GENUS-LEVEL APPROACH TO *TAXUS* SPECIES.

AUTHOR:
Ken Farr

The purpose of this general case study was not to describe a specific non-detrimental finding procedure applicable to all *Taxus* spp. Rather, this study outlines an approach to sustainable harvest of leaf and twig biomass of the North American species *Taxus canadensis,* with the intention of informing discussion around the making of non-detrimental findings for other *Taxus* species.

Within the study, sustainable harvesting guidelines and principles developed jointly by researchers and harvesting companies in Canada for *T. canadensis* are presented. The guidelines focus primarily on the level of harvest intensity that can reasonably be employed if full regeneration of the harvested population is expected. In the specific case of *T. canadensis*, physiological research and field testing have determined that the optimum sustainable harvest level is removal of up to, but not more than, three years of growth (i.e. the three most current seasonal growth extensions) from any stem. Thus, biomass harvest limits are applied directly to individual stems, rather than indirectly to (e.g.) volume of biomass per unit of harvested land area.

In addition to facilitating a sustainable biomass harvest, it is possible use of direct stem-specific limits in harvest guidelines can reduce regulatory burdens associated with enforcing area- or volume-based harvest controls. Stem-specific limits allow direct monitoring of individual harvesters' adherence to guidelines through simple visual inspection of the portion of biomass removed from plants.

Where *T. canadensis* harvesting guidelines have been incorporated in legislation, additional monitoring and control methods are employed. These include requirements for harvest site mapping and reporting, mandatory training and licensing of biomass harvesters and sellers, chain-of-custody and transport controls, and limit of legal biomass export and import to licensed buyers.

Current, ongoing research suggests that in addition to sustainability gains, the stem-specific harvest limits contained in the guidelines can produce

measurable economic advantages for harvesters — an outcome likely to encourage compliance with regulations. Conversely, aggressive harvesting methods that exceed the optimum harvest level result in additional costs to harvesters. Positive economic outcomes are linked to quality and quantity of product (taxanes) in biomass harvested, and to reduced travel, transport and operating costs.

It should be noted that all discussion here relates to harvest of *Taxus* spp. for leaf and twig biomass. Sustainable harvest of *Taxus* spp. for bark appears problematic and, based on available information, cannot be recommended.