INSIGHTS INTO FORESTRY IN OREGON

Can the established knowledge of short rotation forestry gained in Oregon be applied to an Irish context? Ana de Miguel Muñoz of Waterford Institute of Technology reports.

Figure 1: Ana de Miguel in the 10,000 ha hybrid poplar plantation and sawmill in Boardman, Oregon. Ana, a PhD student at Waterford Institute of Technology, was awarded with a six months fellowship in the World Forestry Centre and her research focused in Short Rotation Forestry market development in the Pacific Northwest and its applicability to Ireland. Credit: Andrea Cornejo

INTRODUCTION

Oregon, located in the United States' Pacific Northwest (PNW), is well known worldwide for its forests and forestry sector. It is the number one state for timber production in the United States, and has developed some of the strictest environmental regulations of the world. Oregon is regarded as one of the global leaders in sustainable forest management.

Ana de Miguel, a postgraduate student at Waterford Institute of Technology, Ireland, was selected for an international fellowship programme at the World Forestry Center, in Portland, and travelled to Oregon in May 2016 to complete a six month research programme.

SHORT ROTATION FORESTRY

Ana is studying the viability of Short Rotation Forestry (SRF) in Ireland within the ShortFor Project. SRF is the practice of cultivating fast growing tree species (e.g. eucalyptus and poplar) mainly for the production of biomass, through a rotation length of less than 20 years in Ireland. The ShortFor Project, funded by the Irish Department of Agriculture, Food and the Marine, is investigating the potential of SRF to meet market demands for fibre and fuel. A multidisciplinary team from University College Dublin, University of Limerick, Trinity College Dublin, Teagasc and Waterford Institute of Technology is involved on this project.

Forest policy is already promoting afforestation for fibre and fuel through targeted support measures, such as Grant Premium Category 12: Forestry for Fibre in the Irish Forestry Programme: 2014–2020. However, land owners are not establishing SRF and some of the reasons seem to be related to uncertainties over its economic sustainability and potential markets.

The Waterford Institute of Technology team, led by Tom Kent, is investigating the economic sustainability of SRF. In 2015, they carried out a survey of the Irish wood processing and solid biofuel industry, where they explored market opportunities for SRF. Results showed that although there is a potential market for SRF in Ireland, particularly in the wood energy sector, there are uncertainties and lack of information, on issues such as wood fuel properties, needed for market development. In the PNW a SRF resource and market has already developed, and Ana's research focused on conditions that facilitated this development and its potential applicability, or not, to Irish conditions.

WORLD FORESTRY CENTER AND INTERNATIONAL FELLOWSHIP

The World Forestry Center (WFC) is an international non-profit organization based in Portland, Oregon, which is committed to educating people about the importance of sustainable forest management. As part of the WFC, the World Forest Institute (WFI) offers an international professional development fellowship programme which brings forestry professionals from around the world to learn about natural resources management in the PNW. The late Harry Merlo, the retired CEO of Louisiana Pacific, was the founder of this programme more than 20 years ago. He also sponsored the programme and his foundation, the Harry A. Merlo foundation, will continue funding the programme for at least the next ten years. The fellowship involves three parts: a self-directed research project, group study tours and participation in forestry events.

Figure 2: World Forestry Center International Fellows 2016 in Merlo Ranch in Eastern Oregon learning about Oregon dry forest ecology & management. Forest fire protection is particularly important in this area. Credit: Rick Zenn

Figure 4: Cape Meares, Oregon, where Sitka spruce grows in its native habitat, often in mixture with western hemlock and red alder, along the coastal range where the climate is wet and mild. The biggest Sitka spruce is located in Cape Meares.

STUDY TOURS: OVERVIEW OF FORESTRY IN OREGON

Another important part of the fellowship are the weekly study tours that allow participants to meet the different stakeholders involved in natural resources and forestry in the PNW. These include small forest landowners, forestry companies, sawmills, conservation organizations, tribal forest councils, national forest and parks employees, urban foresters, forestry researchers and extension services. Also, as part of the programme, fellows spend a week in a ranch in the dry forests in eastern Oregon, another in the Redwood Forest Park, among the tallest trees in the world, and another in the spectacular Columbia Gorge participating in the International Educators in Natural Resources professional development week.

Almost half of Oregon's land is covered by forest (over 12 million ha), and about 80% of that can productively grow commercial timber. Oregon offers a great variety of forest: from dry forest in central and east Oregon, such as ponderosa pine, lodgepole pine or juniper forest; to wet forest in the west, mainly of Douglas fir and, along the coast, hemlock and Sitka spruce. Many of these conifers have been extensively planted in Ireland and Britain due to their excellent growth in our climate, so it is particularly interesting to see them in their native ecosystems.

Currently about 60% of the forest is publicly owned but most of the harvesting (nearly 80% out of the annual 10 million cubic metres) comes from privately owned forest. Historically, Oregon forest management had a strong focus on timber production from the end of World War II to the nineties. The conservation movements and environmental legislation in the eighties and nineties have resulted in an evolution to a current more balanced position between timber production and environmental protection.

In 1971, Oregon became the first state with a comprehensive law to regulate forest practices and protect the environment. Since then, the Oregon Forest Practices Act has been updated as scientific knowledge and practical experience have improved management practices. Some of the main requirements are reforestation after harvesting, water and stream protection, wildlife habitat protection and limits on clearcutting and chemical application. Forest fire protection is one of the current challenges in Oregon. As a result of passive management, public forests have accumulated a high amount of biomass, and there is a tremendous risk of fires particularly in drier forests in the east. Some good news is that the area of forest burned in 2016 was considerably less compared to previous years.

The forest sector is an important part of Oregon's economy, contributing about 59,000 jobs. Oregon is a leader in engineered wood in the United States. Many initiatives promote buildings constructed with advanced wood products such as cross-laminated timber (CLT), and try to improve forest sustainability and local communities' development, such as the Build Local Alliance initiative.

FORESTRY EVENTS IN OREGON

The PNW in general and the WFC in particular is a reference and meeting point for forestry professionals. The Centre hosts many national and international forestry conferences, seminars and exhibitions, such as the annual 'Who Will Own the Forest?' conference that brings hundreds of forestry professionals and investors from around the world to discuss perspectives of commercial forest management. Many other conferences and forestry events are hosted in Oregon, and Ana was selected to present her SRF research at the IUFRO Division 3 Forest Operations Engineering and Management Doctoral Students Conference held at Oregon State University in Corvallis.

This was an excellent opportunity to share knowledge, visit forest operations in Oregon and make friends from all over the world. Some of the research topics were on the development of biomass supply chains and their life cycle assessment, sawmill planning and timber storage, and the optimisation and improvement of harvesting systems in steep terrains. Ana also presented her research findings at the World Forestry Centre, and her presentation can be viewed on-line with the link below.

CONCLUSION ON THE WFI INTERNATIONAL FELLOWSHIP EXPERIENCE

The fellowship gives an exceptional opportunity to experience first-hand and learn about Oregon forestry. In addition, this programme provides an extraordinary opportunity to build an international network in the natural resources and forestry sectors. Staying in Oregon for six months gives attendees the possibility to participate in lots of forestry events including national and international conferences, seminars and exhibitions. This allows participants to expand their forestry knowledge from local perception to global perception. Challenges in forestry are not very different globally, so being connected and sharing knowledge and experiences can contribute to the world's forest sustainability.

"Although there is a potential market for SRF in Ireland, particularly in the wood energy sector, there are uncertainties and lack of information, on issues such as wood fuel properties, needed for market development"

LINKS

More information about the fellowship can be found at:

http://www.worldforestry.org/institute/world-forest-institute/

Ana's presentation at the World Forestry Institute on "Short Rotation plantations in the Pacific Northwest" can be viewed here:
https://www.youtube.com/watch?v=92EMHGESGv8

More information about Ana's research and the Shortfor Project can be found at:

https://www.teagasc.ie/crops/forestry/research/shortfor-project/

IUFRO Division 3 Conference
http://www.iufro.org/science/divisions/division-3/30000/podcasts/

A. de Miguel Muñoz, M. Sottocornola, B. Cronin, T. Kent, 2016. Exploring market opportunities for Short Rotation Forestry in the current Irish wood processing and solid biofuel sectors. Irish Forestry Vol. 73.
http://www.societyofirishforesters.ie/

OTHER SOURCES OF INFORMATION:

Oregon forestry http://oregonforests.org/content/ofri-resources
GreenWood Resources http://greenwoodresources.com/
Advanced Hardwoods Biofuels Northwest http://hardwoodbiofuels.org/
Poplar Biocycle Tree Farm http://www.mwmcpartners.org/biocyclefarm.html
Forestry for Fibre Afforestation Scheme. Irish Forestry Programme 2014-2020
https://www.agriculture.gov.ie/

RESEARCH PROJECT: SHORT ROTATION FORESTRY IN THE PACIFIC NORTHWEST

Each fellow chooses a personal research project to complete during their time in the PNW, mainly through networking and literature review, with contacts and administration support provided by the WFC. In Ana's case the research focused on Short Rotation Forestry. In the PNW, SRF was first considered in the 1970's, primarily for the production of fuel and fibre.

Research and development mainly focused on species from the *Populus* genera, commonly known as hybrid poplar. The establishment of hybrid poplar plantations started in the eighties and continued into the nineties, with the goal of meeting the forecast shortage in pulp for the paper industry. However, markets did not develop as the forecasts had predicted. Pulp production decreased, so there was no longer a shortage, and prices declined.

Figure 3: Poplar Biocycle Tree Farm in Eugene, Oregon, where wastewater treatment by-product is recycled, helping to provide the cities of Eugene and Springfield with safe water. Trees are harvested every 10 years to generate revenue, balancing out operating expenses.

Hybrid poplar landowners had difficulties in selling the timber, or in some cases harvesting never proceeded. In some of the biggest plantations, the management regime was changed in order to target other markets.

GreenWood Resources, a timber investment and asset management company, took over some of these poplar plantations and became one of the world leaders in poplar management. High value products and markets were developed. Products such as wine boxes, ceilings, pencils, and interior frames for furniture were made with the poplar sawlogs.

Plywood was produced from poplar, and this was mainly used for cabinets. Poplar cross-laminated timber (CLT) was also tested. Although a wide range of markets were developed for hybrid poplar, by 2016 most of these original plantations had been sold, and are now in the process of being converted to agriculture.

However, there are currently new poplar plantations being grown to service emerging potential markets. For example, the Advanced Hardwoods Biofuels (AHB) project, financed with a major grant from the U.S. Department of Agriculture, aims to develop a renewable transportation fuels industry by growing and converting hybrid poplars into liquid biofuels. Other poplar plantations have been established to remediate pollution. A working example is found at the 160 ha poplar tree farm in Eugene, established to recycle a wastewater treatment by-product.

Ana is currently preparing a research paper for review that will describe in detail the results of her Oregon SRF industry survey and the development and current status of SRF in Oregon.