forest, Blackwater River State Forest, Champion International, NW FL Water Management District

Name of Target: Upland game birds

Description: Hunting of game birds (quail and turkey) is an important recreational activity on GCPEP lands. Quail and turkey require a well-developed, heterogeneous understory for protection from predation. Both birds are ground nesters. The main food sources for game birds are insects and seeds. Breeding and nesting season is from April to September and hunting season runs from October to February for quail and March to May for turkey. Research results are mixed, but it appears that, overall, early growing season fires (early April) are beneficial to game birds because they are protected from hawks during the winter and have an abundance of insects and new green forbs that rebound after the fire. Burning small plots during the summer provides patchy habitat that quail and turkey use for cover and forage. Control of understory hardwoods, usually by fire, is necessary to maintain the understory grasses and herbaceous cover.

Stresses: Upland game birds

Stress	Stress Rank
Habitat conversion	H
Over-hunting	M
Sand pine encroachment	M
Hardwood encroachment	H
Food availability	M

Sources of Stress: Upland game birds

Sources of Stress	STRESSES					Overall Threat Rank
	Habitat conversion	Over-hunting	Sand pine encroachment	Hardwood encroachment	Food availability	
Incompatible fire management	H		M	H	M	H
Incompatible hunting management		M				M
Incompatible development	H				M	H
Incompatible forestry practices	H				H	H

SITE: Eglin Air Force Base, Champion International, Blackwater River State Forest, Conecuh National Forest, NW FL Water Management District

Name of Target: Flatwoods salamander

Description: The flatwoods salamander (*Ambystoma cingulatum*) is a small (5 in.) salamander occupying wet pine flatwoods and scrubby flatwoods with naturally occurring ponds without large predatory fish. Its range is restricted to the lower coastal plain from Mississippi to South Carolina. This species is federally listed as Threatened. Relatively little is known about its natural history, but it appears that individuals have relatively large home ranges of more than 1500 m². Adults live fossorially in pine flatwoods— perhaps in crayfish burrows—most of the year, moving to and from breeding ponds or puddles from October through January. Eggs are laid in clumps attached to detritus. Metamorphosis occurs within 90 days, with movement out of ponds and into uplands by March or April. Adults are apparently long-lived, perhaps up to 15 years. Pine flatwoods have been extensively drained and ditched for intensive silvicultural purposes throughout the salamander’s range, resulting in locally reduced water tables. Many temporary ponds have been planted in pines or drained, and the common practice of winter burning may have detrimental effects during breeding migration. The common use of herbicides may also be a threat. Habitat bisected by heavily traveled roads may increase mortality. Because they require large home ranges relative to their body size, flatwoods salamander populations are vulnerable to any habitat disturbance that fragments movement or access to breeding ponds. Eglin has the largest breeding population east of the Apalachicola, and relict populations are also found on Champion International lands and Blackwater River State Forest. Eglin’s population is considered to be relatively secure and well managed, while its status outside of Eglin is largely unknown. Specific population goals have not yet been set.

Stresses: Flatwoods salamander

Stress	Stress Rank
Non-breeding habitat degradation	H
Increased mortality during migration	H
Alteration of natural fire regime (habitat change)	H
Habitat fragmentation or barriers to movement	H
Loss of breeding ponds	H
Increased predation in breeding ponds	H

Sources of Stress: Flatwoods salamander

Sources of Stress	Stresses						Overall Threat Rank
	Non-breeding habitat degradation	Increased mortality during migration	Altered fire regime (habitat change)	Habitat fragmentation/ barriers to movement	Loss of breeding ponds	Increased predation in breeding ponds	
Forestry-related draining or ditching	H	H			VH		H
Roads and vehicle traffic	M	M	M	H	H		M
Introduction of predatory fish					L	H	M
Off-road vehicle use	M				M		M
Site conversion to pine plantation	VH		VH		H		VH
Groundwater pumping					H		H

SITE: Eglin Air Force Base, Champion International

Name of Target: Florida bog frog

Description: The Florida bog frog (*Rana okaloosae*) is a small frog (<2 in.) that lives in or along clear, shallow, acid seeps and shallow, boggy overflows of larger seepage streams, frequently in association with sphagnum moss. The predominant shrub/tree at most sites is the black titi. In areas that are infrequently burned, woody species invade and shade out the herbaceous layer, and also lower soil moisture levels. The bog frog’s range is restricted to Okaloosa, Walton, and Santa Rosa counties, Florida, and all know localities are on small tributaries to the Yellow or East Bay Rivers. The bog frog breeds from April to August, and tadpoles overwinter and transform the following spring or summer. The bog frog appears to reside year-round in the same areas used as breeding habitat. The main threats to the Florida bog frog are habitat succession due to fire suppression and impoundments. Further inventory is needed to determine the extent of the bog frog’s presence on GCPEP lands.

Stresses: Florida bog frog

Stress	Stress Rank
Sedimentation	H
Habitat degradation	H
Altered hydrology	H

Sources of Stress: Florida bog frog

Sources of Stress	STRESSES			Overall Threat Rank
	Sedimentation	Habitat degradation	Altered hydrology	
Roads and utility corridors	H	H	H	H
Impoundments	H	VH	VH	VH
Incompatible development	H	H	H	H
Incompatible fire management		VH	VH	VH
Groundwater pumping			H	H
Exotic species (feral hogs)	M	H		H

SITE: Eglin Air Force Base

Name of Target: Okaloosa darter

Description: Okaloosa darters (*Etheostoma okaloosae*) were listed as federally endangered in 1973 under the Endangered Species Act. This darter is endemic to the Choctawhatchee Bay system (Okaloosa and Walton Counties, Florida) and the majority of its known range is within the borders of Eglin Air Force Base. The Okaloosa darter was originally listed due to its extremely limited range, and problems associated with water impoundments, sedimentation, and competition with brown darters. Okaloosa darters are typically found along the margins of small creeks fed by groundwater seeping from surrounding sandhills. They tend to avoid areas of low flow and open sand stretches with no cover. Woody debris, root mats and vegetation are used for spawning substrate. Where streams are impounded or subjected to heavy sedimentation, these darters have decreased in numbers and range. Both the Okaloosa darter and the potentially competitive brown darter are found in the Rocky Bayou system, but they appear to have reached a balance. Since the listing in 1973, numbers have decreased in several stream sections (Swift Creek and Mill Creek), but populations in the upper reaches of Boggy and Rocky Bayou stream systems appear stable. Eglin Air Force Base is actively working to restore clay pits and roads that are sources of sediment to darter streams and to modify culverts that have resulted in stream gradients detrimental to Okaloosa darters.

Stresses: Okaloosa darter

Stress	Stress Rank
Sedimentation	H
Habitat degradation	VH
Resource competition	L
Altered hydrology	VH

Sources of Stress: Okaloosa darter

Sources of Stress	STRESSES				Overall
	Sedimentation	Habitat degradation	Resource competition	Altered hydrology	Threat Rank
Roads, culverts, bridges	VH	VH		VH	VH
Groundwater pumping				H	H
Brown darter			L		L
Impoundments	H	VH		VH	VH
Incompatible development	H	H		H	H

SITE: Gulf Coastal Plain Ecosystem Partnership

Name of Target: Gulf sturgeon

Description: The Gulf sturgeon is a federally threatened species of fish that migrates up coastal rivers connected to the Gulf of Mexico in spring to spawn. Primary areas of spawning are flowing waters with a rocky, gravel, or hard substrate. The eggs are then broadcast and adhere to the hard bottom features. Occurrence records indicate that most of the large rivers in the GCPEP are used by the Gulf sturgeon including the Escambia, Yellow, Choctawhatchee and lower Blackwater Rivers. Main threats are loss of spawning habitat and overharvesting (age to maturity and interval between spawning events).

Stresses: Gulf Sturgeon

Stress	Stress Rank
Sedimentation	VH
Nutrient enrichment	H
Contaminants/toxins	H
Harvest (poaching)	VH

Sources of Stress: Gulf sturgeon

Sources of Stress	Stresses				Overall Threat Rank
	Sedimentation	Nutrient Enrichment	Contaminants/ toxins	Harvest (poaching)	
Incompatible farming practices	VH	H	H		H
Incompatible development (residential, commercial)	VH	H	H		H
Incompatible wastewater discharge		VH	H		VH
Roads and utility corridors	VH				VH
Recreation (fishing)				VH	VH
Inadequate funding	H	H	H	H	H
Incompatible forestry practices	M		M		M

TABLE 4-3a. Relationship among conservation targets and threats (stresses and sources of stress) at the Eglin AFB site, including some subsites within Eglin. Site planning targets have been somewhat modified to accommodate unique differences among sites.

THREATS	Conservation Targets					
	Longleaf pine sandhill-flatwoods matrix-east	Longleaf pine sandhill matrix-west	Sand pine scrub	Barrier island complex	Depression marsh	Seepage stream/slope/ rare species complex
Unstable/inadequate funding for management	H	H				
Roads and utility corridors	M	H			H	VH
Incompatible fire management/plowlines	M	M	H	M	H	M
Incompatible adjacent development (residential/commercial)	M	VH	H	VH	H	
Incompatible forestry practices	M	M			H	H
Harvest (poaching)						
Military mission activities	M	M			M	M
Invasive/exotic species					H	H
Groundwater pumping					H	VH
Recreation (off-road vehicle and foot traffic)					M	

TABLE 4-3a (continued). Relationship among conservation targets and threats (stresses and sources of stress) at the Eglin AFB site, including some subsites within Eglin. Site planning targets have been somewhat modified to accommodate unique differences among sites.

THREATS	Conservation Targets						
	Red-cockaded woodpecker-east population	Red-cockaded woodpecker-west population	Florida black bear	Upland game birds	Flatwoods salamander	Florida bog frog	SUMMARY
Unstable/inadequate funding for management			H				H
Roads and utility corridors			VH		M	H	H
Incompatible fire management/plowlines	H	L		H		VH	H
Incompatible adjacent development (residential/commercial)			VH	H		H	H
Incompatible forestry practices	H	M		H	VH		H
Harvest (poaching)			VH				VH
Military mission activities	M	M					M
Invasive/exotic species						H	H
Groundwater pumping					H	H	H
Recreation (off-road vehicle and foot traffic)					M		M

TABLE 4-3b. Relationship among conservation targets and threats (stresses and sources of stress) at the Champion International, Blackwater River State Forest, Conecuh National Forest and Northwest Florida Water Management District sites.

THREATS	Conservation Targets								
	Longleaf pine sandhill-flatwood-upland matrix	Depression marsh	Seepage stream/ slope rare plant complex	Red-cockaded woodpecker	Florida black bear	Upland game birds	Flatwoods salamander	Florida bog frog	SUMMARY
Unstable/inadequate funding for management	VH								VH
Roads and utility corridors	H	H	VH		H		M	H	H
Incompatible fire management/plowlines	H	H	H	H		H		VH	H
Incompatible adjacent development (residential/commercial)	VH	VH			VH	H		H	VH
Incompatible forestry practices	H	H	H	H	H	H	H		H
Harvest (poaching)					VH				VH
Invasives/exotics			H		M		H	H	H
Groundwater pumping		H	VH				H	H	H
Recreation (off-road vehicle and foot traffic)	H	H					M		H

TABLE 4-3c. Relationship among riverine/estuarine conservation targets and threats (stresses and sources of stress) across the GCPEP landscape.

THREATS	Conservation Targets							SUMMARY
	Blackwater river/streams-longleaf pine matrix (upper Blackwater River)	Blackwater river/ bottomland hardwood/ longleaf pine matrix (lower Blackwater River)	Alluvial rivers/ streams/ bottomland hardwoods (upper Yellow River)	Alluvial rivers/ streams/ bottomland hardwoods (lower Yellow River)	Estuarine systems	Okaloosa darter	Gulf Sturgeon	
Incompatible land use (roads, bridges)	VH	H	H	H	VH	VH	VH	VH
Incompatible residential development	M	H	M	M	VH	H	H	H
Incompatible wastewater discharge				H	VH		VH	VH
Incompatible farming practices	VH	H	H	M	VH		H	H
Inadequate/unstable funding	H	H	H	H				H
Recreation	H	H					VH	VH
Incompatible forestry practices	M	M	M	M	M		M	M
Groundwater pumping						H		H

TABLE 4-3d. Relationship between conservation targets and threats (stresses and sources of stress) across the GCPEP landscape. This analyses considers threats to “coarse-scale” species targets that require the majority of the GCPEP landscape to meet the area and habitat requirements for viable populations.

THREATS	Conservation Targets			
	Florida black bear	Red-cockaded woodpecker	Gulf sturgeon	SUMMARY
Incompatible development (residential/commercial, industrial)	VH		H	VH
Roads and utility corridors	H		VH	VH
Smoke management/air quality		H		H
Incompatible forestry practices/sedimentation		H	M	H
Incompatible agricultural practices/sedimentation			VH	VH
Harvest (poaching)	VH		H	VH

TABLE 4.4. Indicators and benchmarks used to evaluate stresses (Center for Compatible Economic Development 1999).

Severity of Damage – what level of damage can reasonably be expected within 10 years under current circumstances	
Very High	The stress is likely to <i>destroy</i> or <i>eliminate</i> the conservation target
High	The stress is likely to <i>seriously degrade</i> the long-term viability of the conservation target
Medium	The stress is likely to <i>moderately degrade</i> the long-term viability of the conservation target
Low	The stress is likely to <i>impair</i> the long-term viability of the conservation target

Duration/Irreversibility of Damage – how long term is the stress, or how likely is the conservation target to recover from the stress, assuming no intervention	
Very High	The stress is <i>very long-term</i> (e.g. 20 years or more) in duration; or the conservation target is <i>not likely</i> to ever recover, regenerate or re-establish itself at the site as a viable occurrence
High	The stress is <i>long-term</i> (e.g. 10 years) in duration; or the conservation target <i>may not</i> recover, regenerate or re-establish itself at the site as a viable occurrence
Medium	The stress is <i>medium-term</i> (e.g. 5 years) in duration; or the conservation target is <i>likely to</i> recover, regenerate or re-establish itself at the site as a viable occurrence
Low	The stress is <i>short-term</i> (e.g. 1-2 years) in duration; or the conservation target is <i>likely to</i> recover, regenerate or re-establish itself at the site as a viable occurrence

Scope of Damage – what is the geographic scope of impact on the conservation target at the site	
Very High	The stress is likely to be <i>very widespread or pervasive</i> in its scope, and affect the conservation target at its <i>locations throughout</i> the site
High	The stress is likely to be <i>relatively widespread</i> in its scope, and affect the conservation target at <i>many of its locations</i> at the site
Medium	The stress is likely to be <i>relatively localized</i> in its scope, and affect the conservation target at <i>some locations</i> at the site
Low	The stress is likely to be <i>very localized</i> in its scope, and affect the conservation target at a <i>limited area</i> at the site

TABLE 4.5. Indicators and benchmarks used to evaluate sources of stress (Center for Compatible Economic Development 1999).

Degree of contribution or “loading” of the Stress that can reasonably be expected to occur from the Source within 10 years, assuming no change in threat abatement	
Very High	The source is a <i>very large</i> contributor of the particular stress (e.g. contributes over 80% of the stress)
High	The source is a <i>substantial</i> contributor of the particular stress (e.g. contributes 40% to 80% of the stress)
Medium	The source is a <i>moderate but meaningful</i> contributor of the particular stress (e.g. contributes 20% to 40% of the stress)
Low	The source is a <i>low or insubstantial</i> contributor of the particular stress (e.g. contributes less than 20% of the stress)

Duration/Irreversibility of the Source	
Very High	The source, once in place, is likely to be <i>very long-term</i> in duration (e.g. lasting or continuing over 20 years) and/or unlikely to be removed or abated
High	The source is likely to be <i>long-term</i> in duration (e.g. lasting over 10 years), and/or could be removed or abated, albeit with difficulty
Medium	The source is of <i>moderate</i> duration (e.g. lasting over 5 years), and/or could be removed or abated with moderate difficulty
Low	The source is of <i>short-term</i> duration (e.g. 1 to 4 years), and/or could be removed or abated

Urgency	
Very High	The threat is likely to be manifested to a degree that produces a <i>high impact within one year</i>
High	The threat is likely to be manifested to a degree that produces a <i>high impact within two to three years</i>
Medium	The threat is likely to be manifested to a degree that produces a <i>high or medium impact within five years</i>
Low	The threat is real, but <i>not likely</i> to manifest to a degree that produces a high or medium impact for five or more years

FIGURE 4-1. Biodiversity planning targets can be usefully organized by geographic scale (figure from Poiani et al. 2000). Conservation targets range from local species with a very limited geographic range (e.g., Florida bog frog) or a geomorphologically defined patch ecosystem (e.g., a sandhill lake) to wide-ranging regional-scale species with large home ranges (e.g., Florida black bear) or regional-scale matrix ecosystems with very broad distributions (e.g., the landscape-level complex of longleaf pine dominated sandhill, flatwood and scrubby flatwood communities).

CHAPTER 5. GULF COASTAL PLAIN ECOSYSTEM PARTNERSHIP PLANNING PROCESS: STEERING COMMITTEE MEETING # 1

Summary of Steering Committee meeting

Meeting summary. The GCPEP Steering Committee serves as the foundation for the conservation planning process. To that end, the first Steering Committee Meeting focused mainly on the planning process. This process is called Site Conservation Planning (Low 1998).

This summary attempted to capture the most important information as recorded on flip charts and transcribed by note takers during the meeting. Editorializing was kept to a minimum except when needed to clarify the context of issues and recommendations. Some of the discussion and recommendations required interpretation. Any errors in translation or interpretation are the responsibility of the author and were unintentional.

Meeting objectives. The Gulf Coastal Plain Ecosystem Partnership (GCPEP) Steering Committee met on December 1–2, 1998 at Bear Lake Recreation Area, Blackwater River State Forest. Issues discussed were to be related to conservation planning and operating guidelines. The meeting was designed to meet the following objectives:

1. Review tentative conservation targets and biodiversity significance of GCPEP;
2. Review seven to ten conservation objectives per partner on lands designated in GCPEP;
3. Agree on and prioritize common conservation objectives;
4. Agree on management challenges to common conservation objectives and list;
5. Review and finalize GCPEP operating guidelines;
6. Agree on procedures for adding new partners to GCPEP.

Tentative conservation targets. The Nature Conservancy presented a report entitled Conservation from an Ecoregional Perspective: The Biodiversity Significance of the Gulf Coastal Plain Ecosystem Partnership. The list of conservation targets was an initial attempt to provide the GCPEP with a conservation overview, realizing that individual partners in the GCPEP may have different species-level targets or none at all. It was hoped that the report would help GCPEP partners focus limited resources on the highest agreed upon conservation priorities.

The significance of the GCPEP lands is clearly stated in the report overview and including such facts as:

- GCPEP comprises only 2% of the 42 million acre East Gulf Coastal Plain Ecoregion area, but includes 38% of its natural communities and 37% of its target species;
- This landscape is considered one of the two most important landscapes in the Southeastern U.S. for conserving biodiversity;
- A national level analysis identified four GCPEP watersheds as critical hotspots for protecting at risk fish and mussel species.

The report also recognized the need for additional information on partner lands concerning occurrences and distribution of both species and community-level targets.

Partner conservation objectives. Each of the partners identified the seven to ten conservation objectives on lands they had designated in GCPEP. Partner lists of these objectives are below. Learning the individual partner objectives will assist the Partnership in recognizing areas of expertise and needs among the partners and across the GCPEP landscape. These objectives will ultimately help shape the long-term conservation strategies and actions of the Partnership.

Champion International

1. Understand biological resources present
2. What's at risk and how to manage
3. Formalization of common map
4. Cooperation to build needed wildlife connectors
5. Successful management of longleaf pine on an economic basis
6. Exotic species control
7. Cooperative erosion control
8. Public recreation management, including interpretation
9. National issues including combining economic and environmental stewardship, prospering with endangered species and emulation of these successes beyond GCPEP to other landowners.

Blackwater River State Forest (Division of Forestry)

1. Longleaf pine / wiregrass restoration
2. Increase prescribed burning
3. Increase public relations and outreach education
4. Protect endangered and other listed species
5. Increase erosion control efforts by controlling public access and improving/closing roads
6. Work on growth management issues within the forest boundary such as purchase of inholdings from willing sellers
7. Improve recreational management, particularly in reference to overuse or damage to areas
8. Control exotic species.

Eglin Air Force Base

1. Support the military mission
2. Restore ecosystem integrity
3. Red-cockaded woodpecker and other endangered/threatened species management
4. Game management
5. Increase prescribed fire to a three to five year rotation

6. Increase cost effectiveness of management activities
7. Protect, maintain and/or improve soil, water and air quality through control of erosion and increased research on aquatic resources/systems
8. Manage outdoor recreation consistent with the military mission (ecotourism)
9. Use adaptive management utilizing GIS, computer simulation models and other tools
10. Emphasize sustainable long-term income from forest management
11. Control exotic species such as hogs.

Conecuh National Forest (National Forests in Alabama)

1. Restore longleaf pine
2. Prescribed burning emphasizing growing season burning
3. Manage to increase the population of red-cockaded woodpeckers
4. Manage for rare and sensitive plants
5. Game management
6. Plan for and manage other recreational uses such as hunting, camping and natural heritage interests
7. Improve forest roads by controlling erosion and permanent or temporary/seasonal closure of needed roads.
8. Increase forest monitoring efforts, both plant and animal
9. Increase public relation effort to assist in meeting the needs of the local and state community
10. Survey for exotic species so control efforts can be initiated.

National Forests in Florida

1. Continue to be a primary donor of red-cockaded woodpeckers
2. Ecosystem management
3. Restore off-site slash pine to longleaf pine while maintaining a healthy groundcover
4. Maintain biodiversity of managed lands
5. Emphasize conservation of soil, water and air quality
6. Provide a sustainable supply of timber and other forest products
7. Prescribe burn on a three year rotation with 50% occurring during the growing season
8. Provide for recreational opportunities
9. Control access to reduce vehicle associated damage
10. Eradicate exotic species

The Nature Conservancy

1. Assist partners in conserving target species
2. Assist partners in conserving functional examples of community types (longleaf pine dominated matrix and embedded communities)
3. Work with each partner to ensure their management actions are biodiversity sensitive and consistent with each partners objectives
4. Work with partners to reduce external stresses and threats, while maintaining consistency with their objectives
5. Work to achieve long-term protection consistent with each partners objectives
6. Engage local people by linking ecosystem protection with economies, health and recreation
7. Learn from the partners

Northwest Florida Water Management District

1. Protect, maintain and improve water resources
2. Provide for protection and enhancement of water resources through integrated management
3. Restore, reforest and manage longleaf pine
4. Maintain existing public access
5. Complete stand description
6. Prioritize and develop action plans for erosion control
7. Protect the wet prairie habitat of Garcon Point with proper burn cycles
8. Enhance the recreation program while protecting the land
9. Continue timber management including loblolly and slash pine stands
10. Control trash/waste dumping through public outreach and road closures.

GCPEP conservation objectives. The development of sound conservation strategies depends upon first determining conservation targets and objectives and then management challenges and system stresses. With this in mind, individual partner conservation objectives were used in preparing the GCPEP conservation objectives. After identifying and discussing the priority objectives on a chart, each partner organization highlighted what they felt were the most important GCPEP objectives.

The objectives follow in priority order:

1. Conserve viable populations of target species
2. Introduce relatively natural fire regimes protecting key ecotypes
3. Protect urban interface and reduce fragmentation by use of conservation easements
4. Control erosion in ecologically sensitive areas
5. Manage recreation and public access

6. Increase communication, interaction and training among partners
7. Increase inventory and monitoring to further adaptive management
8. Increase public education and stakeholder involvement
9. Share resources
10. Secure outside funding and support
11. Inventory and control exotic species
12. Protect aquatic resources
13. Increase understanding of successful economic management of longleaf pine
14. Restore and manage the longleaf pine ecosystem
15. Recover the red-cockaded woodpecker
16. Game management
17. Conservation of examples of functional community types.

Challenges to GCPEP objectives. The partners then used the prioritized list of GCPEP conservation objectives to help in identification of management challenges to these objectives. A list of challenges was identified for each conservation objective. The following table identifies these challenges by objective.

TABLE 5-1. GCPEP conservation objectives and challenges.

Objectives	Challenges
Conserve viable populations of target species	<ol style="list-style-type: none"> 1. Lack of systematic inventory 2. Lack of information on management impacts on target species 3. Need for a clear conservation strategy for the connector corridor including use by large mammals and optimum size of corridor 4. Lack of knowledge of biological importance of lands that surround GCPEP 5. Need for prioritizing conservation targets by significance (species and communities)
Introduce relatively natural fire regimes protecting key ecotypes	<ol style="list-style-type: none"> 1. Insufficient acreage burned 2. Insufficient return interval 3. Resistance to growing season burning due to public misconceptions
Protect urban interface and reduce fragmentation by use of conservation easements	<ol style="list-style-type: none"> 1. Inholdings cause fragmentation and increased management problems 2. Fragmentation may harm and cause difficulty in protecting species that require large areas 3. Protection of water resources becomes increasingly difficult with fragmented ownerships
Control erosion in ecologically sensitive areas	<ol style="list-style-type: none"> 1. Graded roads and public access points are major sources of erosion 2. Erosion problems cross partner/non-partner boundaries 3. Lack of native seed source and plant material 4. Lack of funding sources for restoration projects 5. Ecologically sensitive areas needing priority protection not identified

Objectives	Challenges
Manage recreation and public access	<ol style="list-style-type: none"> 1. Lack of information, expertise and personnel to manage recreation carrying capacity and incompatible recreational activities 2. Lack of law enforcement personnel 3. Need for coordination by law enforcement on recreational issues 4. Lack of quantification of negative recreational impacts
Increase communication, interaction and training among partners	<ol style="list-style-type: none"> 1. Lack of internal communication among partners 2. Need for shared GIS as a communications tool 3. Need for establishment of radio and e-mail communication among partners 4. Lack of shared organizational charts and contact lists among partners 5. Need for partner visits with their staff on other partner lands 6. Need for annual report/brochure listing important issues and topics
Increase inventory and monitoring to further adaptive management	<ol style="list-style-type: none"> 1. Lack of common GIS product 2. Insufficient aquatic inventory 3. Lack of monitoring prioritization 4. Insufficient resources for monitoring 5. Mis-matched data sets and methods
Increase public education and stakeholder involvement	<ol style="list-style-type: none"> 1. No communication plan 2. Existing communication is often not strategic. Needs to be related to specific conservation objectives 3. Lack of demonstration areas 4. Lack of information on most effective types of communication
Share resources more effectively	<ol style="list-style-type: none"> 1. Need to document resources that are available 2. need to understand individual partner plans and solidify partnership plans 3. Need to justify and demonstrate benefits 4. Internal rules need to be understood and followed so as to better allow sharing of resources
Secure additional outside funding and support	<ol style="list-style-type: none"> 1. Maintain funding to keep Project Director funded 2. Lack of funding for staff to assist with project management 3. lack of funding for priority projects 4. Need for coordinated partnership response to increase chances of priority project funding 5. Funding restrictions differ by partner 6. Funding cycles differ among partners and sources 7. Need for demonstration and documentation of successes 8. Need for pursuit of non-money resources such as donations and volunteers 9. Need for securing of cooperators that can provide equipment, time and/or money 10. Need for strategy development with cooperators
Exotic species control	<ol style="list-style-type: none"> 1. Lack of inventory 2. Problem originates on non-partner lands 3. Aggressive spreading of exotic species on partner lands from private property and roads 4. Lack of knowledge on methods and techniques for control 5. Need for coordination of control treatments 6. Need for identification of additional funding sources

Objectives	Challenges
Protection of aquatic resources	<ol style="list-style-type: none"> 1. Insufficient inventory of resources 2. Limited control and influence due to parts of watersheds being outside of partner lands 3. Increased water use related to increasing urban development 4. Need for aquatic management plan
Restoration and management of longleaf pine ecosystem	<ol style="list-style-type: none"> 1. Need for groundcover protection during management and restoration 2. Lack of available cost information on reforestation, restoration and management 3. Lack of market for hardwood removal contracts 4. Possibility of Champion/Eglin landscape management strategy on connector parcel 5. Need for combined partnership contracts on herbicides, chipping or other restoration techniques to reduce site prep costs 6. Need for partnership agreements on restoration objectives

Conservation of examples of functional community type. It was agreed upon by the partners to use the GCPEP tentative conservation targets, conservation objectives and management challenges to assist in the next steering committee meeting in the development of conservation strategies. First, major stresses and sources of stress to the priority natural systems will be identified by the partners to assure priority identification of the conservation strategies. Stresses may be defined as impacts to natural systems caused by destruction, degradation or impairment to a system. Often stresses are caused by incompatible human uses of resources, but may be caused by natural phenomena. For each stress there may be one or more causes or sources of stress. Identifying sources precisely is important, as addressing each different source may require very different strategies.

Other issues

Operating guidelines. A Memorandum of Understanding (MOU) was signed by the partners in 1996. The MOU serves as the foundation of the partnership. The Steering Committee agreed upon the following operating guidelines to insure efficient operation of the partnership.

1. Each partner chooses representatives. The Steering Committee consists of a primary and alternate contact. The alternate contact may be represented by a designee chosen by the primary contact. There is one primary contact and one alternate contact per partner. Attendance and representation by each partner at the steering committee meetings is encouraged.
2. Consensus is desired in reaching agreements among the partners. If there is minority dissent, then the majority is charged with finding an alternative solution acceptable to all. The goal is to always maintain productivity while keeping the consensus process efficient.

A suggestion was made to consider having a Co-Chair for the Steering Committee. The Project Director currently serves as the Chair. Responsibilities of the Co-Chair were recommended to include working with the Chair on setting meeting agendas and serving as an additional public relations spokesperson. The position was recommended to rotate annually

among the partners. It was agreed that further discussion was needed by and between the partners before the next steering committee meeting.

New partners. Two agencies approached GCPEP during 1998 expressing interest in joining the Partnership. The Steering Committee agreed that the addition of new partners should be based on objectives, targets and needs of GCPEP and that all new partners should be landowners. It was also recommended that an application process should be considered in which clearly defined benefits to GCPEP could be stated. Any application would be reviewed by the Steering Committee and agreement by consensus would be required. The partners clearly desire to work with cooperators in the GCPEP area and recognize their importance to the overall success of the partnership. Steering Committee consensus was to continue discussion on new partners during the next meeting.

Next meeting. The next steering committee meeting will be June 22-23, 1999 at the Champion International Research Office near Jay, Florida. The goal of the meeting will be to develop draft GCPEP conservation strategies and actions. Five to seven prioritized projects will be identified with measurable goals. After the meeting Champion will provide a tour of their Forest Resources and Land Management programs.

CHAPTER 6. GULF COASTAL PLAIN ECOSYSTEM PARTNERSHIP PLANNING PROCESS: STEERING COMMITTEE MEETING #2

Summary of Steering Committee meeting

Meeting summary. The second meeting of the Gulf Coastal Plain Ecosystem Partnership Steering Committee served to continue the conservation planning process. The focus of the meeting centered on identification of threats and development of strategies to abate these threats. The goal was to end with major cooperative projects that would address the key strategies.

Meeting objectives. The GCPEP Steering Committee met on June 22-23, 1999 at the Champion Forest Genetics Research Program office near Jay, Florida. The goal of the meeting was to develop a common set of voluntary conservation strategies consistent with each partner's individual legal mandates, mission and objectives. Strategies addressed the challenges and threats identified in the previous GCPEP Steering Committee Meeting from December 4-5, 1998. Current and future funding and the addition of new partners were also discussed. The meeting was designed to address the following objectives:

1. Assess GCPEP conservation status;
2. Review key stresses and threats on GCPEP lands;
3. Develop strategies to abate critical threats;
4. Identify major projects, addressing key strategies;
5. Discuss new partners;
6. Discuss GCPEP funding: current and future;
7. Tour Champion International lands and projects.

Assess GCPEP conservation status. A report prepared by The Nature Conservancy for the GCPEP Steering Committee titled *The Gulf Coastal Plain Ecosystem Partnership: An Assessment of Conservation Opportunities* (Hardesty et al., 1999) was given to each steering committee member. The report focused on conservation of biological diversity in the context of GCPEP. It was intended to be used as a reference throughout the meeting for the development of GCPEP conservation strategies. The report contains a discussion on conservation planning at the ecoregional and the site level. Also covered are site planning targets, a socioeconomic assessment, and a summary of the previous GCPEP Steering Committee meeting.

GCPEP members asked The Nature Conservancy to develop a regional assessment of biodiversity that the GCPEP could use to shape their collective conservation strategies. The

partners tentatively adopted a set of conservation targets, species and natural communities that become the focus of conservation effort, as suggested by Conservancy staff. The Nature Conservancy used a planning process termed ecoregional planning to determine which sites in the U.S. have the greatest conservation value. The ecoregional classification adopted by The Nature Conservancy is a modification of that adopted by the U.S. Forest Service (Bailey 1995).

The ecoregional planning process consists of:

1. Subdividing the United States into ecoregions based on Bailey's classifications (1995). Ecoregions are areas that are large enough to cover processes and occurrences of rare and imperiled species and natural communities. They are, however, small enough within which to plan, identify partners and take action;
2. Using the ecoregion as the basic planning unit;
3. Reviewing all available information on the status of species, ecological groups and natural communities to choose ecoregional conservation targets. Ecoregional conservation targets consist of G1-G2, declining, imperiled or keystone species, and all representative natural communities or ecological groups;
4. Setting quantitative ecoregional conservation goals as targets (e.g., 10 populations of bird species X, each population with at least 100 breeding pairs);
5. Assessing all known occurrences of targets across the ecoregion to choose a suite of conservation sites sufficient to meet the ecoregional target goals. A site is a defined place in the ecoregion that is sufficiently large enough to protect viable populations of target species and/or functional examples of natural communities or ecological groups.

The East Gulf Coastal Plain ecoregion covers 42,439,000 acres, stretching from northeastern Louisiana across the southern portions of Mississippi, Alabama, Georgia and western Florida. The Nature Conservancy identified 310 target species (148 vascular plants, 1 lichen, 73 invertebrates, 28 fishes, 12 amphibians, 20 reptiles, 15 birds, and 13 mammals) and 297 target natural communities that are considered to be rare, imperiled or of conservation concern. The exceptional biological diversity in this ecoregion ranks it among the richest in North America. Unfortunately, historical and current rates of alteration and habitat loss also make its biological resources among the most threatened.

The GCPEP landscape, despite encompassing less than 2% of the 42 million acre ecoregion, includes 37% of the target species and 38% of the natural communities of the ecoregion. Many of the partner lands host endemic or near endemic species and communities, and thus have an important role to play in conservation at a larger scale. Eleven species within the GCPEP landscape are federally endangered or threatened. Sixty-one of the target species occurring on GCPEP lands have Natural Heritage ranks of G1, G2, T1, or T2, meaning that from a global perspective they have extremely limited distribution. Of these, 16 (and perhaps more) occur only within the GCPEP managed areas, and nowhere else.

GCPEP lands also include portions of the Escambia-Conecuh, Blackwater, Yellow-Shoal and Choctawhatchee River watersheds. A recent assessment of North American freshwater systems identified three of these watersheds as important hotspots for protecting at-risk fish and mussels and critical for conserving freshwater biodiversity in the United States. Of the 12

freshwater mollusk target species found in GCPEP managed areas, nine are G1 or G2 species (Master, Flack, and Stein, 1998), and six are endemic to the watersheds of the GCPEP landscape.

Once conservation targets have been chosen for a site through ecoregional planning, managers should then choose a smaller subset of targets that occur at the site for planning purposes. The known conservation needs of the ecoregional targets that occur at the site can be used to determine site boundaries and local threats to long-term persistence. This process is called site conservation planning.

Site conservation planning has the following components:

- Identifying the ecoregional target species and natural communities that are present at a given site that serve as the site conservation targets;
- Assembling and assessing all available ecological information pertinent to the targets and the site;
- Assembling and assessing pertinent socioeconomic information;
- Using this information to assess the threats to the targets at the site. A threat is defined as a stress and its source. For example, erosion causes habitat smothering in Okaloosa darter streams (stress) as a direct result of runoff and gully formation from roads and borrow pits (source of stress).

At the site level, the appropriate choice of planning targets is the single most important step. Resulting management strategies are directed at abating the threats to persistence of these planning targets, and indirectly the entire suite of conservation targets. Greg Low, in his manual *Landscape-Scale Community-Based Conservation* (Low 1998) states that “the goal is to choose a set of conservation targets that represent multiple levels of biological organization, have different life history requirements, depend on different ecological processes and encompass a variety of different spatial scales.” He adds that “in effect, planning targets act as conservation umbrellas or surrogates, however imperfectly, for all other similar target species and natural communities occurring in the geographic area”. Attempting to use all conservation targets for planning purposes is often impossible because large sites may have numerous targets and because we know so little about many species-level targets. Planning targets are thus used to cumulatively address the ecological requirements for all species and communities occurring at a site.

In addition to the choice of species and communities as the focus of conservation efforts, The Nature Conservancy also currently defines four overlapping geographic scales: local, intermediate, coarse and regional. These scales are used to define functional conservation areas capable of sustaining biodiversity over the long term. The boundaries of a site will vary with the ecological needs of different targets. Any one landscape can consist of a number of differently sized and shaped sites nested within the larger landscape. Black bears would be an example of a coarse-scale species because they require large, relatively undisturbed areas, use many different natural community types, and require abundant safe movement corridors between home ranges. An example of a local-scale species would be a rare plant that inhabits only a certain limited soil type or a small geographic area, such as the Cooley’s Meadowrue.

Of the 115 species-level ecoregional targets that occur in the GCPEP landscape, the Partners chose eight as planning targets. They were chosen because they were either declining across their range, they are found on GCPEP lands or waters, and/or they would not necessarily be protected through management of natural community level targets. GCPEP species-level targets are:

- Okaloosa darter;
- Florida bog frog;
- Gulf sturgeon;
- Red-cockaded woodpecker;
- Black bear;
- Flatwoods salamander;
- Aquatic fish/mussel complex; and
- Game birds.

Of the 115 ecoregional community/ecosystem-level targets that occur on GCPEP lands and waters, 10 matrix-forming community types were chosen as planning targets. Each of these matrix community types protects rare, threatened and endangered species. The assumption is that if these systems are managed appropriately, then the majority of species-level targets would be protected. GCPEP community-level targets are:

- Pitcher plant bogs;
- Barrier island complex;
- Estuarine systems;
- Ephemeral ponds;
- Sand pine scrub;
- Longleaf pine sandhill matrix;
- Longleaf pine flatwoods matrix;
- Seepage stream/slope complex;
- Blackwater rivers/streams; and
- Alluvial rivers/streams.

Review key stresses and threats on GCPEP lands. Once conservation targets were identified by GCPEP, threats could then be articulated. *Threats* are anything that compromises the long-term viability of the target at a site. A threat is defined as a stress and its source. Understanding the difference between a stress and its source will ensure the selection of the right conservation strategies to address critical threats. For example, a proposed road may be called a threat in a creek system. We are then drawn to the conclusion that we must stop construction of the road. Threat: road. Solution: stop road. However, if we separate the threat into stress and source, the stress isn't the road. The stress is loss of flow and associated erosion. That formulation of stress inclines us to think, instead, of ways to keep flood waters flowing through the corridor that is the proposed location of the road. A bridge that spans the major flood plain may be the answer. Examples of other stresses include altered fire regimes, habitat destruction, fragmentation, and exotic species.

For each stress on a given target, there may be one or more causes or sources of stress. An example would be nutrient loading, which is a stress to many aquatic ecosystems. Excess nutrients in the water draw off oxygen leading to fish kills and harm to other aquatic life. However, the nutrient loading might be caused by many different sources, such as septic systems, sewage treatment facilities, suburban runoff, farm fertilizers, and improper grazing. Other sources of stress include incompatible development, incompatible agricultural practices, filling of wetlands, and fire suppression. It is critical to precisely identify the most important source, because addressing each different source often requires a very different strategy.

At most sites one (or a few) threat often emerges as the “killer threat”. This single threat, if not addressed, may cause destruction or irreparable harm to a conservation target. Tables 6-2a-d combine the original eight targets and threats (in this case, sources of stress) by site. Rankings are all based on expert opinion, including GCPEP partners, with reference to the relative severity and immediacy of the threat to the target. Additionally, the rankings act as a filter for developing and prioritizing conservation strategies.

Develop strategies to abate critical threats. Conservation strategies are designed to abate threats to conservation targets at sites. The way we respond, or fail to respond, to critical threats will very likely be the single most important factor affecting the long-term health of the conservation targets on GCPEP lands. If the threat is not serious or not likely to occur, then some type of low-cost holding action or no action would be appropriate. If the threat is serious, then potential strategies to address critical threats should be evaluated using three criteria:

- Benefits;
- Probability and feasibility;
- Costs.

There is no shortage of worthwhile ideas. There is, however, a shortage of resources for completing strategies. The GCPEP partners identified “killer” threats to begin their strategy identification work. These threats (sources of stress) to the original eight targets are identified in Tables 6-2a-d. For each source of stress, strategies and actions are identified in Table 6-1.

TABLE 6-1. Strategies and actions for major sources of stress for GCPEP conservation targets.

SOURCE OF STRESS	STRATEGIES AND ACTIONS
Incompatible residential and commercial adjacent development	<ul style="list-style-type: none"> • Each partner must identify specific purposes and needs for acquisition of land. Of these, identify most threatened. End product should be a map. • Identify parcels already on acquisition lists. • Identify most desirable parcels for acquisition to protect buffers. • Identify mechanisms, partners, and funding for acquisition. • Use the sale of Choctawhatchee National Forest lands near Eglin for funding to acquire Conecuh National Forest or Eglin acquisitions. • National Forests in Florida and Alabama, The Nature Conservancy, and Eglin work on mechanisms for sale of Choctawhatchee National

	Forest lands.
Inadequate/unstable funding	<ul style="list-style-type: none"> • Learn outcome of Florida Governors Report on Prescribed Burning. • Cooperate with Pensacola Bay Ecosystem Management Advisory Council for FEMA funding for road and erosion control projects. • Pursue external funding of \$10,000 for helicopter prescribed burning assistance. • Establish GCPEP burn crew (10 people, 6 months/year). • Pursue GCPEP targets inventory funding. Funding to possibly come from non-game grant, TNC, USFWS, USFS cost share, Champion, DEP, National Council for Air & Stream Improvement, and EPA. • Project Director to interview partners on target lists and inventory needs. Aquatic Ecologist at Eglin to interview partners on aquatic inventory needs. • Project Director and TNC staff to develop list of funding sources for conducting conservation target inventories on partner lands.
Incompatible fire management	<ul style="list-style-type: none"> • Consider a public opinion poll and/or focus groups to craft a pro-fire message for stakeholders and the general public. • Contact the Florida Division of Forestry, the Governors Council on Fire and the North Florida Prescribed Fire Council on public education and/or polling after the 1998 Florida wildfires. • Work with Garry Peterson to complete the fire model for Blackwater River State Forest and Conecuh National Forest. • Assist Eglin Air Force Base with Cape San Blas burn.
Incompatible silviculture and land management practices	<ul style="list-style-type: none"> • Hire graduate student to compile information on herbicide/mechanical site preparation and ground cover. • Partners send available aquatic inventory information to Project Director to compile and send to GCPEP. • Arrange tour or workshop looking at herbicide rates, longleaf pine restoration and groundcover composition. Tour may include Eglin Air Force Base, Longleaf Pine Project, Blackwater River State Forest and Conecuh National Forest. Workshop to cover longleaf pine restoration and species composition goals. • Christina Kennedy from Duke University to provide land cover mapping information. • Compile information on longleaf pine growth and yield model. Discuss cooperating on this project with the Longleaf Alliance.
Roads and utility corridors	<ul style="list-style-type: none"> • Partners to pursue info on laws related to road BMP's from the Department of Environmental Protection and the Northwest Florida Water Management District. • Pursue funding for demonstration projects, BMP development and outreach person to work with counties. • Complete report on GCPEP roads, erosion, and impacts. Report to be presented to the Bay Area Resource Council.

Other Issues

Identify major projects, addressing key strategies. After identifying strategies and actions to abate critical threats, the partners agreed upon a list of work projects to immediately begin or complete work on. The projects follow in priority order.

1. Pursue Choctawhatchee National Forest land exchange or sale. Chris Zajeck of Apalachicola National Forest in Tallahassee will be the point person. Also involve Conecuh National Forest, Eglin Air Force Base, the Alabama Heritage Program, and George Willson of The Nature Conservancy.
2. Each partner identify critical parcels for land management or protection of conservation targets. Complete a map and state why the parcel was selected. Complete by September 30, 1999.
3. Pursue public opinion poll. Project Director to discuss with TNC Government Relations and Gary Taylor of Conecuh National Forest. Jeff Hardesty (TNC) to discuss with Susan Jacobsen (University of Florida). Funding to be committed by October 1, 1999.
4. Finish fire model for Blackwater River State Forest and Conecuh National Forest. Host workshop for stakeholders. Rick Lint to provide Conecuh map. Project Director to provide needed information to Garry Peterson.
5. Project Director to approach Alabama and Florida Natural Heritage Inventory programs and DEP Ecosystem Management Coordinators for possibility of producing target maps for GCPEP.
6. GCPEP Burn Team to review and possibly pursue funding from National Turkey Federation. Team to include James Furman (Coordinator) from Eglin Air Force Base, Sonny Greene from Blackwater River State Forest, Pat Brinn or Michael Heard from Conecuh National Forest, and Steve Brown from the Northwest Florida Water Management District. Recommendations to be made by September 30, 1999.
7. Compile report on herbicide impacts on groundcover in the longleaf pine ecosystem. The Longleaf Pine Restoration Project at Eglin Air Force Base will complete by December 30, 1999.
8. Complete assessment of aquatic systems status. Rick McWhite of Eglin Air Force Base will take the lead on developing a rapid assessment technique. Team to assist will include Kevin Leftwich of the National Forests in Alabama, Joe DiVivo of Eglin Air Force Base, and the GCPEP Aquatic Specialist.

Discuss new partners. Interest has been expressed by organizations outside the partnership in joining or learning more about GCPEP. Those interested have included the Naval Air Station, Alabama Forestry Commission, Hancock Timber Resource Group, and the Florida Department of Environmental Protection (Blackwater River State Park).

The GCPEP Steering Committee previously agreed that the addition of new partners should be based on objectives, targets, and needs of GCPEP and that all new partners should be landowners. It was also recommended that an application process should be considered in which clearly defined benefits to GCPEP could be stated. Any application would be reviewed by the Steering Committee and agreement by consensus would be required. It should be noted that the

partners clearly desire to work with cooperators in the GCPEP area and recognize their importance to the overall success of the partnership.

During further discussion on new partners, the Steering Committee agreed that a Committee should be formed to determine draft eligibility criteria and membership categories. The committee will consist of Arden Shropshire of Champion International and Jeff Hardesty of The Nature Conservancy.

GCPEP funding: current and future. With the current staffing, equipment, travel, and vehicle budget, approximately \$120,000/year is needed for GCPEP to operate. Funding for GCPEP, including salary for the Project Director and other Conservancy staff who provide assistance, has been provided by the following:

- Department of Defense Legacy;
- Champion International;
- The Nature Conservancy;
- Turner Foundation;
- Dunn Foundation;
- Camp Younts Foundation;
- Gulf Power Corporation/Southern Company.

The success of GCPEP is due in part to all who have provided support through the initial planning process and the startup of cooperative projects. Additional funding has been secured by The Nature Conservancy for two positions to assist GCPEP with priority projects selected by the partners. The first position to be filled will be an Aquatic Specialist, shared with the Apalachicola River & Bay Project. The second position will be a Conservation Biologist to assist with conservation planning and inventory associated with targets selected by the partners. These positions will have initial funding for one year.

Tour of Champion International lands and projects. The meeting concluded with a well designed and organized tour of the Champion connector parcel. The tour highlighted parcel management objectives. Tour stops included an erosion control/restoration project, hardwood orchard, sand pine orchard, southern pine trial planting, Florida bog frog site, and a slash/longleaf pine flatwood site. Discussions during the tour were very helpful in giving the partners a better understanding of Champion goals and objectives.

Next meeting. The next steering committee meeting will be in late October or early November. A partner host for the meeting has not been selected at this time. The goal of the meeting will be to complete the planning process for the new conservation targets chosen by the steering committee at this meeting. In addition, project updates will be given, and short and long-term cooperative projects with measurable goals will be selected.

TABLE 6-2a. Relationship among conservation targets and threats (stresses and sources of stress) at the Eglin site, including some subsites within Eglin. Site planning targets have been somewhat modified to accommodate unique differences among sites.

THREATS	Conservation Targets							Summary
	Longleaf pine sandhill-flatwoods matrix-east	Longleaf pine sandhill matrix-west	Seepage stream/slope /rare species complex	Red-cockaded woodpecker-east population	Red-cockaded woodpecker-west population	Florida black bear	Flatwoods salamander	
Unstable/inadequate funding for management	H	H	H	L	L	H		M-H
Roads and utility corridors	M	H	VH	M	L	VH	M	M-H
Incompatible fire management/plowlines	H	VH	H	VH	H			H-VH
Incompatible adjacent development (residential/commercial)	M	VH	VH?			VH		H-VH
Incompatible silviculture/land management practices	VH	H	VH	VH	L		M	H
Harvest (poaching)						VH		VH
Military mission activities	M	H	H	M	M			M-H

TABLE 6-2b. Relationship among conservation targets and threats (stresses and sources of stress) at the Blackwater River State Forest site.

THREATS	Conservation Targets					
	Longleaf pine sandhill-flatwoods matrix	Seepage stream/slope rare plant complex	Red-cockaded woodpecker	Florida black bear	Flatwoods salamander	Summary
Unstable/inadequate funding for management	M	H	H	VH	M	H
Roads and utility corridors	H	VH	M	VH	M	H
Incompatible fire management/plowlines	VH	M	VH	L	VH	M-VH
Incompatible adjacent development (residential/commercial)	VH		M	VH	H	H-VH
Incompatible silviculture/land management practices	M	VH	H	L	VH	H
Harvest (poaching)				VH		VH

TABLE 6-2c. Relationship among conservation targets and threats (stresses and sources of stress) across the GCPEP landscape.

THREATS	Conservation Targets						Summary
	Blackwater river/streams-longleaf pine matrix(upper Blackwater River)	Blackwater River/bottom land hardwood/longleaf pine matrix (lower Blackwater River)	Alluvial rivers/streams/bottomland hardwoods (upper Yellow River)	Alluvial rivers/streams/bottomland hardwoods (lower Yellow/Shoal River)	Gulf Sturgeon (Yellow/Shoal River-Pensacola Bay)	Aquatic Fish/Mussel Complex (Yellow/Shoal River)	
Incompatible land use (roads, bridges)	VH	M	L	M	M	M	M-H
Incompatible economic development	L	H	L	M	M	M	M
Incompatible residential development	L	H	L	VH	VH	VH	M-VH
Incompatible wastewater discharge	L	H	L	H	H	H	M-H
Incompatible farming practices	H	M	H	H	H	VH	H
Inadequate/unstable funding	H	H	H	H	H	H	H
Recreation	VH	H	L	M	VH	H	H

TABLE 6-2d. Relationship among conservation targets and threats (stresses and sources of stress) across the GCPEP landscape. These analyses consider threats to “coarse-scale” species targets that require the majority of the GCPEP landscape to meet the area and habitat requirements for viable populations. *The Gulf sturgeon is a tentative planning target.

THREATS	Conservation Targets			
	Florida Black Bear	Red-cockaded Woodpecker	Gulf Sturgeon*	Summary
Incompatible development (residential/commercial)	VH			VH
Roads and utility corridors	VH			VH
Smoke management/air quality		H		H
Incompatible silviculture/sedimentation			H	H
Incompatible agriculture/sedimentation			H	H
Harvest (poaching)			H	H

CHAPTER 7. GULF COASTAL PLAIN ECOSYSTEM PARTNERSHIP PLANNING PROCESS: STEERING COMMITTEE MEETING #3

Summary of Steering Committee meeting

Meeting summary. The third meeting of the GCPEP Steering Committee centered on operational issues surrounding a large landscape-scale project and project updates. Cooperative projects with measurable successes form the foundation of any partnership.

Meeting objectives. The Gulf Coastal Plain Ecosystem Partnership (GCPEP) Steering Committee met on December 2-3, 1999 at Jackson Guard, Eglin Air Force Base in Niceville, Florida. The goal of the meeting was to consider operation issues, projects and strategy identification. Projects and strategies would address the challenges and threats identified in the December 4-5, 1998 GCPEP Steering Committee Meeting. The meeting was designed to address the following objectives:

1. Finalize on several GCPEP operation issues including addition of new partners and job expectations for GCPEP staff;
2. Review status of major projects;
3. Continue strategy and action identification;
4. Identify new projects with measurable goals and expectations.

GCPEP Operations. A Memorandum of Understanding was signed by the partners in 1996. The MOU serves as the foundation of the partnership. The Steering Committee agreed upon the following operating guidelines to ensure efficient operation of the partnership.

1. Each partner chooses representatives. The Steering Committee consists of a primary and alternate contact. The alternate contact may be represented by a designee chosen by the primary contact. There is one primary contact and one alternate contact per partner. Attendance and representation by each partner at the steering committee meetings is encouraged.
2. Consensus is desired in reaching agreements among the partners. If there is minority dissent, then the majority is charged with finding an alternative solution acceptable to all. The goal is to always maintain productivity while keeping the consensus process efficient.

Since the formation of the partnership, several agencies and companies have expressed interest in GCPEP. The Steering Committee agreed over the past year that the addition of new partners should be based on objectives, targets and needs of GCPEP. A committee consisting of Arden Shropshire of Champion International and Jeff Hardesty of The Nature Conservancy was formed at the June 1999 meeting to determine draft eligibility criteria. These draft criteria were presented to the Steering Committee and after review, discussion and minor modifications, the criteria were agreed upon by all.

New Partner Criteria.

1. Understand and support the purposes of GCPEP and can clearly articulate both what their organization has to gain from and what they plan to contribute to the partnership.
2. Meets one or both of the following criteria:
 - a) Manage and/or own significant land or water holdings in the GCPEP geographic area¹, with strong preference given to those sharing a border with one or more existing GCPEP partners, and/or;
 - b) Can offer significant expertise in one or more of the following management or conservation disciplines: Forestry, water and watersheds, wildlife, biodiversity, prescribed fire, endangered species or recreation.
3. Commit to appointing and sending at least one and preferably two representatives to all GCPEP Steering Committee meetings and other functions as needed.
4. Agree to take lead or co-lead responsibility on one or more cooperative GCPEP projects per year.
5. Agrees in principle to provide financial or operational support to the core partnership, either as direct funds or as in-kind support, and agrees to seek additional resources to support cooperative projects.
6. Understands and agrees to adhere to the GCPEP operating guidelines.
7. Agree to keep all appropriate people within their organization informed and knowledgeable about GCPEP purposes and activities.

Steering Committee Job Expectations for all GCPEP Staff. At a minimum, once each year, job expectations of the GCPEP staff will be reviewed by the Steering Committee. Suggestions from the Steering Committee will be included in the job objectives for each staff member. Job summaries and duties are provided for the two new positions. Steering Committee expectations for all GCPEP positions are listed below.

Project Director, Steering Committee Job Expectations:

1. Initiate new partner contacts and screen all candidates. Report back to Steering Committee.
2. Develop and complete Site Conservation Plan for GCPEP.
3. Acquire private and/or public funding to support GCPEP operations.
4. Oversee and/or assist implementation and planning for cooperative projects with partners.
5. Continue select involvement in groups and councils critical to GCPEP mission.
6. Administration of GCPEP support.
7. Improve communications within the partnership.

Aquatic Specialist Responsibilities. The Aquatic Specialist position will be split between two programs, the Apalachicola River and Bay and the GCPEP. The region covered by these two projects in the Florida panhandle is rich in aquatic biodiversity. The Aquatic Specialist will work closely with the Apalachicola Project Manager and the GCPEP Project Director in strengthening

¹ Generally, from the Gulf of Mexico in the south, to the Escambia-Conecuh River watershed in the west, to the Choctawhatchee River in the east, to the southern most counties in Alabama.

aquatic conservation activities in these areas. In the GCPEP area, the Aquatic Specialist will be responsible for doing a rapid ecological assessment of the creeks and rivers of the region and will assist in prioritizing areas for conservation activities. In addition to working with the GCPEP, work will also occur within the community to build support for aquatic ecosystem protection and to encourage Best Management Practices (BMPs) on private and public lands.

Aquatic Specialist Duties.

1. Complete rapid ecological assessment of GCPEP creeks and rivers and prioritize areas for conservation activities. Host aquatic conservation planning meetings for GCPEP and selected personnel.
2. Participate in the development of a basinwide monitoring program for the Apalachicola-Chattahoochee-Flint (ACF) basin. Work with state and federal partners in identifying biological monitoring needs for the aquatic and estuarine ecosystems associated with the allocation formula. Assist in designing a monitoring plan that will meet those needs.
3. Increase partner capacity for conservation, monitoring and restoration of freshwater biodiversity by acting as a contact between agencies and with other experts. Identify monitoring needs for the accomplishment of the conservation goals of the Apalachicola River and Bay and GCPEP projects. Design and implement monitoring plans to address these needs.
4. Research and provide aquatic biodiversity conservation information to GCPEP and other partners. Assist GCPEP Project Director and Apalachicola Project Manager in preparing reports and issue papers.
5. Assist in the implementation of aquatic conservation strategies identified in the site conservation plans.
6. Build political support for aquatic ecosystem protection by serving on the Bay Area Resource Council, Choctawhatchee Basin Alliance and other selected watershed protection groups. Represent GCPEP and The Nature Conservancy concerning aquatic issues at selected workshops and conferences.
7. Assist in grant writing and identifying sources of funding.
8. Assist the GCPEP Project Director and the Apalachicola Project Manager with other duties as needed.

Aquatic Specialist, Steering Committee Job Expectations:

1. Prioritize stream segments/watersheds for biodiversity protection and identify threatened sites. Develop action plan to address problems. Research the availability of aquatic data/information.
2. Develop monitoring design and criteria. Review Eglin's monitoring design and coordinate with the Aquatic Biologist. Also coordinate with Alabama and Florida state agencies, and Federal agencies including U.S. Forest Service (USFS), U.S. Fish & Wildlife Service (USFWS) and the U.S. Geologic Survey (USGS).
3. Identify reference streams in the GCPEP area.
4. Develop a GCPEP plan of action on target species.
5. Provide training to GCPEP personnel, especially standard operating procedures for aquatic sampling.
6. Provide expertise and advice on stream restoration techniques.

7. Cooperate with continuing education, such as Master Logger BMP training.
8. Complete literature searches on deadhead logging, roads and other activities that may impact aquatic systems. Provide partners with research information.

Project Administrator responsibilities. Provides administrative and technical support to the GCPEP Project Director. Manages the administrative aspects of GCPEP, such as answering the telephone, routine correspondence, travel arrangements, purchasing and producing routine documents. Prepares and tracks project contract and grant budgets. Assists with research and literature searches. Organizes workshops and meetings. Coordinates project communications needs. Coordinates project human resource needs. Assists with project fundraising.

Project Administrator Duties.

1. Manage the administrative needs of the GCPEP project. This includes handling secretarial support to the Project Director and administrative activities such as correspondence, travel arrangements, maintaining files, telephone answering, tracking documents, producing routine reports, purchasing and administering the petty cash budget.
2. Manage project contracts and grants. Coordinate all reporting requirements. Prepare project budgets as needed. Track and monitor expenses. Act as liaison to subcontractors we hire.
3. Coordinate project communications needs, such as writing, editing, designing, producing and reviewing documents. Work with TNC staff to develop media strategies and plan media events.
4. Assist with project information management, conduct literature searches and maintain literature database.
5. Organize workshops, meetings and training sessions aimed at natural resource managers, scientists and TNC staff.
6. Assist with project development/fundraising needs, such as research for and production of grant proposals.
7. Act as a resource for general personnel information, benefits and policies. Generate all paperwork on new and terminated positions and personnel changes and forward to Florida Chapter Office.
8. Other duties as assigned.

Project Administrator, Steering Committee Job Expectations:

1. Communicate GCPEP budgetary needs to the Steering Committee on a regular basis. Include GCPEP equipment needs in partner notifications.
2. Assess GCPEP communication needs by working closely with each partner's Public Relations staff.
3. Develop communication strategies including displays, slides and issue papers.
4. Improve GCPEP internal communications with progress reports, calendars and Email newsletters. Distribute a GCPEP newsletter on a quarterly basis.
5. Work with the Steering Committee to develop a GCPEP logo for use on all correspondence.

Other Issues

Major Project Updates. At the previous GCPEP Steering Committee Meeting, strategies and actions were developed for the most serious threats to GCPEP conservation targets. The

conservation strategies selected were chosen to abate threats to the conservation targets. From these strategies, eight major projects were chosen to initiate work on. An update on each of these major projects follows:

- 1. Pursue Choctawhatchee National Forest land exchange or sale. Chris Zajeck of Apalachicola National Forest in Tallahassee will be the point person. Also involve Conecuh National Forest, Eglin Air Force Base, the Alabama Heritage Program and George Willson of The Nature Conservancy.**

The National Forests in Florida manages 12 parcels in Santa Rosa, Okaloosa and Walton counties, all of which are part of the original Choctawhatchee National Forest. Currently negotiating with St. Joe on possible exchange for parcels St. Joe owns in the Apalachicola National Forest. Walton County is interested in one parcel for a possible industrial park. The National Forest in Florida wishes to sell the remaining parcels to provide needed funding to purchase other critical parcels in and around other national forest lands.

- 2. Each partner identify critical parcels for land management or protection of conservation targets. Complete a map and state why the parcel was selected. Complete by September 30, 1999.**
 - a) Northwest Florida Water Management District priorities include the Yellow and Escambia Rivers and the Garcon Point peninsular. Currently nearing closing on Yellow River parcels north of land under current management. Could consider Blackwater River or tributaries if connected to water protection.
 - b) Division of Forestry mainly pursuing in holding parcels. Will consider parcels abutting state lands if it assures protection of major tributaries of the Blackwater River.
 - c) Champion International presented a map showing land management categories for lands they manage, ranging from high yield areas to protected areas. The Steering Committee identified protecting the Champion connector parcel as critical. This is especially critical due to the rapid growth that is occurring along the Highway 90/Interstate 10 corridor. Conservation Easements may be a beneficial option for both Champion and other partners also.
 - d) Eglin Air Force Base is concerned about encroaching buffer development, which interferes with mission testing and with land management. Important buffer parcels include Escribano Point, First American Farms and the Shoal River Ranch. Escribano Point has been on the P2000 list previously. GCPEP supports acquisition of this parcel under the new Florida Forever program. The Nature Conservancy agreed to help in every way possible to assure this parcel is purchased and protected from development.
 - e) Conecuh National Forest also pursuing in-holdings. The Nature Conservancy has assisted with the purchase of some parcels. Purchasing in holdings is difficult due to large number of parcels, the need for appropriation of funding and the lack of personnel.
 - f) The Nature Conservancy has identified important parcels for protecting biodiversity. Many of these parcels are of concern also to the partnership. The need is great for

additional Protection staff time for GCPEP to acquire land parcels of concern as quickly as possible. There is also a need for a compelling map showing the GCPEP area and all partnership parcels of concern. GCPEP staff will work on completing this map.

- 3) Pursue public opinion poll. Project Director to discuss with TNC Government Relations and Gary Taylor of Conecuh National Forest. Jeff Hardesty (TNC) to discuss with Susan Jacobsen (University of Florida). Funding to be committed by October 1, 1999.**

The GCPEP Project Director discussed with the TNC Government Relations Staff. Jeff Hardesty (TNC) discussed with Susan Jacobsen of the University of Florida. The Project Director is currently pursuing funding for conducting the poll and has included this request into one funding proposal. The Steering Committee agreed that it was important to assure that GCPEP was providing the needed educational information to the surrounding communities. Sometimes the problems managers feel are most critical to the local communities are not the same ones the communities recognize. Community profiling creates a more accurate picture of community attitudes and values. There are several different types of profiling, including focus groups, surveys, one-on-one interviews and newspaper content analysis. Each of these tools is capable of collecting certain types of information.

- 4) Finish fire model for Blackwater River State Forest and Conecuh National Forest. Host workshop for stakeholders. Rick Lint to provide Conecuh map. Project Director to provide needed information to Garry Peterson.**

Rick Lint of Conecuh National Forest and Tom Arrington of Blackwater River State Forest have provided the necessary maps. Project Director will set up schedule to complete the fire model with Garry Peterson. Steering Committee agreed we should consider the possibility of a GCPEP burn team or a GCPEP Fire Resource Coordinator. Jim Murrian noted the successful interagency, cooperative fire team organized for the Lake Wales Ridge area. Both public and private funding was use for this fire team. Burn plans for the partnership lands are aggressive for the next year with the following acreage planned:

- Conecuh National Forest 25,000 acres
- Blackwater River State Forest 65,000 acres
- Eglin Air Force Base 100,000 acres
- Apalachicola National Forest 100,000 acres

Andy Colannino, Apalachicola National Forest, mentioned the possibility of using Fire Training Center teams or USFS teams needing training with different fuels in different settings. The National Forest in Florida needs only prior notification to plan for such a training event.

- 5) Project Director to approach Alabama and Florida Natural Heritage Inventory programs and DEP Ecosystem Management Coordinators for possibility of producing target maps for GCPEP.**

Project Director has not approached Natural Heritage programs about production of needed GCPEP maps. However, the Director has worked with Christina Kennedy of Duke University on a possible directed study with an end product of GCPEP GIS maps. Christina presented her proposal consisting of two possible products, a threat analysis or an ecological uniqueness analysis (see attached proposal). The Steering Committee agreed that creating an up to date GCPEP map and completing a threat analysis would be most beneficial. Main concerns are development pressures, smoke management, recreation, roads and population density.

- 6) GCPEP Burn Team to review and possibly pursue funding from the National Turkey Federation. Team to include James Furman (Coordinator) from Eglin Air Force Base, Sonny Greene from Blackwater River State Forest, Pat Brinn or Michael Heard from Conecuh National Forest and Steve Brown from the Northwest Florida Water Management District. Recommendations to be made by September 30, 1999.**

GCPEP Burn Team discussed in Project #4.

- 7) Compile report on herbicide impacts on groundcover in the longleaf pine ecosystem. The Longleaf Pine Restoration Project at Eglin Air Force Base will complete by December 30, 1999.**

The report by the Longleaf Pine Restoration Project will be completed and discussed at the next GCPEP Steering Committee Meeting. The report will consist of a literature review of herbicide effects on groundcover species in southern pinelands. Included will be relevant, peer-reviewed articles from journals, technical reports, theses and agency literature. To date, over 100 articles have been scrutinized. After careful reading, 35 papers were retained that met the primary objective of the report. The studies varied enormously in quality. Beyond quality issues, the following additional challenges had to be overcome in order to pursue statistical analysis.

- Few studies share common treatments
- Few studies report on the same variables
- Some studies measure treatment effects from a few lumped variables (all herbaceous plants), whereas others subdivide treatment effects at the species level.

The next steps of the study are to choose variables and treatments, decide how many to keep from each study and then to decide if there are enough studies to perform statistics on. To date, it has not been possible to gauge the prevalence of negative or positive effects because the data is too heterogeneous. General observations are that the positive effects of herbicides may be more common than negative ones when herbaceous plant species are grouped into life forms (forbs, grasses). This may occur if a dominant species such as broomsedge responds positively to herbicide application.

- 8) Complete assessment of aquatic systems status. Rick McWhite of Eglin Air Force Base will take the lead on developing a rapid assessment technique. Team to assist will include**

Kevin Leftwich of the National Forests in Alabama, Joe DeVivo of Eglin Air Force Base and the GCPEP Aquatic Specialist.

First, the GCPEP Aquatic Specialist will conduct a rapid assessment of partner aquatic resources. Then, she will work with the Eglin/USFWS Aquatic Ecologist on a GCPEP long term monitoring plan. This team will also include the Aquatic Specialists from Champion International, National Forests in Alabama and the Northwest Florida Water Management District.

Additional Major Projects Selected. The Steering Committee decided with the remaining meeting time it was important to select additional projects the partners could work cooperatively on. Projects are identified along with project leader(s).

- 1) GCPEP hosted red-cockaded woodpecker translocation meeting, scheduled for August 2000. The purpose of meeting is to discuss translocation of birds within the southern region. All recipient locations of red-cockaded woodpeckers must be present at the meeting and make a case for receiving birds from a donor population. Jim Murrian (TNC), Andy Colannino (Apalachicola National Forest) and the Project Director will work on the feasibility of the proposal.
- 2) Research the possibility of a GCPEP Volunteer Coordinator. Andy (Eglin) will contact the Project Director and other partners. Rick McWhite (Eglin) and Jim Murrian (TNC) will lead this effort. Recommendations will be made to the Steering Committee on whether to have a GCPEP Volunteer Coordinator or not.
- 3) GCPEP Prescribed Fire Resource Council. The Project Director will discuss with the partners and other possible cooperators.
- 4) The Nature Conservancy hire a dedicated Land Protection Specialist for western Florida and south Alabama. Jim Murrian and Larry Ellis (TNC) and the Project Director will work with TNC Protection staff to discuss this need. Recommendations will be offered to the Steering Committee.
- 5) GCPEP host an annual meeting to celebrate successes.
- 6) Possible GCPEP site on partner web pages. GCPEP Project Administrator and/or Director will contact partners and report back to Steering Committee.
- 7) Partners assist the Northwest Florida Water Management District with a prescribed burn on the Garcon Point Clark parcel.
- 8) Complete one cooperative GCPEP burn each year.
- 9) Compile GCPEP success stories. Project Administrator will work on including in a quarterly GCPEP Newsletter.
- 10) Find funding to conduct target surveys on partner lands. GCPEP Staff will pursue funding opportunities for terrestrial and aquatic targets surveys.

The meeting concluded with an evaluation and a discussion on possible dates for the next Steering Committee meeting. The dates April 6-7, 2000 were selected and Conecuh National Forest volunteered to host the meeting.

CHAPTER 8. GULF COASTAL PLAIN ECOSYSTEM PARTNERSHIP PLANNING PROCESS-STEERING COMMITTEE MEETING #4

Summary of Steering Committee meeting

Meeting summary. The fourth meeting of the GCPEP Steering Committee reflects the growth, successes and challenges of a strong, cooperative partnership. Project updates and operational issue discussions were an important component of the meeting. Partner updates on needs and issues emerged as a desired topic for all future meetings. Additional planning for new conservation targets represents the changing needs across the GCPEP landscape.

The Steering Committee members in attendance were Steve Brown, Vernon Compton, Joe Cox, Stephanie Davis, Larry Ellis, Rick Lint, Jim Murrian, Carl Petrick and Ad Platt. The guests were Jon Blanchard and Andrea Litt. Perrin Penniman attempted to capture the most important information as recorded on flip charts and tape recorder during the meeting. Editorializing was kept to a minimum except when needed to clarify the context of issues and recommendations. Some of the discussion and recommendations required interpretation. Any errors in translation or interpretation were unintentional.

Meeting objectives. The Gulf Coastal Plain Ecosystem Partnership (GCPEP) Steering Committee met April 6–7, 2000 at Conecuh National Forest, Andalusia, Alabama. The goal of the meeting was to consider operational issues, project updates and identification and strategy identification. Projects and strategies would address the challenges and threats identified in the December 4–5, 1998 GCPEP Steering Committee Meeting. The meeting was designed to address the following objectives:

- Finalize several GCPEP operational issues including addition of new partners and job expectations for GCPEP staff;
- Review status of major projects;
- Partner updates;
- Conservation target strategy and action identification.

An information manual was given to each Steering Committee member containing articles on conservation planning, herbicides, gulf sturgeon, aquatic woody debris, coastal plain streams, biological monitoring and amphibians.

GCPEP Operations. GCPEP has been fortunate to hire three additional staff to support the partnership. These positions were chosen first because of needs, threats and strategies identified by the Steering Committee members. At a minimum of once each year, job expectations of the GCPEP staff will be reviewed by the GCPEP Steering Committee. Suggestions from the Steering Committee are included in the job objectives for each staff member.

- The Aquatic Specialist was funded for the first year 50% from a Dunn Foundation grant and 50% from a TNC Freshwater Initiative (FWI) grant. The Aquatic Specialist works 50% of the time for GCPEP and 50% of the time for the Apalachicola Bay and River program. Next fiscal year the Aquatic Specialist position will again be jointly funded by the GCPEP and Apalachicola programs.

- The Project Administrator is funded by TNC and DOD to work for GCPEP. Conecuh National Forest supports GCPEP with funds and Champion International donates office space to the entire GCPEP staff.
- A Project Conservation Ecologist position is in the process of being filled. This position is funded by TNC and DOD. Job expectations for this position were agreed upon by the Steering Committee.
- The GCPEP Aquatic Specialist and Project Administrator reviewed their own job responsibilities, duties and expectations prior to covering their work accomplishments of the last quarter.

Aquatic Specialist Job Accomplishments:

Job Expectations are numbered and Accomplishments-to-date are bulleted (Responsibilities and Duties are detailed in Chapter 7.)

1. Prioritize stream segments/watersheds for biodiversity protection and identify threatened sites. Develop action plan to address problems. Research the availability of aquatic data/information.
2. Develop monitoring design and criteria. Review Eglin's monitoring design and coordinate with the Aquatic Biologist. Also coordinate with Alabama and Florida state agencies, the USFS, USFWS and the USGS.
3. Identify reference streams in the GCPEP area.
 - Aquatic site visit with each partner to better understand the partners' lands and the goals each of them has for the aquatic resources. The sites visited were with Blackwater River State Forest, Champion International, Conecuh and Eglin staff. A meeting with NFWFMD is scheduled to occur in May.
 - Training took place on the Florida Department of Environmental Protection's Bio Reconnaissance and habitat assessment protocol, with visits to DEP's lab to become familiar with the facilities, protocols and resources.
 - Monitoring discussions and training continued with USFWS, Eglin, FL DEP, Florida Fish and Wildlife Conservation Commission (FFWCC), and TNC. Meetings with these agencies to discuss regional monitoring ensure that efforts are not being duplicated. Introduction of an Adopt-a-Stream program for Florida that could aid in monitoring efforts was discussed.
 - The Aquatic Specialist participated in a meeting with national Nature Conservancy Freshwater Initiative (FWI), USFWS and FFWCC to discuss aquatic classification for North Florida. Work will continue with this group to pursue aquatic classification for the GCPEP area waters. Environmental Protection Agency (EPA) funding was pursued for aquatic classification and aquatic surveys in our area, but no university would take the lead on the grant.
 - Sampled insects on Eglin AFB with FL A&M University biologists
 - Participated in TNC Freshwater Initiative planning retreat, SE Division staff retreat and International Science and Stewardship conference

4. Develop a GCPEP plan of action on target species.
 - Literature and information on aquatic targets in the GCPEP area has been collected. Discussions with experts will continue to work on a plan of action for the aquatic targets including mussels, gulf sturgeon, Okaloosa darter, fish and mussels in Conecuh, Blackwater and alluvial systems. The aquatic specialist has participated in several meetings at Eglin concerning aquatic and biodiversity issues, including the Aquatic Resource Management meeting and the Okaloosa darter Recovery Plan meeting.
 - The aquatic specialist attended a workshop on steephead ravines hosted by the Florida Benthological Society that included talks on hydrology, geology, insects, vegetation and amphibians and a site visit to ravines near Bristol, FL.
5. Provide training to GCPEP personnel, especially standard operating procedures for aquatic sampling.
6. Provide expertise and advice on stream restoration techniques.
 - Expertise was provided for a restoration project at Blackwater River State Forest in the Mare Creek area, funded in part by DEP penalty money. A heavily used road fords both Mare Creek and a small, unnamed branch. Driving through these creeks has made them wider and shallower downstream and the habitat is silted over. In order to reduce these impacts, a Bailey Bridge is being constructed across Mare Creek and a rock ford across the small branch. The Department of Forestry (DOF) is also rebuilding the road, blocking off go-arounds and closing vehicle access to roads that lead to sandbars. Pre-restoration biological and habitat evaluations were conducted on the two streams with the assistance of DEP and Blackwater staff. The sites will be re-sampled one year after the restoration to evaluate the impacts of the project. Though Mare Creek and the small creek are both heavily smothered, they have good woody debris and good potential for recovery.
7. Cooperate with continuing education, such as Master Logger BMP training.
8. Complete literature searches on deadhead logging, roads and other activities that may impact aquatic systems. Provide partners with research information.
 - A list of the rare and imperiled plants and animals that live in and around the streams and wetlands in the GCPEP region is being compiled. Information on woody debris and log removal from rivers is being compiled and distributed to interested parties. Scientific evidence has been presented about why log removal is detrimental to streams and rivers.
 - A report and poster on aquatic resources and issues in the Blackwater River watershed entitled "*A Guide to Understanding and Protecting the Blackwater River Watershed*" was published as an effort of the GCPEP Staff, TNC Regional Staff and other cooperators. The project was funded by a DEP In-Kind Service Penalty Payment mentioned above. The report is aimed at community leaders to discuss problems and solutions in the watershed and to highlight current protective actions.

Three of the top eight conservation objectives chosen by the Steering Committee were:

1. Control erosion in ecologically sensitive areas
2. Manage recreation and public access
3. Increase public education and stakeholder involvement.

The Blackwater River guide represents an initial effort at addressing these objectives.

- Slide shows and displays are being presented at meetings on topics such as GCPEP, non-point source pollution, river stewardship and aquatic woody debris. Spoke to NW FL Canoe Club about deadhead logging.
- Apalachicola River and Bay duties

Project Administrator Job Accomplishments:

Job Expectations are numbered and Accomplishments-to-date are bulleted

(Project Administrator Responsibilities and Duties are detailed in Chapter 7.)

1. Communicate GCPEP budgetary needs to the Steering Committee on a regular basis. Include GCPEP equipment needs in partner notifications.
 2. Assess GCPEP communication needs by working closely with each partner's Public Relations staff.
 3. Develop communication strategies including displays, slides, and issue papers.
 4. Improve GCPEP internal communications with progress reports, calendars and e-mail newsletters. Distribute a GCPEP newsletter on a quarterly basis.
 5. Work with the steering committee to develop a GCPEP logo for use on all correspondence.
- Transferred all GCPEP administrative responsibilities to the Jay, FL office that were previously handled in Gainesville, FL including accounting, human resources, public relations establishing and maintaining files, compiling mailing lists and research information, and tracking expenses.
 - Met with TNC Florida Regional Staff on FY 2001 GCPEP budget & future needs
 - Reviewed and tracked documents to gain a thorough understanding of public and private grant reporting requirements to produce required funding deliverables for critical GCPEP funding.
 - Submitted pre-proposal for FY 2001 Legacy grant; Prepared Quarterly Reports for TNC Stewardship, Legacy Program, Solutia/DEP In-Kind Penalty, Steering Committee Meetings; Prepared Final Reports for Solutia/DEP In-Kind Penalty and The Turner Foundation
 - Increasing GCPEP communications, including assessing needs, developing strategies and working to improve external and internal communications.
 - Co-wrote and distributing "A Guide to Understanding and Protecting the Blackwater River Watershed".
 - The first two editions of an internal newsletter, the GCPEP Partners' Quarterly News were produced in February and March 2000.
 - Working closely with the GCPEP partners and public relations departments to produce a logo for GCPEP letterhead, brochure and public newsletter about the partnership for community support and fundraising. Other requests include a slide or PowerPoint presentation and video documentary.
 - Compiling information and attending workshops about organizing volunteers.

Project Conservation Ecologist Responsibilities. A Project Conservation Ecologist will soon be added to the GCPEP staff and the position will focus on planning on Eglin Desired Future Condition Workshop, increasing the planning and monitoring for GCPEP Conservation Targets and synthesizing ecological information for the partners.

Project Conservation Ecologist Duties.

1. Synthesize ecological and conservation planning information for identified conservation targets at Eglin. Work with the TNC Southeast Division Conservation Ecologist, Eglin G.I.S. and operational staff and other TNC staff to prepare background materials for an Eglin Desired Future Condition Workshop.
2. Take lead role in organizing Eglin Desired Future Condition Workshop and assist with workshop facilitation. Assist with organization of other workshops as scheduled.
3. Develop report on Eglin Desired Future Condition Workshop and work with Dr. Garry Peterson on completion of a landscape disturbance model for partner sites.
4. Work with GCPEP partners on conservation planning and development of site conservation plans for Eglin and other partner sites.
5. Write the ecological portions of GCPEP reports and other communication efforts geared toward specified audiences.
6. Assist the GCPEP staff in grant development and fundraising efforts.
7. Compile new scientific and management information at the species and community level for GCPEP sites.
8. Develop and implement monitoring programs for identified conservation targets.
9. Assist with other activities as requested by the Project Director.

Project Conservation Ecologist, Steering Committee Job Expectations:

1. Attend North Florida Prescribed Fire Council Meetings and USFS NEPA Meetings. Learn the process and assist in the future. Assist with Eglin 5 year Management Plan.
2. Work with Engineer/Road Maintenance departments on solutions to erosion problems using Road Best Management Practices (BMP's). Prepare a manual for Road BMP's.
3. Work on Integrated Exotic Species Management Plan for GCPEP and area lands. Coordinate an exotic species treatment information and equipment exchange between the partners.
4. Prepare a "GCPEP Native Species for Restoration" guide, for large-scale restoration projects listing plant availability, propagation and production information. Possibly purchase equipment to collect native seed.
5. Assist with a "Native Plants for Groundcover Restoration" workshop for GCPEP at Apalachicola Preserve.
6. Work on management guidelines for GCPEP Conservation Target beginning with the Florida bog frog. Visit known sites on Eglin and Champion International lands and investigate possible new sites.
7. Work on G.I.S. mapping needs for GCPEP. Follow-up on Christina Kennedy's map. Research Longleaf Alliance's possible availability to coordinate G.I.S. efforts with GCPEP. Research downloading already prepared maps of partners and other agencies.
8. Work on hog impacts on rare plant communities including pitcher plant bogs and other conservation targets. Include in threats, strategies and management plans. Research hog

management in other areas and agencies in the state. Research projects and funding sources including Lake Wales Ridge working on hog enclosures to reduce threats.

9. Plant native trees on specific soil types and prepare a guide for Arbor Day handout “GCPEP Native Tree Plantings for Local Communities”.
10. Assist in coordinating release of gopher tortoises.

Other Issues

New and Current Partner Discussions. The National Forests in Florida have been very supportive of GCPEP from the beginning, especially in the area of management and red-cockaded woodpeckers. However, with the distance between GCPEP lands and the major land holdings of the National Forests in Florida, and with increasing budget and personnel constraints, they are continually faced with difficult decisions. Recently, Forest Supervisor, Marsha Kearney, indicated the need for the National Forests in Florida to withdraw from GCPEP. The withdrawal was based on several issues including a concern over repetition with National Forests in Alabama and the need for increased personnel effectiveness and efficiency. It is clear, though, that GCPEP continues to have the full support of the U.S. Forest Service.

Additional discussions are occurring with the National Forests in Florida regarding roads, recreation, public access and the Florida National Scenic Trail. The National Forests in Florida also have land responsibility for one of eight National Scenic Trails in the United States, the Florida National Scenic Trail. GCPEP, under the guidance of the Steering Committee, is playing, and can continue to play, a critical role in the completion of the Florida National Scenic Trail in the panhandle.

Considering a change to their Steering Committee members to reflect National Forest and GCPEP needs in the area of recreation and eco-tourism can be beneficial to the Steering Committee by bringing in additional expertise in an area the partnership has chosen as a priority objective – management of recreation and public access and increasing public education and stakeholder involvement.

New Partner Criteria are detailed in Chapter 7.

Several agencies and/or landowners have expressed some level of interest in joining GCPEP. These possible partners include the Florida Fish & Wildlife Conservation Commission, John Hancock, Naval Air Station, Pensacola and the Florida Department of Environmental Protection. The partners also discussed cooperating more closely with Gulf Islands National Seashore. The Steering Committee has requested that the GCPEP Project Director conduct initial meetings with the interested parties. To date, the Project Director has met with the Alabama Nature Conservancy and Alabama Natural Heritage Programs to learn more about South Alabama landowners, of which one, John Hancock, owns property in and around Conecuh National Forest. An initial meeting will be set with John Hancock and information will be brought back to the Steering Committee.

Major Project Updates. At the previous GCPEP Steering Committee meeting, strategies and actions were developed for the most serious threats to GCPEP conservation targets. The conservation strategies selected were chosen to abate threats to the conservation targets. From these strategies, eight major projects were chosen to initiate work on. An update on each of these major projects follows:

- 1. Pursue Choctawhatchee National Forest land exchange or sale. Chris Zajeck of Apalachicola National Forest in Tallahassee will be the point person. Also involve Conecuh National Forest, Eglin Air Force Base, the Alabama Heritage Program, and George Willson of The Nature Conservancy.***

Currently Apalachicola is working to sell this parcels in a way that will most benefit the National Forest in Florida, including negotiating with St. Joe on possible exchange for parcels St. Joe owns in the Forest.

- 2. Each partner identify critical parcels for land management or protection of conservation targets. Complete a map and state why the parcel was selected. Complete by September 30, 1999.***
 - Yellow River – Project Director worked with Steve Brown and Bill Cleckley of the Northwest Water Management District on the pursuit of a 12,384-acre parcel Rayonier was selling that included land along the Yellow River. The land was previously owned by Jefferson Smurfit Corporation and was purchased by Rayonier in October of 1999. All Florida lands were put up for purchase by bid with a January 2000 closing. Upon learning of this purchase possibility, the NFWMD could not complete legal requirements in time to put in a bid. TNC also did not have time to do appraisals. However, both expressed an interest to Rayonier if the parcels did not sell.
 - East Fork Coldwater Creek, Manning & Wolf Creeks –These are important tributaries of the Blackwater River. Discussed with Champion first about the possibility of purchasing property because of proximity to other Champion parcels, but the purchase was not a possibility. Then discussed with both Blackwater River State Forest and the Northwest Florida Water Management District. The parcel was another Rayonier piece (6045 acres) for purchase by bid. For the same reasons as the Yellow River property, they could not bid on it. However, this parcel was bought by a landowner from Alabama, who has turned around a put it up for sell again. The Division of Forestry is currently pursuing the inholding and all land along Coldwater Creek.
 - Escambia River – The Project Director met with the landowner interested in a partner or a conservation easement for a 590 acre parcel along the Escambia River. Put in contact with Steve Brown of the Northwest Florida Water Management District and he will now follow up on this.
 - Escribano Point- a 6,500-acre parcel lying west of Eglin and east of Garcon Point on East Bay. Escribano Point has been on the P2000 list previously. GCPEP supports acquisition of this parcel under the new Florida Forever program. One letter was written by the Project Director to Eglin about military and land management issues, such as prescribed burning. DEP is taking the lead and is now actively pursuing this property. Letters have been sent to all landowners expressing interest. The largest landowner, Louisiana Development Corporation, is interested in selling and is doing appraisals. DEP has completed appraisals and surveys. The Nature Conservancy agreed to help in every way to assure this parcel is purchased and protected from development. Possible managers for this property include the Northwest Florida Water Management District and the Yellow River Aquatic Preserve.

- e) Clark Property – DEP has purchased some critical parcels in the Garcon Point Area, to be managed by the Yellow River Aquatic Preserve. One is a 40-acre parcel in the middle of the Clark property. DEP has also purchased land on some of their North boundaries and has received permission to do additional appraisals.
- f) Conecuh National Forest – Conecuh is pursuing inholdings and TNC has assisted with the purchase of some parcels. Purchasing inholdings is difficult due to the large number of parcels, the need for appropriation of funding and the lack of personnel. Conecuh met with Alabama TNC and NHP staff to discuss important parcels in and around Conecuh National Forest. Alabama TNC is pursuing appropriation of additional Federal funds to assist Conecuh in purchase of critical inholdings. For the Forest Service, most projects take approximately a year or more to finalize, but with it is very helpful having TNC's help because they have a quicker timeline.
- g) Mid Bay Timber/First American Farms–Highway 331 Landowner wants to consider doing something positive for conservation with this parcel. This could be a model for restoring agricultural lands back to a longleaf pine ecosystem. It is highly disturbed with the possibility of seepage slopes.

3) *Pursue public opinion poll. Project Director to discuss with TNC Government Relations and Gary Taylor of Conecuh National Forest. Jeff Hardesty (TNC) to discuss with Susan Jacobsen (University of Florida). Funding to be committed by October 1, 1999.*

Met with the Longleaf Alliance and discussed the possibilities of doing a joint community profiling project.

4) *Finish fire model for Blackwater River State Forest and Conecuh National Forest. Host workshop for stakeholders. Rick Lint to provide Conecuh map. Project Director to provide needed information to Garry Peterson.*

Maps have been provided by the partners. The GCPEP Project Conservation Ecologist will take the lead on completing this project with the scientist who completed the model for Eglin, Dr. Garry Peterson.

Eglin Air Force Base:

30,000-acres have been burned on Eglin. The objective is 70,000-acre minimum and 100,000-acre optimum. Drought and military missions have caused postponements.

Conecuh National Forest:

11,000-acres burned, finished winter burning in March. Will try to burn 14, 000-acres in April, May and June depending on the drought conditions. Will bring in teams from Oregon to finish by July.

Champion:

Burned south side of virgin longleaf stand with good results. Would like to burn north side and the Cooley's Meadowrue site.

Northwest Florida Water Management District:

5,000 burned, have shut down since winter with plans for growing season burns in May and June. Depends on the weather and they are getting further behind and recently have cancelled burns due to poor conditions. NFWMD gets a lot of help in burning from the John Fort group.

Blackwater River State Forest:

At last report, Blackwater had burned 25,000-acres of a planned 60,000-acres.

- 5) ***GCPEP Burn Team to review and possibly pursue funding from the National Turkey Federation. Team to include James Furman (Coordinator) from Eglin Air Force Base, Sonny Greene from Blackwater River State Forest, Pat Brinn or Michael Heard from Conecuh National Forest, and Steve Brown from the Northwest Florida Water Management District. Recommendations to be made by September 30, 1999.***

GCPEP was a part of an East Gulf Coastal Plain proposal to the Rodney Johnson/Katherine Ordway Stewardship Endowment. If funded, this proposal would initiate a fire team to lead or assist on priority sites in the GCPEP area. The proposal includes hiring a seasonal burn crew from SCA, AmeriCorps or interns. Urban Interface Burn. Volunteer and local fire services were able to provide many more people than DOF. Trained six certified burners and equipment to work with private landowners. Working with people in their community and working in a more efficient way. John Fort is looking for opportunities for the burn teams later in the spring when central and south Florida no longer need them. Equipment is possibly available on a volunteer basis to help out from Eglin. Geoff Babb is working with Randy to scale down project since less funding is available than expected. Steering Committee agreed to consider the possibility of a GCPEP burn team or a GCPEP Fire Resource Coordinator. Jim Murrian noted the successful interagency, cooperative fire team organized for the Lake Wales Ridge area. Both public and private funding was used for this fire team.

- 6) ***Project Director to approach Alabama and Florida Natural Heritage Inventory programs and DEP Ecosystem Management Coordinators for possibility of producing target maps for GCPEP.***

There is a need for a compelling map showing the GCPEP area and all partnership parcels of concern. The Steering Committee agreed that creating an up-to-date GCPEP map and completing a threats analysis would be beneficial. The data analysis is very helpful as a tool for identifying targets, threats and sources. Ecosystem management is fine-tuned with this type of detail. The main concerns are development pressures, smoke management, recreation, roads and population density. Using ArcView, public domain background coverages and cooperating efforts with other partners, the GCPEP staff will attempt to create the necessary maps. Subcontractors may be necessary to create the coverages for targets, for pulling individual maps together and for incorporating Alabama.

7) *Compile report on herbicide impacts on groundcover in the longleaf pine ecosystem. The Longleaf Pine Restoration Project at Eglin Air Force Base will complete by December 30, 1999.*

Herbicide Effects on Groundcover Vegetation in Southern Pinelands; A Literature Review - by Andrea Litt, Brenda Herring, and Louis Provencher of the Longleaf Pine Restoration Project at Eglin Air Force Base. The report by the Longleaf Pine Restoration Project was completed and discussed at the GCPEP Steering Committee Meeting. The Steering Committee has recognized the need for a review of herbicide impacts on groundcover, especially when considering restoration of longleaf pine sites. The report consists of a literature review of herbicide effects on groundcover species in southern pinelands. Included is relevant, peer-reviewed articles from journals, technical reports, theses and agency literature. Over 100 articles were scrutinized. After careful reading, 35 papers were retained that met the primary objective of the report. The studies varied enormously in quality. Beyond quality issues, the following additional challenges had to be overcome in order to pursue statistical analysis:

- Few studies share common treatments
- Few studies report on the same variables
- Some studies measure treatment effects from a few lumped variables (all herbaceous plants), whereas others sub-divide treatment effects at the species level.

The next steps of the study chose variables and treatments, decided how many to keep from each study, and then decided if there were enough studies to perform statistics on. To date, it has not been possible to gauge the prevalence of negative or positive effects because the data is too heterogeneous. General observations are that the positive effects of herbicides may be more common than negative ones when herbaceous plant species are grouped into life forms (forbs, grasses). This may occur if a dominant species such as broomsedge responds positively to herbicide application.

8) *Complete assessment of aquatic systems status. Rick McWhite of Eglin Air Force Base will take the lead on developing a rapid assessment technique. Team to assist will include Kevin Leftwich of the National Forests in Alabama, Joe DeVivo of Eglin Air Force Base, and Stephanie Davis, the GCPEP Aquatic Specialist.*

The GCPEP Aquatic Specialist is preparing to conduct a rapid assessment of partner aquatic resources. She is working with the Eglin/USFWS Aquatic Ecologist on a GCPEP long term monitoring plan. This team also includes the Aquatic Specialists from Champion International and National Forests in Alabama. The Adopt-a-Stream method is used for quick assessment and DEP Biorecon for pre and post monitoring for restoration. The Aquatic Specialist will continue working with USFWS, DEP, FFWCC, on long-term monitoring, keeping abreast of regional monitoring and will meet with aquatic people from each partner to become more specific.

Additional Major Projects Selected. The Steering Committee decided to dedicate the remaining meeting time to selecting additional projects the partners could work on cooperatively. Projects were identified along with project leader(s).

- 1) GCPEP- Blackwater RCW translocation, cavity inserts and aggressive burning has succeeded in building the population from 15 to 24 families. Conecuh NF is up to 18 families, getting more areas ready for new centers of activities. Eglin has 5 – 6 donor birds available. Apalachicola will be translocating birds to Wakulla unit.
- 2) Research the possibility of a GCPEP Volunteer Coordinator-Project Administrator will work with Jim Murrian and Rick McWhite on this need. A proposal will be given to the Steering Committee.
- 3) GCPEP Prescribed Fire Resource Council. The Project Director will discuss this with the Fire Managers for each of the partners and other cooperators.
- 4) The Nature Conservancy needs to hire a dedicated land protection specialist for western Florida and south Alabama. TNC Protection staff has been reorganized. Special emphasis has been given to the GCPEP area with continued work on the Perdido Pitcher Plant Preserve and one specialist working on other GCPEP issues. Larry Ellis (TNC, AL) is leading the efforts with other TNC/AL staff on needs in South Alabama. Project Director put in 2-5 year plans the need to have additional protection help for GCPEP and surrounding lands. The Project Director will work with TNC Protection staff to discuss this need.
- 5) GCPEP to host an annual meeting to celebrate successes. For leaders of partner organizations, to bring community leaders, media event, successful partner projects, corporate management, resigning MOU, bring in new partners, fun time, celebrations and products out for leaders to see.
- 6) Expand GCPEP website and link to other partners and other agencies' web-sites. TNC/FL has now included GCPEP in their web-site. A meeting is scheduled for May with TNC PR departments to expand the web-page and to design and produce a GCPEP Brochure.
- 7) Partners to assist the Northwest Florida Water Management District with a prescribed burn on the Garcon Point Clark parcel.
- 8) Complete one cooperative GCPEP burn each year with locations suggested by the Steering Committee members.
- 9) Compile GCPEP success stories to be included in a quarterly newsletter internally circulated to the partners.
- 10) Find funding to conduct target surveys on partner lands. GCPEP Staff will pursue funding opportunities for terrestrial and aquatic targets surveys. Project Director and Aquatic Specialist met with USFWS Director from the Panama City office on GCPEP/USFWS cooperation and needs. Terrestrial and aquatic target surveys across GCPEP lands were highlighted as GCPEP needs. These are critical survey needs that we can always use help in finding funding sources to pursue.
- 11) Beaver, culvert blow-outs, stream systems, impoundments, culvert sizes, what to do, perforated culverts.
- 12) LLP Growth Yield & discuss with James the progress of research.

Partner Updates: Round Table Discussion for the partners to share concerns, successes, needs and suggestions.

Northwest Florida Water Management District

- Producing Public and Internal Reports
- Working on logo design for GCPEP
- Purchasing additional land parcels, including a critical parcel along the Yellow River

Conecuh National Forest:

- Roads and Trails Grant for County Roads
- 5-year Slash Pine Reforestation
- Environmental Impact Statement
- Looking for site preparation funding, possibly from American Forests
- AL Natural Heritage Program proposal for large watershed with rapid assessment of aquatics
- Research and analysis of planting native grasses on restoration areas

Eglin Air Force Base:

- Integrated Natural Resource Management Plan (INRM) issue driven workshops
- Barrier and Strategies Range and General Plan
- Conservation Action Plan for the Golf Course

Champion International Corporation.

- Champion International joined the GCPEP Aquatic Specialist on a tour of the watersheds within the “connector parcel” on February 3, looking for candidate streams to serve as possible benchmarks for water quality assessment studies
- Early planning beginning for a possible cooperative burn of (potential) flatwoods salamander habitat later this summer
- Discussions continued on formally establishing an agreement for the Florida Trails segment passing through the Champion “connector parcel”
- Completion of a Florida Endangered Species Booklet

Champion opened the company’s forest management practices to scrutiny under the Sustainable Forestry Initiative (SFI) verification program. The SFI program is founded on twelve broad principles that, among other things, require prompt reforestation; provide for wildlife habitat; protect water quality; and protect sites of special significance. An Expert Review Panel comprised of some of the nation’s leading natural resource professionals—six from academia; six from government and six from environmental groups oversees the program. The SFI program has been broadly acknowledged as an effective means of promoting responsible forest management. A team of five, including three resource specialists – a wildlife ecologist, silviculturist, and water quality specialist, conducted the week long review

The review team summarized their findings into two or three categories:

- (1) Good Management Practices,
- (2) Opportunities for Improvement, and, if it applies,
- (3) Non-Conformance.

Champion sailed through with total conformance and few Opportunities for Improvement

After touring 400 miles of dirt roads each day for a week Champion sailed through with total Conformance and only a few Opportunities for Improvement.

Several of the members were unable to attend the Steering Committee meeting due to other critical commitments or agency/organization issues. With the increasingly involved schedules of our partner organizations, we want to continue to address the needs of the Steering Committee in the most effective and efficient way possible. Different options to better accommodate the busy schedules of the Steering Committee members were discussed including:

1. have one (1) day meetings, three (3) times a year, begin earlier & end later;
2. have the one day meetings at a centralized location;
3. have only one (1) of the quarterly meetings be a two (2) day meeting, which would include a tour of partner lands;
4. hold meetings Monday through Thursday, so travel is not on Friday night.

The meeting concluded with an evaluation and a discussion on possible dates for the next Steering Committee meeting. The date July 19, 2000 was selected and the location is to be announced.

CHAPTER 9. CONCLUSIONS

Summary of Findings

Over the past two years, the Gulf Coastal Plain Ecosystem Partnership has grown from a visionary concept to a successful landscape scale conservation project. The Partnership represents a strong commitment from the seven public and private landowners to further conservation in the area. The process of moving from a conceptual phase to a successful project is discussed in two stages, planning and implementation.

Planning. This innovative, voluntary Partnership was formalized in 1996 with the signing of a Memorandum of Understanding (MOU). Total lands included in the partnership comprise an 845,800-acre landscape stretching from the Gulf of Mexico in the Florida Panhandle into Southern Alabama. The stated purpose of the MOU is to develop and implement a voluntary and cooperative stewardship strategy to sustain the long-term viability of native plants and animals, the integrity of ecosystems, the production of commodities and ecosystem services and the human communities that depend upon all of them. The partners agreed to the following primary goals to guide GCPEP:

- Develop a set of voluntary, cooperative conservation strategies and projects encompassing some or all of the 845,800 acres included in the GCPEP Memorandum of Understanding;
- Sustain and restore ecosystems occurring on GCPEP lands and the services they provide to local communities;
- Work within the constraints of the existing missions, management objectives and plans of each partner organization to find solutions to management challenges shared in common;
- Demonstrate how complex land management organizations with different missions can work cooperatively;
- Share lessons learned with other agencies, organizations and communities.

After reaching the milestone of the MOU, it was important for both planning and operations to bring together a group of managers representing each of the partners in GCPEP. This collective group is called the Steering Committee and serves to direct the operations of the Partnership. Each partner agency or organization chooses primary and secondary representatives for the Partnership. All decisions are reached by consensus.

One of the first priorities of the Steering Committee was to hire a GCPEP Project Director. Recruitment for the GCPEP Project Director began in March 1998. The Steering Committee, including Rick McWhite of Eglin, selected the final candidates and conducted the interviews. The Project Director, previously employed at Blackwater River State Forest as the Forest Resource Administrator, began work in May 1998. Other GCPEP staff, including a Project Administrator and an Aquatic Specialist, have been added to better address the needs of the Partnership, stakeholders and the surrounding communities. A Project Conservation Ecologist will soon be added to the staff to assist with conservation planning and monitoring for terrestrial targets.

The Partnership immediately began work on a GCPEP site conservation plan. GCPEP lands are clearly recognized as one of the most biologically significant landscapes in the United

States. This significance is recognized in a recent book entitled *“Precious Heritage – The Status of Biodiversity in the United States”* (The Nature Conservancy and the Association For Biodiversity Information 2000). *“Precious Heritage”* identifies the Florida Panhandle as one of six national hot spots for diversity, taking into account both the richness and the relative rarity of species. This significance is also highlighted in a report completed for the Steering Committee by The Nature Conservancy entitled *“Conservation From An Ecoregional Perspective: The Biodiversity Significance Of The Gulf Coastal Plain Ecosystem Partnership”* (Hardesty 1999) and includes the following points:

- GCPEP comprises only 2% of the 42 million acre East Gulf Coastal Plain Ecoregion area, but includes 38% of its natural communities and 37% of its target species;
- The GCPEP landscape is considered one of the two most important landscapes in the Southeastern United States for conserving biodiversity;
- A national level analysis identified three GCPEP watersheds as critical hotspots for protecting at-risk fish and mussel species (The Nature Conservancy 1998b).

The development of sound conservation strategies depends upon completing a site conservation plan. The partners identified individual partner conservation objectives used to agree upon overall GCPEP conservation objectives. Planning and implementation has centered on these partners objectives, the top eight of which are listed below in priority order:

1. Conserve viable populations of target species
2. Introduce relatively natural fire regimes protecting key ecotypes
3. Protect urban interface and reduce fragmentation by use of conservation easements
4. Control erosion in ecologically sensitive areas
5. Manage recreation and public access
6. Increase communication, interaction and training among partners
7. Increase inventory and monitoring to further adaptive management
8. Increase public education and stakeholder involvement

Selection of targets is the first step in site conservation planning. At the site level, the appropriate choice of planning targets is the single most important step (Low 1998). The GCPEP Steering Committee agreed on an initial list of 8 conservation targets, which was then increased to 18 conservation targets (Chapter 6), representing both the species level and the community level. At the request of the Steering Committee, the GCPEP staff reviewed and then narrowed the target list to a final 16 conservation targets (Chapter 4). After selection of the targets, pertinent target ecological information was assembled, socioeconomic information was assessed and threats to the targets were identified. At most sites, one threat emerged as the “killer threat”. Strategies were then selected to abate critical threats for the original eight conservation targets. Additional strategies for the remaining targets will be selected by the Steering Committee at meetings in the upcoming year. The response by GCPEP to these threats will very likely be the single most important factor affecting the long-term health of the conservation targets on GCPEP lands.

Even with the initial site conservation plan complete, the GCPEP Steering Committee recognized the importance of exporting the knowledge gained through the planning process to

other stakeholders and landowners. Only then would GCPEP gain the support needed to abate the serious threats facing the conservation targets. Having GCPEP staff and partner staff conduct presentations, workshops, tours and work closely with the local media increased community support and involvement. The GCPEP staff has also become involved in community and business organizations to build support for GCPEP objectives, while advancing the recognition of threats and viable solutions to address them.

As mentioned in the Acknowledgements, many governmental and non-governmental agencies, and committed individuals have contributed time, expertise, funding and materials for support of the Gulf Coastal Plain Ecosystem Partnership. To list them all is difficult because they are so numerous and to leave even one out would be unfortunate. Everyone we have worked with has been very generous and helpful and we appreciate them all.

The GCPEP Steering Committee also recognized the significance of using and having access to the best science to assure proper management for the conservation targets. Increasing management and planning information is a critical step in any partnership. To properly address this issue, GCPEP staff completed information manuals for four of the Steering Committee meetings addressing partner needs and conservation targets (Appendices E, F, G and H). These manuals have proven to be important in providing scientific information to the partners and have led to improved land and water management.

Implementation. During and after completion of the site conservation plan, the GCPEP Steering Committee selected projects to implement objectives and strategies. These are detailed in the Steering Committee Meeting Summaries (Chapters 5-8). Successful implementation of projects is not only important in abating threats to conservation targets, but also in building trust within the Partnership and increasing community recognition. Two of the major challenges in a large, landscape-scale partnership are managing the wealth of worthwhile ideas and overcoming resource shortages to implement required strategies.

While considering projects, the GCPEP Steering Committee and Staff kept in mind objectives, threats, strategies and actions. Of course, the best planning will only lead to protection of conservation targets if the most critical projects are addressed. Major projects centered on the following:

- Red-cockaded woodpeckers
- Prescribed fire
- Land protection
- Recreation and public access management
- Watershed management
- Longleaf pine restoration
- Private landowners

Red-cockaded Woodpeckers. The red-cockaded woodpecker (RCW) is a federally listed species that requires large areas of high quality (primarily) longleaf pine habitat. Eglin has the fourth largest remaining population in the world. RCWs are found on 88% of the land area involved in the partnership. The first phase of the GCPEP cooperative work was to document the current status of RCWs in the GCPEP landscape, use a spatially-explicit, demographic model to assess the extent to which each partners' RCW populations are connected to each of

the others, assess which parts of the population are most susceptible to decline and then develop specific cooperative strategies and actions to mitigate the declines (Moranz and Hardesty 1998, Appendix B) Both monitoring and modeling indicated that Blackwater River State Forest populations were most vulnerable to decline and that the Blackwater and Conecuh National Forest populations were one and the same.

The model results, along with efforts from GCPEP partners and cooperators, led to a Division of Forestry RCW recovery plan. This plan is one of the first comprehensive RCW state management plans in the nation. The DOF also increased the local Ecology Unit staffing to assist in a more aggressive management for the RCW. To date, Eglin, Conecuh, Apalachicola, TNC, USFWS, FFWCC and the Francis M. Weston Audubon Society have all assisted in the recovery effort. The Audubon Society, through a cost share agreement between the USDA Forest Service and GCPEP, funded the first year RCW translocations at Blackwater. Initial success has continued to be high with 15 of the 31 cavity inserts now in use by RCW's. All five of the first year translocated females on Blackwater have been found and have paired with males. Recent efforts have centered on completion of the banding effort and an attempt to assure prescribed burning of all RCW foraging zones. Habitat improvement with cavity inserts has proved successful on Eglin, Conecuh and Blackwater (Appendix E). RCW populations are now increasing on all three partner lands containing RCW populations. Blackwater's population has increased from 15 to 24 families over the past two years. The RCW recovery effort stands as a very successful cooperative project for the GCPEP.

Prescribed Fire. Prescribed burning has been identified as a priority objective by GCPEP because of the significant role it plays in maintaining a healthy system for several different community types on GCPEP lands. On May 14, 1999 a GCPEP Cooperative Prescribed Burn was conducted on the Garcon Tract of the Garcon Point Water Management Area. The goal of the burn was to protect and enhance the ecological diversity of the wet prairie system. This prescribed burn would not have been possible without the efforts of the GCPEP, as the Northwest Florida Water Management District did not have the needed personnel or equipment to conduct the burn. Over 40 people participated in the burn, including personnel from The Nature Conservancy, Northwest Florida Water Management District, Florida Division of Forestry, Eglin Air Force Base, U.S. Bureau of Land Management, Florida Game & Freshwater Fish Commission, Office of Agricultural Law Enforcement, Avalon-Mulat Volunteer Fire Department and the Bagdad Volunteer Fire Department. The Project Director served as the Public Relations Manager for the burn, which offered an excellent opportunity to educate the public about GCPEP and prescribed burning. Information pertaining to the burn was broadcast on two local television stations and in the *Pensacola News Journal*. Additional cooperative burns have occurred on Eglin, NFWMD, and Champion lands.

Even with the successes of cooperative prescribed burns, prescribed burning is becoming increasingly difficult due to the rapid growth occurring in the area. A landscape disturbance model workshop was held June 1998 at Eglin with participation from other GCPEP partners and cooperators. The landscape disturbance model creates "movies" of expected landscape change over time resulting from different management scenarios. This innovative computer simulation model graphically showed the results of various fire management rotations and highlighted the need for aggressive use of fire on partner lands (Peterson et al. 1998). Based on information from the model, Eglin managers increased their burn plan acreage to over 100,000 acres per

year, representing a 3-year burn rotation. Conecuh National Forest is also on a 3-year burn rotation. Eglin and Conecuh, in particular, are emphasizing lightning season (summer) fire.

The Project Director led another landscape disturbance model workshop at Blackwater. This workshop was designed to allow for increased participation by Blackwater fire management supervisors. The model was modified to show effects of fire over time specific to the Blackwater landscape. Over recent years, the burn rotation at Blackwater has increased from a 2-3 year rotation to a 4-5 year rotation. The model showed that this would have serious negative environmental consequences. As a result, Blackwater managers are modifying their prescribed burning planning process to insure that acreage not burned each year is included in the next year's plan. A request has also been approved for a Division of Forestry helicopter to be stationed at the Crestview Work Station of Blackwater. This should greatly increase the capacity for prescribed burning at Blackwater.

Information and recommendations from these two workshops have been incorporated into draft management guidelines and plans, including development of a management plan for Blackwater and the continuing development of the next Eglin Integrated Natural Resources Management Plan. The landscape disturbance model and associated workshop proved instrumental in making important changes in partner prescribed burning programs. In addition, cooperative GCPEP burns have led to higher total prescribed burn acreage for the partners.

Land Protection. Incompatible development encroachment in and around partner lands is making land management and protection of conservation targets increasingly difficult. It is critical to have an expert land protection staff person available to move expediently on important land parcels when they come available. GCPEP staff have continued cooperative efforts between TNC, NFWMD, Blackwater and Conecuh to pursue important land acquisitions along the Yellow River, Coldwater Creek and several in-holdings on Blackwater and Conecuh. Additional parcels of concern include Escribano Point on the west side of Eglin, a parcel on the Escambia River near the Alabama line, and lands bordering the Perdido Pitcher Plant Prairie. The 6,045-acre Coldwater Creek parcel was purchased by an Alabama landowner and is now for sale again. The DOF is now pursuing all parcels within this package that are in-holdings or that are along Coldwater Creek. TNC has offered assistance if needed.

The Project Director has also been active in moving forward the acquisition of Escribano Point (Appendix H) on the west side of Eglin. This large parcel of over 6,000-acres also borders Blackwater Bay and East Bay and harbors extensive wetlands, bayous and imperiled species and communities. Besides protecting critical habitat, the purchase of this parcel would provide an important buffer to both land management activities and the military mission at Eglin.

DEP is taking the lead on purchasing the Escribano Point property through the Florida Forever program. The largest landowner, Louisiana Development Corporation, is interested in selling and has been negotiating with DEP. TNC has offered assistance to DEP and has agreed to help in every way possible to assure this parcel is purchased and protected from development. Potential managers for this property include the NFWMD and the Yellow River Aquatic Preserves.

Recreation and Public Access. Controlling erosion in sensitive areas is a priority objective of GCPEP. However, public access is a very sensitive issue in the GCPEP area. Several of the partners have struggled for decades to find solutions to the problems surrounding

roads, erosion and access. Using the Eglin Range road plan (Natural Resources Management Jackson Guard 1999) and planning process as a model, the Project Director presented a proposal to Blackwater River State Forest to complete an Environmental Assessment and Road Study. The study was suggested to be a cooperative effort involving Blackwater, surrounding communities, forest user groups, The Nature Conservancy and other agencies that could assist with expertise and/or funding. Suggested study issues included current road status, current and future road needs, environmental impacts and options for a forest road management plan. Working closely with Blackwater, the Project Director began pursuit of matching funds required for this priority project. The concept that started with discussions between the Project Director and managers at Blackwater River State Forest is to be implemented this year with funding from the Florida Division of Forestry. After completion of the study, the goal is to have a stakeholder supported public access plan balancing use and protection.

The GCPEP partners recognize the dual significance of compatible ecotourism for providing opportunities both for economic gain and for the public to learn about the natural world. Completion of the Florida National Scenic Trail is a significant recreation addition for the GCPEP area. The Project Director, Eglin, the Florida Trail Association (FTA) and the U.S. Forest Service continue with efforts to complete the Eglin portion of the Florida National Scenic Trail.

The Project Director applied for and successfully recruited the American Hiking Society Volunteer Vacation program to Eglin for one week during March 2000. The volunteers spent the week constructing seven miles of trail at Eglin, bringing the trail completed to date to an estimated 24 miles. The Volunteer Vacation was so successful that the majority of the participants volunteered to return to Eglin to assist in construction of trail bridges.

Community enthusiasm continues to grow with the local communities and the national trail community. This enthusiasm is evidenced by a recent article in Backpacker Magazine, a national trail and outdoor magazine that featured the Eglin Trail (Appendix G). In 1999 alone, over 3,600 hours were donated to completing the Eglin Trail and other connecting trails on Partnership lands. Currently, trails are being constructed or are in the planning stages on all contiguous partner lands.

Watershed Protection. The first GCPEP public education report focused on aquatic system threats in the Blackwater River watershed. Because of urban sprawl and increasing use of public lands and waters, freshwater systems in the GCPEP area are especially threatened. Sedimentation, nutrient loading, water withdrawals, water diversions, in-stream woody debris removal and landscape-level fragmentation of riparian buffers and corridors are the primary aquatic challenges.

“*A Guide to Understanding & Protecting the Blackwater River Watershed*”, which was funded by TNC and the DEP, provides: 1) an explanation of how a watershed functions; 2) a brief history of the watershed; 3) list of important habitat, flora and fauna, 4) outline of challenges in the watershed; and 5) how the community can work together to protect and restore the Blackwater River. Emphasis was placed on solutions and good examples in the community. The guide was initially mailed to community leaders and educators with a personal note from the Project Director about its purpose. A correlating poster and slide show will be used for community presentations.

Community response to the “*Guide*” has been more positive than expected with several requests for presentations and a high demand for the document. As a result of the report, the Santa Rosa County school system has requested the guide for use in all high school biology classes and a Santa Rosa County Commissioner has asked the Project Director to serve on the Santa Rosa County Stormwater Task Force. The guide was the subject of a recent news article in the *Pensacola News Journal*. The “*Guide*” provides much-needed education on aquatic systems that can be used in all GCPEP watersheds (Appendix H)

Another serious threat to watersheds in the GCPEP area is the removal of woody debris. In an attempt to abate this threat, the GCPEP Project Director served as a member of the Florida Department of Environmental Protection Deadhead Logging Technical Advisory Committee (DLTAC). In addition, the GCPEP Aquatic Specialist completed an exhaustive literature review.

The recovery of pre-cut, largely virgin timber logs from submerged land is commonly referred to as deadhead logging. These logs sank during transport down rivers early in the century. Because many of the rivers and creeks were channelized to move timbers and most of the old-growth trees in the river floodplains were cut, aquatic systems were subsequently starved of woody debris. In many places, the only large woody debris remaining was the sunken deadhead timber. While the river riparian areas continue to heal and recover with large trees, these are logs critical for habitat and structure. Deadheads are especially critical in rivers or creeks that are impacted by poor land management practices or are smothered with erosion.

By participating in the DLTAC, TNC was able to influence recommendations to the Florida Cabinet and also educate area citizens. In part due to TNC efforts, a temporary moratorium was placed on deadhead logging and the Blackwater River was removed from the Department of Environmental Protection permitted list. Now, deadhead removal from the Blackwater River can only occur with the permission of the Florida Division of Forestry. The majority of the recommendations of the DLTAC were the approved by the Florida Cabinet in April 2000 (Appendices G and H).

The Project Director and the Aquatic Specialist have also worked with the GCPEP partners and the DEP on restoration projects, aquatic monitoring, and bioassessment. An important GCPEP restoration project currently underway involves a stretch of a heavily used river road in Blackwater. The road runs through both Mare Creek and a small, unnamed branch. Driving through these creeks has made them wider and shallower downstream and the habitat is silted over. In order to reduce these impacts, a Bailey Bridge is being constructed across Mare Creek and a rock ford across the small branch. The Division of Forestry (DOF) is also rebuilding approximately ½ mile of the road, blocking off go-arounds, and closing vehicle access to roads that lead to sandbars. The Aquatic Specialist conducted pre-restoration biological and habitat evaluations on the two streams with the assistance of DEP and Blackwater staff. The sites will be re-sampled one year after the restoration to evaluate the impacts of the project. (Appendix H).

In addition to the need for aquatic restoration projects, the need also exists for aquatic classification locally. Aquatic classification is a tool that has the potential to aid in the identification of conservation sites. The classification framework can be used to describe and predict biological community diversity and distribution by spatially relating biotic classification units to an abiotic hierarchy. Aquatic classification of the waters in the GCPEP area would

make it possible to identify a comprehensive set of ecologically defined conservation targets without having an extensive biological data set. The Aquatic Specialist recently participated in a meeting with the Freshwater Initiative (FWI) of TNC, USFWS, and FFWCC staff to discuss aquatic classification for North Florida. She will continue to work with this group as funding and staff become available to pursue aquatic classification for the GCPEP area waters.

Longleaf Pine Restoration. Millions of longleaf pine trees have been planted by the GCPEP partners in a very aggressive longleaf pine restoration effort. However, establishing the longleaf pine trees has proven to be the simple part of the restoration--groundcover restoration has been much more difficult. Much of the difficulty surrounding groundcover restoration centers on the lack of research, monitoring and information. It is known, though, that groundcover can be negatively impacted by both intensive site preparation and by excessive use of some herbicides. Negative impacts from herbicides seem to be primarily from application methods and formulations. Realizing the significance of the groundcover to conservation targets and to the continued use of prescribed fire, the GCPEP Steering Committee requested a report on herbicide impacts on groundcover. The Nature Conservancy conducted a literature review of herbicide effects on groundcover species in southern pinelands (Appendices G and H). Results from the study showed that despite widespread herbicide use, effects on groundcover vegetation are not well understood. The review of 21 studies pointed out that woody cover generally declined with herbicide applications while herbaceous cover results were mixed. Several species of concern declined with herbicide use, but the results on wiregrass were contradictory. The review clearly indicates that additional research using proper experimental design needs to be conducted. Especially on public lands, caution should be used when using herbicides due to the tremendous groundcover diversity and the important role it plays in the longleaf pine ecosystem.

Working with Private Landowners. The single most important landscape linkage in the region is the 7,550-acre parcel owned by Champion International connecting the 464,000-acre Eglin AFB to the 273,000-acre Blackwater River State Forest-Conecuh National Forest landscape. To succeed in restoring the longleaf pine ecosystem across the southeastern United States, it is crucial to have success stories showing public and private landowners working together cooperatively. This is particularly true in the GCPEP landscape area. The first objective for the Champion connector was to have a successful Partnership project involving Champion and other partners. The project was an erosion control effort on the connector parcel involving Champion, Florida Department of Transportation (DOT), The Nature Conservancy, Blackwater River State Forest, Eglin Air Force Base and the Northwest Florida Water Management District. The initial phase of halting erosional input was completed quickly. Under the direction of the Project Director, a restoration effort was completed on the site that included planting of native trees and shrubs and cleanup of illegally dumped materials. The restoration effort was centered around two steephead creeks with a population of the rare Florida bog frog. The Florida bog frog is found only on a small area on Eglin Air Force Base and Champion International. Twenty-two people participated in the effort including community volunteers.

Several meetings have also been conducted with Champion managers on setting priorities and objectives for the connector parcel. It was agreed that the first step would be a complete biological survey of the entire Champion connector parcel. This has proven to be a very difficult task, as the GCPEP staff has been unable to locate the funding necessary to conduct the needed surveys. However, the GCPEP Aquatic Specialist is continuing to work

closely with the Florida Department of Environmental Protection to survey and monitor creeks on the Champion connector parcel. The GCPEP staff is also pursuing funding to start a Florida Adopt-a-Stream program, making use of the area's willing volunteers.

Many other successful projects have been initiated and/or completed by GCPEP. The Partnership stands as an example of what can be accomplished when people work together. The partners accomplish the majority of the on-the-ground work required to maintain healthy land and water, but a dedicated Partnership staff is vital to move the Partnership forward. The assistance and continuity provided by the GCPEP staff has been instrumental in building this successful partnership.

REFERENCES

- Alabama Natural Heritage Program (AHNP). April 15, 1999. Elements occurring in the Conecuh National Forest (including Blue Spring W.M.A.), Alabama. Data from the Biological Conservation Database of the Alabama Natural Heritage Program, Montgomery, AL.
- Bailey, R.G. 1995. Description of the ecoregions of the United States, 2d ed. rev. and expanded (1st ed. 1980). Misc. Publ. No. 1391 (rev.). USDA Forest Service, Washington, DC.
- Brown, Mark J. 1996. Forest statistics for Florida, 1995. Southern Research Station, Asheville, NC.
- Brown, Mark J. 1988. Forest statistics for Northwest Florida, 1987. Southern Research Station, Asheville, NC.
- Bureau of Economic and Business Research. 1991. 1991 Florida Statistical Abstract. Bureau of Economic and Business Research, University of Florida. Gainesville, FL.
- Bureau of Economic and Business Research. 1997. 1997 Florida Statistical Abstract. Bureau of Economic and Business Research, University of Florida. Gainesville, FL.
- Bureau of Labor Statistics. 1999. *Bureau of Labor Statistics data*, [online] one page data table. Available URL: <http://stats.bls.gov/datahome.htm> [1999, May 27].
- Center for Business and Economic Research. 1997. Economic Abstract of Alabama. Center for Business and Economic Research, University of Alabama. Tuscaloosa, AL.
- Center for Compatible Economic Development. 1999. Efrogymson Community-based Conservation Fellowship Program: Identifying and Ranking Systems, Stresses & Sources. The Nature Conservancy, Arlington, VA.
- Conant, R. and J.T. Collins. A field guide to reptiles and amphibians, eastern and central North America. Houghton Mifflin Co. Boston, MA.
- Conecuh National Forest, 1999. Data on rare elements at Conecuh. Conecuh National Forest, Andalusia, AL.
- Deyrup, M. and R. Franz. 1994. Rare and endangered biota of Florida: volume IV, invertebrates. University Press of Florida, Gainesville, FL.
- East Gulf Coastal Plain Core Team. 1999. East Gulf Coastal Plain ecoregional plan. The Nature Conservancy, Southern Conservation Science Support Office, Chapel Hill, NC.
- East Gulf Coastal Plain Core Team. 1999. East Gulf Coastal Plain ecoregional plan. Southern Conservation Science Office, The Nature Conservancy, Chapel Hill, NC.
- Florida Natural Areas Inventory (FNAI). 1999. Occurrence records currently in the FNAI database. Florida Natural Areas Inventory, Tallahassee, FL.
- Florida Natural Areas Inventory (FNAI) and Florida Department of Natural Resources (DEP). 1990. Guide to the Natural Communities of Florida, Tallahassee, FL.

- Flowers, R.W. 1997. An invertebrate survey of Hulburt Field, FL, with special reference to species of special concern. Florida A&M University, Tallahassee.
- Hardesty, J.L. and R.A. Moranz. 1999. Longleaf pine ecosystem restoration in northwest Florida sandhills: Issues and recommendations. The Nature Conservancy, Gainesville, FL.
- Hardesty, J.L., R.A. Moranz, S.P. Woodward, and V.S. Compton. 1999. The Gulf Coastal Plain Ecosystem Partnership: An assessment of conservation opportunities. The Nature Conservancy, Gainesville, FL.
- Hawkins, R. and S. Kastro. 1999. Job quality and economic distress of west Florida, [online] four-page article. Available URL: <http://www.haas.uwf.edu/indicators/income.htm>.
- Jelks, H.L. and S.K. Alam. 1998. Recovery plan for Okaloosa darter, *Etheostoma okaloosae*. U.S. Fish and Wildlife Service. Atlanta, GA.
- Kindell, C.E., B.J. Herring, C. Nordman, J. Jensen, A.R. Schotz, L.G. Chafin. 1997. Natural community survey of Eglin Air Force Base, 1993-1996: Final report. Florida Natural Areas Inventory, Tallahassee, FL.
- Land Acquisition Advisory Council (LAAC) and Florida Natural Areas Inventory (FNAI). August 1992. Project Assessment: Yellow River Ravines Conservation and Recreation Lands Project, Pensacola, FL
- Low, G. 1998. Landscape-scale, community-based conservation. The Nature Conservancy, Arlington, VA.
- Marois, K.C. 1998. Plants and lichens, vertebrates, invertebrates and natural communities tracked by Florida Natural Areas Inventory. Florida Natural Areas Inventory, Tallahassee, FL.
- Master, L.L., S.R. Flack, and B.A. Stein, eds. 1998. Rivers of life: critical watersheds for protecting freshwater biodiversity. The Nature Conservancy. Arlington, VA.
- Moler, P.E. 1992. Rare and endangered biota of Florida. University Press of Florida, Gainesville, FL.
- Moranz, R.A., and J.L. Hardesty. 1998. Adaptive management of red-cockaded woodpeckers in northwest Florida: Progress and perspectives. The Nature Conservancy, Gainesville, FL.
- Natural Resources Management Jackson Guard. 1999. Integrated Natural Resources Transitional Plan. Eglin Air Force Base, FL.
- Noss, R.F. 1990. Indicators for monitoring biological diversity: a hierarchical approach. *Conservation Biology* 4:355-364.
- Obersholster, Chris. The Nature Conservancy, Birmingham, AL. Personal communication.
- Peterson, G., J. L. Hardesty and D. Gordon. 1998. Development of a spatial forest dynamics-fire model for a sandhill matrix ecosystem in northwest Florida (Eglin Air Force Base). The Nature Conservancy, Gainesville, FL.
- Poiani, K.A., B.D. Richter, M.G. Anderson and H.E. Richter. 2000. Biodiversity conservation at multiple scales. *Bioscience* 50:133-146.

- Printiss, D.J. and D.L. Hipes. 1999. Rare amphibian and reptile survey of Eglin Air Force Base, Florida, Final Report. Florida Natural Areas Inventory, Tallahassee, FL.
- Santa Rosa County Community Planning. 1998. Comparison table: existing and current land use by land use category and percentage of change. Zoning and Development Division, Santa Rosa County Community Planning. Milton, FL.
- Sheehan, James. Tall Timbers Research Station, Tallahassee, FL. Personal communication.
- The Nature Conservancy and Association for Biodiversity Information. 2000. Precious Heritage, the status of biodiversity in the United States. Oxford Press. New York, NY.
- The Nature Conservancy. 1997. Designing a Geography of Hope: Guidelines for Ecoregion-based Conservation in The Nature Conservancy. Arlington, VA.
- The Nature Conservancy. 1998a. Landscape-scale, Community-based Conservation: A Practitioner's Handbook. Arlington, VA.
- The Nature Conservancy. 1998b. Rivers of Life: Critical Watersheds for Protecting Freshwater Biodiversity. Arlington, VA.
- The Nature Conservancy. 1998c. An Approach for Conserving Biodiversity at Portfolio Sites: Site Conservation Planning. Arlington, VA.
- Thorpe, P., R. Barel, P. Ryan, K. Albertson, T. Pratt and D. Cairns. 1997. The Pensacola bay system surface water improvement and management plan. Northwest Florida Water Management District. Tallahassee, FL.
- U.S. Bureau of the Census. 1997. USA Counties, [CD-ROM]. Available: U.S. Bureau of the Census, Washington, DC.
- U.S. Bureau of the Census. 1998. Estimates of the population of counties. Population Estimates Program, Washington, DC.
- Wolfe, S.H., J.A. Reidenauer and D.B. Means. 1998. An ecological characterization of the Florida panhandle. U.S. Department of the Interior, Washington, DC
- Vissage, John S. 1991. Forest statistics for Alabama counties-1990. U.S. Dept. of Agriculture, Forest Service, Southern Forest Experimental Station. New Orleans, LA.

APPENDIX

- A. A Guide to Understanding and Protecting the Blackwater River Watershed
- B. Adaptive Management of Red-Cockaded Woodpeckers in Northwest Florida: Progress and Perspectives
- C. Development of a Spatial Forest Dynamics-Fire Model for a Sandhill Matrix Ecosystem In Northwest Florida (Eglin Air Force Base)
- D. Longleaf Pine Ecosystem Restoration in Northwest Florida Sandhills: Issues and Recommendations
- E. Steering Committee Manual # 1.
 - Groundcover Restoration
 - Exotics
 - Longleaf Pine Genetics
 - Endangered Species
 - Prescribed Burning
 - Game Species
 - Aquatics, Wetlands
 - General
- F. Steering Committee Manual # 2.
 - Isolated Wetlands
 - Citronelle Ponds
 - Amphibians
 - Flatwoods Salamander
 - Other Amphibians
 - Blackwater River
 - Aquatic Insects
 - General
- G. Steering Committee Manual # 3.
 - Aquatic Woody Debris
 - Flatwoods Salamander
 - Public Education
 - Longleaf Alliance
 - Herbicides
- H. Steering Committee Manual # 4.
 - Conservation Planning
 - Gulf Sturgeon
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 - News Articles