

## **2001 Land Condition Trend Analysis Field Reports Introduction**

### **Angel Lombardi, LCTA Coordinator**

The Land Condition Trend Analysis (LCTA) program on Fort Lewis, Washington (FLW) collects ecological data from the training areas. The LCTA program is a part of the Directorate of Plans, Training, and Mobilization in Range Control's Integrated Training Area Management (ITAM) branch. Being in Range Control puts the ITAM program and LCTA in direct contact with the Army's process for planning and executing training, which means we can get our results and support straight to the trainers. This means that LCTA starts off inside current and planned training events so that ecological information can be incorporated into a training event's planning process. It also allows the training community to keep abreast of environmental regulations that could impact their mission. Housing LCTA in Range Control is a mutually beneficial relationship.

LCTA collects vegetation, bird, and butterfly data to monitor species richness and diversity in relation to habitat type and/or land use activities. In addition, specific data for species or habitats of concern, as deemed by the State, is gathered since these may have significant ramifications on training. All of the LCTA data is disseminated via yearly reports, "specific need" reports, memorandums, and other installation mandated reports; for example, an Integrated Natural Resource Management plan and an Environmental Impact Statement.

In order to fulfill the LCTA mission of monitoring land use trends, a majority of the data collection is done within high use training areas. Most of the LCTA vegetation plots are within the prairie habitat but there are also plots in forest and riparian habitats.

The LCTA field season is from April through December. Eight of the nine months, the field technicians are collecting data in the field. The ninth month is spent writing project reports, which include field observations, mission impacts, data analysis, and management considerations/courses of action. In addition to these reports, the LCTA field crew presented a 10-minute Power Point Presentation about the findings of each report to an audience of natural resource and military personnel on Fort Lewis. The LCTA Coordinator is a full-time contract position, to facilitate the projects, complete data analysis and production of maps, coordinate exchange of information with other organizations, and prepare presentations for conferences.

The collected ecological data is used as the quantitative evidence for supporting the development of land use recommendations. LCTA combines the data with professional expertise to make recommendations for preventing irreversible damage. LCTA data also provides a good understanding of what is changing over time.

The LCTA program completes its task with professionalism, foresight, and planning. LCTA is not just about collecting data, it is about understanding what is changing in the military and what is changing in the field of conservation in this bioregion, in order to predict and prevent a train wreck between the military mission and the State or Federal environmental requirements.

The LCTA program also supports other organizations on FLW by coordinating efforts on data collection needs. For example, the LCTA crew collects water *Howellia* data for Public Works Fish & Wildlife instead of developing a new contract. It is more cost effective to transfer funds to the LCTA crew since they are familiar with the Installation, are knowledgeable of the data collection methods, and are acquainted with the floristic make-up of FLW. The FLW LCTA crew and coordinator also spent a week at the Yakima Training Center (YTC) in June completing a land condition mapping (LCM) project for

knapweed in a critical habitat area. YTC is planning on replicating the LCM methods with their own field crew in 2002.

The LCTA Coordinator advises on many habitat management groups off of FLW; for example, the Scatter Creek Watershed Habitat Conservation Plan group and The Nature Conservancy Prairie/Oak woodland Conservation Plan group. The participation in these groups allows for the exchange of information, cohesion in regional management plans, collaboration on research projects, and building rapport with outside agencies.

As the result of many years of hard work within the LCTA and ITAM program, the LCTA Coordinator was chosen by FORSCOM to represent the national LCTA program in a State Department Mobile Training Team (MTT) mission to the Republic of South Africa (RSA). The MTT mission was to present information and ideas on establishing an integrated management program for their training ranges and land. The LCTA Coordinator collaborated in the development of a 2-hour training on establishing and executing a LCTA program on military installations in RSA. The training was given to over 100 students, in Pretoria and then in Bloemfontein.

Recently, the overall Army LCTA program was questioned as to its value-added in supporting the training mission. So a DA-level LCTA Ad Hoc group was developed to review what the program is doing on all of the installations and then propose mechanisms to better support the LCTA programs. The FLW LCTA program is one of the primary examples of how to successfully disseminate ecological information, how to integrate the information into the training mission, and how to collaborate with the other components of the ITAM program and Range Control. So the Fort Lewis LCTA Coordinator is participating on this Ad Hoc group with support and recommendations from the Range Officer and the ITAM and LRAM Coordinators.

Enclosed are the 2001 field season reports. The field crew writes these reports with data analysis and map production completed by the Coordinator. The field crew is the eyes and ears of the program and is a critical component in making the LCTA program as successful as it has become.

If you have any questions or comments, please contact the LCTA Coordinator at 253-967-1550 or [Lombardi@lewis.army.mil](mailto:Lombardi@lewis.army.mil).



## **Acknowledgments**

The LCTA program would like to thank the following people for their comments and support of the work completed during the 2001 field season. Apologizes to anyone who may have been accidentally left off this list.

Scott Ballentine	Northwest Adventure Center
Perry Beale	Thurston County Noxious Weed Control
Julie Brown	PW-GIS
Ken Cadwell	ENRD – Fish & Wildlife
Dave Cleland	Engineering & Environment, Inc.
Dave Clouse	ENRD – Forestry
Roy Corn	PW – Noxious Weeds
Pat Dunn	The Nature Conservancy
Jeff Foster	ENRD-Forestry Branch
Inger Gruhn	ITAM Coordinator
Teresa Hansen	PW-GIS
Dave Jones	CSU/CEMML
Roslyn Knox	Range Control Scheduling
Virginia Lanoue	Range Control Systems Administrator
Del Larson	Range Control Scheduling
Gary McClausland	PW - Forestry
Col. Shanney	DPTMS
Bill Sprouse	CSU/CEMML
Ann Potter	Washington State Fish and Wildlife
Carl Ramsey	Range Control Facilities Manager
Lisa Randolph	LRAM Coordinator
SFC Richter	Range Control Safety Officer
Don Rolfs	Butterfly enthusiast
Debbie Warfield	Environmental Restoration Company
John Weller	Range Officer
Walt Wilson	Deputy DPTMS

# Land Condition Trend Analysis 2001 WORKPLAN

Prepared by Angela Lombardi, LCTA Coordinator

The overall goal for the 2001 season is to monitor the Fort Lewis special use plots and areas of ecological importance. LCTA will also strive to fulfill the LCTA II requirement of providing current and predictive resource information that assists in training activities. At the end of the season a field report for each priority will be widely disseminated and the LCTA field crew will present a 10-minute synopsis of each priority to interested Fort Lewis personnel.

## **Priority #1 Vegetation Surveys**

**Est. Priority Cost \$40,000.00**

The following areas will be surveyed during the 2001 field season. The established LCTA methods will be used with the addition of quantitative military disturbance measurements. All the data collected from the surveys will be added to the LCTA relational database for analysis. (161 total plots)

- ∞ **13<sup>th</sup> Division Special Use Plots** All 13<sup>th</sup> Division special use plots will be monitored. (34 plots)
- ∞ **Johnson Prairie Special Use Plots** All Johnson special use plots will be monitored. (17 plots)
- ∞ **Upper Weir Special Use Plots** All Upper Weir special use plots will be monitored. (39 plots)
- ∞ **Lower Weir Special Use Plots** All Lower Weir special use plots will be monitored. (28 plots)
- ∞ **Training Area 6 and 18 Plots** All TA 6 and TA18 special use plots will be monitored. (29 plots)
- ∞ **Range 51 Plots** All Range 51 special use plots will be monitored. (3 plots)
- ∞ **Range 79 Plot** All Range 79 special use plots will be monitored. (1 plot)
- ∞ **Mortar Point 10** In continuation with the restoration project that was started in 1996, the ten special use plots will be monitored. The information from these plots will contribute to a better understanding of intensive restoration projects. (10 plots) time dependent

## **Priority #2 Bird Surveys**

**Est. Priority Cost \$5,000.00**

Point count and line transect bird surveys will be conducted during the 2001-breeding season. A total of 65 point count bird plots are located in mixed forest and oak woodland habitats will be monitored. In addition, the original prairie habitat line transect bird plots, that were established when LCTA began on Fort Lewis, will be monitored. To supplement the prairie bird plots, a number of plots will be established on the RTA prairies, Marion, and TA 6 to give a more representative sample of birds breeding on the prairies.

## **Priority #3 Water howellia Study plots**

**Est. Priority Cost \$8,000.00**

Monitor the 18 ponds that have populations of Water howellia using the monitoring plan produced by the WSNHP. Monitoring includes vegetation surveys, GPS data, maintaining plot markers, plot photos, and a report. A photo monitoring method will be established to better assist with monitoring the invasive reed canarygrass species.

\*This monitoring is done with the support of Fort Lewis Fish & Wildlife.

## **Priority #4 Tracked Vehicle Impacts Study**

**Est. Priority Cost \$9,500.00**

Continue surveying the dry treatment plots. Data collection includes vegetation surveys, soil measurements, and photos.

## **Priority #5 Land Condition Mapping**

**Est. Priority Cost \$33,000.00  
for YTC \$4,000.00**

The land condition mapping will an undated map for the no dig sites, the hot spots for LRAM, the high activity areas for training, and the potential seed source sites for the prairie. During the 2001 field season, Upper Weir, 13<sup>th</sup> Division, TA 7S, and Marion prairies will be mapped.

**Priority #6 Butterfly Surveys**

**Est. Priority Cost \$6,000.00**

Continue monitoring butterfly species on the existing two transects in El Guettar and east Training Area 15. Survey known population of the Mardon Skipper (*Polites mardona*) within the southern part of the Artillery Impact Area. Begin general observation surveys of other prairies to determine if they would be appropriate for surveys. LCTA will coordinate with the State and Fort Lewis Fish and Wildlife so that efforts are not duplicated.

\*This monitoring is done with the support of Fort Lewis Fish & Wildlife.

**Priority #7 Aster curtus Demographics Study**

**Est. Priority Cost \$8,000.00**

Monitor the existing *Aster curtus* research plots in TA18, 21, and 22.

**Priority #8 Trainer's Report**

**Est. Priority Cost \$N/A**

Collect data for a report that will detail training area statistics such as forest density, trafficability, percentage of concealment area, percentage of disturbance, and rehabilitation prioritization ranking. Beginning in training areas 5 and 6, random plots will be established every 1.5 acres and slope, disturbance, ground cover, canopy percentage, tree density, vegetation structure, accessibility, and erosion inputs data will be collected. Since this is the first year for this project, only two training areas will be surveyed so that methods can be refined.

As the LCTA crew is fulfilling their primary priorities, they will also complete the following tasks:

**Task #1 Spot Reports**

**Est. Priority Cost \$N/A**

The Range Control Spot Report form will be completely filled out and given to the appropriate Range Control personnel as needed.

**Task #2 Noxious Weeds Monitoring**

**Est. Priority Cost \$2,000.00**

Continue to monitor the known noxious weed populations within the training areas and along the section of the Nisqually River that flows through Fort Lewis's boundaries. A GPS point or UTM coordinate and plant density measurement will be assigned to each location. The report of findings will be disseminated to Fort Lewis' noxious weed coordinator and the Pierce and Thurston Counties noxious weed board. No new surveys will be performed this season

**Task #3 Threatened, Endangered, or Sensitive Flora Species of Washington State**

**Est. Priority Cost \$N/A**

Continue monitoring the known populations of *Trillium parviflorum*, *Carex comosa*, *Carex interrupta*, *Pityopus californica*, and *Aster curtus*. No new surveys will be performed this season.

### List of Acronyms

AIA	Artillery Impact Area
BA	Biological Assessment
BMP	Best Management Practice
CEMML	Center for Ecological Management of Military Lands
CG	Commanding General
CSU	Colorado State University
DA	Department of Army
DCSOPS	Deputy Chief of Staff for Operations and Plans
DOC	Directorate of Contracting
DPTMS	Directorate of Plans, Training, Mobilization, and Security
E&E	Engineering and Environment, Inc.
EA	Environmental Awareness
EIS	Environmental Impact Statement
ENRD	Environmental and Natural Resources Division
ERC	Environmental Restoration Company
F&W	Fish and Wildlife
FLMR	Fort Lewis Military Reservation
FLW	Fort Lewis Washington
FORSCOM	Forces Command
FP	Firing Point
FY	Fiscal Year
GC	Garrison Commander
GIS	Geographic Information Systems
GSA	General Supply Administration
HMCC	Hazardous Material Control Center
ITAM	Integrated Training Area Management
IWAM	Installation Workplan Analysis Module
LAV/IAV	Light or Interim Armored Vehicle
LCTA	Land Condition Trend Analysis
LRAM	Land Rehabilitation and Maintenance
MFR	Memorandum for Record
MOA	Memorandum of Agreement
MP	Mortar Point
OP	Observation Point
PW	Public Works
RFMSS	Range Facilities Management Support System
ROD	Record of Decision
ROTC	Reserve Officer Training Corps
SOW	Scope of Work
TA	Training Area
TNC	The Nature Conservancy
TO	Task Order
TRI	Training Requirements Integration
UAV	Unoccupied Aerial Vehicle
USAEC	U.S. Army Environmental Center
UTM	Universal Transverse Mercator
WPS	Work Plan Submission
YTC	Yakima Training Center

**Field Report for  
LCTA Plot Inventory  
on Ft. Lewis, WA.  
2001  
Erika Ressa**

**ABSTRACT:**

The Integrated Training Area Management (ITAM) program was implemented on Fort Lewis, Washington (FLW) in 1992. The Land Conditions Trend Analysis (LCTA) component of ITAM provides FLW land managers with sound data regarding floristic trends and can be used in evaluating long term holding capacity of training lands. The LCTA program was specifically designed to monitor the status of natural resources and the changes in response to land use over time.

There are two types of vegetation plots inventoried on FLW installation: special use (prairie) plots and core (forest) plots. Special use plots are monitored annually on prairie habitats as they are highly used areas for tracked and wheeled vehicle training maneuvers. In the 2001 field season 142 special use plots were surveyed on 13th Division, Marion, Training Area (TA) 6, TA 15, Johnson, Lower, Upper and South Weir prairies.

The data is showing a significant shift in species composition, specifically between 1996-97, in all prairies surveyed on FLW. The apparent shift shows an overall increase in non-native plants. The invasion of introduced exotic plant species is an ever increasing problem on all prairie training areas of FLW. It is in the Army's best interest to keep all training lands environmentally viable in order to ensure future training, indefinitely (DOA, 1995).

**Bird Survey Report**  
**Fort Lewis, WA**  
**2001 Field Report**

**Written by Mary Chramiec**

**Abstract**

The Land Condition Trend Analysis Program has conducted breeding bird surveys of songbird populations on Fort Lewis, Washington (FLW) over the last five years to determine the effects of military training on the environment; and to track diversity and richness of these populations among different habitat types. Songbirds are used to indicate environmental health due to their specific habitat requirements and because they are easily observed. Sixty-five study plots in Douglas-fir forests and oak woodland habitats are surveyed twice each spring using the Point Count Technique (PCT). Within each of these habitats, types of disturbances have been identified. Plots found in the same habitat and with similar disturbance histories are grouped together and analyzed as a sample set. This year it was determined that there are too many variables when factoring disturbance to confidently assess the impacts of land use disturbances on avian populations. However, bird surveys do provide quantitative information on the fluctuation of bird richness, diversity, and overall numbers of breeding pairs from year to year; therefore, trends can be assessed and changes detected. Overall, our results show that bird populations have remained stable on FLW, with no major declines. Major changes in bird populations can be used as red flag to land managers of degrading changing habitat, at which time further investigation would be necessary.

**Status Report For Water Howellia (*Howellia aquatilis*)**

**On Fort Lewis, Washington.**

**December 2001**

**Rod Gilbert**

**Abstract**

Water Howellia, or Howellia (*Howellia aquatilis*) is a rare regionally endemic annual aquatic forb of ephemeral wetlands, that was federally listed as threatened under the Endangered Species Act 1973 (ESA) in July 1994. It is known from only seven disjunct Northwest locations. Howellia was first found on Fort Lewis, Washington (FLW) in the spring of 1994, and is currently known to occur in 18 wetlands on Fort Lewis. Under Section 7 of the ESA, taxa listed as federally threatened and found to occur on federally owned property require an Endangered Species Management Plan (ESMP) to be developed to maintain the integrity of the population. In accordance with this provision, the Washington Natural Heritage Program (WNHP) in conjunction with the U.S. Fish and Wildlife Department (USFW), developed a monitoring plan in accordance with National Environmental Policy Act (NEPA) guidelines. WNHP personnel implemented this in 1998, and Land Condition Trend Analysis (LCTA) personnel have completed annual surveys since.

**The Effects of the M1A1 Abrams Tank  
On Vegetation and Soil Characteristics of a Grassland Ecosystem  
At Fort Lewis, Washington**

**2001 Field Report**

**Lenny R. Wolford**

**Abstract**

In 1998 a five-year study was implemented at Fort Lewis, Washington (FLW) to examine the effects of the M1A1 Abrams tank on the soil and vegetation of the South Puget Sound (SPS) prairies. These prairies, a unique mosaic of fescue dominated grasslands and oak savannas, have been in steady decline due to land conversion and fire suppression. Only 3 percent of historical grassland cover is currently considered high quality, dominated by native prairie species. The study was designed by the Center for the Ecological Management of Military Lands (CEMML) at Colorado State University and surveys were conducted by the Land Condition Trend Analysis (LCTA) field crew. There has been increasing concern over the damaging impacts of tactical vehicle maneuvering on grassland ecosystems. U.S. Army Regulation 200-1 states that it is Fort Lewis' policy to plan and execute Army requirements that will minimize adverse effects on the environment without impairing the military mission. This includes assessing the environmental impacts of all activities and including provisions to minimize these impacts. Controlled tests were conducted at five study plots near Mortar Point 1 in the Artillery Impact Area. Vegetative cover and soil compaction data was collected before and after tracking intensities of one, two, four and eight straight line passes of the M1A1 Abrams tank. This is the third year of successful data collection. Preliminary analysis of data by CEMML indicate several detrimental effects are occurring on the study site one year post treatments including: compaction of soil; decrease in native grass cover; increase in introduced grass and forb cover and the removal of micro-biotic crusts. Analysis of data from the 2000 and 2001 field season will be completed in 2002.

# Land Condition Mapping Report

Fort Lewis, WA 2001

Rod Gilbert

## Abstract

Land Condition Mapping (LCM) is a simple, repeatable methodology developed in 1997 by the Land Condition Trend Analysis (LCTA) crew to subjectively assess the overall quality of Fort Lewis' (FLW) prairies. Prairie quality assumptions are based on native graminoid cover. Graminoids are grass-like plants and include grasses, sedges and rushes. Each prairie is surveyed by overlaying a grid system divided into 25m<sup>2</sup> quadrats. Using Global Positioning Satellite (GPS) coordinates, flags are placed at every 50m interval as survey grid markers. Each 25m<sup>2</sup> quadrat is assessed for native graminoid cover, Scot's broom cover and height, and for obvious signs of military and civilian disturbance. In addition, a simple presence or absence is recorded for: two rare endemic prairie plants, white-topped aster and Puget balsamroot (*Aster curtus* and *Balsamorhiza deltoidea*); sickle-keeled lupine (*Lupinus albicaulis*), which is an important nectaring plant for the rare Puget blue butterfly; and Garry oak and Ponderosa pine. Data are entered into an Excel database, and then transferred to Geographic Information System (GIS) format. A series of GIS generated prairie maps are produced to assist military planners prepare for training exercises, and land use managers for Scot's broom control and restoration efforts. During the 2001 field season, all of Upper Weir, South Weir, Lower Weir, Marion and Training Area (TA) 7S Prairies were surveyed, including a small section of Mortar Point 3. In addition, the crew spent one week at the Yakima Training Center and adapted these methods to survey for a noxious weed (diffuse knapweed) in high quality shrub-steppe habitat.

## **Report of Butterfly Survey's**

**Ft. Lewis, WA. 2001**

**by Erika Ressa**

### **Abstract:**

A regional effort was made between the Washington Department of Natural Resources, Department of Fish and Wildlife, and the Nature Conservancy in order to gain a better understanding of butterflies found in the South Puget Sound prairies. There are five target species which are considered rare in the South Puget Sound prairies and on Fort Lewis, Washington (FLW): Mardon skipper, Whulge, or Taylor's, checkerspot, Valley silverspot, Great spangled fritillary, and the Puget blue. Two of these species are candidates for the Federal Endangered Species Act: Mardon skipper and the Whulge checkerspot. The Mardon skipper has been designated as a Washington State endangered species. If the status of these butterflies were to change and be upgraded to threatened or endangered, there might be considerable impacts to military training in prairies.

Butterfly surveys have been conducted on FLW since 1997 by the Land Condition Trend Analysis (LCTA) crew. Data collected through butterfly surveys provide quantitative information in regards to species diversity and abundance of populations on FLW. There are three survey sites on FLW, which include Johnson prairie, TA 15, and the Artillery Impact Area (AIA).

The largest threat to butterfly populations are changes in the vegetation structure and composition of prairie habitats due to agricultural conversion, urbanization, and invasion of Scot's broom and Douglas fir into the prairie habitat.

# **White-topped aster (*Aster curtus*)**

## **Demographic Survey**

### **2001 Field Report**

**Lenny R. Wolford**

#### **Abstract**

White-topped aster (*Aster curtus*) is a perennial forb associated with the glacial outwash prairies of the Pacific Northwest. The Washington Natural Heritage Program lists white-topped aster as ‘sensitive’ and it is considered a species of concern. Habitat loss, due mainly to land conversion and fire suppression, are considered the primary reason for the species decline. The majority of known populations exist on Fort Lewis, Washington (FLW) prairies. To aid FLW land managers a five-year study was designed by the University of Washington Zoology Department and The Nature Conservancy, to determine population demographics of white-topped aster. Data was collected on twenty study sites representing four prairies: Marion (TA18), Johnson (TA22) and Upper and Lower Weir (TA21). Plots chosen had a wide range of disturbance histories and plant community structures. Data is applied to a statistical test that calculates the probability of a future change, if conditions were to stay the same, in white-topped aster populations. After five years of data collection the matrix application predicts that white-topped aster populations appear to be shrinking by 48.5 percent annually. However, field observations do not support this finding and predict a much more stable population exists.