A Forester’s Journey Through the complex landscape of sustainable forest management—Lessons learned in Oregon

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World Forest Institute
Personal background

- Assistant Researcher
- Taiwan Forestry Research Institute (TFRI)
- Forest Dynamics Research
- Been in Oregon for 6 months
Outline

• Background on Taiwan forestry situation
• Personal research interest and reason for coming to Oregon
• Examples of disturbance in Oregon Forests
• Public forest management
• The importance of forestry education
• Conclusion
Taiwan

- **Location:** 120°E~122°E, 22°N~25°N
- **Area:** 36,193 sq km (13,974 sq ml)
  - 1/7 the size of Oregon
- **Population:** 23,252,392
  - 6 times more than the population of Oregon
  - Population Density: 2nd highest in the world
- **Capital:** Taipei
- **People:** Han majority with some aborigines
- **Language:** Mandarin/Taiwanese/Hakka
Physical environment

- Annual av. temp.: 75°F
- Annual av. humidity: 78-85%
- Annual av. rainfall: 2,500 mm
  - Portland: 915 mm/year

- 293 mountain peaks are higher than the altitude of 10,000 feet.

- Jade Mountain (14,000 feet) has the highest mountain peak in Northeast Asia.
Natural Disturbances Impacting Taiwan’s Forests

• Earthquakes
• Annual typhoons
• Landslides
Catastrophic disturbance: Numerous landslides triggered by 921 earthquake

Richter Scale: 7.3
Numerous landslides triggered by Typhoon Morakot on August 15, 2009. A six-day rainfall amount reaching 3,059.5 mm (120 inches). ("rain elephants and whales!")

On August 16, 2009, numerous landslides are observed.
Taiwan’s forest coverage area is 2,102,400 ha (5.2 million acre) 58.53% of the total island area.

High biodiversity

Endemic species 30%
Coastal Forest

Low altitude
100~1,500 m

Medium altitude
1500~2,500 m

High altitude
2,500~3,300 m
Trees

- Hardwood: 53.29%
- Conifer: 20.86%
- Conifer-hardwood mixed forest: 18.61%
- Bamboo: 7.24%
# History of Forestry in Taiwan

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[Diagram showing Venn diagram with overlapping circles labeled Social, Environment, Economy]
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**Has the Economic sector shrunk too much?**

**Timber self – sufficiency ratio only 0.22%**

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![Social](image1.png) ![Environment](image2.png) ![Economy](image3.png)
Logging ban problems

• After disturbance—usually typhoons—a lot of snags and weakened trees fall down, and are washed into water ways, clogging rivers and streams, and beaches.

• Some thinning of snags and weak trees would lessen such tree falls, but logging ban prohibits this.

• Clean up is expensive. 200,000USD

• Government sometimes allow the public to use the salvaged wood and woody debris.
Exporting deforestation

- By not using its own wood resources, Taiwan has to import almost all of its wood.

- Much of the wood being imported is hardwood, from SE Asia.

- We are just exporting deforestation, often to countries with less sustainable forest management.
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### Future

? How can Taiwan actively manage forests to better utilize its resources while also protecting it and allowing recreation?
What brought me to Oregon

• Objective: To observe how US public forests are managed and see what lessons can be applied to Taiwan national forest management.

• Research Inquiry: Given Taiwan has a lot of forest, can we better manage it to balance economic, social, environmental needs?
What brought me to Oregon

- Objective: To observe how US public forests are managed and see what lessons can be applied to Taiwan national forest management.
- Research Inquiry: Given Taiwan has a lot of forest, can we better manage it to balance economic, social, environmental needs?
- I was surprised to learn that there is not much harvesting on federal forests!
- i.e. you have the same problems we do
What brought me to Oregon

- What are other governments doing to manage and utilize their forests in a balanced way, especially after natural disturbance?
- What can US Federal Forest management teach us?
3 Examples of Disturbance in NW and How the government responded
Tillamook Burn

1933, 1939, 1945, 1951

Tillamook Reforestation
Environmental groups plan to sue over state forest logging

A coalition of environmental groups issued a 60-day notice of intent to sue the state of Oregon to prevent the planned increase in logging in several state forests, including Tillamook State Forest. The groups allege that increasing logging in the forest violates the U.S. Endangered Species Act's protection of the marbled murrelet, a small seabird. The lawsuit could have a huge impact on Tillamook County, which received 20 percent of its general operation funds from state forest timber harvests in the 2010-2011 budget year.

The lawsuit comes at a bad time for Tillamook County - the end of Secure Rural Schools program, which had helped make up for revenue lost as logging decreased in the county's federal forests.

"We have been hit hard by the loss of Secure Rural Schools revenue," said Tillamook County Commissioner Tim Josi. "Losing state timber revenue will mean severe reductions in the services our county government provides."

According to Josi, state forests make up 44 percent of timber land in the county and represented $2.8 million in revenue for county government last fiscal year.

Josh Laughlin, a campaign director with Cascadia Wildlands, one of three groups that filed the notice to sue, said increased logging in Tillamook, Elliot and Clatsop state forests would harm the marbled murrelet by

Structure-Based Management on NW Oregon State Forests

Structure-based management uses harvesting techniques to develop and maintain diverse forest stand structures that emulate natural conditions. It uses a forest’s actual components – trees of various sizes and types, snags, decaying logs and other vegetation – instead of simply a forest age to define habitat.

Stand Structure Types

**Regeneration (Goal 5-15%)**
Occupied primarily by tree seedlings or saplings, and herbs and shrubs. Trees can be conifers or hardwoods. Vigorous herb, shrub and/or grasses can cover up to 80% of land. Also snags, residual trees and down wood. Begins when disturbance – timber harvest, fire or wind – has killed or removed most or all larger trees.

**Closed Single Canopy (Goal: 10-20%)**
Trees fully occupy site and form a single, main canopy layer. Little or no understory vegetation. Later, as less competitive trees die, snags and down wood appear.

**Understory (Goal: 15-35%)**
Gaps in tree canopy of branches from one tree to another provide adequate light to reach ground to allow shade-tolerant diversified understory of shrubs and herbs.

**Layered (Goal: 20-30%)**
Tree canopy of two or more layers, with extensive layering of diverse shrubs and herbs in understory. Trees of 18-inch diameter and 100 feet tall, mixed with younger trees at least 30 feet tall.

**Older Forest Structure (Goal: 20-30%)**
Trees with desirable wildlife characteristics. A minimum of eight trees per acre with at least 32-inch diameters. Two or more canopy layers with shade-tolerant species. At least six snags per acre. Substantial down wood at various stages of decay. Diverse understory.
Mount St. Helens Post-eruption: Active vs. Passive forest

30 years

300 years
2003 B&B Complex Fires—mostly burned USFS land

USFS proposed salvage logging

Green groups opposed Ecological Sham
Lessons from Oregon

• Even after natural disturbances have left dead and damaged trees, salvage logging is often blocked

• Nature recovers eventually, without active replanting, but economic impact can be severe and should be considered
Lessons from Oregon

• Before coming to Oregon, I thought the solution should be science-focused
• Now I believe that in democracies such as Taiwan and US, the solution must be socially-driven, because the public must accept forest policy
• Therefore more public education about forest management is needed
The Importance of Forestry Education

- Environmental education starts in elementary school, but
- Forestry education is limited to conservation messages
- All young students know they must preserve trees and not cut them!
- Result is that the public understands very little about the benefits of active forest management
- By adulthood, everyone is very anti-harvest
Even at TFRI, the education programs focus on environmental conservation, not on forestry!

- 2001-2012 Volunteer Training in TFRI
  5 of 127 (3.9%) learning program about forestry.
- 2012-2013 Learning Program of 8 natural environmental education of Taiwan Forestry Bureau. (7.4%) learning program about forestry.
Only focus on biodiversity and preserve forest, very few on forest resources management
Forestry Education in Taiwan

Limited to the past logging history, not sustainable logging methods in the future
Forestry education in the USA
Sustainable use forest properties

Plant

Harvest
Examples of forestry education programs

YOUR OWN LITTLE FOREST
Wouldn’t it be fun if we all had 80 acres of forest property and we could make the decisions on what to do with it? We’ve designed a program for students of all ages that will send them on a fact-finding quest and get them asking important questions so they can make informed decisions. With the task of managing a fictional 80 acre forest property, students will determine a management plan and decide what the best scenario for this land is. Students will work with our education staff who will draw them into the scenario, get them role playing and help their creative minds flow with ideas.

EDUCATION EVENTS

Webelos Forester
First Saturday of each month / 9am- noon
Magness Memorial Tree Farm
$6 per child • Sign up on website

This program, held at our demonstration tree farm in Sherwood, is designed specifically for youth groups ages 8-10 and satisfies many of the requirements for beginning level forestry, conservation, or natural resource badges for Boy Scouts. Approximately two hours of the course is indoor, hands-on activities and one hour is outdoors. Topics covered may include, but are not limited to: tree identification, tree growth, wildfires, and how to plant a tree. Non-scouts welcome!
Another example:
Training courses: International Educators Institute (IEI)

• Teachers
• Forest researchers
• Land managers
Wildlife management
Conclusions

• For forests management, never forget human and economic dimensions of issues.

• Education provides one of the most effective strategies for assuring the long term management of forests.

• Thinning is a management tool to actually help us manage our forests more sustainably.

• Must find ways to explain that this type of thinning is different from the overcutting of the past.

• Science may be the tool we use to understand the world, but our hearts guide us in the work of building the future.
Challenges

- Very few Taiwanese own or live on forestland, so they are not as socially or economically linked to forestland.

- Ministry of Education controls school curriculum so have to convince them that forestry education from elementary school and up is important.

- TFRI education programs based at Botanical garden in Taipei—to have greater outreach more forestry education programs and partners are needed throughout Taiwan.

- Taiwan Forestry Bureau does environmental education for the general public, but again it is not forestry focused.

- People fear that harvesting will leave the soil more unstable and cause more landslides. This is true if there is overcutting or poorly planned harvests. The government argues it just wants some thinning to prevent tree fall after disturbance.
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