A joint meeting of faculty and staff from the Department of Forestry and Wildland Resources and the Schatz Energy Lab met at the tree farm on June 13th to conduct a reconnaissance and to further discussions about joint research into biofuel utilization. Of particular interest was to acquaint new forestry and energy lab faculty and staff with the possibility of using the tree farm as a supply source for experimental work on gasification of woody fuels. The group examined a variety of vegetation types and concluded that it was possible to utilize hardwood and conifer wood in a gasifier. Concern was expressed about fuel moisture and cleanliness.

Some of the topics that could be investigated by the forestry faculty include research on silviculture, harvesting, economics, and environmental impacts of small wood utilization for biofuel production. The Schatz Energy Lab faculty and staff expressed interest in determining the feasibility of gasifying small woody fuel. They intend to purchase a gasifier and were interested in assessing the possibility of locating it at the tree farm. Two possible sites were identified: adjacent to the tree farm building in a new building yet to be constructed or in the powerhouse. It was felt that the powerhouse would have to be renovated if it were to house the gasifier.

Han-Sup Han indicated a strong interest in collaborating with the Schatz Energy Lab on biofuel production and extraction.
2007 Accomplishments

Continuing Research Projects:

1. Archiving: Edith Butler completed the archiving project begun in 2006. She developed a finding aid for all tree farm documents, maps, photographs, and videos.

2. Vegetation classification and mapping: Christine West completed her classification and map of the tree farm vegetation (see page 4) and she completed her thesis in December. It can be found on HSU library’s “Digital Scholar” (http://dscholar.humboldt.edu:8080/dspace/handle/2148/280). The title of her thesis is “A comparison of high spatial resolution images for fine scale vegetation mapping.”

New Projects:

1. Chris Edgar’s proposal, “Evaluation of forest biomass and carbon measurement protocols as applied to non-industrial private lands in the North Coast of California,” was jointly funded by the tree farm and by the McIntire-Stennis program. In 2007, graduate student Ryan Coltrin conducted measurements to estimate the live-tree carbon pool. Measurements to estimate the standing dead trees and down woody debris pools were initiated in 2007 and will be completed in early 2008. A literature search into methods for estimating carbon pools in Douglas-fir — hardwood stands was conducted.

2. Chris Edgar’s proposal to measure ingrowth and reestablish plot centers on the permanent plot inventory was funded. In 2007, graduate student Ryan Coltrin measured ingrowth on all of the permanent plots. The centers of the permanent plots were estimated and permanently marked with rebar and PVC pipe. All trees that had grown into merchantable size classes since the original inventory were measured. The ingrowth data will be combined with the data on accretion and mortality collected in 2006 to provide an overall assessment of growth on the Tree Farm.

3. Han-Sup Han’s proposal, “Integrated harvesting of small-diameter trees and forest biomass,” was funded by the McIntire-Stennis program and will, in part, be conducted on the tree farm. The field-based study will examine an alternative method to collect and transport woody biomass for energy production. In 2007, a hook-lifted truck equipped with “roll-off” containers was tested to carry woody biomass for a short distance (less than 10 miles) to a centralized processing site. “Roll-off” refers to a straight frame truck configuration in which modular containers are “rolled” onto and off of the straight frame truck by means of a truck-mounted hydraulic hook. The overall objective of this project was to quantify the operational performance and costs of removing slash piles using a hook-lift truck with roll-off containers in mountainous conditions in northern California.

4. Chris Edgar’s and Morgan Varner’s proposal, “Fuel measurements on permanent plots at the tree farm,” was funded. Chris Edgar and Morgan Varner worked with undergraduate student Steve Alton to design a long-term monitoring design for downed woody and litter fuels that is embedded within the permanent plot network at the tree farm. In 2007, Steve Alton and Ryan Coltrin sampled about 25% of the permanent plots.

Other Projects:

A new staff position was created to develop and manage a geographic Information system (GIS) for the tree farm. Jennifer Kauffman was hired on an intermittent basis. She developed a framework for a GIS as well as a document describing best practices and procedures for the GIS.

Over the summer Han-Sup Han drafted a tree farm safety plan, a tree farm appropriate use plan, and a request for proposals for a registered professional forester to write a non-industrial timber management plan for the tree farm.

The tree farm was recertified by the American Tree Farm System as a certified tree farm. John Stuart drafted the necessary application and supporting documents and a representative from the American Tree Farm System met with Gordon Schatz and conducted an evaluative site visit in October.

A 21’ x 25’ steel car port was erected near the tree farm building. It will be used to house the wood mizer, iron horse, quads, and trailers. The mower and fire pump will be housed in the tree farm building garage. The existing smaller car port will house the road mower and
Vegetation at the free farm was sampled using 274 systematically spaced surface plots. The field data were classified using cluster analysis and a map was made using the high resolution imagery shown on page 4. Field sampling was performed by Christine West and Jasper Peach and classification and mapping was done by Christine West.
A multispectral, 4-band airborne image with 0.15 m spatial resolution was acquired on June 22, 2006 to be used as a base layer in our GIS and to aid in classification of vegetation. The image was acquired from Hammon, Jensen, and Wallen and consisted of a color infrared and red, green, and blue panchromatic bands. Classification and GIS work was performed by Christine West under the supervision of Drs. Stuart, Fox, and Steinberg.
Summer Crew Activities for 2007

Steven Alton and Jonathan Dockweiler were hired for the 2007 summer maintenance crew. Projects worked on include:

- Construction of a rainwater catchment for emergency fire suppression
- GPS/Trimble data logging of features to be entered into GIS
- Improving visual safety of blind road corners
- Slashing of competing hardwood sprouts and brush in a 10-acre redwood plantation under a mature hardwood stand
- Assisting Ryan Coltrin in re-measuring permanent plots
- ATV logging with the forwarding arch, junior arch, and iron horse

Anticipated Projects for 2008

New projects that may be initiated in 2008 include:

1. Hiring a California Registered Professional Forester to create a Non-industrial Timber Management Plan,
2. Adopting and implementing the tree farm safety and appropriate use plans,
3. Implementing and enhancing the tree farm’s GIS (West),
4. Producing a large format photograph of the tree farm similar in scale to those photos that adorn the tree farm building’s walls. The photo will be printed on a plotter using the 2006 imagery (West),
5. Repairing or replacing the deteriorated entryway beams to the building (Pease and Schatz),
6. Continuing to collaborate with the Schatz Energy Lab on a biofuel project (Han and other interested faculty),
7. Establishing more GPS points for roads, culverts, buildings, project areas, and any other objects of interest (West and summer crew),
8. Installing a solar vent in the tree farm building garage (Pease and Schatz),
9. Proposing a research project on Sudden Oak Death and prescribed fire in tan-oak stands (Varner),
10. Proposing a research project and a demonstration of fuel reduction treatments at the tree farm (Varner and Han),
11. Developing a fire management plan for the tree farm (Varner),
12. Purchasing equipment for the wildland fire laboratory (Varner and Pease),
13. Making the fire pump operational (Pease, Varner, and Schatz),

Continuing research projects include:

- Tree farm history project (Guerra)
- Growth and yield (Edgar)
- Integrated harvesting of small-diameter biomass (Han)
- Forest biomass and carbon measurement protocols (Edgar)
The Tree Farm’s mission is to provide a demonstration tree farm operation for the benefit of the instructional and research needs of the students and faculty of Humboldt State University and as an example for owners of small timberland parcels. The Demonstration Tree Farm enables experimentation and research regarding the growing, harvesting, and replacement of trees on timberland. The Tree Farm aims to utilize as many square feet as practical for production of commercial wood crops. The Tree Farm serves as an outdoor classroom for educational purposes and also enables public educational assistance to landowners through publications, photos, lectures, symposia, and tours.