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IMPACTS OF EXOTIC
PINE SPECIES ON
SUBTROPICAL
GRASSLANDS IN
SOUTHERN BRAZIL



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The International Forestry Students' Association (IFSA) was established in 1990 and is the global network for students in forest sciences. It unites approximately 3000 students in 80 member associations (called Local Committees) in 55 countries. IFSA is a non profit and non religious organisation entirely run by students for students. IFSA provides a platform to exchange knowledge and build understanding in order to create a sustainable future for all forests on the planet, and to provide a voice for youth in international forest policy processes.



EDITORIAL

Dear readers,

For the last time I proudly present to you a new issue of the IFSA News. As the end of the IFSA year 2011/12 is approaching, so is my time as the HOC coming to an end, and I want to use this opportunity to thank all the students who dedicated some of their valuable time to writing articles for the IFSA News Journal. Know that my work as an editor would not have been possible without your support. I can look back at three wonderful issues filled with valuable information and knowledge from around the globe. And even this fourth issue is not letting the readers down when it comes to learning. It also contains some very interesting articles with essential data on South America and Asia.

In 2009 I had the opportunity to travel through some Brazilian States. The culture, the landscapes and biodiversity made me fall in love with this beautiful country and I cannot wait until I get another chance to visit Brazil again. The more concerned I got after reading Andrea Skiba's article (page 6) about the impacts of exotic pine species on the subtropical grasslands in Southern Brazil.

Once again she made me realize how fragile our ecosystems are and how important it is for us to do all we can to protect them.

Thomas Naake explains in his article (page 11) very well how the reconstruction of the climate is done and how it helps to get a feeling for the speed of climate change and its dynamics. He also points out that the current CO₂ concentration in the atmosphere of 390 ppm is the highest value for the first time in 650.000 years.

Grace Aragon introduces to us the king of the Philippine forests and the very hard challenges he is facing today (page 14).

In addition to the informative reports on the IFSA Northern African Regional Meeting and Southern European Regional Meeting 2012, Sebastian Schwibach and Erica Merrit from Italy wrote a lovely article (page 16) about their experience during a three day event organized by AUSF Italia in collaboration with the IFSA LC AUSF Viterbo. They managed to package essential messages in a very poetic way, which makes it a real pleasure to read these paragraphs.

Furthermore you will find some informati-

on on the famous Moringa oleifera tree and some important tips on how you can contribute to saving resources on daily bases.

Finally I want to encourage you to apply for the position of IFSA News HOC!!!! I can honestly say that it is a very interesting and fun job that will bring you lots of joy each time you publish a new issue.

So enjoy reading! Get inspired! Start writing! Join the team and spread the IFSA spirit!!!!

With lots of Love,

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P R E S I D E N T ' S C O R N E R

Dear LC members, dear IFSA News readers,

On the behalf of our IFSA network, I have the great honor to welcome you to this second edition of the IFSA News for the year 2011-2012.

First, let me thank our head of the IFSA News commission, Kris Chigbu, for managing to put together this second edition before the end of the IFSA year. What a pleasure it will be to distribute it to the Local Committees (LCs) during the 40th International Forestry Students' Symposium (IFSS) happening in Turkey from the 1st until the 15th of August 2012 with the theme "Forest and Watershed"!

During this event, the IFSA News will be accompanied by another publication, just as important: the "40 IFSS stories" booklet.

To celebrate the 40th anniversary of the IFSS, our immediate past Vice President, Ping-Lian Wu, originated the idea to create a collection of pictures and anecdotes since the creation of the IFSS. The fruit of this hard work will give us the unique opportunity to see all generations of students that have met year after year, to create and feed our network with new ideas, experiences, joy and fun.

So yes, the IFSS is coming very soon and once again it is time for LCs around the world to send their representatives to participate in our 23rd General Assembly (GA): closing one IFSA year and opening a new one.

During this major event we will certainly find out that the IFSA year 2011-2012 has been another one of those many fruitful years IFSA has experienced so far. Thanks to the dedication of our board, our officials and all of our members, the IFSA tree is continuously growing and strengthening its roots and trunk, and also extends its branches and unfolds new leaves.

Regional Meetings took place in Southern Europe, Northern Europe, Northern Africa

and Asia, giving me the outstanding chance to attend three of them (in Switzerland, Ghana and Indonesia).

The first Colombian meeting took place in May, and our South African and Northern American meetings are gathering their strengths to make it happen next year. New members have been registered and a "members' needs questionnaire" was established in order to better implement everyone's needs. What kind of stronger root system could we have?

Moreover, thanks for the continuous efforts commissioners and heads of commissions have made in building a better foundation for all of us to rely and grow on.

Meanwhile our board, coordinating all those parallel activities and holding together this foundation, has been preparing our soon to come GA, which is no piece of cake, believe me!

Finally, our "messengers" or Liaison Officers (LOs), working with different partner organizations, have fully dedicated their work to the exploration of opportunities given to us by those partnerships, enhancing students' participation to conferences, creating new internship possibilities and establishing memorandums of understanding to strengthen the relations between our organizations.

Out of this combined energy, efforts and work, we have enabled our organization to get a step closer to its vision:

Prepare a sustainable future for the world's forests and related ecosystems, thanks to global cooperation, knowledge sharing and understanding among students of forestry sciences.

Buds have turned into leaves, enabling IFSA to start another fruitful year with a strong forestry students' representation on major environmental events, with more input to the whole debate around forestry education and with the effort to continue enabling forestry students to



Picture: Juliette Mouche, IFSA President

meet, discuss and initiate activities together.

With this in mind, I sincerely hope to see a majority of our members represented in Turkey in order to give a strong impulse to the opening of the new IFSA year by voting, running for an official position and sharing positive energy.

Come and join us! And if you can't make it, please receive through these words all my gratitude for your past, current and future involvement within our ever-growing network.

Enjoy the reading!

Your dedicated President,

Juliette Mouche
IFSA President 2011/12
France
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WHAT DID YOU DO TODAY TO PROTECT OUR EARTH?

As we start to observe and experience radical climate change all around the world, we must start to adapt and begin to prepare ourselves for the inevitable. Unfortunately history has shown that governments have always been the last group to react. This should be taken as a sign. As individuals we need to start empowering ourselves to embrace the necessary changes! Many people may say that one person cannot make a difference. That is the biggest lie ever propagated. Throughout history it has always been individuals who have made the biggest difference! We simply have no choice but to start behaving in a way that recognizes our individual impact upon the environment.

Always reading bad news concerning the Earth's environment made me feel overwhelmed by all the issues humanity is facing. So I tried to get myself out of this mellow mood by looking at my home and what is actually happening in my community. And then I realized that there are so many things that I can do on a daily basis that will not only decrease my own carbon footprint, but will also save resources and will also give me a good feeling inside! So here is my little list of inspirations on how you can also help protect our Earth starting now:

Do your part to reduce waste by choosing reusable products instead of disposables. Buying products with minimal or no packaging will help to reduce waste enormously. Go shopping with your own bags made of cotton. This will reduce consumption of plastic bags! And whenever you can, recycle! If there isn't a recycling program at your school, workplace or in your community, ask about starting one.

Return your organic waste where it belongs: to the soil! If you recycle your organic waste, you'll reduce the amount of energy used to send this waste to the dump. Compost also makes your plants stronger and healthier, reducing the need for fertilizers and chemical pesticides. Here you can watch how to even make an indoor compost bin:

http://www.youtube.com/watch?v=Lcv69QL_Ers&feature=related

Heat and cool your home more efficiently by fixing leaks, you'll save money and reduce your impact on the environment.

Replace regular light bulbs with compact fluorescent light (CFL) bulbs. CFLs last 10 times longer, use two-thirds less energy, and give off 70 percent less heat. You can also save electricity and reduce global warming by turning off lights and any electronic devices whenever they are not needed. Many times I find myself in public facilities where lights are on unnecessarily, then I simply turn them off. Nobody ever complained, moreover people are grateful for the reminder to stop wasting energy. It is just a matter of getting used to doing the right thing.

Less driving means fewer emissions! Besides saving gasoline, walking and biking are great forms of exercise.

Plant trees!!!! A single tree will absorb approximately one ton of carbon dioxide during its lifetime.

If possible invest in solar energy. There are lots of inexpensive solar gadgets out there you can try out. If you can afford it get solar panels for your home. Check this out for more inspiration:

<http://www.youtube.com/user/GREENPOWERSCIENCE/videos>

Fill a water bottle (preferable glass bottle) up with filtered water from home and take with you instead of buying bottled water. No waste, it saves you lots of money and most important: it is improving your health:

<http://www.youtube.com/watch?v=v3i7vMluVj4>

If you like the flavored bottled waters, try adding a slice of lemon, lime, cucumber, or strawberry to your own water bottle. It is very tasty!

I read that the simplest, cheapest, easiest way to dramatically help save the environment is to stop eating meat. The amount of land cleared to rear animals for eating and the amount of ocean life killed and ecosystems damaged is simply staggering. 10 000 liters of water are used to produce 1 kg of beef! The Number one thing on the list should be cutting meat and dairy out of your diet. A vegan diet is the lowest carbon footprint diet. As much more energy is used to make animal products as opposed to plant based diet.

And last but not least: reduce your consumption!!!! This is one of the most effective ways to protect our environment. So before you buy something, ask yourself if you really really need it and if there are other possibilities to fit the need. For instance instead of buying new clothes all the time you could organize a swapping party with your friends! This can be really fun and it saves you money!!!!

So these were just a few possibilities on how you can add to the protection of our Earth. But there are many more!

Always remember: in order to be sustainable you should apply the following 3 rules:

1. REDUCE

2. REUSE

3. RECYCLE

For further questions contact the editor.

IMPACTS OF EXOTIC PINE SPECIES ON SUBTROPICAL GRASSLANDS IN SOUTHERN BRAZIL

This study aims to investigate the ecological impact of introduced North American pine species that escaped from afforestations on South Brazilian Campos grassland vegetation. The main hypothesis of this investigation states that introduced pine trees alter the community composition of native grasslands in South Brazil and lead to a shift in functional group and species composition under pine crowns as well as to changes in soil properties. To study the impacts of single pine trees on grassland ecology multiple features of the plant community structure were surveyed and soil samples as well as dendrochronological data from pines were collected. In one analysis the vegetation cover of plots beneath pine trees was compared to control plots in adjacent grassland. In another, vegetation plots were treated as a gradient while pine trees were separated by age in the temporal scale. All statistical analyses were performed using the software MULTIV. The results of the study showed a reduction in cover of the functional groups graminoids and shrubs and a decline in the number of species under large pine crowns. A shift in species composition towards species with a higher tolerance to shading and altered environmental conditions occurred under pine crowns. Increased soil acidification and a change in ion and nutrient composition were found in the soil of the oldest pine trees. It is concluded that urgent measures are needed to control Pinus invasion in order to maintain South Brazilian Campos in their natural state.

Subtropical grasslands (Campos) of the southernmost state of Brazil, Rio Grande do Sul (see Fig.1 and Fig. 2), exhibit a large fine-scale biodiversity (Overbeck et al. 2005). Recent paleoecological evidence indicates that Campos are natural remnants of Glacial, Early- and Midholocene times, and not former forest areas as supposed in the past (Behling & Pillar 2007). This ancient condition of the Campos accounts for their high numbers of endemic species and makes them especially important for conservation (Overbeck et al. 2007).

Land use in Southern Brazil goes back to the native Indians in Pre-Colombian times that practiced shifting cultivation (Moure 2000). Intensification of agriculture and land use occurred after 1824 with the arrival of the first German and Italian settlers in the area. Towards the end of the 19th century logging of native Araucaria forest had become a major source of income (Waibel 1955), which led to large deforestations in South Brazil. With the decrease in native forest and the abolition of Araucaria logging the first pine plantations were established in the 1970s (Wachtel 1990).

According to the most recent agricultural

census (IBGE 1996) almost 3.5 million hectares of native grasslands have been transformed to agricultural lands between 1970 and 1996 in the state of Rio Grande do Sul. This corresponds to an annual loss of 137,000 hectares of grasslands. Despite the total loss of nearly 25% of grasslands to agricultural land use, only 0.36% of native grasslands are currently under conservation (Overbeck et al. 2007, Pillar et al. 2006). This area is certainly not sufficient to preserve the biodiversity of the Campos when considering the velocity of

agricultural expansion in Rio Grande do Sul.

Besides the ecological reasons for the conservation of the Campos there is also a socio- economical aspect to be considered. The “gaúcho” culture of Rio Grande do Sul is based on cattle grazing which has been the traditional land use of the Campos since the eighteenth century (Behling & Pillar 2007). Disturbances like grazing and frequent burning hinder the expansion of forest over grassland vegetation (Oliveira & Pillar 2004), thus indirectly contributing to maintain the natural Campos vegetation in Southern Brazil (Overbeck et al. 2007).

Pine afforestations offer a new way of land use in Southern Brazil that at first sight may seem economically superior to cattle. When considering the possible ecological consequences of exotic pine invasion in Southern Brazil though, the costs of habitat restoration in the future might exceed the profit made in the present by the afforestations. In the Southern hemisphere many species of pine trees have been introduced to several areas outside their natural range for commercial purposes (Richardson, Williams & Hobbs 1994). The role of



Figure 1: Location of Rio Grande do Sul in South America (in red)

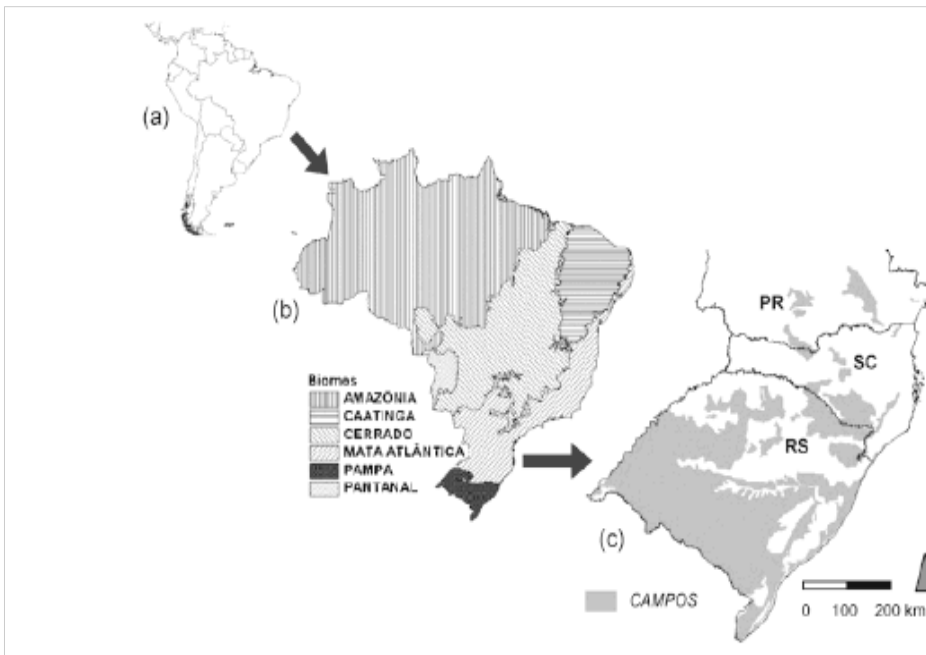


Figure 2: Location of South Brazilian grasslands: (a) in South America, (b) official Brazilian classification of biomes (IBGE, 2004) and (c) distribution of grasslands in Brazil's southern region (abbreviation of states: RS: Rio Grande do Sul; SC: Santa Catarina, PR: Paraná, Overbeck et al. 2007)

pinus as invasive species has been documented for several types of habitats and there are many factors contributing to success of pine invasions in the Southern Hemisphere such as high degree of serotony, small seed mass and a large extent of human planting (Higgins & Richardson 1998). Pine seedlings that escape from afforestations pose a major threat to local ecosystems because they succeed in competition against native species (Richardson 2006). Grasslands, as found in this area, belong to the most invadable environment types (Higgins & Richardson 1998) and thus they are particularly threatened by pine invasion from adjacent afforestations.

Aim of Study

The effects of invasive species on ecosystems have to date remained a question of science and current research is attempting to gain a deeper insight into the ecological interactions of invasive species and their new habitats. Exotic pine invasion at the Research Center Pró-Mata offers an opportunity to study the dynamics and effects of a biological invasion in South America. Campos at the study site on the Research Center Pró-Mata are currently threatened by pine invasion from surrounding afforestations.

This study aims to investigate the ecological impact of introduced North American pine species that escaped from afforestations on South Brazilian Campos grassland vegetation.

The main hypothesis of this investigation states that introduced pine trees alter the community composition of native grasslands in South Brazil (Campos) and lead to a shift in functional group and species composition under pine crowns.

To get a better understanding of the impacts of single pine trees on grassland ecology multiple features of the plant community structure were surveyed and soil samples were collected. Local effects of individual pine trees on the surrounding native grassland vegetation were investigated by assessing the difference in biodiversity on grassland in its natural stage and on grassland sites invaded by pines.

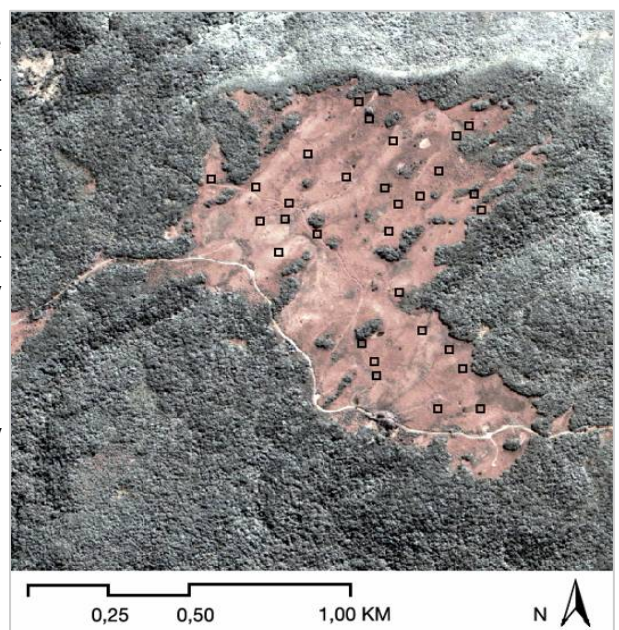
Materials and Methods

Study site

The study site, Research Center Pró-Mata, is located

in the region of Campos de Cima da Serra in the state Rio Grande do Sul in Southern Brazil (29° 27-35' S, 50° 08-15' W, 900 a.s.l.). The area is on the border of a high altitude plateau (Planalto) with close proximity to the ocean. The region is characterised by the coolest climate and the highest altitudes in the state. The climate is temperate with an annual mean temperature of 14.5° C and a mean annual precipitation of 2252 mm (Bertoletti & Teixeira 1995). On average 25 days of frost occur annually with frosts limited to areas without trees only. The soils are classified as Andosols or Umbrisols and characterized by high clay contents, low bulk densities and low pH values.

Three vegetation types are present on the Research Center: Atlantic Rainforest, Araucaria forest and Campos. The predominant forest species are *Araucaria angustifolia*, *Podocarpus lambertii* and many species of the Myrtaceae family. Campos comprise 146.5 ha which corresponds to an area of 3.02 % of the total area of the Research Center Pró-Mata (Baaske 2001). Grasses (Poaceae) are the largest family found on the study



Campos area with location of sampled pine trees

site regarding species cover and number. The Poaceae genera with the highest species number on Pró-Mata include *Paspalum*, *Briza*, *Axonopus*, *Eragrostis*, *Andropogon*, *Danthonia*, *Panicum* and *Schizachyrium* (Caporal & Eggers 2005).

Fire and grazing have been excluded from the Research Center Pró-Mata since its establishment in 1994 (Bertoletti & Teixeira 1995). As a result of over ten years of abandonment the grass layer has become exceptionally high and dense with a strong accumulation of litter and dominance of a few species of caespitose grasses (Overbeck. et al. 2005).

Tree and vegetation sampling

30 pine trees were selected for the study from the native Campos area in the central part of Pró-Mata. The geographic location of all pines in the study site was mapped using a GPS. The selection of the trees occurred in a stratified sampling process whereby the native Campos area was divided into five equally sized parts and six trees selected from each part.

To compare floristic composition and assess biodiversity between invaded and non-invaded sites, plots of 0.5 x 0.5m were placed directly under the 30 selected pine trees growing in the native Campos area. Control plots were placed in adjacent undisturbed grasslands. Plots were located along a transect from pine trunk to crown edge. The same number of plots was then sampled in the adjacent undisturbed grassland. The height of the vegetation along the plot transect was measured under the pines and in the adjacent Campo plots. In each plot the percent cover of bare soil, litter, needles, moss and occurring species were visually estimated (%). Species that could not be identified were treated as morphotypes according to their functional groups (graminoids, forb, shrub or tree). In order to obtain an overview on the amount of dead material produced by invasive pines, dead vegetation below trees was separated into litter (dead native vegetation) and needles (dead material from pine trees).

Soil sampling



Natural grasslands at the study site on the Research Center Pró-Mata

In order to evaluate the effects of single-tree areas on soil patterns soil samples were collected under each of the sampled trees and its adjacent native grassland control. A composite soil sample consisting of five different sub-samples mixed together was taken from under all pine trees and their Campo controls. The samples were taken at 10cm depth using a hand auger.

Statistical analysis

The data obtained for pine plots and Campo control plots was tested for significant differences by ANOVA and Duncan test for post-hoc analyses. Non-parametric data was tested for significant differences by Kruskal-Wallis one-way analysis of variance and Mann-Whitney-U-test. A threshold value of $p \leq 0.05$ was adopted for accepting statistical significance. Spearman's rank correlation method was used in order to obtain correlations between vegetation variables. The Evenness index $E 1/D$ (Smith & Wilson 1996), which is independent of species numbers, was used in order to measure the equitability of species along the transect from pine trunks to Campo control plots. All statistical analyses were performed using the software MULTIV (Pillar 2005) and SPSS 16 (SPSS Inc. 2008).

Conclusions and recommendations

The results of this study show that impacts of pine invasion on the Campos of Pró-Mata have clearly affected

community composition of the grassland vegetation and to some extent already altered soil conditions. The effects of invasive pines have led to a decline in cover and species numbers of native grassland vegetation, opening up new habitats for native forest species beneath their crowns. Overbeck et al. (2007) have described the high ecological value of South Brazilian Campos and their ancestral condition, which makes them particularly worthy of protection. Considering the rapid growth rate of pine trees on the study site and their increasing impacts with increasing crown size their effects on native grassland vegetation are only going to increase in a near future.

The Research Center Pró-Mata contains many ecological and environmental conditions that make it prone to pine invasion. Some of these are: acidic and nutrient-poor soils, cool climate, high altitude, and an upwind location (Rouget et al. 2004, Richardson & Bond 1991). Both occurring pine species on the study site were classified to be of the 11 most invasive species on the Southern Hemisphere (Richardson et al. 1994). Invasiveness of pine species is related to the size of the founder population, thus in the case of Pró-Mata to the size of adjacent pine afforestations. Considering the large quantity of adjacent pine afforestations on the vicinity of Pró-Mata and the susceptibility to pine invasiveness of the grasslands on the Research Center an urgent need for action is

needed in order to maintain the Campos and their unique diversity.

In other parts of the Southern hemisphere, where pine invasions have become a major ecological problem, many solution attempts have been tried. In New Zealand, where pines have managed to establish themselves successfully in tussock grasslands, taking advantage of microsites beneath tussocks and in between tussock areas (Allen & Lee 1989), the situation is similar to that in *Pró-Mata*. Here intensive grazing has been effectively applied to control pines (Richardson 2000). In South African fynbos, where the risk of soil erosion is lower than in New Zealand, cutting with subsequent fire application has been applied as a control method (Richardson 2000). Since grazing has traditionally been part of the culture in Rio Grande do Sul, its application on the pine-invaded Campos of *Pró-Mata* would be one possible management implication. Another possible management strategy might be the use of manual removal with subsequent controlled burning since neither *Pinus taeda* nor *Pinus elliottii* exhibit serotony. In addition, controlled fires on the unmanaged Campos of *Pró-Mata* would increase herb cover and species numbers of fire adapted grassland species, which in turn serves as a natural barrier to prevent pine invasions (Richardson et al. 1994).

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“.....Since grazing has traditionally been part of the culture in Rio Grande do Sul, its application on the pine-invaded Campos of *Pró-Mata* would be one possible management implication. Another possible management strategy might be the use of manual removal with subsequent controlled burning since neither *Pinus taeda* nor *Pinus elliottii* exhibit serotony.....”

Andrea Skiba

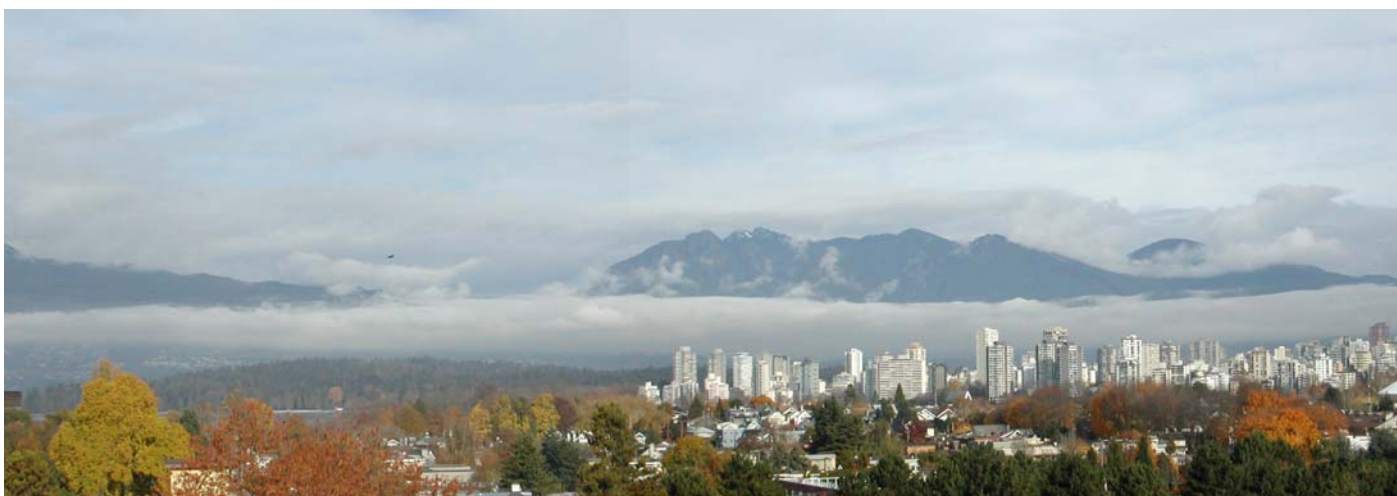
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THE MASTER OF SUSTAINABLE FOREST MANAGEMENT A NEW PROFESSIONAL DEGREE OF THE UNIVERSITY OF BRITISH COLUMBIA

Sustainable forest management maintains and enhances the long-term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social, and cultural opportunities for present and future generations (Canadian Council of Forest Ministers). Contemporary forest land management encompasses ecosystem restoration, conservation, carbon management, community forestry, and the assessment of cumulative impacts and integration of land-based activities such as timber harvesting, mining, grazing, recreation and electricity generation and transmission.



Traditionally, most professional foresters completed undergraduate degrees in forestry. With the broadening of undergraduate programs in environmental sciences, graduates with allied sciences degrees are finding employment in forest land management but without a solid foundation in the ecology, growth, conservation, economics and management of forested lands.

The new Master of Sustainable Forest Management (MSFM) degree at the University of British Columbia (UBC) is a one-year course-based program that provides students with Bachelor's degrees in forest sciences, conservation, ecology, physical geography, environmental sciences or other allied disciplines, opportunities for advanced scholarship and professional growth in natural resource management principles and practice. It prepares students for careers as forestry professionals in temperate forests in North America and overseas, and sets the stage for life-long learning.

The major components of this program are:

- 1. Tree and stand dynamics**
- 2. Forest to landscape: structure and function**
- 3. Forest management**
- 4. Economics and administration of forestry**
- 5. Leadership skills: communication and critical reasoning**
- 6. Information acquisition and analysis**
- 7. Professionalism and ethics.**

As integrating capstone projects, students work in teams designing site and forest level plans. The latter by working with clients to develop management plans for woodlots, community forests, and conservation areas. The UBC campus in Vancouver, BC is a wonderful place to study, with nearby forests, beaches and downtown life. During our program we will visit the University Research Forests and Rural

Communities, giving students an opportunity to learn about old-growth and managed forest ecology, indigenous rights, and life in resource dependent communities.

For more information on this program please visit the program website at the following link

www.forestry.ubc.ca/grad

or contact gradforapp@ubc.ca

Stephen Mitchell, PhD, RPF



RECONSTRUCTION OF PAST CLIMATE

With an estimated rising trend in global mean air temperature from 1°C to 6°C expected at the end of the 21st century, the earth is facing an effective impulse on humanity and natural systems. What does such a temperature rise mean in a historical context and how is it possible to examine series of meteorological variables such as air temperature or precipitation which describe climate?

Climate research avails itself with several climate archives, or so-called proxy-data, to both investigate the effects of climate on the specific compartments, and to deduce the predominant climate. By using a more or less effective combinatorial approach to understanding the secrets of the former climate, it is possible to conclude what changes occurred in the earth's history. In general, there are two opposed fractions of time in earth's history to distinguish between: non-cryogen, with a mean air temperature 4°C to 9°C higher than conditions and glacial, 2°C to 4°C colder (Wakonigg, 2007).

Methodology

Proxy-data, with a strong correlation to changing atmospheric conditions, is predestinated for reconstruction. This offers a wide bouquet of possibilities such as to ascertain the O_2 isotope relations in ice cores or in stalagmites, look at sequences of palynomorphs in sea and swamp sediments, and investigate sources in written form and techniques offered by dendrochronology.

Dendrochronology uses the phenomenon of perennial plants, which develop thin-walled vessel elements with a wide lumen (water transport) in the vegetation period and thick-walled vessel elements with a thin

lumen at the end of each vegetation period for the purpose of stability (Braune et al., 1999).

Hence, basal area increment R_t related to a time t can be described as a function of climatic influence C_t , age trend A_t , disturbance signal of the examined single tree $D1t$ such as concurrence, disturbance signals of external factors $D2t$ exempli gratia azotic input and standard error ϵ_t :

$$R_t = f(C_t, A_t, D1t, D2t) + \epsilon_t$$

To eliminate the microsignals (A_t , $D1t$) the evaluation is enhanced by statistical methods, such as a moving average or

splines. Non-climatical disturbances can be reduced by targeted sampling which orientates at the selection of unattached trees (low concurrence) (Piutti & Cescatti, 1999) and sites near the polar or alpine tree line (Eronen et al., 1999). The intended aim is a result which combines the effect of daily temperature and humidity conditions (see image 1).

Palynology uses the fact that plants develop palynomorphs (polls, spores) in their life-cycle which consist of durable and resistant bio molecules (chitin, sporopollenin) that preserve them under anaerobic conditions with a vulnerability to oxid, alkaline, high-temperature and

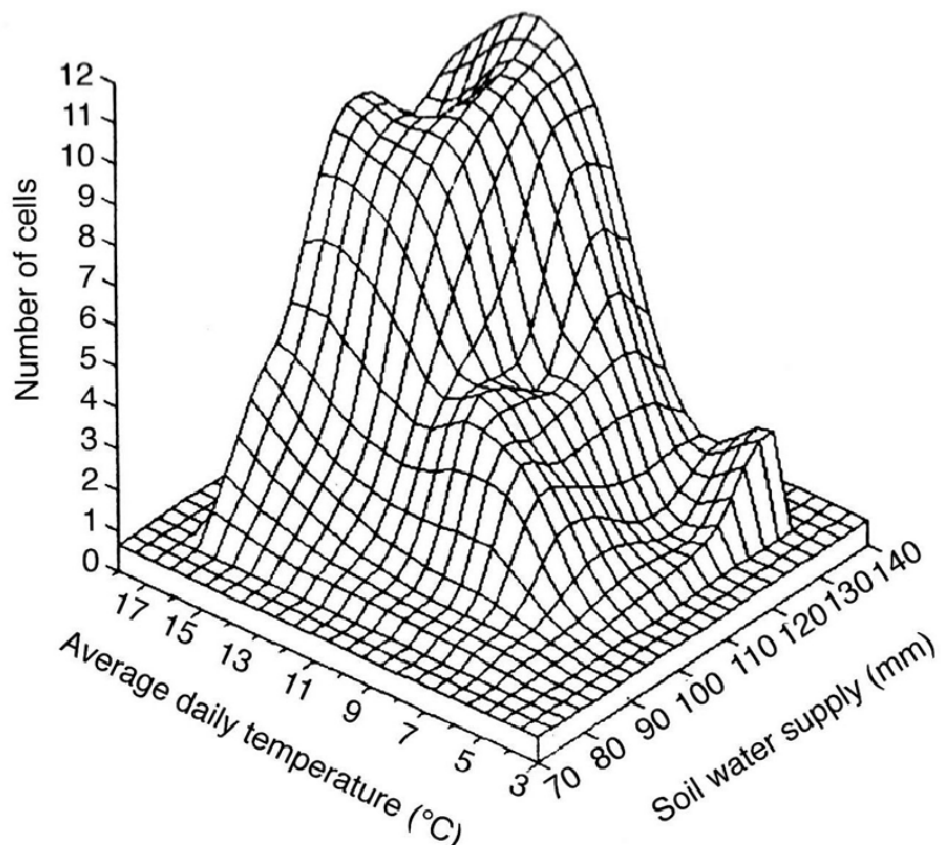


Image 1: Influence of daily temperature and soil water supply on radial growth (Horacek et al., 1999)

high-pressure conditions; thus leading to a lack of data availability in these certain geologic regions (Traverse, 2007). The investigated object is the sedimented sequence of palynomorphs from that it is concluded to the predominant flora.

Lowe reports, that „good“ results can be achieved by sampling, which orients at former tree lines and which feature a weak resilience to climate fluctuation. In contrast, several factors complicate the correlation between distribution of a species and climate:

- the phenotypic plasticity of a species, i.e. to bear variations in air temperature and precipitation,
- missing or insufficient information of time delay in species composition of climate change,
- deficient knowledge of the present and former parameters of ecological niche [Lowe, 1991].

To approximate humidity, the ratio

$$r = \frac{AP}{NAP}$$

can be taken, with *AP*, the amount of arboreal pollen, and *NAP*, the amount of non-arboreal pollen. Bottema investigated today's pollen structure in the Near East, which are considered to be humid, and assessed a dominance of arboreal pollen. In arid areas the *AP/NAP*-ratio was low due to a high abundance of herbaceous plants. Hence, Bottema postulated that this correlation exists under the conditions of the present day. (Bottema, 1991).

Results

Reconstructing the climate helped to evolve a feeling for the speed of changing in air temperature, precipitation and other meteorological variables. It was then possible to gain knowledge of the natural changes in the climate system thus illustrating the human impact and the CO₂ concentration in the atmosphere which is currently 390 ppm which is the highest value for the first time in

650.000 years. The concentration during this time period fluctuated between 180 ppm in the cold glazials and 300 ppm in the warmer interglazials, however millions of years ago there was a time when the concentration was higher.

The „great“ preceding changes in air temperature occurred during the ice ages, when the increment was about 4 °C to 7 °C on a global scale. Keep in mind that this was a process, which lasted 5000 years. It is obvious, that the actual speed in climate change (1 °C to 6 °C in 100 years) is more rapid and unusual in a natural context (DE-IPCC, 2007).

Furthermore, reconstructions are used in climate science as a playground for the validation of climate models, as a useful tool in history, where the climate is linked with famines, settlement or other events (Wakonigg, 2007), as well as in vegetation science (e.g. succession) (Sengbusch, 2003).

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“.....Reconstructing the climate helped to evolve a feeling for the speed of changing in air temperature, precipitation and other meteorological variables. It was then possible to gain knowledge of the natural changes in the climate system thus illustrating the human impact and the CO₂ concentration in the atmosphere which is currently 390 ppm which is the highest value for the first time in 650.000 years.....”

CRITERIA FOR SCIENTIFIC ARTICLES PUBLISHED IN IFSA NEWS

All IFSA students who want to write a scientific article should follow the listed criteria:

1. Articles must be related to forest science or natural resource management.
2. Scientific articles should have a minimum of 1000 words and should not exceed 2000 words.

3. A title of not more than fifteen words should be provided.

4. Articles must conform to the following generic format:

- Introduction
- Literature review
- Methodology
- Findings/discussion
- Conclusion/implications
- Reference

5. Articles are not allowed to be published elsewhere once published in IFSA NEWS.

The checklist provided below is to ensure that articles meet the requirements prior to submission:

Send your articles in WORD DOC format not PDF files

All text is using Arial 11 pt or New Times Roman 12 pt font

Author(s) affiliation, address and email is provided at the end of the article

Figures, tables and charts are included within the body (able to be copied out) of the paper with a brief description

All text is justified

All references are provided at the end in alphabetical order

IFSA NEWS can only consider your scientific article for publication if you

have followed the above listed recommendations.

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MEET THE KING OF PHILIPPINE FORESTS

The Philippine Eagle is a giant forest raptor endemic to the Philippines. It is considered one of the largest and most powerful eagles in the world. Unfortunately and ironically for the king of the Philippine forest, it is also one of the world's rarest and certainly among its most critically endangered vertebrate species.

The Philippine Eagle is primarily a rainforest raptor. It is known to nest on large, old growth trees at an altitude of 700 to 1,200 meters. Most of the nesting sites discovered during the recent decade have been associated with steep, forested valleys or ravines. The food habits of the Philippine Eagle are known from prey items brought into nests.

Studies from 1978 to 1983, and recently in 2000, revealed that 15 species of vertebrate prey were used for feeding the young including flying lemurs, squirrels, snakes, civets, hornbills, bats, and monkeys. The variety and size differences of prey suggest that the Philippine Eagle is an opportunistic hunter with preference for tree-dwelling species. The breeding season extends from July to February. The threats to the survival of the eagle are many and complicated.

Hunting

Philippine eagles are still hunted down despite the presence of laws protecting the bird. Very often, they are killed without provocation, and mostly out of fear and ignorance, or worse, just for sport.

Deforestation

In the long term, the forests are continually being denuded, leading to the loss of nesting places for the eagles. For the Great Philippine Eagle, the forest is their

only home. It is where they obtain their food, and the place where they reproduce and nourish their offspring. The forests are becoming increasingly unhealthy and unable to satisfy the needs of the eagles for food and shelter. What we must realize is that a forest that is unable to fulfill an eagle's needs will soon be unable to fulfill our own. Since it occupies the highest position in the food chain of the forest ecosystem, the Philippine

linked. Hence, PEF is committed to promote the survival of the Philippine Eagle, the biodiversity it represents, and the sustainable use of their forests resources for future generations to enjoy. The PEF in order to optimize its efforts to conserve this majestic bird, has created programs on Conservation Breeding (CB), Conservation Education (CE), Research and Community-based (RAC), and Development. The conservation breeding program is directed at developing a viable gene pool and propagating the target species ex situ. The goal of this program is to release offspring back into the wild to help complement wild populations. So far, PEF was able to produce 14 captive bred PEs to date.

The RAC program aims to ensure that PEF's conservation actions is based on sound and informed decisions. Hence, this team is responsible for conducting research in the field on wild population behaviour and more importantly find ways to better understand why they are declining. RAC also monitors

released eagle in the wild to know their behaviour patterns wherein such data could further enlightened PEF on how to improve further the PE release program. Moreover, RAC is responsible in creating community-based programs in areas where there are wild Philippine Eagles in order to empower these communities to become conservation champion themselves.

The Conservation Education Program targets urban and rural communities in developing public awareness and understanding of wildlife conservation issues.



A Philippine Eagle in the wild. Probably eyeing on its next prey. (Photo from animaldiscovery-chanel.blogspot.com)

Eagle, as the national bird, is an effective gauge of the environment's health and its conservation can create an umbrella of protection for all the unique life forms that dwell in the Philippine forest.

The Philippine Eagle Foundation

Protecting the Philippine Eagles has long been the battle cry of the Philippine Eagle Foundation (PEF) who firmly believes that the health of the Philippine Eagle, the health of Philippine environment, and the quality of the Philippine life is inextricably

PEF's partners and linkages include teachers, students, local government units, private business corporations, and indigenous cultural communities as well as the print and broadcast media.

In all these conservation efforts that the Philippine Eagle Foundation has been doing, it requires a significant amount of monetary resources to run its operations. The Development Program is responsible for resource mobilization and acts as the official spokesperson of the Foundation. Moreover, volunteers of different backgrounds, e.g. biologists, ecologists, veterinarians, architects, photographers, students, families, etc. come regularly to help the Foundation in its conservation efforts. With this, PEF also urged people from all over the world to help PEF in saving the Philippine Eagle. In order to help, one can donate, volunteer its time, expertise, talent, or simply help promote this cause to friends, family members, officemates and the like.

For further information on how to contact PEF especially on latest updates about this critically endangered specie, you can visit their website

www.philippineeagle.org

or email its Executive Director Mr. Dennis Salvador at

djis_raptor77@yahoo.com
or djisalvador@gmail.com.

Saving the Philippine Eagle now means saving the remaining Philippine forests !



In a flight cage at the Philippine Eagle Foundation near Davao, Mindanao, a staff member displays an eagle perched on a glove heavily padded to protect against the bird's talons. Now a significant tourist attraction, the center educates thousands of visitors a year about the Philippine eagle's life history and conservation needs. (Photo by Klaus Nigge at ngm.nationalgeographic.com).

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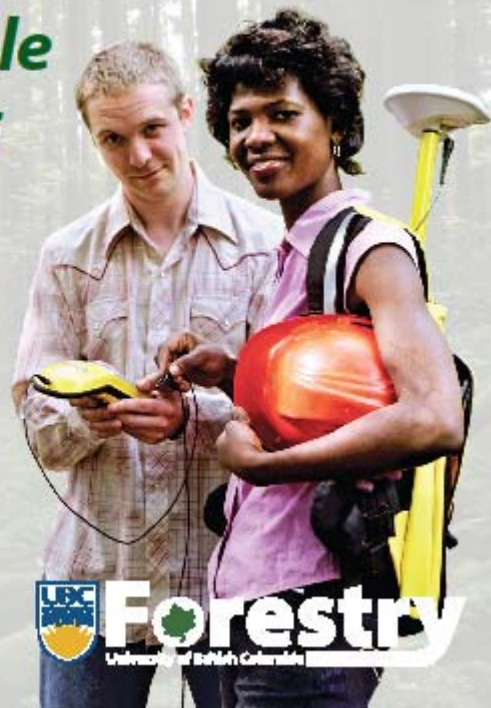
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MAN INTO THE WOODS

Man and wood, nature and culture, spirit and matter: two principles, two forces, two poles that are attracted to each other, but also reject one another, that love and hate each other at the same time, but try again and again to come together, to re-create the original unity, to get over the imperfection in order to live in the absolute.

During three days, the AUSF Italia (University Association of Italian Forestry Students) in collaboration with the IFSA LC AUSF Viterbo, gave students the opportunity to live this unity with nature, to manifest it and make it a reality in the soul, to share spirit and actions.

During our meeting the members of the association were given an overview on the entire history of nature and were able to see the deep connection between man and wood, the deep unity of the history of nature and human history. They were taken back into the past, and then flown into the future, a future that will not be able to exist unless we return to the underlying unity with the world that surrounds us.

On Thursday 17th of May, during a hot and sunny spring afternoon at the University of Tuscia, an amazing seminar about forestry history and archeology of the mediterranean area took place.

The participants, which attended from many different Italian regions, learned about their ancestral connection with forests, how important the woods were for their lives, how holy the trees, the plants, the sea, the earth, the rivers, the rocks, the sky and the stars were to them.

The seminar started with the origins of human life on earth, and then analyzed the continuous interconnection between man and woods, talking about the coevolution of the language in relation

with the environment, which greatly shaped the culture of ancient populations.

The professor analyzed the narrow yarn that connects names of trees and presence of each species in different countries like Italy or Germany for instance.

With this knowledge, it was possible to see that native species have a name that has an exact meaning in that language, while for species from other countries the

civilizations, which in order to reach the spiritual world, tried to hear the voices of the highly sacred trees: Ashes, Birches, Oaks, one of these really famous trees was the Oak of Dodona, in Greece. Under its murmuring leaves, the priests heard silently the voice of God, the will of the father Zeus and of the mother Gea.

Friday 18th of May the participants went to a meeting that took place in the Natural Reserve of Castel Porziano, where the speakers talked about wood products and their relation to forests and their functions.

The present situation of the relationship between man and wood was discussed, a relationship that has been mainly focusing only on the usage of trees, is now slowly trying to revitalize the essential value of every stump, the inner poetry of every beautiful truss, the pleasure of smelling a book and find in this smell the hard work, the pain, the gladness of the tree that gave us that paper.

During the meeting, the president of A.U.S.F. Italia

Lapo Brau, reminded us in his speech how important it is to overcome our individualistic instincts in order to become one big organism, a community that is able to operate in the present without being trapped by miserable egoism, but being aware of all the future consequences of its actions.

Humanity should become aware of its true opportunities, should free its wings from the weight of individuality and fly together with the other living beings toward a continuous improvement of our



name is often given by thinking of native species that have some similarities with the foreign one.

After that, the professor talked about the great migrations that took place in many periods and in many places, migrations that are responsible for the common roots of many words in many different languages.

Then, after a short introduction about the meaning of wood for the construction of ships, the seminar arrived at an important topic: the holy rites of various

world.

On Saturday 19th of May the participants had an excursion to the National Park of Abruzzo, where they saw all the different kinds of forests:

From forests that are cut in order to have good timber, to the forests that are completely preserved from any human activity, including tourism.

With this, they saw how the future of forests could and should be, how man should use forests in a sustainable way, which means paying attention to all the needs of nature as well as economy.

This future could take us into an era where we won't need to have natural reserves any more, where nobody can enter. Humanity would be in harmony with the environment and wouldn't have to be a hungry beast in search of blood and eternally in fight with the external forces. It would be a part of the All, a small cell in a bigger organism, that can't live even if just one part doesn't work. In

this future, humanity changed its approach to viewing nature, not separated from it, but as a fundamental part of each human interaction.

During these three exceptional days the AUSF members were truly able to discover how necessary it is to find a new way dealing with timber and forests, and they also had the possibility to learn more deeply the importance of sharing friendship, ideas and feelings.

Indeed, the true meaning of this kind of gathering is not really in what is done or seen, but in what each one feels, in meeting people, and in the sensation of brother- and sister-hood that can be felt. A sensation that, although it is inside of us, we often forget about, maybe because we don't want to get closer to the people around us, but most of all because we are used to building walls between us and others, between us and the world of which we are afraid to enter.

To live such experiences help us to pull down these walls, to see how common

our passions, fears and even our pains are.

The AUSF Italia is like a fertile soil, rich with potentialities, waiting for the life-giving light of the sun to show all its strength, a light that comes from the relations between the members, that, despite the distance, like trees, intertwine their roots, in order to be able to resist against the gust of the wind.

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DID YOU KNOW . . .

The **Moringa oleifera** tree is grown mainly in semiarid, tropical, and subtropical areas. It grows best in dry, sandy soil, but it also tolerates poor soil, including coastal areas. It is fast growing and drought resistant. The tree is highly nutritious and very energizing. It has potential to boost food security, foster rural development, and support sustainable landcare. It can also be used as fodder for livestock. India is the largest producer of Moringa, but it is also widely cultivated in other Asian countries, Africa, Central and South America.

Its several health benefits is the reason why it is also named the "Miracle Tree" and the "Tree of Life" in many cultures.

In some regions, the young seed pods (drumsticks) are most commonly eaten, while in others, the leaves are the most commonly used part of the plant. The flowers are edible when cooked and taste like mushrooms. The bark, sap, roots, leaves, seeds, oil, and flowers are



Moringa oleifera (kalamungay, drumstick tree) Leaves and flowers at Kahului, Maui. Source: <http://www.hear.org/starr/images/image/?q=060921-9054&o=plants> (Photographed by "Forest & Kim Starr")

used in traditional medicine in several countries. For instance the traditional Indian Ayurvedic medicine, notices that Moringa leaves can cure more than 300 diseases. Modern science has confirmed some of these beneficial attributes and has shown that the Moringa leaves actually have more nutritional value than most of the common fruits and vegetables. Moringa oleifera contains all of the key amino acids, which is unusual for a plant source.

In April 2008, the USA National Institutes of Health (NIH), which is one of the most respected scientific institutions in the world, celebrated Earth Day with exhibits, posters, programs dedicated to Moringa. The NIH record publication mentions: "perhaps like no other single species this plant has the potential to help reverse multiple major environmental problems and provide for many unmet human needs."

Moringa truly deserves our attention!

AWESOME EXPERIENCE AT THE NORTHERN AFRICA REGIONAL MEETING, KNUST KUAMSI, GHANA 15TH - 20TH MAY 2012

The 2012 edition of the Northern Africa regional meeting has come and gone but the unquantifiable experiences and lessons learnt during the events lingers on the minds of the participants and host institution as well as the senior friends from the Commonwealth Forestry Association Nigeria who were in attendance.

This six days event geared toward equipping the forestry and natural resources students with knowledge as well as strengthening the IFSA bond among LCs in the North African Region.

The theme of the meeting was „Green economy and environment for Africa; the roles of the forestry students“.

Over 80 participants from different countries took part in the lectures, presentations, debates, discussion groups, field trips and the Ghana Tree Planting Campaign.

Participants from different LCs in Nigeria travelled in a bus together across two countries (Benin Republic and Republic of Togo) before arriving in Ghana.

According to Nigerian participants this meeting will remain one of the most memorable events in their life, as the beautiful site of the sea along the travel way coupled with the experiences of the

different cultures of these countries was awesome in its entirety.

The first days of the event took rather a more academic dimension as various academic activities centering on the

city of Kumasi, the home of the Ashanti's enroute the Kitampo water fall, where the participants had the opportunity to see the beautiful work of nature of the waterfall embedded in a sparsely populated/dense forest area.

On the fifth day, the participants embarked on a tree planting sensitization walk around the campus with the unified slogan "Stop talking and start Planting". This was rounded up with a tree planting exercise at the Toase Axis of Kumasi, the activities of the fifth day came to a climax with a cultural night where participants dressed in their cultural attire showcasing their cultural dance steps and songs

to the admiration of all present.

One unforgettable aspect of the meeting was the nice treat of mouth watering Ghanaian delicacies as well as the various side attractions such as the football viewing centers for the football lovers as well as a nice night out at the pool side.

The last event of the meeting was the nomination and election of the committee for the organization of NARM 2013.

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theme of the meeting were extensively covered, this was to enhance the knowledge of the participants.

Lecturers drawn from both the academia as well as professional field of forestry took their turns in delivering seasoned lectures and trainings on different crucial

topics. High point of the activities was the syndicate discussion session, inter-LCs debate competition on selected forestry related issues, CFA presentation as well as the special IFSA workshop by Juliette Mouche our IFSA president.

On the fourth day the participants were taken on a bus ride around the beautiful ancient



S E R M 2 0 1 2 - S W I T Z E R L A N D

The 2012 edition of the Southern European Regional meeting was held from the 10th to the 15th of March in Switzerland. For one week, 43 forestry students from all over Europe and even the world converged on this little gem of a country to discover and explore its forests, food (mostly chocolate and cheese), towns, landscapes and of course each other. Students from Germany, Albania, Italy, Spain, France, Slovenia, Turkey, Romania, Bulgaria, Holland, Sweden, Kenya, China, and Canada were there.



The theme of the week was multifunctional forestry and each excursion was meticulously planned to give us an insight as to how the Swiss manage their forests.

Day 1, Tuesday 10th of March: Guided visit of the ETH University of Zurich and a few words from the professors, then back to the youth hostel to start to get to know everybody.

Day 2, Wednesday 11th of March: Excursion to the recreational forests of Uetliberg, where two ETH professors explained how they manage forest and the public at the same time, the second of the two often being more of a



Here a helicopter is lowering its load of wind thrown timber onto the landing.

challenge. In the afternoon two lovely Swiss maidens organized games in the woods allowing us to get to know and mess around with our fellow forester friends.

Day 3, Thursday 12th of March: The Swiss treated us with a demonstration of helicopter extraction and cable extraction, an impressive sight which left us all speechless. Helicopters are often used to remove timber from steep inaccessible terrain, particularly for sanitation efforts. The afternoon was spent wondering around a Swiss cheese museum in Gruyère and a woodchip heating plant. After the evening meal, games and dancing kept us busy until the early hours.

Day 4, Friday 13th of March: Friday took us up to Leukstadt to marvel at the largest mountain pine forest in Europe and the consequences of an arson induced forest fire. The day was concluded in style with wine tasting in the beautiful mountain village of Varen and a pleasant walk back to the hotel for the famous international evening, where we dined out on the weird and wonderful specialities of everyone's homelands.

Day 5, Saturday 14th of March: A refreshing visit to the exemplary plenterforest of the Emmental region. The evolution and structures of this uneven-aged conifer forest was deftly explained by the local forester, who went on to show us a spectacular example of wooden bridge construction with a two hundred year old specimen that was still used a couple of years ago! It was then time to make our way back to Zurich for



Cable logging is an economical method to harvest timber from steep terrain in Switzerland. Sometimes entire trees are brought to the landing, where they are processed and sorted by large machines.

the last supper and evening together, enjoying the memories and congratulating the organisers on a job well done.

Day 6, Sunday 15th of March: After breakfast and a lengthy farewell, we separated knowing we now had friends in many countries and many stories to tell back home.

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On the way to the woodchip heating plant. All the wood fuel originates from within 1 to 15 km radius. This plant provides heat energy to hotels, public facilities as well as private houses.

CALL FOR ARTICLES PUBLISHED IN IFSA NEWS

IFSA NEWS is calling for articles to be published in our journal. Students around the world have the opportunity to write articles about their LC activities, attended IFSA events or their personal forest science interest area.

Let IFSA world know what you or your LC is up to!

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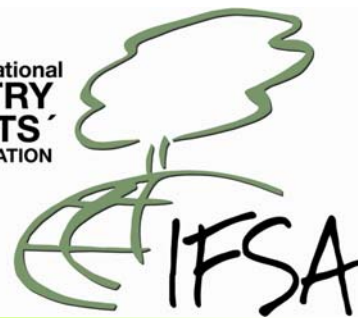
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