

Aspects of conservation management of forest fauna in England, Scotland and Ireland: A two week study tour during June/July 2002.

Report to the forest Practices Board

Dr Sarah Munks, FPB Senior Zoologist.

Summary of information relevant to fauna conservation management in production forests in Tasmania

General Comments

The importance and value of maintaining forest biodiversity is generally accepted. Research has shown that retention of mature forest structures are important for the maintenance of fauna diversity. In the UK ancient woodlands are being restored and plantations in England and Scotland originally established with the narrow objective of providing a timber reserve are being restructured to enhance environmental values including fauna diversity. In southern Ireland recent forestry development includes a policy of afforestation with the aim of enhancing environmental values of the landscape as well as to increase future wood production potential. A large amount of resources are being directed toward getting the plantation establishment right with respect to biodiversity enhancement and maintenance.

The foresters, forest ecologists and the wider community encountered in the countries visited envied our extensive tracts of native forests in Tasmania. The general feeling was that the aesthetic and natural heritage value and hence eco-tourism potential of our native forests, both managed and reserved, could be promoted more extensively to the economic benefit of the State. Management of our 'off-reserve' forests should aim to avoid the loss of this current and future potential and the potential future costs involved in restoration activities to bring back lost values, such as those currently underway in the UK and Ireland. As part of the continual improvement of the States Forest Practices System, exploring ways to manage the matrix to maintain the unique environmental values of Tasmania's native forests whilst also meeting the economic requirements of the industry need to continue to be supported and adequately resourced.

The experience in Britain has been that the greatest progress in achieving conservation outcomes occurs where research, policy, regulation, incentives and published guidance are made to work together effectively. This requires stakeholders working together and not solely to their own agendas. The Forest Practices System in Tasmania provides us with the opportunity to have this 'joined up' approach to assist achievement of ecologically sustainable forestry goals. The current closed loop between researchers, guideline development and forest operations within the Forest Practices System should continue to be encouraged and adequately resourced. In addition, recognition and links to the system by other agencies and research organisation in the State need to be encouraged or enhanced.

Plantation design and fauna conservation

There is increasing evidence that plantation forests can have value for both vertebrates and invertebrates. The Forestry Commission in the UK and Coillte in Ireland both

recognise the important role of their plantations in contributing to biodiversity conservation. A number of innovative approaches to the management of plantations have been developed some of which are also applied under current plantation establishment and management guidelines here in Tasmania. As part of the continual improvement of these Tasmanian guidelines, however, other strategies being adopted overseas could be considered, particularly where plantations exist in areas of high conservation significance. These include retention of open spaces within a plantation node established on former grassland or open woodland, maintaining mature age stands and woody debris within newly regenerated stands, increasing rotation times and adopting silvicultural systems other than clearfelling, to promote understorey growth

Monitoring and Research

There is a continuing challenge to find the appropriate balance between conservation and wood production within non-reserve forests in Tasmania. The RFA process resulted in some excellent GIS coverages and there are some fauna databases (eg., threatened fauna database managed by the FPB and general fauna database managed by DPIWE) which can be used in strategic planning of forestry activities. However, there is still an urgent need for projects like the Bioforest program being undertaken in Ireland, for the development of protocols to assess fauna diversity value at the forest block and coupe scale and the levels of structural complexity required. This could include a review of indicators of biodiversity used nationally and internationally (ie., structural, compositional and functional) and the testing and tailoring of indicators to the Tasmanian situation. Such work would also provide information of use in evaluating the efficacy of existing Forest Practices Code provisions for the maintenance of fauna diversity in areas where production forestry activities occur.

Some excellent reviews of research needs to deal with fauna conservation issues have been undertaken in the UK and Ireland to ensure that the \$'s available target the priority areas. Similar reviews would be of use here in Tasmania to identify research and monitoring needs for fauna management under the Forest Practices System and to identify strategies to deal with the needs. In particular research needs for priority fauna (including threatened fauna) and complimentary work being undertaken by other agencies needs to be reviewed and a practical strategy to deal with the required actions developed. One of the outcomes of such a review could be the setting up of a freely available FPB database of research projects (Web based) which could be continually updated.

Training/Education

Both education courses for foresters encountered in the UK and Ireland were collaborative efforts between the industry, government departments and a recognised education provider, ie. University. The Forest Practices Board currently runs courses to facilitate implementation of Code provisions, including one on fauna conservation management under the Forest Practices System. The demand on specialists time and need for accreditation of such courses by a recognised education provider has increased with the increasing complexity of the system. The biodiversity courses (flora, fauna, soils and geomorph) could be amalgamated and run through the School of biological sciences at the University of Tasmania. The FPB specialists could share the responsibility for the development of course content and desired outcomes with the University course co-ordinator, but the University would be responsible for the

delivery and administration of the course. The FPB would continue to run practical field days to reinforce and demonstrate information provided in the course.

At the Society for Conservation Biology Conference in Canterbury a posters noted included one reporting on an industry funded program to support undergraduate students wishing to undertake an internship with a conservation or government organisation (eebweb.arizona.edu/CBIPWEB/Index.htm). This could either be to gain work experience in conservation management or to undertake a collaborative research/monitoring project. Such a program could be set up in Tasmania with the relevant departments from the University of Tasmania. This would help to increase links with the University and would assist resourcing of the FPB monitoring and research programs. Students met in Ireland expressed a keen interest in gaining work experience with the Forest Practices System in Tasmania. Such a program could facilitate such international links.

1.0 Introduction

Maintenance of the State's unique fauna diversity in areas subject to production forestry is a major and ongoing challenge. Difficult fauna conservation management issues commonly arise both in Private and State forests and the frequency with which such issues arise has increased with the intensification of forest management in 'off-reserve' areas in recent years.

Under the Forest Practices System the Forest Industry in Tasmania must comply with a whole variety of State and Federal legislation, Agreements and Recovery Plans relating to fauna conservation, including threatened species. To meet the requirements of these legislative and policy instruments a variety of provisions have been developed for fauna and included in the Tasmanian Forest Practices Code. Advising the Forest Practices Board on policy and prescriptions required to achieve internationally recognised standards of sustainable forest management for fauna and assisting forest managers on how to meet the Forest Practices Code fauna provisions in production forest areas are the main challenges faced by zoologists within the FPB. Over the past 5 years the priority task of the Zoology program has been to develop a process and associated planning tools to ensure that threatened fauna provisions are implemented effectively in production forest areas.

In addition to those relating to threatened fauna, significant current conservation management issues include; stream management issues related to conservation management of aquatic fauna and the design of plantations to maintain fauna diversity. The latter has become a problematic and costly issue with the current trend toward conversion of highly productive areas of the northwest and northeast of the State to plantations and the establishment of plantations on cleared land. Interim guidelines have been proposed to assist the maintenance/ enhancement of fauna diversity in plantation areas and some of these have been adopted by the system.

This paper summarises the outcomes of a two week study tour conducted in June/July 2002. The aim of the study tour was to discuss existing and emerging conservation management issues relevant to the work of the FPB Zoology program with colleagues in the UK and Ireland. This report summarises the information collected relevant for fauna conservation management under the Tasmanian Forest Practices system. This

information will be of use in a review of fauna conservation under the FP System which is one of the goals of the FPB Zool program in 2002/2003.

2.0 Notes on Kielder Forest visit, UK.

2.1 Background

A visit was made to the Forest Enterprise, Kielder Forest District Office to learn about the implementation of aspects of the UK Biodiversity Action Plan and the management of threatened species habitat in the plantation landscape. A field trip was also undertaken to learn about threatened species surveys (mainly raptors) and management in Kielder forest and the planned re-structuring of the forest to enhance its biodiversity value. Contacts and publications obtained are listed on page 12 and 14.

2.2 About the forest

- Kielder forest is the largest and oldest State owned plantation forest in Britain and is managed by Forest Enterprise (the agency of the Forestry Commission entrusted with the management of the Forest Estate see, <http://www.forestry.gov.uk/>).
- The native vegetation and wildlife of Kielder has its origins in post Ice-Age era 14,000 years ago. About 10,000 years ago the Border Hills where Kielder is situated were covered in native broadleaf forest (open forest of oak, ash, alder, elm, hawthorn and hazel, birch and scots pine at higher altitudes), peat bogs and upland moorland. Forest clearance by man began in the Iron Age with major clearance during the Roman occupation. There is evidence that some forest cover survived into the sixteenth century but by the early twentieth century, the landscape of Kielder was dominated by open, treeless hills with small remnants of native woodland.
- Major afforestation of the area began in 1926 and by the 1970s 50 000ha of cleared land had been planted with predominantly non-native conifers (eg., 50% Sitka Spruce, 24% Norway Spruce, 11% Scots and lodgepole pine, 8% Japanese larch, 2% Douglas fir, 3% other conifers and 2% broadleaf species) with the original objective of providing a strategic reserve of timber against the possibility of future wars and as a source of employment in rural areas.
- This narrow original objective was broadened over the following years, and the other economic benefits the forest can provide were recognised by the government. Secondary objectives include the provision of public recreation and ensuring a balance between the needs of timber production and the environment. The current aim is that the forest (as all State owned forest in the UK) is managed sustainably to produce environmental social and financial benefits; the environmental quality and productive potential being maintained or enhanced.
- Kielder forest is currently being restructured to meet this modern aim. The current management strategy aims to convert the single-purpose, rather uniform plantation into a diverse structured forest with value for tourism and biodiversity as well as wood production. Current annual timber production is approximately 400 000m³.

80 people are directly employed to manage the forest and 180 contractors. 500 000 people visit the forest each year for its recreation values.

2.3 Policy, Agreements and Action Plans influencing conservation of forest fauna

- Forestry practices in the UK have to adhere to the wildlife policy and protocols covered by the UK Woodland Assurance Scheme (reflecting the requirements of the FSC's GB standard). These include the Forestry Commission best practice guidelines . An audit conducted by the Forest Authority (regulatory body) has been set up to assess compliance but the general feeling is that this hasn't really changed things on the ground. Forest Enterprise also does its own auditing of compliance. Statutory responsibilities include compliance with the Wildlife and Countryside Act, 19 (scheduled species) and the Deer Act, (for browsing control, poaching etc).
- Following the Rio Summit the UK Biodiversity Action Planning system was developed. Lists of priority fauna species and habitats, biodiversity action plans (BAPS), habitat action plans (HAPS) and species action plans (SAPS) have been developed and adapted to suit local county conditions.
- The Forestry Commission is the lead agency for the development and implementation of the woodland action plan. The objective of this plan is to rehabilitate all ancient woodland sites converted to conifer plantations in the 1940s and 1950s. An inventory of ancient woodland sites is being drawn up, scoring by naturalness and predicted past vegetation type.

2.4 Site Planning

- All areas of special interest are mapped at compartment level, including scheduled species sites. These are consulted by the forester when planning an operation. Maps and details of the proposed operation are e-mailed to the specialists for advice on any conservation actions.
- The District Forester – Environment based at Kielder provides such advice for any operations within a forested area of approximately 75,000ha. Other specialists are contracted/consulted when required.
- An efficient e-mail notification process is used with links to sites where the plans for operations are posted.
- There is considerable pre-plan negotiation with the local community and other relevant agencies (Parks, local council, local naturalist groups etc.). A design plan for an area of forest can take up to 12 months to get approved. Design plans have a 10 year life with 5 yearly review.

2.5 Management actions to enhance and maintain fauna diversity

- Enhancing the wildlife conservation value of the forest involves actions to increase the general level of habitat diversity across the landscape as well as specific measures for the conservation of particular species.
- Tree species choice in particular areas of the forest is considered carefully. The tree species choice strategy adopted has resulted in a drop in the net present value

of the forest by about 7 pounds per hectare per year from the potential value of the forest if a purely commercial strategy had been adopted. However, the loss in value is justified by the other management outputs such as landscape, recreation and wildlife conservation. Although there is growing pressure to increase the planting of native broadleaved trees to enhance habitat value this is resisted in areas of the forest designated as 'red squirrel reserves' to avoid invasion by the introduced grey squirrel. Kielder is the only forest in England where the red squirrel survives in any numbers.

- Open spaces within the forest are being expanded from the focus on rides and firebreaks to increase the proportion of edge within the forest and hence habitat value for fauna (eg., merlins, hen harriers, wood mouse, short-tailed vole, bank vole etc.) and flora, visual diversity and enhance deer control opportunity.
- There is a move away from clearfelling of plantations. Shelterwood type logging system is being trialed and smaller group felling to retain canopy coverage.
- 15ha of remnant native vegetation woodland patches were retained by default during the plantation establishment. However, many of these areas have died due to drying out or crowding out by plantation trees (see Photo 1). Under the UK Woodland assurance scheme 1% of any plantation area needs to be reserved/excluded from harvesting or rehabilitated to native forest. Existing healthy patches of ancient woodland are reserved and where necessary actively rehabilitated..

Comments for Tasmania: The long term viability of small remnant patches retained within a plantation node needs to be considered in the design or restructuring of plantations to enhance their biodiversity value.

- Actions taken to enhance plantation areas for various fauna species at the local scale include the placement of nest boxes for owls and ducks and nest platforms for species like the long eared owl (see Photo 2). These are working successfully and make the monitoring of breeding success easy.
- Increasing habitat diversity in Kielder plantation has increased populations of fauna species monitored and stabilised populations of some birds. The boom and bust cycles (eg., tawny owl and vole) typically seen in early succession or disturbed forest areas have declined.
- To compensate for 'set-aside' areas there have been attempts to increase wood volume production by genetically improved trees. However problems have been encountered in restock areas; 2,500 trees per hectare aimed for but 'brash'(slash) on sites prevented this, the endemic pine weevil is a significant problem in that it eats young trees, browsing damage by deer results in multiple stemming.

2.6 Conservation management of priority fauna

- There are a number of species of protected birds, mammals and invertebrates (scheduled species listed in the *Wildlife and Countryside Act, 1985*) that occur in the Kielder area. These include the red squirrel, *Sciurus vulgaris*, the goshawk,

Accipiter gentilis the golden eagle, Tawny owls, *Strix aluco*, merlin, *Falco columbarius* and the large heath butterfly. The mature conifer plantation provides habitat for some of these species eg., nesting sites for the goshawk, forage areas for the red squirrel, refuge sites for the dormouse, food resource for the Scottish crossbill (see Photo 3).

- A recording system is in place that details information on species and their locations and this is used in the planning of forestry operations. However, to ensure that critical sites for threatened species which may change from year to year (eg., goshawk nest locations) are catered for a project officer is employed on a seasonal basis to undertake the required surveys. Forest Officers are also made aware of the fauna issues to look out for but efficient pre-harvesting surveys by an experienced naturalist ensures that costly conflicts rarely arise. The monitoring information collected by the scheduled species project officer enables assessment of the performance of fauna conservation measures and informs decisions on future management strategies.

Comments for Tassie: Information collected by trained fauna officers during pre-logging surveys needs to be recorded in a more comprehensive and systematic fashion and fed into a database maintained by FPB Zoology. Currently only presence sites are recorded to update the TFM mapsheets or industry GIS systems. Further basic information on negative sites, habitat disturbance, previous landuse activities, vegetation communities and structure and other habitat characteristics could be recorded. Such information will assist decision in the planning of future operations.

- Pre-harvest surveys for some priority species are only required on State forest. Private landowners do not have to survey for scheduled species prior to forestry activities on their land. However, if there is a known site, eg., goshawk nest then it must be protected. The major threat to raptor conservation is persecution by game keepers and private landowners. Most raptor species, like the goshawk and peregrine are making a comeback after their decline in the early part of the 20th century and habitat quality and availability is improving. The Forestry Commission is actively involved in raptor conservation and now recognises the importance of maintaining established nest sites. The size of the retention area varies with topography but the general guideline is no harvesting during the breeding season and a 400m exclusion buffer around the nest is required if harvesting nearby. Harvesting of the nest tree can occur outside the breeding season but this is discouraged as the birds move creating problems elsewhere.
- Forest Officers do not have access to agreed prescriptions on threatened fauna management in a particular operation area. Broad guidelines are provided in Species action plans (SAPS) and specific advice is sought on a case by case basis during the planning of an operation from the District Forester for Conservation. The prescriptive approach is avoided to prevent problems arising when actions need to change as a result of new information becoming available.

Comments for Tasmania: The Tasmanian Threatened Fauna Adviser (decision support program) is a useful tool required because of the need to provide information to a large number of operations per year in Tasmania. However, it is

important that the advice delivered by the program is not regarded as being set in concrete. Despite the push toward being more prescriptive to provide certainty to the industry and to satisfy the need to have decisions open and transparent, prescriptions delivered by the program must not replace site specific actions when required. A process should be developed to ensure monitoring of the efficacy of prescriptions and their update if required.

2.7 Stream Management

- Kielder reservoir was built within the forest to supply water to the nearby major population centres (eg., Newcastle). The maintenance of water quality and quantity is a major consideration in forest management operations.
- Rehabilitation of riparian areas is being undertaken in second rotation areas. Most sites are being left to regenerate naturally with broadleaf species or planted with natives (see Photo 4). Sitca spruce regeneration is a problem in these areas. All streams have a minimum of 10m native vegetation regeneration either side.
- Along with the policy of creating broadleaved woodlands along the major riparian zones, open spaces are also left for 'open space' species (eg., the merlin, short-tailed vole etc.). The aim of this regeneration of a more 'natural' riparian zone is to improve habitat for fish, by reducing the effects of siltation, overshading and acidification, and to improve amenity value for visitors to the forest. (see Photo 5)

3.0 Notes from visit to the Woodland Ecology Branch, Edinburgh

3.1 Background

A visit was made to the Woodland Ecology Branch of the UK Forestry Commission in Edinburgh to discuss the work of the branch. The research of this branch covers; the needs of priority species and habitats, habitat management and enhancement and integrated research at the landscape scale. Some advisory and education work is also undertaken, including involvement in the development of best practice guidelines for foresters.

A field trip to Glentress forest was undertaken to learn about biodiversity assessments and more about the re-structuring of the UK's plantation forests to enhance biodiversity value. Contacts made and publications obtained are listed on page 12 and 14.

3.2 Priority Species

- The work of this branch currently includes a review of species action plan (SAP) research needs, including Lterm monitoring for the Forestry Commission (Broome, 1999). This review prioritises species directly impacted by forest practices and identifies the research and resourcing requirements. This type of a review also identifies the research roles of the different agencies involved in implementing a particular Action Plan.

Comments for Tasmania: This sort of a review needs to be undertaken for the Forest Practices Board but expanded to include general forest fauna research . Research and monitoring needs for fauna management under the FP system and strategies to deal with the needs should be identified. It could include prioritisation of research requirements for priority fauna (including threatened fauna) and identify complimentary work being undertaken by other agencies. A database could be compiled.

- The majority of the research and monitoring work undertaken by the Branch involves collaboration with researchers from other government and non-government organisations. Priority projects include;
 - Lterm monitoring of grey and red squirrel populations,
 - Impact of rehabilitation of ancient woodland sites on the dormouse (this species uses conifer plantations for refuge),
 - Re-establishment of juniper understorey,
 - Re-structuring of conifer forest to benefit the pearl-border fritillary butterfly and the chequered skipper butterfly (Forest Enterprise see this as important for eco-tourism, the butterfly Conservation community group will be involved in the Lterm monitoring),
 - Ecology of ET a high profile deadwood invertebrate species (*Exoporus tiliae*).
- In general there are few conflicts over priority species conservation and the activities of the Forest Industry. This is primarily because there is an emphasis on conserving non-wood values and enhancing the biodiversity value of an area of forest and hence the eco-tourism value. This is primarily to comply with the UK Woodland Assurance Scheme. There appear to be considerable funds available to meet this aim from the EU.

Comments for Tasmania: Tourism value of threatened species/priority fauna needs to be recognised. Combining research and monitoring sites for threatened fauna with development of interpretation sites and volunteer programs etc.

3.3 Landscape ecology

- A project is underway which aims to model forest structural dynamics using SELES, a landscape modelling program. The results of this project will be used to inform forest re-structuring to enhance biodiversity values.
- A PC based wind risk model (Forest Gales) and an ecological site classification decision support system have also been developed to assist forest management decisions. The wind risk model has been tested in New Zealand and could be tested for use in Tasmania.
- Biodiversity assessment in plantation forests found that fungi and canopy insects as diverse in plantations as in native forests. Forest structure found to be most important not plant species composition.

3.4 Browsers

- Five million pounds a year is spent on deer control.

- Advisory and research work undertaken includes deer management advice, deer impact assessments, advice on the pros and cons of cattle browsing.
- Preliminary results of monitoring work suggests that maintenance of continuous cover/smaller coupes may reduce browsing damage.

3.5 Blanket Bog Rehabilitation

- A project is looking at rehabilitation of blanket bog systems planted with lodgepole pine in the 1980s. This work is funded by the RSPB and EU. So far rehabilitation work has been successful but expensive.

3.6 Deadwood program

- The importance of deadwood for maintenance of biodiversity in forested areas is generally accepted by the industry following work by Humphrey *et al.* (see references). This work found that the presence of late successional structures, such as deadwood enhanced the biodiversity value of a particular area of forest.
- Excellent deadwood management guidelines have been developed recently from the research work (Humphrey *et al.*, 2002a). UK foresters are encouraged to implement these broad guidelines in the development of design plans for coupes.
- A course is conducted by researchers from the FC, Woodland Ecology Branch to train forest planners in the use of the guidelines. Course content looks good.

Comments for Tasmania: The experience in Britain has been that the greatest progress in achieving conservation outcomes occurs where research, policy, regulation, incentives and published guidance are made to work together effectively. This requires stakeholders working together and not solely to their own agendas.

The Forest Practices System in Tasmania provides us with the opportunity to have this ‘joined up’ approach to assist achievement of ecologically sustainable forestry goals. The current closed loop between researchers, guideline development and forest operations within the system should continue to be encouraged and adequately resourced. In addition, recognition and links to the system by other agencies and research organisation in the State need to be encouraged or enhanced.

3.7 Fieldtrip to Glentress ‘working’ Forest

- While it is recognised by conservationists, foresters, researchers and policy makers that ancient and semi-natural woodlands are the best overall for biodiversity, the part played by maturing planted forests are also now acknowledged. Stand management and the resulting structure can have an important influence on biodiversity.
- Glentress is a large plantation forest with a similar species mix to Kielder. It is a popular for recreational activities by the local community and visitors to the area. Some of the beneficial features of the forest have been obtained accidentally. However, the forest is now managed to enhance biodiversity and aesthetic values.

For example through increasing tree species diversity, open space, stand retention (variable retention) and incorporation of deadwood. Small 3ha coupes are being trialed to assist maintenance of continuous cover.

4.0 Notes on Bioforest Project - Environmental Research Institute, University College Cork, Ireland

4.1 Background

A visit was made to the Environmental Research Institute, University College Cork, in Ireland to discuss the Bioforest project and related research and advisory work.

A field trip was undertaken to learn about biodiversity values of managed forests in southern Ireland. Contacts and publications collected are listed on page 12 and 14.

4.2 Forestry in southern Ireland

- Only 0.5% of the total land area of Ireland has broadleaf woodland cover. Less than any European community country. Mature forest fauna species have been lost and bird species in decline.
- Current government policy is to increase forest cover from 9% to 15% by 2010 (National Development Plan). This involves afforestation of both State and Private land. The objective seems to be a mix of increasing the environmental quality of the landscape whilst also increasing wood production potential for the future. The main driver ensuring that afforestation occurs in an environmentally sustainable way is the need for Environmental Certification.
- There has also been an increase in funding and government policy commitment to increase research into biodiversity of afforestation sites and impacts of forest practices. The main players include the Council for Forest Research and Development (COFORD), the government forestry agency (Coillte) and the EPA (monitors outputs from guideline implementation).
- All forest operation over 100ha need an EIA during forestry plan development by developer or contractor. This is assessed by a government forestry inspector and other stakeholders (e.g., the heritage council and central fisheries agencies) have input. Once the plan is approved the landowner obtains a grant from the government to undertake the forestry development.
- There are a number of published guidelines produced by Coillte, including ones on forest biodiversity conservation and enhancement (see publications list), which apply to all grant-aided projects and to all activities associated with a felling licence. The system is self regulating. Reported breaches may result in forfeit of grant aid or withdrawal of the felling licence.

4.3 Bioforest Program

- The Bioforest program is a large scale five year research program running from 2001- 2005 that aims to address gaps that exist in the current information on biodiversity in Irish plantation forests. The program funded by the EPA and COFORD includes three overlapping projects; Biodiversity assessment of afforestation sites, Assessment of biodiversity at different stages of the forest

cycle and Investigation of experimental methods to enhance biodiversity in plantation forests.

- The Bioforest program is a collaborative project and includes researchers from the University College, Cork, Trinity College, Dublin and Coillte teoranta (The Irish Forestry Board). Coillte has only recently employed ecologists to work within the organisation.
- There is an absence of standard inventory data to underpin strategic planning in Ireland and therefore there is a concern that the development of the forest industry and conservation of biological diversity may come into conflict. It is hoped that the outcomes of the Bioforest program ie., a protocol for assessing the biodiversity of afforestation sites and information for projecting how forestry activities may affect them, will enable decisions to be made based on objective scientific data and hence reduce the potential for conflict.
- Results from the Bioforest program will be used to assess the efficacy of the current Forest Biodiversity Guidelines produced by Coillte and in the development of any changes to the guidelines.

Comments for Tasmania: The RFA process resulted in some excellent GIS coverages and there are some fauna databases (eg., threatened fauna database managed by the FPB and general fauna database managed by DPIWE) which can be used in strategic planning of forestry activities. However, there is still an urgent need for projects like those being undertaken in Ireland, for the development of protocols to assess fauna diversity value at the forest block and coupe scale and the levels of structural complexity required. This could include a review of indicators of biodiversity used nationally and internationally (ie., structural, compositional and functional) and the testing and tailoring of indicators to the Tasmanian situation. Such work would also provide information of use in evaluating the efficacy of existing Forest Practices Code provisions for the maintenance of fauna diversity in areas where production forestry activities occur.

4.4 Education program

- A certificate course on 'Biodiversity Components of Forestry' is run by the University College for foresters and others involved in the industry. This course is well attended and includes three modules; Introduction to biodiversity and Habitats, Forests and the environment and Conservation and Forest Practice. Topics covered range from the economic impacts of biodiversity maintenance to practical implementation of specific forest biodiversity guidelines. The course fees help to fund a part-time course co-ordinator.

Comments for Tasmania: The Forest Practices Board currently runs courses to facilitate implementation of Code provisions, including one on fauna conservation management under the Forest Practices System. However, the demand on specialists time and need for accreditation of such courses by a recognised education provider has increased with the increasing complexity of the system. The biodiversity courses (flora, fauna, soils and geomorph) could be amalgamated and run through the appropriate departments at the University

of Tasmania. The FPB specialists could share the responsibility for the development of course content and desired outcomes with the University course co-ordinator, but the University would be responsible for the delivery and administration of the course. The FPB would continue to run practical field days to reinforce information provided in the course.

5.0 Society for Conservation Biology (SCB) Conference, Canterbury,UK

The overall theme of this conference was *People and Conservation*. The 41 Symposium topics varied widely under this broad theme and included conservation issues concerning all fauna and flora groups, ecosystem management, conservation planning and reserve design, sustainable resource use, scientists and managers:bridging the gap and conservation issues concerning people.

Summary points gained from the talks attended include:

- Social issues must be addressed in any conservation management program,
- Successful implementation of any conservation measures requires science, community consultation as well as industry involvement. Processes need to be set up to achieve this.
- A lot of focus on developing strategies, plans and guidelines from research, however little recognition of the difficulties involved in implementation and monitoring of conservation measures or demonstration of successful adaptive management.
- The requirement for conservation measures in the matrix (outside of reserves) generally accepted.

SCB provides a good forum for a broad mixture of folk working in the field of conservation biology and resource management including land managers, educators, scientists, lawyers and policy makers and consultants.

Posters noted included one reporting on an industry funded program to support undergraduate students wishing to undertake an internship with a conservation or government organisation (eebweb.arizona.edu/CBIPWEB/Index.htm). This could either be to gain work experience in conservation management or to undertake a collaborative research/monitoring project. Such a program could be set up in Tasmania with the relevant departments from the University of Tasmania. This would help to increase links with the University and would assist resourcing of the FPB monitoring and research programs.

For full abstracts:

<http://conservationbiology.org/SCB/Activities/meetings/2002/sessions.cfm>

6.0 List of Contacts

Kielder Forest, UK

Bill Burlton,
District Forester - Conservation
Kielder Forest District Office,
Forest Enterprise
Forestry Commission,
Bellingham,
Northumberland,
UK.
bill.burlton@forestry.gsi.gov.uk

Martin Davison
Project officer – Raptor conservation management
Kielder forest District Office
Forest Enterprise
Forestry Commission,
Bellingham,
Northumberland,
UK.

Woodland Ecology Branch, Forestry Commission, Roslin, Scotland

WWW: http://www.forestry.gov.uk/forest_research

Dr Jonothan Humphrey (research scientist and educator, deadwood courses,
biodiversity assessment)
Woodland Ecology Branch
Forest Research
Northern research Station
Roslin
Midlothian
E25 9SY
UK
jon.humphrey@forestry.gsi.gov.uk

Alice Broome
Priority Species Officer
Woodland Ecology Branch
Forest Research
Northern research Station
Roslin
Midlothian
E25 9SY
UK

Joe Hope
Landscape dynamics modeller
Woodland Ecology Branch

Forest Research
Northern research Station
Roslin
Midlothian
E25 9SY
UK

Helen Armstrong
Browsing animal ecologist
Woodland Ecology Branch
Forest Research
Northern research Station
Roslin
Midlothian
E25 9SY
UK

Chris Quine
Head of Branch
Woodland Ecology Branch
Forest Research
Northern research Station
Roslin
Midlothian
E25 9SY
UK

Russell Anderson
Open habitat management officer
Woodland Ecology Branch
Forest Research
Northern research Station
Roslin
Midlothian
E25 9SY
UK

***Bioforest Project - Environmental Research Institute, University College Cork,
Ireland***

Dr John O'Halloran
Department of Zoology and animal Ecology
University College Cork
Lee Maltings
Prospect Row
Cork
Ireland
j.ohalloran@ucc.ie
<http://bioforest.ucc.ie/>

7.0 References and Publications Collected (Copies available if anyone interested).

Guidelines/Education leaflets and reports

- Anon (2000) Forest Biodiversity Guidelines. Forest Service, DMNR, Dublin, Ireland.
- Anon (2000) Forest Harvesting and the Environment Guidelines. Forest Service, DMNR, Dublin, Ireland.
- Anon (2000) Forestry and Archaeology Guidelines. Forest Service, DMNR, Dublin, Ireland.
- Anon (2000) Forestry and the Landscape Guidelines. Forest Service, DMNR, Dublin, Ireland.
- Anon (2000) Forestry and water Quality Guidelines. Forest Service, DMNR, Dublin, Ireland.
- Anon(?) Indicators for monitoring and evaluation of forest biodiversity in Europe. Report from a pan-European concerted action comprising 27 European research organisations. ZooBo Tech/Grafikgruppen.
- Forest Enterprise (1993) The Birds of Kielder .Forestry Commission.
- Forest Enterprise (1996) Kielder Forest Park – Guide Book. Forestry Commission.
- Forest Enterprise (2002) Kielder Forest District Design Concept Map. Forestry Commission, UK.
- Forestry Commission (1990) Forest Nature conservation Guidelines. Forestry Commission, UK.
- Forestry Commission (2000) Forests and Water Guidelines. Third Edition.Forestry Commision,UK.
- Humphrey,J.,Stevenson, A.,Whitfield, P.,Swales, J. (2002a) ‘Life in Deadwood’. A guide to managing deadwood in Forestry Commission forests. Forest Enterprise,UK.
- The Forestry Authority (1998) The UK Forestry Standard – The governments approach to sustainable forestry. Department of Agriculture for Northern Ireland and the Forestry Commission for Great Britain.
- The Heritage Council (1999) Policy paper on Forestry and the National Heritage. The Heritage Council of Ireland.
- UKWAS Steering Group (2000) Introduction to the UK Woodland Assurance Scheme. UKWAS Support Unit, Forestry Commission, UK.
- UKWAS Steering Group (2000) Certification Standard for the UK Woodland Assurance Scheme. UKWAS Support Unit, Forestry Commission, UK.
- Walsh, P.M., O’Halloran, J., Giller, P.S., and T.C. Kelly (draft, 2002) Forestry and bird diversity in Ireland: a management and planning guide. Unpublished draft report. National University of Ireland, Cork.

Research Publications – Biodiversity/Plantations

- Broome,A.C. (1999) Review of species action plan research needs for the Forestry Commission. Executive Summary. Draft report to GB Policy and Practice Division, November 1999.
- Ferris,R.,Peace,A.J.,Humphrey,J.W.,Broome, A.C (2000) Relationship between vegetation, site type and stand structure in coniferous plantations in Britain. Forest Ecology and Management 136:35-51.
- Gill, G.,McIntosh, B (2001) Restructuring of plantation forest: Kielder, UK. In the Forests Handbook, Blackwell Science Ltd, pp298-309.

- Gittings, T., McKee, A., O'Donoghue, S., Pithon, J., Wilson, M., Giller, P., Iremonger, S., Mitchell, F and O'Halloran, J (2001) Biodiversity Assessment in Preparation for Afforestation: A Review of Existing Practice in Ireland and Best Practice Overseas. Unpublished report to Bioforest Steering Group, Ireland.
- Humphrey, J., Ferris, R and Quine, C (2002) Biodiversity in Britain's Forests. Results from the Forestry Commission's biodiversity assessment project. Technical paper xxx. Forestry Commission, Edinburgh.
- Humphrey, J., Ferris, R., Jukes, M and Peace, A. (2002) Biodiversity in planted forests. Forest Research Annual Report and Accounts 2000-2001.
- Humphrey, J.W., Davey, S., Peace, A.J., Ferris, R., Harding, K (2002) Lichens and bryophyte communities of planted and semi-natural forests in Britain: the influence of site type, stand structure and deadwood. *Biological Conservation* 107, 165-180.
- Humphrey, J.W., Ferris, R., Jukes, M.R., Peace, A.J (2001) The potential contribution of conifer plantations to the UK biodiversity action plan. *Bot.J.Scotl.* 54(1), 49-62.
- Humphrey, J.W., Newton A.C., Peace A.J., Holden, E (2000) The importance of conifer plantations in northern Britain as a habitat for native fungi. *Biological Conservation* 96:241-252.
- Humphrey, J.W., Patterson, G.S. (2000) Effects of late summer cattle grazing on the diversity of riparian pasture vegetation in an upland conifer forest. *Journal of applied ecology* 37: 986-996.
- Humphrey, J., Quine, C (2001) Sitka spruce plantations in Scotland: Friend or Foe to biodiversity? *Glasgow Naturalist*, 23 pp66-76.
- Lehane, B.M., Giller, P.S., O'Halloran, J., Smith, C., and Murphy, J. (2002) Experimental provision of large woody debris in streams as a trout management technique. *Aquatic Conservation: Marine and freshwater Ecosystems* 12:289-311.
- Quine, P.C., Humphrey, J.W., Purdy, K., Ray, D (2002) An approach to predicting the potential forest composition and disturbance regime for a highly modified landscape: a pilot study of Strathdon in the Scottish highlands. *Silva Fennica* 36(1):233-247
- UK Biodiversity Group (1988) 'Wet woodland- A Habitat Action Plan'. UK Biodiversity group Tranche 2 Action Plans. Volume II – terrestrial and freshwater habitats. English Nature, Peterborough.
- Walsh, P.M., O'Halloran, J., Kelly, T.C and Giller, P.S (2000) Assessing and optimising the influence of plantation forestry on bird diversity in Ireland. Paper presented at the Annual Symposium of the Society of Irish Foresters.

Wind damage

- Dunham, R., Gardiner, B., Quine, C., Suarez, J (2000) Forest Gales. A PC based wind risk model for British Forests. Version 1.3. Forestry Commission, UK. (CD available).
- Gardiner, B.A., Quine, C.P (2000) Management of forests to reduce the risk of abiotic damage – a review with particular reference to the effects of strong winds. *Forest Ecology and Management* 135: 261-277.
- Moore, J., Quine, C (2000) A comparison of the relative risk of wind damage to planted forests in Border Forest Park, Great Britain, and the Central North Island, New Zealand. *Forest Ecology and Management* 135:345-353.

Quine,C.P.,Humphrey,J.W and Ferris,R. (1999) Should the wind disturbance patterns observed in natural forests be mimicked in planted forests in the British uplands? *Forestry*, 72(4):337-358.

Acknowledgements

I thank the CFPO and Forest Practices Board for supporting this study tour and conference attendance. I also thank the many people (listed in 6.0) who gave up their time and made me feel very welcome. Thanks especially to my initial contacts Jonathon Humphries, Woodland Ecology Branch, FC, Bill Burlton, FE and Jon O'Halloran, University of Cork.



Photo 1 Dead native woodland remnant within plantation, Kielder Forest.



Photo 2 Tawny owl nest box at Kielder, UK.



Photo 3 Active european goshawk nest in mature Sitca spruce plantation.



Photo 4 Regenerating a streamside reserve at Kielder.



Photo 5 Plantation landscape at Glentress with retained open spaces on streams.



Photo 6. Moorland adjacent to plantation. Merlin nest monitoring by raptor project officer.



Photo 7 Tasmanian tree fern for sale (300 pounds) in garden centre in the UK.



Photo 8 Small 3 ha coupe in continuous cover zone at Glentress.



Photo 9 Southern Upland landscape in Scotland.