

Colorado State Forest Service Insect and Disease Quarterly Report May 2010 Volume 2, Issue 2



Inside this Issue:

- Feature: Aerial Detection Survey Program 1
- Meet *Pheidole stephensi*, aka "Ant Sky" 1
- Statewide Forest Resource Assessment 2
- Spotlight: Tiger Moth 3
- Things to Watch For 4
- Events and Announcements 4

Aerial Detection Survey Program

As summer approaches, the Colorado State Forest Service will begin participating in the 2010 aerial detection survey program in cooperation with the USFS. The aerial detection survey (ADS) program is one of the tools forest managers use to assess, monitor and track changes in forest conditions on a landscape level.

History

ADS programs have been used since the 1920s and were formally established as part of the 1947 Federal Forest Pest Control Act, which authorized surveys and reporting on forest insect and disease conditions. This long history of ADS has provided invaluable insight into impacts of insects and diseases on forests in the U.S. We can use historical survey data to better understand changes in forest health and see patterns of pest emergences.

Operations

ADS is conducted from small fixed-wing aircraft that are capable of making low-level flights over the landscape. Aerial observers can

cover large areas in a short period of time at an average cost of less than a penny per acre. Flights can cover around 200,000 acres per day, much of which may be otherwise inaccessible. ADS flights are typically flown as grid flights over large areas of relatively level terrain or contour flights over more mountainous terrain.



Fixed-wing aircraft.



Example contour flight map.

Observers

ADS observers visually assess the forested areas flown to map insect and disease activity. Recently, digital sketch mapping systems have replaced traditional paper maps. Digital sketch mapping

and GPS systems are advancing ADS and help make the ADS data transferable to users in more formats including: printed maps, GIS shapefiles and tabular summaries.

ADS observers undergo considerable training on the ground and in the air and need a specific skill set to be qualified observers. Observers receive extensive flight operations and safety training. They also need to be able to recognize tree species and insect and disease signatures, so observers must also have normal color vision. Each tree species, insect and disease impact has a unique aerial signature.

(continued page 3)

Meet *Pheidole stephensi*, aka "Ant Sky"

CSFS Forest Entomologist Sky Stephens recently had a species of African ant named after her, following research she had conducted in Ghana, West Africa.

In 2004, Sky Stephens started her doctoral research in West Africa. One component of her work involved using ants as indicators of land use, forest type and as general measures of biodiversity. Sky had worked with ants during her mas-

ter's program in Arizona, so was familiar with ant taxonomy (she's also a self-professed "ant geek").

She soon learned that the diversity of ants she was collecting in Africa was at least tenfold greater than the diversity of ants in Arizona, with more morphospecies and genera than she had previously been exposed to. While collecting the few and generally very old taxonomic works on African ants,

Sky came across the work of Dr. Brian Taylor, who was working on a compilation of ant taxonomy keys for Africa. Sky corresponded with him and was able to obtain early versions of the key. Sky and Dr. Taylor kept in touch through her doctoral program, and she often sent him specimens or digital photos of ants.

(continued page 2)





Statewide Forest Resource Assessment

The 2010 Colorado Statewide Forest Resource Assessment is now available on the CSFS website. The assessment is the first geospatial assessment ever completed by the Colorado State Forest Service. This report contains the complete set of data used to generate the assessment, as well as the process followed and a list of the people engaged.

The objective of the assessment is to provide a spatial overview of Colorado's forests and display areas in the state where resources would be best focused to achieve desired future conditions.

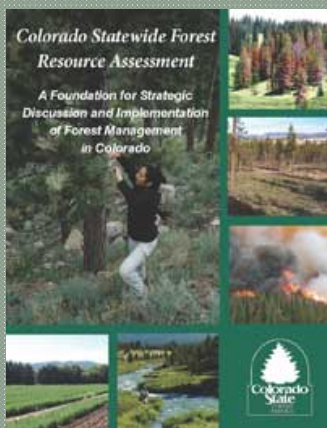
The report includes:

- Overview of Colorado's Forests
- Opportunities for Positive Management Action
- Priority Landscapes
- Outreach Presentations & Workshops
- Data Methods and Sources
- Data Gaps
- Spatial Analysis Project
- Forest Legacy Program Lands
- Assessment of Need

- Forest Industry Profile
- Departure from Modeled Historical Conditions
- Urban Influence Areas in Colorado
- Wildlife Action Plan

View the full report at:

<http://csfs.colostate.edu/pages/wide-forest-assessment.html>



The Statewide Forest Resource Assessment.

Meet *Pheidole stephensi*, aka “Ant Sky”

(continued from page 1)

Once, she sent him a collection of particularly difficult ants to identify, and about eight months later, when Sky was returning to Arizona from Ghana, she spent 10 days working with Dr. Taylor at the Natural History Museum in Oxford. While there, she improved her ant taxonomy skills and looked at reference collections. She also enjoyed several local pubs in the company of, as the British like to say, “the charming Dr. Taylor” while talking ants.

Fast forward to February 2010, when Sky arrived at her desk and found an email regarding the recent naming of a number of new species of African ants. The message indicated that a number of the new species had been named in recognition of collectors. Sky looked at the list and under new species in 2010 was *Pheidole stephensi*. When she clicked on the link, there it was – an ant named in recognition of our very own Sky Stephens! To say that Sky was beaming would be a gross understatement. As she says, “I’m not

sure I’ve ever felt so ridiculously flattered.” As evidence of her excitement, Sky did the happy entomologist dance in her office.

The irony of this story is that the *Pheidole* genus is one of Sky’s least favorites. According to Sky, “they’re a great group of ants, but the taxonomy is a complete bear.”

Pheidole stephensi apparently doesn’t have any crazy spines or stylish hairs, so it might not be the most impressive ant on the block, but it does have a strong median tooth and “Appears to be completely unique in having the frontal carinae excavated so as to expose the base of the scape and the torus, also in having quite distinct antennal scrobes; the scape itself has a well developed basal expansion or flange; scapes and frontal carinae reaching three-quarter point of face; antennal scrobes while superficially quite distinct; alitrunk with transverse mesonotal welt; propodeum with sharp lateral margination and quite deeply longitudinally concave; with large distinctive propodeal

spiracle; postpetiole from above smoothly ovoid; with faint rugae on the anterior dorsum of the head; other sculpturation restricted to weak spiculation on the lateral mesonotum and propodeum; erect hairs relatively long, fine and moderately abundant. Colour yellow-brown, gaster darker.”

If you understood all that, then you speak ant geek too!



Pheidole stephensi, soldier or major form.



Some unique characteristics of *Pheidole stephensi* including scape insertion and hypostomal and median teeth.

Special thanks to Katherine Timm for writing this story.



Aerial Detection Survey Program

(continued from page 1)

Tree and Damage Signatures

Knowing where you are observing on the landscape (i.e., elevation, aspect, riparian zone) is key to recognizing tree signatures. Tree signatures are identified by color, crown shape/margin, branching pattern and foliage texture. Insect and disease signatures are identified by the host trees' responses including defoliation and foliage discoloration.

During flights, ADS observers sketch polygons on maps and code them for tree species and insect or

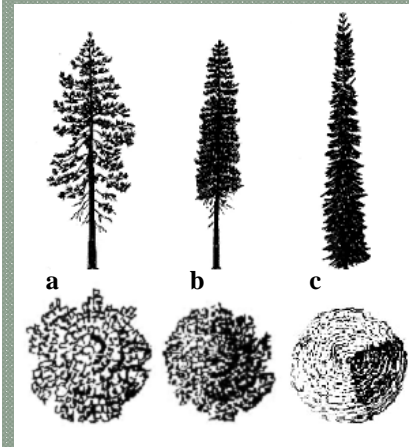
disease agent. Numerous areas are ground-truthed post flight to confirm diagnosis made during flight.

Uses for ADS Data

After ADS data is collected and compiled it becomes a very useful tool for land managers. ADS data can help develop future forest management activities, can be used in education and outreach programs and can illustrate landscape level impacts on forests by insects and diseases.

It is important to remember that ADS data are meant to give a broad landscape-level assessment of forest condition. ADS numbers are often misused as more specific. The numbers given in ADS data have at least a 10 percent error margin. ADS data are a powerful tool when used appropriately and when you understand the nature of the data presented.

Look up this summer and you might just see ADS in action!



Example tree shapes seen by aerial observers: a) ponderosa pine, b) lodgepole pine and c) subalpine fir.

Tiger Moth

Multiple species of tiger moths occur in the Western U.S. and several are common in the southern Rocky Mountains. Two species (*L. ingens* and *L. argentata*) have conspicuous silver spots on the adult moth and are sometimes called silver-spotted tiger moths. The caterpillars



Larva of *Lophocampa ingens*.

have longitudinal rows of orange and yellow with tufts on a black body with short stiff bristles, or setae, known to cause dermatitis in humans that handle the caterpillars.

Tiger moths reproduce once per year. Late instar caterpillars

disperse from the tent and become solitary feeders. In June, one can find these caterpillars on the ground preparing to pupate among branches, litter or along trunks. After emerging, the nocturnal adults are in flight from late July through mid-August, at which time they will mate and search for suitable host plants. The moths lay small, green eggs in loose clusters on host twigs and needles.

Emerging larvae feed in tents constructed in the foliage of piñon and ponderosa pine. Although larvae are present and feed overwinter, the tents usually go unobserved until spring. Feeding is typically confined to one or two branches. The larvae do not feed on the newly emerging buds so new growth can be seen later in the season. During outbreak years the damage can become quite extensive, and in some cases causes mortality in younger pine trees. Moth outbreaks tend to last two to three

years. While the specific factors contributing to outbreak events are unknown, tiger moth populations are generally controlled by cold winter temperatures, pathogens, and the presence of their natural parasitoid enemy: a Braconid wasp.

Recent studies have focused on the high mortality rates of piñons as a result of drought and beetle infestations. However, studies investigating the effects of tiger moth herbivory on piñon pine physiology, chemical defenses, and susceptibility to insect attack are lacking. Research focused on this system and its complex interacting mechanisms will aid in better management of affected pine forests and provide a more thorough understanding of this important ecosystem.

Special thanks to Amy Trowbridge, Univ. of Colorado at Boulder for her contributions.



Tent constructed by tiger moth larvae.



Things to watch for:

- Updated Fact Sheets on forest insects, diseases and products
 - ◇ Western Spruce Budworm
 - ◇ Spruce Beetle
 - ◇ Thousand Canker Disease
 - ◇ Emerald Ash Borer
 - ◇ Gypsy Moth
 - ◇ Products for Preventative Use Against MPB
- Gypsy Moth and Emerald Ash Borer Seasonal Technicians begin work
- USGS-CSFS-USFS Front Range MPB work begins
- Aerial Detection Survey flights begin

Upcoming events & announcements

May 2010

- 7 - Colorado Tree Coalition Board of Director's Meeting, Broomfield
- 8 - Estes Park Landowners Tree Symposium, Estes Park
- 11 - Mile High Chapter SAF Urban Forestry Field Tour, Denver
- 12 - Northern Colorado Pest Group Meeting, Fort Collins
- 12 - Emerging Pest Issues in Colorado meeting, Fort Collins
- 19 - CAPS Program begins, Statewide
- 20 - Front Range Urban Forestry Council Denver

June 2010

- 14-18 - ADS Fly-in, Bozeman, MT
- 16 - Northern Colorado Pest Group Meeting, Fort Collins
- 23 - Thousand Cankers Disease Workshop, Denver Metro Area

July 2010

- 6 - Aerial detection survey season begins!
- 14 - Northern Colorado Pest Group Meeting, Fort Collins
- 15 - Front Range Urban Forestry Council, Littleton

Submissions for I&D Quarterly Report:

Do you have a FAQ?

Is there something you want to know more about?

Submit your event or announcement, ask a question or suggest an insect, disease or product for a feature to sky.stephens@colostate.edu.

Deadline for submission is July 15, 2010.

Colorado State Forest Service
Colorado State University
5060 Campus Delivery
Fort Collins, CO 80523

Phone: (970) 491-7282
Fax: (970) 491-7736

Email:
sky.stephens@colostate.edu

