SECTION 2
METHODOLOGY

2.1 SURVEY METHODOLOGY

The USFWS has established procedures for determining presence/absence of GCWA and BCVI (USFWS 2002). These protocols formed the basis for the survey methods used at CSSA, and are included in Attachment A.

2.1.1 Permit Requirements

Survey personnel were either individual USFWS Endangered Species Permit holders or listed on existing GCWA or BCVI permits. TPWD also has permitting requirements. Although TPWD often defers to USFWS, appropriate permit verification and coordination activities with TPWD were conducted prior to the survey season. Permits are required by USFWS and TPWD if disturbance of listed species occur. Such disturbances include flushing of birds from territories to determine territory size, approaching nests for egg or fledgling counts, or taped playbacks of BCVI, GCWA, or raptor calls to initiate an audible alarm call. None of these activities occurred during the survey.

2.1.2 Survey Season Schedule

Seven visits were conducted at the installation. The first visit involved habitat analysis GCWA surveys. Table 2.1 shows the calendar for the 2005 survey season.

Table 2.1 Schedule for the 2005 GCWA and BCVI Survey Season

Site Visit Number	Date	Purpose
1	March 28, 2005	GCWA survey, Habitat Analysis
2	April 4, 2005	GCWA survey
3	April 11, 2005	GCWA, BCVI survey
4	May 2, 2005	GCWA, BCVI survey
5	May 9, 2005	GCWA, BCVI survey
6	May 23, 2005	BCVI survey
7	June 6, 2005	BCVI survey

2.1.3 Potential and Core Habitat Determination

Determinations of potential habitat were based on previous habitat mapping (Stewardship Services 1993), recently acquired aerial photography (Parsons 2002), sighting location information of GCWA and BCVI on Camp Bullis, and field observations.

Factors that indicated potential suitable habitat were:

- Vegetation characteristics, such as species type, vertical canopy structure and height, and succession state;
- Management activity;
- Degree of habitat continuity; and
- Topographic considerations, such as slope and aspect.

Core habitat was determined after the survey results were compiled. A buffer of 100 meters around each bird detection was mapped. Core habitat buffers expire after 3 years, but new detections of GCWA and BCVI on subsequent surveys will add to core habitat areas. The practice of mapping core habitat was borrowed from other Department of Defense (DoD) lands with GCWA and BCVI management programs, including Camp Bullis and Fort Hood Military Reservations.

2.1.4 Meandering Transect Establishment and Survey Duration

Meandering transects were walked in potential habitat areas, and were sufficient to meet the minimum 4 hours per 100-acre requirement. Transects were adjusted throughout the survey season to increase the likelihood of a BCVI or GCWA detection. Figure 2.1 is a map of survey transects. Survey time for each surveyor was set at a minimum of 4 hours per 100-acres of suitable habitat.

2.1.5 Survey Start and End Times

Surveys began approximately 30 minutes before sunrise, and terminated by 1:00 PM. Table 2.2 lists sunrise times and start times for each survey date.

Table 2.2 Sunrise and Survey Start Times and Maximum Survey Duration

Tentative Survey Date	Sunrise Time	Survey Start Time	Maximum Survey Duration (Hours)
March 28, 2005	0633	0600	7:00
April 4, 2005	0721	0700	6:00
April 11, 2005	0709	0630	6:30
May 2, 2005	0651	0630	6:30
May 9, 2005	0643	0615	6:45
May 23, 2005	0636	0600	7:00
June 6, 2005	0635	0600	7:00

2.1.6 Weather Condition Requirements

Weather conditions strongly influence songbird vocalizations and flight activity (Robbins 1981). Therefore, weather conditions were assessed prior to a survey day to maximize the likelihood of BCVI or GCWA detection. To maximize potential detections, surveys were conducted only if certain weather conditions were present. These weather conditions included:

- Less than a 25 percent chance of rain for the survey time period on a given survey day, based on weather forecasts; and
- Wind speeds under 12 miles per hour.

Regional weather patterns in Central Texas are highly variable in spring and summer months. Three survey days were cancelled and rescheduled with CSSA for another day. This decision was made by 5:00 am, and was based on forecast information from the National Weather Service and phone conversations with CSSA security personnel.

2.1.7 Field Data Recording

A field form was completed for each BCVI and GCWA detection. Field forms are included in Attachment B. At each detection of GCWA and BCVI, the following data were collected:

- Weather conditions (wind speed, temperature, precipitation, cloud cover);
- Habitat characterizations (vegetation, vertical habitat structure including species and canopy heights, slope, and aspect of the topography);
- Global positioning system (GPS) location of the observer, plus distance and bearing to the detection (UTM NAD83 Zone 14N coordinate system);
- Gender of the observed bird (if possible); and
- Behavioral characteristics pertaining to breeding status or defense of territory.

Additional data collected in the field included:

- Non-target bird observations to update the existing bird inventory for CSSA (Stewardship Services 1993). Each surveyor kept a running tally of observed birds without specific location data.
- Signs of predation factors. Because of documented parasitism of BCVI nests throughout Central Texas by brown-headed cowbirds (BHCO) (*Molothrus ater*), BHCO observations were recorded. Other signs of predation from known predators were also recorded, including feline and canine scat.
- At the end of each survey day field forms, digital photographs, and GPS data were collected by Parsons staff and all digital data was downloaded to the CSSA Environmental Server for storage and distribution.

2.2 EQUIPMENT LIST

The following items were carried by all survey personnel:

- Binoculars with high quality optics;
- Field notebook, pencil, write in the rain paper;
- Field forms;
- Digital camera;
- GPS unit;
- Compass; and
- Field safety kit composed of a first aid kit, list of emergency contact numbers, and cell phone.

2.3 VEGETATION MAPPING

Vegetation community types were mapped based on observations concurrent with field surveys, recent aerial photography, and a LiDAR (Light Distance and Ranging) dataset. In 2002 Parsons contracted photogrammetry and LiDAR flights for CSSA. Vegetation

community types noted in the field at various locations were compared to obvious vegetation community boundaries shown in the high resolution aerial photography. Ground resolution of the aerial photography was 6 inches. Field observations of canopy structure were compared to parameters derived from the LiDAR dataset. These parameters included canopy height, canopy closure, and slope.