



Mr. Zengwang Ma is a forestry researcher in ecological forestry at Hebei Academy of Forestry Science, which is a provincial institute for local government to study forest management and ecological rehabilitation techniques. Zengwang Ma was an international fellow at World Forest Institute for one year from 2006 to 2007.

# Learning from the Pacific Northwest for Ecological Restoration in Hebei, China

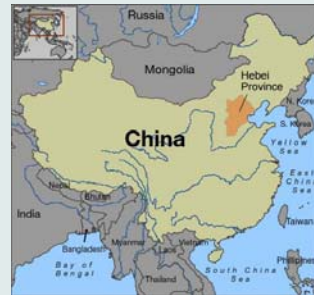
Zengwang Ma, Hebei Academy of Forestry Science, China



World Forest Institute  
4033 SW Canyon Road  
Portland, OR 97221 USA  
<http://wfi.worldforestry.org>

## Hebei: Large Scale Restoration

Hebei province is located in northern China and surrounds Beijing. 70% of its land is mountain or plateau with 19% forest cover. Hebei is smaller than Oregon, but has a much larger population of 67 million. The government has focused a lot of energy on improving the environment and increasing forest cover to improve its fragile ecological areas, which have been subject to overuse. Currently, large areas have been reforested and stands are very young. Logging is only permitted in select plantations and is banned in ecological areas.



**Area:** 188,000 km<sup>2</sup>  
**Density:** 363 people/km<sup>2</sup>  
**Climate:** Temperate monsoon  
**Northwest:** South edge of Mongolia Plateau, Yan Mountain  
**West:** Tai Hang Mountain  
**East and Southeast:** North China Plain

## The Main Ecological Challenges

Desertification in the Northern plateau and soil degradation in the western mountains have led to sandstorms and soil and water erosion. This is a result of both natural and human factors.



Desertification



Water and soil erosion



Seedling preparation



Site preparation



Young forest

Hebei has been working hard on reforestation projects in the mountains, plains, coast and Beijing area to restore degraded ecological systems. Government projects such as Converting Farmland into Forest, Desertification Control, and the Taihang Mountain Reforestation have changed degraded barren lands into vigorous young forests. The task now is to manage these young stands for future threats, including wildfire prevention, invasive species, and new forestland management techniques. An integrated strategy should be considered as early as possible.

## Forest Problems in Oregon

Compared to China's long history, forestry in Oregon is young with only two hundred years history. After various periods of "cut and run," intensive harvest, and 100 years of fire suppression, Oregon has recently begun to treat its public forest as a legacy. The biggest threats to Oregon's forests are catastrophic wildfire, invasive species, loss of open spaces, and unmanaged recreation but managers are working to restore this large scale forestland. Gradual improvements in forest restoration have been achieved through increasingly better forestry practices.



Catastrophic wildfire has a destructive effect on forests, threatened and endangered species, wildlife habitat, soil, life and property. Fighting these fires greatly increases the financial burden on public agencies.



Countless invasive species have invaded Oregon's forestlands. The top offenders include English Ivy, Himalayan Blackberry, and Scotch Broom. These invasives push out native species, and are difficult to control or eradicate.



Undermanaged forests have seen a decline in forest health due to lack of finances, political will, and public trust of forest managers.

## The Oregon Response

### Wildfire Prevention



**Fuels Reduction:** fuel and biomass reduction occurs through thinning, mowing, pruning, and prescribed burning.

**Prediction:** computer models such as FARSITE can help predict wildfire possibilities and estimate fire locations and intensity.

**Detection:** wildfires can be detected through fixed lookouts, aerial equipment, satellite imagery, and other technologies.

**Education:** agencies educate the public about fire behavior, ecology, hazards, and prevention using Smoky Bear, trainings, advertising, and volunteer opportunities.



### Invasive Species Control



**Detection and prevention:** early detection and rapid response are by far the most cost-effective ways of dealing with undesirable invaders.

**Mechanical control:** removal of invasive species by hand or with machines – this method strongly relies on volunteers due to labor costs.

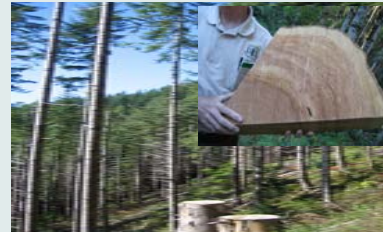
**Chemical control:** use of herbicides to remove invasives.

**Biological control:** this eco-friendly method is becoming more popular.

**Integrated approaches:** using multiple approaches along with cooperation between agencies, landowners, and other stakeholders.

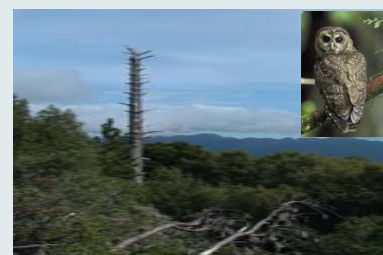


### Sustainable Forest Management



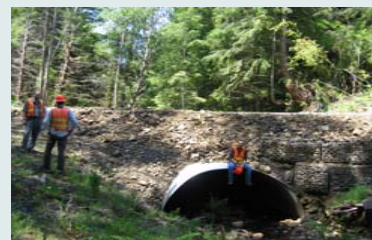
**Thinning:** very important approach to improve tree growth, provide habitat for wildlife, and reduce risk of wildfires, windstorm damage, and insect outbreaks.

**Planting and tending:** planting trees to restore forest ecosystems after logging and disturbances such as catastrophic wildfire, windstorms, and insect outbreaks.



**Wildlife protection:** creating structures for wildlife, such as fish passage ladders, leaving or creating snags for birds, creating forest openings for deer and elk, and promoting tree species diversity.

**Water protection:** leaving no-harvest buffers to protect riparian areas. Buffer width varies and depends on size of stream and species present; also prohibiting logging at headwaters.



## Lessons for Hebei from Oregon

### Consider Ecosystem Integrity From the Beginning

Ecological restoration of Hebei is offering the unprecedented opportunity to improve the ecological values of forests while also benefiting ourselves. Properly planned and implemented, restoration treatments will increase biodiversity, improve forest health and stand structure, create wildlife habitat, protect water sources and rivers, cultivate old growth forests, and also reduce the risk of wildland fires, insect outbreaks and other disasters. An integrated strategy addressing all of these issues is necessary.

### Keep a Long Term View

Ecological rehabilitation is a long term task. Consider a wide range of questions for the future, including potential consequences of any given action. Focusing on the long-term will make degraded ecosystem restoration more effective and efficient. Often only the short-term economic benefits are considered.

### Forest Management Should Be Emphasized

Management plays a very important role during forest development. The first step is to know what the problems are. Necessary investigation should be performed. Secondly, an adaptive management strategy should be implemented. The most important step is enforcement of management plans and strategy. This is a long term endeavor. We often say "To have successful silviculture, 30% is planting, 70% is managing," yet we still do not put enough emphasis on management.

### Conduct Proactive Research

More research is needed on the management of young stands. It is necessary to set up long term ecological research sites in different ecological regions, such as HJ Andrews Experimental Forest. Conduct proactive projects, including management technology in planting trees at different stages, wildfire ecology and prevention using GIS, RS, and GPS technologies, invasive plants prevention and control, and biodiversity and wildlife habitat preservation. Long term research that addresses potential future problems will be of great benefit.

## Conclusions and Future Questions

Although Hebei has achieved some progress in environmental improvement through large scale planting over two decades, Hebei still faces many issues because forest ecosystem restoration is a long term task. A wide range of possible problems and future questions exist, such as how to deal with wildfire prevention, wildlife habitat conservation, watershed conservation, and invasive species prevention. These factors should be considered in ecosystem restoration planning and management. As long as we follow the natural rule with our active help, we can restore the forest ecosystem successfully.

### Future Questions for Hebei:

- How can we manage young forests well during early ecosystem restoration?
- What else should we consider in addition to planting trees? Do we need to think of wildlife habitat and endangered and threatened species conservation?
- What can be done for wildfire prevention for the future?
- How do we prevent and remove invasive species?