RECENT PUBLICATIONS

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Journal Articles

Duffy, S.P., Young, A.M., Morin, B., Lucarotti, C.J., Koop, B.F., and Levin, D.B. 2006. Sequence analysis and organization of the *Neodiprion abietis* nucleopolyhedrovirus genome. *Journal of Virology* **80**: 6952–6963.

Of the 30 baculovirus genomes that have been sequenced to date, the only nonlepidopteran baculoviruses include the dipteran *Culex nigripalpus* nucleopolyhedrovirus and two hymenopteran nucleopolyhedroviruses that infect the sawflies *Neodiprion lecontei* (NeleNPV) and *Neodiprion sertifer* (NeseNPV). This study provides a complete sequence and genome analysis of the nucleopolyhedrovirus that infects the balsam fir sawfly *Neodiprion abietis* (Hymenoptera, Symphyta, Diprionidae). The *N. abietis* nucleopolyhedrovirus (NeabNPV) is 84,264 bp in size, with a G+C content of 33.5%, and contains 93 predicted open reading frames (ORFs). Eleven predicted ORFs are unique to this baculovirus, 10 ORFs have a putative sequence homologue in the NeleNPV genome but not the NeseNPV genome, and 1 ORF (neab53) has a putative sequence homologue in the NeseNPV geneome but not the NeleNPV genome. Specific repeat sequences are coincident with major genome rearrangements that distinguish NeabNPV and NeleNPV. Genes associated with these repeat regions encode a common amino acid motif, suggesting that they are a family of repeated contiguous gene clusters. Lepidotperan baculoviruses, similarly, have a family of repeated genes called the bro gene family. However, there is no significant sequence similarity between the NeabNPV and bro genes. Homologues of early expressed genes such as ie 1 and lef 3 were absent in NeabNPV, as they are in the previously sequenced hymenopteran baculoviruses. Analyses of ORF upstream sequences identified potential temporally distinct genes on the basis of putative promoter elements.

Luther, J.E., Fournier, R.A., Piercey, D.E., Guindon, L., and Hall, R.J. 2006. Biomass mapping using forest type and structure derived from Landsat TM imagery. *International Journal of Applied Earth Observation and Geoinformation* **8**: 173–187.

A method for mapping forest biomass was developed and tested on a study area in western Newfoundland, Canada. The method, BIOmass from Cluster Labeling Using Structure and Type (BioCLUST), involves: (i) hyperclustering a Landsat TM image, (ii) automatically labeling the clusters with information about forest type and structure, and (iii) applying stand-level equations that estimate biomass as a function of height and crown closure within forest species-type classes. BioCLUST was validated with biomass values measured at georeferenced field plots and mapped across the study area using an existing forest management photo-inventory. Root mean square error (RMSE) values ranged from 43 to 79 tonnes/ha, and were lowest for intermediate height classes when validated with field plots. Overall bias was negative at 10 tonnes/ha compared with a negative bias of 3 tonnes/ha estimated for the photo-inventory. Validation of the biomass map gave RMSE values of 37–47 tonnes/ha and overall landscape biomass estiamtes within 0.4% of biomass mapped by the photo-inventory. BioCLUST offers an alternative to other biomass mapping methods when scene-specific plot data are limited and a photo-inventory is available for a representaive portion of a Landsat scene.

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MacDonald, J.E., and Little, C.H.A. 2006. Foliar application of GA_3 during terminal long-shoot bud development stimulates shoot apical meristem activity in *Pinus sylvestris* seedlings. *Tree Physiology* **26**: 1271–1276.

The effect of exogenous gibberellin (GA_3) on shoot apical meristem activity in conifer vegetative buds was investigated by spraying 0 or 0.1% GA_3 on the foliage of first-year Scots pine (*Pinus sylvestris* L.) seedlings twice weekly for 9 weeks during development of the terminal long-shoot bud. Exogenous GA_3 promoted mitotic activity in the apical zone, thereby increasing both the rate and duration of cataphyll formation and giving rise to a higher and wider apical meristem. The increase in number of cataphylls increased the number of axillary meristems, which developed as short-shoot buds.

McLaren, B.E., Roberts, B.A., Djan-Chékar, N., and Lewis, K.P. 2006. Effects of overabundant moose on the Newfoundland landscape. *Alces* **40**: 45–59.

The long-term effects of introduced and overabundant herbivores on community development must be monitored and managed in an ecosystem-based forest management approach. This paper builds on previously published ecological descriptions and hypotheses offered on the effects of moose overabundance in Newfoundland. The island, in the absence of wolves, provides a setting for study of local irruptions in moose populations, which now affect an increasing area of the forest. Moose effects occur most often after natural disturbances and logging, involving unique forest succession patterns. We describe some of these changes, along with anticipated and realised changes in associated forest biodiversity. We offer suggestions to improve or refine monitoring of moose populations, especially at local scales, to detect cases of overabundance. Finally, we offer recommendations for the management of overabundant moose populations.

Penner, M., Swift, D.E., Gagnon, R., and Brissette, J. 2006. A stand density management diagram for balsam fir in New Brunswick. **The Forestry Chronicle 82**: 700–711.

A stand management density diagram (SDMD) is presented for balsam fir (*Abies balsamea* (L.) Mill.) forests in New Brunswick. The SDMD incorporates a maximum size density line, as well as quadratic mean diameter and top height isolines. Several mortality functions are evaluated. The resultant SDMD should be a useful tool for projecting early stand development and determining the timing and intensity of thinnings.

O'Connell, L.M., Mosseler, A., and Rajora, O.P. 2006. Impacts of forest fragmentation on the reproductive success of white spruce (*Picea glauca*). *Canadian Journal of Botany* **84**: 956–965.

The fragmentation of forests into small, isolated remnants may reduce pollen quantity and quality in natural plant populations. The reproductive success of white spruce (*Picea glauca* (Moench) Voss) was assessed in a landscape fragmented by agriculture in northern Ontario, Canada. We sampled a total of 23 stands and 104 white spruce trees from three different stand size classes. Each sampled stand was separated by 250–3000 m from the nearest neighbouring stand. Reproductive success, measured as the number of filled seeds per cone, increased with stand size. The total number of seeds per cone, a measure that includes both filled and aborted seeds, also increased with stand size, suggesting that pollen receipt limits the number of seeds in a cone. The proportion of empty seeds (postzygotic abortions) was highest in the two smallest stand size classes, suggesting that inbreeding levels were also highest in these stands. We detected no difference in germination success, seedling growth, and growth of trees up to 10 years from seeds produced by trees from different stand size classes. These results suggest that inbred individuals are largely eliminated during the seed development stage. We estimated that a threshold population size of 180 trees is needed to reduce the negative effects of pollen limitation and inbreeding and maintain seed yields observed in large contiguous stands.

Varghese, J., Krogman, N.T., Beckley, T.M., and Nadeau, S. 2006. Critical analysis of the relationship between local ownership and community resiliency. *Rural Sociology* **71**: 505–527.

Collectively, current resource-development literature has given little attention to organizational features of ownership as important variables in community resilience. By drawing from six local buyout cases in Canada's forest sector, we reveal the complexity and numerous constraints on local ownership and expose a more nu-

anced context than most sociologists tend to consider. Our findings suggest that the meaning of local ownership and community resiliency varies depending upon the composition (e.g., private vs. public; mill vs. forest license vs. coupled mill & forest license), type (social, cooperative, trust and/or direct-share ownership), extent of ownership (percentage of local vs. extra-local shares), and the level of control (e.g., proportion of locally held seats on the Board of Directors) associated with ownership. Future research on local ownership should more carefully differentiate between the nature of local ownership and its associated outcomes.

Books and Book Chapters

Swift, D.E., Kilpatrick, B., Murray, T., Toole, D., Henderson, J. and Pitt, C. 2006. Acadia Research Forest: a brief introduction to a living laboratory. Pages 104–118 *In* L.C. Irland, A.E. Camp, J.C. Brissette, and Z.R. Donohew (eds.). *Long-term silvicultural & ecological studies: results for science and management.* Yale University, School of Forestry and Environmental Studies, Global Institute of Sustainable Forestry Research Paper 005.

Forest research activities began at the Acadia Research Forest (ARF, then known as the Acadia Forest Experiment Station) in 1933. The ARF was the second in a series of research forests that were established by the Canadian government to develop and demonstrate sustainable forest management practices. It occupies approximately 9000 ha of forest in the Acadian Forest Region near Fredericton, New Brunswick, Canada. Presently, it serves as a living laboratory for the Atlantic Forestry Centre of Natural Resources Canada's Canadian Forest Service. A brief history of its establishment is provided. The climate, site conditions, long-term databases, collaborators, and facilities of the research forest are also described. Examples of past and present research activities are presented, with indications of their application to forest management.

Miscellaneous

Adam, C.I., and Ostaff, D.P. 2006. *Balsam woolly adelgid.* Natural Resources Canada, Canadian Forest Service - Atlantic Forestry Centre Pest Note 3.