



NOVA FOREST ALLIANCE

CONTRACTORS & OPERATORS

BEST MANAGEMENT PRACTICES MANUAL

MARCH, 2012



A Contractors Code of Practice

I will conduct forest operations in accordance with a mutually developed woodlot operations plan that recognizes landowner objectives and ecological values.

I will plan and operate in a manner designed to protect biodiversity.

I will conduct harvesting operations to facilitate forest renewal.

I will construct forest roads in a manner that minimizes impact on the environment.

I will operate with due diligence for the health and safety of employees and the public.

I will promote public awareness of sustainable forest management and respond to public concerns about forest practices in a sensitive and progressive manner.

I will participate with the Nova Forest Alliance in monitoring and evaluating my compliance with these principles.

Contractor

Chair, Nova Forest Alliance

TABLE OF CONTENTS

INTRODUCTION	1
NOVA FOREST ALLIANCE MEMBERSHIP LIST	2
FOREST PRODUCTS ASSOCIATION OF NOVA SCOTIA	3
DEVELOPING LANDOWNER AGREEMENTS: BEST MANAGEMENT PRACTICES	5
ROAD CONSTRUCTION: BEST MANAGEMENT PRACTICES	12
WILDLIFE HABITAT: BEST MANAGEMENT PRACTICES	16
HARVESTING: BEST MANAGEMENT PRACTICES	21
ENSURING A SAFE OPERATION: BEST MANAGEMENT PRACTICES	33
FUEL AND OIL STORAGE AND HANDLING	35
PERFORMANCE MONITORING: BEST MANAGEMENT PRACTICES	38
BUSINESS: BEST MANAGEMENT PRACTICES	39
SELF PERFORMANCE CHECKLISTS	41
ADDITIONAL RESOURCES	47
LIST OF LEGAL REQUIREMENTS	49
USEFUL PHONE NUMBERS	52

INTRODUCTION

Welcome to the latest edition of the Nova Forest Alliance Best Management Practices (BMP) Manual. It was prepared through the diligent efforts of a number of individuals and organizations that work together to improve forestry practices in Nova Scotia. The manual is the basis for training sessions offered by the Forestry Safety Society of Nova Scotia.

Many of the fundamental procedures and practices remain unchanged from the 2007 edition of the manual. The format has been improved so that information may be found more easily. Good forestry is a process of continuous improvement, and this manual sets the bar a little higher for practitioners of forest management in the province.

The manual is intended to be a reference that can be kept handy at the job site. It is the product of more than a decade of collaboration and revision. We hope that it will be used by all contractors and woodlot owners who wish to operate safely, efficiently and with respect for the environment.

Nearly three-quarters of Nova Scotia's forest land is under private ownership. Of paramount importance are the landowners' visions for the future of their properties. This manual suggests effective ways of working with woodlot owners to achieve their objectives. Other sections describe procedures that are valuable in recognizing significant wildlife habitat, the proper construction and maintenance of woodlot roads, safe handling and storage of fuel and oils, and harvesting methods that require ecological consideration of each forest site.

An increasing public scrutiny of forest practices and greater demand for products from well-managed forests indicates that a multitude of techniques must be used in managing forests. This manual lays a foundation for procedures that most woodlot owners and forest contractors implement on a regular basis.

With ever-increasing demands on Nova Scotia's forests to provide ecological and economic values to society, woodlot owners and contractors must exhibit – by practice – a progressive approach towards sustainable forest management.

We hope that this manual lays the groundwork for efficient and effective harvesting of wood fiber, respect for wildlife habitat and the prudent renewal of our forest resources. We recognize that this manual is a work in progress and welcome your feedback. Please feel free to contact us should you have any comments or suggestions for improvement.

Yours sincerely,

Nova Forest Alliance BMP Working Group

NOVA FOREST ALLIANCE MEMBERSHIP LIST

PARTNERS

AbitibiBowater
Barrett Lumber Company
Canadian Forest Service
Canadian Institute of Forestry Nova Scotia Section
Canadian Parks and Wilderness Society-NS Chapter
Christmas Tree Council of Nova Scotia
Cobequid Salmon Association
Conform Ltd.
CMM - First Nations Forestry Program
Dalhousie University
Department of Fisheries and Oceans
Ecology Action Centre
Eskasoni Fish and Wildlife Commission
Federation of Nova Scotia Woodland Owners
Forest Group Venture Association
Forest Products Association of Nova Scotia
Halifax Water
JD Irving
Ledwidge Lumber Company Ltd.
Mersey Tobeatic Research Institute
Musquodoboit Valley Tourism Association
Nature Nova Scotia
NewPage Port Hawkesbury Corp
Nova Scotia Agricultural College
NS Department of Natural Resources
NS Environmental Network
NS Forest Technicians Association
Nova Scotia Forestry Association
NS Silviculture Contractors Association
Registered Professional Foresters Association of NS
PEI Model Forest Network Partnership
Russell White Lumber
Southwest Nova Biosphere Reserve Association
St. Mary's River Association
Unaffiliated Environmentalists
Unaffiliated Landowners
Unama'ki Institute of Natural Resources

ASSOCIATE MEMBERS

Atlantic Forestry Review
Athol Forestry Cooperative
Central Nova Tourist Association
Centre for Wildlife and Conservation Biology
Colchester Regional Development Agency
Elmsdale Lumber Co. Ltd.
Environment Canada
Forestry Safety Society Nova Scotia
Fundy Model Forest
Groupe Savoie Westville Division
Guysborough County Regional Development Authority
Harrison Lewis Coastal Discovery Centre Society
Heffer Forest Products
Interforest Inc.
John Tanner and Son
Kaiser Meadow Brook Preservation Group
Louisiana Pacific Canada
Municipality of Colchester
North Nova Forest Owners Co-op Ltd
NS Environment
Parks Canada
PEI Department of Environment, Energy and Forestry
Ruffed Grouse Society of Canada
Sierra Club of Canada-Atlantic Chapter
St. Francis Xavier University
Tourism Industry Association of NS
Town of Stewiacke
Verboom Grinders Ltd.
Wood Product Manufacturing Association
Woodcock Conservation Society

BMP WORKING GROUP MEMBERS

Al Angrignon, Forestry Safety Society
Calvin Lambert, Verboom Grinders Ltd.
David Harrison, Wagner Forest NS
David Sutherland, Association for Sustainable Forestry
Gerald Holmes, NewPage Port Hawkesbury Corp. (chair)
Ian Millar, Registered Professional Foresters Association
Ian Johnstone, Wagner Forest NS
Jamie Simpson, Ecology Action Centre
Jason Casey, Elmsdale Lumber
Jim Verboom, Verboom Grinders Ltd.
Jonathan Kierstead, SFI Implementation Committee
Mike Hutchinson, Federation of NS Woodland Owners
Mark MacPhail, Unama'ki Institute of Natural Resources
Matt Miller, Ecology Action Centre
Stephen Thompson, Elmsdale Lumber
Terry Traer, AbitibiBowater
Jillian Weldon-Genge, SFI Implementation Committee

FOREST PRODUCTS ASSOCIATION OF NOVA SCOTIA

The Forest Products Association of Nova Scotia (FPANS) is adopting this Best Management Practices Manual as a tool to help its members follow the seven Principles of Forest Stewardship for Nova Scotia.

Our forest industry directly supports 13,000 jobs and indirectly provides employment to an additional 10,000 Nova Scotians each year. The forest is a complex resource that we all must treat with great respect. Through the use of this manual the Forest Products Association of Nova Scotia endeavors to ensure our industry continues to thrive by managing this complex resource in a sustainable fashion.

As the forest industry we also recognize our responsibility to work with landowners, maintain clean water, provide opportunities for forest recreation, and to enhance our natural, biodiverse, Acadian Forest landscape. Following the Best Management Practices detailed throughout this manual will ensure contractors, woodlot owners and industry members are contributing to the sustainable use of our forest resource while maintaining our environment and contributing to our social needs.

By adopting, distributing and providing training on this Best Management Practices manual the Forest Products Association of Nova Scotia intends to:

1. Provide a better understanding of the Principles of Forest Stewardship.
2. Increase awareness of some measure of sustainability.
3. Demonstrate a commitment to fulfilling the Principles of Forest Stewardship by members of FPANS.
4. Provide consistency in the way all FPANS members understand and apply the Principles.

Principles of Forest Stewardship in Nova Scotia

Forest Products Association of Nova Scotia

1. Forest operation will be conducted in accordance with an operations management plan for the property which identifies environmental protection and forest conservation measures.
2. Forest planning and operations will be conducted in accordance with the Wildlife Habitat and Watercourse Protection Regulations for Nova Scotia which are designed to sustain forest biodiversity and wildlife habitat.
3. Harvesting operations will be designed to facilitate forest renewal either by natural regeneration or planting.
4. Forest roads will be constructed in accordance with the Standards of the Nova Scotia Department of the Environment.
5. The health and safety of employees and the public will not be compromised by any forest practice.
6. Through the Forest Products Association of Nova Scotia, public awareness and information on Nova Scotia forests will be promoted. Members will cooperate with the Association in responding to public concerns about forest practices in a sensitive and progressive manner.
7. Private landowners have the right to manage their individual forest properties in accordance with their own objectives, while meeting or exceeding government standards for environmental protection and forest conservation.

DEVELOPING LANDOWNER AGREEMENTS: BEST MANAGEMENT PRACTICES

MAKING CONTACT WITH THE LANDOWNER

Making contact with the landowner is the critical first step. First impressions are important and contractors need to approach landowners with honesty and professionalism. Your first step is to prepare thoroughly before meeting the landowner.

PREPARING FOR THE INTERVIEW

STANDARD PRACTICES

- Prepare yourself mentally for the interview. Think about the landowner's point of view and what kind of reassurances and information they may want of you.
- Remember you need to take time to get to know the landowner. Try to establish a rapport. The best way to do this is by asking questions.
- Have some information about yourself. This can be written material such as pamphlets about your company, business cards, photos of past operations or just information you can tell the landowner. The idea is to show professionalism, not to brag.
- It is helpful to have information on the property on which you want to work. Things such as aerial photographs, property maps and woodlot size can be helpful when talking to landowners. You must use your judgment on when it is appropriate to use this information. Some landowners may feel you are checking up on them if you bring out the information too soon.
- Have a working knowledge of the area where you are operating, this could include topics such as: species-at-risk, invasive exotic species, and significant wildlife habitat.
- You may want to have some information on current silviculture programs. Pamphlets are available for most programs. This is helpful even if you do not plan on doing silviculture work yourself. It demonstrates that you are committed to more than just cutting down trees.
- Allow time to walk the woodlot or portion of the woodlot with the owner.

ENHANCED PRACTICES

- Bring the landowner to other sites where you have worked to show the quality of your work.
- Show landowners examples of other uses of the forest on their land – for example, a sugar bush or recreational trails.

FPANS
Stewardship
Principles
6 & 7

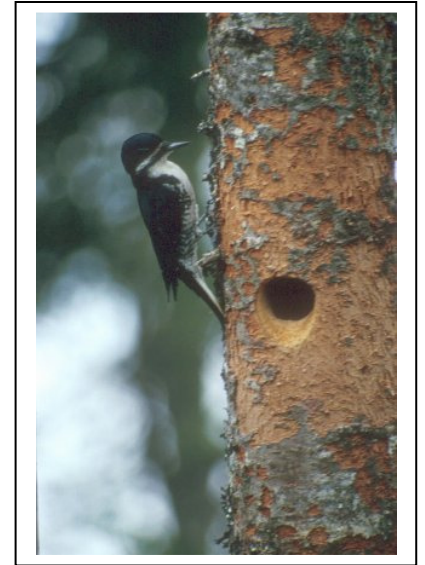
- Develop a portfolio with photographs of previous work on other woodlots.

OWNER'S OBJECTIVES AND EXPECTATIONS

STANDARD PRACTICES

It is important to remember that landowners have the right to manage their property according to their own objectives while meeting or exceeding government regulations. Contractors need to take the time early in the process to determine what those objectives are.

- Asking questions is one of the most important approaches to determining the landowner's objectives and values for their woodlot. Values could include cultural, ecological and geologically important features. Objectives that may be important to landowners include: timber production, income generation, appearance, protection of old growth, wildlife, biodiversity, heritage values such as burial grounds and old farm sites, traditional travel routes, and recreational values such as walking, snowmobiling or having a camp.
- Suggest other forest management alternatives with respect to harvesting, silviculture and the potential for non-timber forest products.



ENHANCED PRACTICES

- Complete a survey or questionnaire to assist in determining the landowner values and/or objectives for the woodlot.

PROPOSED OPERATION PLAN


If you plan to perform a forestry operation on a particular woodlot, you likely have in your mind a rough plan of where you are going to work and how you are going to go about it. This is taken a step further in an operation plan by putting it on paper. An operation plan may be very simple, consisting of a single piece of paper showing the location of the proposed operation and legend. For larger undertakings it may be more complex. Basically, an operation plan outlines what you intend to do, and:

- Demonstrates accountability and responsibility.
- Shows due diligence.
- Reduces misunderstandings.
- Demonstrates a professional image.
- Helps ensure quality work.

WOODLOT ASSESSMENT (INVENTORY)

An operation plan begins with determining what is on the woodlot. This will help determine what can be done to meet the landowner's objectives. An assessment should include a number of actions:

STANDARD PRACTICES

- Conduct an inventory of forest products present on the site. The woodlot condition and the landowner requirements will determine what this inventory will consist of. The inventory may be a formal technical cruise or it may be a less formal descriptive type cruise.
 - Identify all watercourses including springs, brooks, rivers, streams, ponds and lakes.
 - Record observations of wildlife and habitat such as nests and dens.
- 
- Assess other items important in designing the operation such as: soft or wet ground, wetlands and areas of human interest such as old farm sites or graveyards.
 - Identify special management areas such as old growth forests, unique or endangered plants or areas with significant wildlife habitat such as deer wintering areas.
 - Identify opportunities to pursue work with other landowners/contractors in the area to discuss broader landscape objectives.
 - Identify areas with potential opportunities for afforestation, including: old fields/pastures, abandoned roads/landings, and pits/quarries.
 - Identify the potential for prescriptions other than clearcutting.

ENHANCED PRACTICES

- Conduct assessment of broader woodlot values (i.e. non-timber) in consultation with a forestry professional.
- Inventory assessment should document any observed invasive exotic plant or animal species. Consult with DNR if necessary.
- Complete Landowner Decision Support Tool.

PUTTING THE PLAN TOGETHER

The operation plan should include a description of the proposed operations and their location on a map. In finalizing the plan it will be important to re-examine landowner objectives to determine if all of them are met. The plan at this point may have to be revised if not all objectives can be met.

The plan should also include the following items:

STANDARD PRACTICES

- Landowner objectives where applicable.
- A map outlining boundary lines and areas of operation.
- A description of the vegetation present on the area of operation including tree species and size.
- Area to be harvested, harvest prescription and the harvesting method and system to be used.
- Special management areas, wildlife clumps, sensitive or unique areas, recreational trails and graveyards.
- Watercourses and wetlands.
- The number of clumps, wildlife trees and Coarse Woody Debris (CWD) to remain after harvest.
- Stream crossings required and the methods for crossing the stream.

ENHANCED PRACTICES

The operation plan includes in addition to the above:

- Forest stand characteristics from the timber cruise such as stand age, stand health, site quality, stand volume and timber quality.
- Results of consultations with forestry professionals such as the potential for alternative treatments.
- Forest Inventory data; this can be in the form of a table.
- A general description of the type of prescription to be applied, where applicable (e.g. shelterwood, thinning, etc.).
- Potential locations for clumps, corridors, etc. detailed on an operating plan map.

NEGOTIATIONS WITH THE LANDOWNER

Negotiations begin with doing your homework. A proposed operation plan for the landowner to review demonstrates professionalism and responsibility. For example, a great deal of information can be conveyed on a map which can be easily understood by many people. You may also want to include the results of the timber inventory. This could be total volume by product and/or species.

STANDARD PRACTICES

- Go through the proposed operation with the landowner by showing what you plan to do.
- Explain the timing, type of operation, the boundaries of the operation and how you plan to do it.
- Make sure you explain how your proposed operation will help them meet their objectives.
- Detail any areas that will not be cut and why (e.g. around hawk nests, sensitive areas or stream buffers).
- Agree on the financial arrangements.
- Be prepared to revise the operation plan to reflect the landowner's thoughts.

ENHANCED PRACTICES

- Visit the operation area with the landowner to review the operation plan.

HELPFUL HINTS ON FINANCIAL ARRANGEMENTS

- The best method of payment for both the contractor and landowner must be decided. If the landowner has not talked to an accountant, you should advise them to do so before finalizing an agreement.
- Two common methods of payment are lump sum (a complete payment based on what the contractor believes the timber is worth) or piece rate (payment is made as the timber is scaled). Each method has different implications under current tax laws. Type of payments can have impacts for contractors as well. For example, lump sum payments may affect cash flow. All these aspects must be considered when negotiating with an owner and you may be able to offer several options.
- If the agreed arrangement is a piece rate payment, you will have to determine what scale will be used for payment. This could be roadside scale or mill scale. In the case of mill scale it is best to provide the owner with copies of all mill scale receipts.
- The Landowners may require some or all of the following items:

- Liability insurance.
- Clear beginning and end dates of the harvest.
- A specific season of harvest.

AGREEMENT WITH THE LANDOWNER

Any agreement between people or companies should include a contract or lease. This will help protect both you and the landowner and will help avoid future misunderstandings. Contractors should consult a lawyer to develop an agreement that meets their needs.

STANDARD PRACTICES

- Reference to the Operation or woodlot management plan, if applicable, or a description or map of the area of operation.
- Requirement to adhere to fire regulations.
- Method and terms of payment.
- Liability issues.
- Cancellation/termination conditions.
- Wildlife and environmental protection.
- Road construction, maintenance and upgrading.
- Timing of operation.
- Definition of merchantable timber and minimum stump heights.
- Reference to applicable laws such as Wildlife Habitat and Water Course Protection Regulations, Occupational Health and Safety Act, Workers Compensation Act, Forest Act, Wildlife Act, Water Resources Protection Act and Endangered Species Act.
- Workers Compensation Clearance letter.
- Verify that landowner has clear title.
- Binding of agreement to executors and heirs of the property in case something should happen to the landowner.
- Extension of operation timing due to unforeseeable acts.
- Provision for or against assignment of contract.



ENHANCED PRACTICES

- In addition to providing a contract with all of the above listed items, the contract should be registered with a lawyer to provide additional protection to both parties.
- Provide a performance bond to the landowner (if requested).

HELPFUL HINTS

Once you have an agreement with the landowner, your communications should not stop there. It is a courtesy that pays off in trust, to keep landowners informed of the progress of the operation. You may want to send a notice to the landowner a week before you actually start. You may also want to send a notice a week before you finish. Keep a paper trail of your activities for that woodlot, particularly mill scale receipts. You may not plan on using the information but it pays off to keep a paper record.

ROAD CONSTRUCTION: BEST MANAGEMENT PRACTICES

Roads have a major impact on a forested area including impacts on watercourses, drainage, access, wildlife habitat, soil erosion and the visual aesthetics of an area. Roads can enhance the benefits from the forest if constructed properly. Roads essentially take land out of forest production; as a result, careful consideration should be given to their location and requirements. Investing now in a well planned and constructed road will reduce long term maintenance costs and environmental impacts. The following outlines some best management practices that contractors can follow in order to provide the highest quality service to their customers in the design and construction of an access road.

GETTING STARTED - PLANNING AND LAYOUT

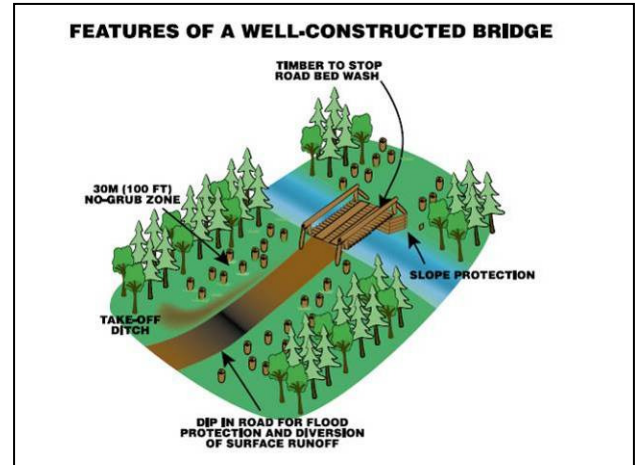
STANDARD PRACTICES

- Owner objectives must be identified and considered.
- The potential for multiple use of the road should be identified.
- Information should be gathered on the area such as topographic information, stream locations, special management features, soil types and drainage.
- Locate roads on stable ground (such as low slopes and high ground).
- Avoid river valleys, steep slopes, swamps and rock ledges, fragile areas (e.g. thin sandy soils) and sensitive areas (e.g. marshes, deer wintering areas, hawk nests).
- Minimize impact on watercourses by reducing the number of crossings and locate the road as far away from watercourses as possible.
- Prepare a preliminary sketch of the road location.
- Adjust road location to reflect site conditions.
- Complete a final sketch of the road location noting special features (i.e. watercourse crossings, landings, etc.).
- Flag and review road location with landowner and reach an agreement.
- Apply for and receive permits and applications (i.e. NS Environment approval for installation of a bridge or culvert and DOT road access permits).

FPANS
Stewardship
Principle
4



- Any work that disturbs a watercourse or wetland requires a permit from NS Environment and work must be carried out or supervised by a person certified by NS Environment as a Recognized Individual who has completed the NS Watercourse Alteration Certification training.
- In-stream work is only allowed between June 1st and September 30th.
- Temporary bridges may be installed year-round, but must have a permit.



ENHANCED PRACTICES

- Consider the sight distance for landscape/aesthetic values.
- Road construction staff should be trained/equipped to implement best management practices (e.g. erosion Control, grading).
- Narrow the road corridor to 10 meters in width with a 30 meter no grub zone on either side of watercourse.
- Seeding – Erosion Control.

APPLYING ROAD CONSTRUCTION TOOLS AND TECHNIQUES

STANDARD PRACTICES

- Use standard accepted road construction practices and follow all regulations and policies (i.e. woodlot roads/stream crossings, endangered species legislation, wetland conservation policy).
- Ensure road is built with proper erosion control.
- Fuel and oil machinery must be more than 30m away from a watercourse on bare mineral soil.
- Dispose of used oil properly through a used oil recycle facility. Information is available through your fuel and oil supplier.
- Avoid having water running in a ditch for greater than 300m to minimize erosion.
- Use cross culverts to avoid blocking natural drainage.

- Use ditches or culverts to direct drainage through vegetation filters and not directly into streams.
- Construct stream crossings with the first priority placed on minimizing impacts on the aquatic ecosystem, including NS Environment water crossing regulations.
- Apply road construction practices that exceed minimum regulations, such as crossing at the narrowest part and at right angles to the stream, crossing at locations with stable soil and without steep sides and crossing where the stream is running relatively straight.
- Bridges must be constructed to the conditions in your permit and the NS Environment regulations.

ENHANCED PRACTICES

- Seed roadsides or use brush mats.
- Use advanced construction techniques such as the use of a rock apron at the culvert outlet.
- Document the work with digital photography.
- Prepare an annual inspection and maintenance plan for your roads and water crossings.
- Post appropriate signage to indicate location of bridges and gates.

HELPFUL HINT

Avoid using the road excessively during wet weather. This can damage the road and create erosion/sedimentation problems, especially in areas with steep slopes.

TEMPORARY STREAM CROSSINGS FOR FORWARDING WOOD

STANDARD PRACTICES

- Temporary stream crossings require a permit from NS Environment. Application must be accompanied by a best management practices document that includes:
 - Bridge design diagram.
 - Erosion and sedimentation control measures.
 - Method of bank stabilization at approaches.
 - Location map (1:50,000 topographic map).
 - Contact information of landowner.
 - Timing and type of harvest operation.



- Use brush mats or logs at ends of crossing.
- Cross at right angles to stream.
- Do not put crossing structure in stream.
- A copy of the permit must remain on-site during operations.
- Remove temporary crossing after operation, and within the specified time limits stated in the permit.
- Stabilize the approaches to the bridge location after removal.
- No silt should enter the stream.

ENHANCED PRACTICES

- Construct a portable solid-bottom bridge that can be re-used from site to site.
- Document installation and removal procedure with digital photography for record-keeping and to be used in future permit applications.



Practice set-up of a temporary watercourse crossing using bunk logs and fabricated runners.



WILDLIFE HABITAT: BEST MANAGEMENT PRACTICES

Wildlife is an important forest value. Wildlife habitat can be defined as an area characterized by a distinct assemblage of landforms, aquatic forms, vegetation, soil and moisture regimes that are considered to be important for a variety of selected wildlife species. Forest operations can either enhance wildlife habitat, detract from it, or maintain the status quo. It is important to consider wildlife aspects at both the woodlot level as well as on adjacent woodlots. One extremely important aspect to consider is species at risk which is governed by both federal and provincial legislation. The Nova Scotia Department of Natural Resources and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) maintains a list of species that are considered to be vulnerable and therefore may need special conservation measures to be implemented.

FPANS
Stewardship
Principle
2

WILDLIFE HABITAT PLANNING

Adequate information should be available in order to integrate wildlife considerations into forest operations. For example, the following should be considered in the design of any forest operation:



STANDARD PRACTICES

- Have a working knowledge of the species at risk (SAR) in your area of operation
 - Key factors include:
 - Habitat requirements.
 - Applicable legislation.
 - Operational restrictions.
 - Options for researching SAR information include:
 - Contacting regional DNR wildlife biologist (see phone listings in Resources section).
 - Consult relevant websites (as listed in Resources section).
 - Document SAR research actions.
 - Operation plan shall include specific SAR protection measures.
- Significant wildlife habitat features should be located on the property and their impact on the operation considered. Significant wildlife habitat features could include:
 - Active nesting sites.
 - Deer wintering areas.
 - Watercourses.
 - Large diameter snags.
- The landowner's objectives for wildlife habitat should be identified and incorporated into the operation plan.

- Forest workers should be trained to apply best management practices in wildlife habitat.

ENHANCED PRACTICES

- Landscape level issues should be considered in the design of the forest operation. For example adjacent woodlot harvests could have an impact on cut size, the need for clumps and corridors.
- Late successional Acadian forests offer unique wildlife habitat and should be left intact for biodiversity.

APPLYING TOOLS AND TECHNIQUES FOR WILDLIFE HABITAT

DEVELOPING A VARIETY OF FOREST HABITATS - HARVEST DESIGN:

STANDARD PRACTICES

- Harvest prescriptions should promote a variety of age classes, tree species and vegetation types.
- If the prescription is clearcut, areas should not exceed 50 hectares (125 acres) except in the case of salvage as a result of blowdown, insect and disease damage, or fire.
- In cuts exceeding 50 hectares, wildlife corridors 50 metres in width should be used to join uncut areas.
- If cutting next to an old cut, wait until regeneration is at least 2m tall to avoid creating cuts that exceed 50 hectares (125 acres).
- Blocks should follow stand or landform edges to create irregular cut boundaries.
- Trees within the corridors can be selectively cut, ensuring that a minimum of 20 m²/ha of basal area is left at all times.
- Leave live wind-firm trees and snags within the corridors.
- Corridors should be located to include a variety of wildlife habitat features.

The BEST corridors provide a variety of cover including:

- * shrubs
- * dense young softwoods
- * low lying areas
- * mixture of mature hardwood and softwood trees

ENHANCED PRACTICES

- Harvest prescriptions will promote a variety of age classes, tree species and vegetation types.

PROTECTING AQUATIC ECOSYSTEMS

When forests are harvested adjacent to watercourses, special management zones (SMZ's) should be established along each side to leave enough vegetation for stream protection and to maintain a rich wildlife community. An ideal buffer zone involves minimal disturbance within 20 metres of the watercourse.

STANDARD PRACTICES

- Refer to the Nova Scotia Wildlife Habitat and Watercourse Protection Regulations and the Nova Scotia Wetland Conservation Policy prior to harvesting.

WATERCOURSE PROTECTION

Watercourses less than 50 cm in width.

- Vehicles cannot be operated within 5m of the watercourse.
- Ground vegetation and non-commercial trees must be left intact within the SMZ.

Watercourses 50 cm and greater in width.

- Vehicles cannot be operated within 7m of the watercourse.
- Increased buffer width is required if slopes within the SMZ are greater than 20%. Add one metre of buffer width for each additional 2% in slope.
- Trees within the buffer zone may be selectively cut leaving a minimum of 20 m²/ha of basal area.
- No opening larger than 15m in the dominant tree canopy can be created.
- To reduce blowdown leave green wind-firm trees within the SMZ.

WETLAND CONSERVATION

- Any areas that potentially could be classified as wetlands under the Nova Scotia Wetland Conservation Policy, which could include wooded swamp, should have further consultation by a qualified wetland specialist.



ENHANCED PRACTICE

- The BEST buffer is the widest buffer possible.

PROVIDING WILDLIFE CLUMPS, SNAGS AND CAVITY TREES

At least one third of Nova Scotia's wildlife use snags and cavity trees for habitat. The following practices should be considered to protect this habitat in harvest areas:

STANDARD PRACTICES

- Refer to the Nova Scotia Wildlife Habitat and Watercourse Protection Regulations prior to harvesting.
- Leave snags and cavity trees within clumps.
- Any cut greater than 3 ha of forest land must have at least one wildlife clump.
- Cuts greater than 8 ha in size require additional clumps, relative to the size of the cut (refer to Regulations).
- Each clump shall contain at least 30 trees.
- The trees left standing shall be in the same proportion by species, height and diameter as the forest stand being cut.
- Where there is one clump, it shall be situated at least 20 m but no more than 200 m from the edge of the forest stand being cut.
- Where there are additional clumps, they shall be situated no closer than 20 m apart, and no further than 200 m apart. The clumps must be no more than 200 m from the edge of the forest stand being cut.
- There shall be no harvesting of trees within a clump.

A good clump includes:

- *A cavity tree with a dbh > 30 cm, with woodpecker holes, living or dead
- *Average tree diameters and species mix representative of the original stand
- *At least 10% dead trees
- *At least 0.02 ha (10 m x 20 m)



Coarse-Woody Debris

- Leave snags and woody debris scattered evenly across the site.
- Ensure that levels of snags and coarse woody debris are similar to natural patterns to the fullest extent possible.

PROTECTING SIGNIFICANT WILDLIFE HABITAT:

Some forests contain special characteristics that make them more important to wildlife species than other areas. These areas are referred to as significant wildlife habitat, and they may contain any or all of the following:

- A site that is unique within the province.
- Provides habitat for species at risk.
- Is used by unusually large concentrations of wildlife.

Some examples of these sites that may be encountered are:

Deer Wintering Areas

- Provide thermal and snow cover for deer.
- Typically mature conifers on south/southwest slopes.
- Look for heavy browse & lots of tracks.

Raptor/Heron Nests

- Look for large nest structures in trees.
- Normally occupied and sensitive to disturbance between March and mid July.

Local interest groups and the Nova Scotia Department of Natural Resources have gathered information on these sites and have created wildlife habitat maps. Contact the Department of Natural Resources prior to operations to determine if there is any significant wildlife habitat areas present on the woodlot.



HARVESTING: BEST MANAGEMENT PRACTICES

HARVESTING CONSIDERATIONS

Harvesting is a forest practice that can have a significant impact on the environment. Forest harvesting operations can be designed to benefit environmental, economic and social values. However, improperly designed and implemented harvest operations can have negative effects on the landscape. The following best management practices will contribute to sustainable forest management.

GETTING THE PRESCRIPTION RIGHT - FOR THE FOREST AND THE LANDOWNER

The first step in setting a prescription for a woodlot is to determine the landowner's objectives. This step guides the decision-making process from which prescriptions are developed. Some prescriptions may favor one objective over the other, but the ultimate decision rests with the landowner. A variety of objectives (including recreation, preserving old growth, wildlife habitat conservation and fibre production) can be met by implementing the appropriate prescriptions.

FPANS
Stewardship
Principles
1 & 3

Financial assistance may be available and contractors are encouraged to refer to the Nova Scotia Forest Sustainability Regulations for further information.

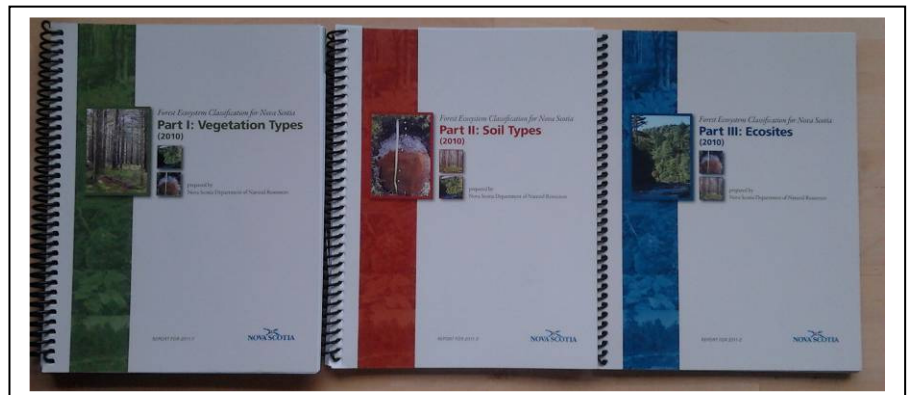
Getting the prescription right involves collecting relevant data about the forest to assist in determining appropriate prescriptions. With this information, the landowner can make an educated decision as to which prescription is most appropriate to meet their objectives.

The "Getting the Prescription Right for the Landowner - Decision Support Tool" is a useful tool to aid contractors in identifying suitable options and provides documentation on the decision-making process.

DETERMINING THE FOREST TYPE AND STRUCTURE

In order to determine the range of viable prescriptions possible on a woodlot, an assessment of the forest type and structure is necessary. This assessment should be conducted as part of the development of the operation plan and should include the following items:

- Soil type – texture, drainage and site quality.
- Description of the major tree and plant species present on the site.



- Stand characteristics such as age, health, tree size, density and growth rate.
- Stand history – determine if any previous treatments have been done.
- Terrain – slope and obstacles to equipment.
- Presence of advanced regeneration.
- Potential for high value products such as veneer or sawlogs.

Best Management Practices

Getting the Prescription Right for the Landowner - Decision Support Tool

Forest management has a significant impact on the environment. Choosing the best management option depends on many factors including: landowner objectives, stand type and condition, non-timber values, and economic and operating conditions.

A good forest management prescription will help to address your goals as a woodlot owner as well as consider the health of the future forest.

This tool:

- Is to be used by a forester, forest technologist or forest contractor in consultation with the landowner.
- Is based on the premise that collectively we are striving towards maintaining forest types that are consistent with the Acadian Forest Region.
- Assesses various values or aspects of the stand being considered for timber harvest and then evaluates a series of harvest options in terms of whether they will contribute positively or negatively to that particular value.
- Does not make a recommendation or a final decision. It does, however, identify suitable options and provides documentation on the decision-making process. It can be extremely helpful in explaining harvest decisions to family members, neighbours or concerned community members who may not fully understand why a specific prescription has been chosen.

Planning your forest management options properly will contribute to the future health and productivity of your woodlot and ensure that you will be able to continue to enjoy your forest for the many values it provides.

Two useful references supporting this tool are Nova Forest Alliance's:

Contractors and Operators Best Management Practices Manual
and
Forest Ecosystem Classification of Nova Scotia's Model Forest Guide

IDENTIFYING THE MANAGEMENT AREA - STAND #	
Woodlot Owner Name	Forester/Technologist/Contractor Name
Woodlot Location PID #	Date Completed
Approximate Stand Area	Prescription
Forester/Technologist/Contractor Signature	Date
Landowner Signature	Date

Landowner Objectives for Stand: The following diagram illustrates potential landowner objectives for a stand.

PRESCRIPTION OBJECTIVE	Alternative treatments to achieve prescription objectives		
	Heavy Removal 100% to 80% of Merchantable Volume	Moderate Removal 60% to 40% of Merchantable Volume	Light Removal Less than 40%* of Merchantable Volume
Promotion of Regeneration	Clearcut Overstory Removal Seedtree	Shelterwood Strip/Patch Cut	Selection Cut Commercial Thinning Crop Tree Release
Promotion of Existing Tree Quality	n/a	n/a	Selection Cut Commercial Thinning Crop Tree Release
Maintenance of Forest Cover	n/a	Shelterwood Strip/Patch Cut	Selection Cut Commercial Thinning Crop Tree Release

* 30% in moderate or higher exposure

Landowner Objectives/Issues to be Considered:

PART 1 STAND ASSESSMENT - This section provides a brief description of the stand including the trees to be harvested (merchantable) and the younger trees that may be growing beneath (regeneration). To complete this section the user needs to traverse the stand area to get a feel for the stand characteristics.

MERCHANTABLE PORTION - (Please circle or write in appropriate response)

1	Forest Ecosystem Classification units. (Determine which ecosystem units describe the stand. Each unit is associated with management interpretations which should be reviewed to aid further stand assessment and decision making. See FEC Guide)	Vegetation Type		Soil Type			
2	Does the stand contain trees of similar ages? OR Does the stand contain trees of different ages? Please circle	Evenaged					
		Unevenaged					
		Long-lived Species		Short-lived Species			
3	What is the stand's merchantable species composition? (Rate scoring on the largest % of species)	Species 1	Species 2	Species 3	Species 4		
		%	%	%	%		
4	Is the current stand volume increasing, staying constant or decreasing?						
5	Is there evidence of insect or disease damage?	none	insect	disease	none	insect	disease
6	Is there evidence of physical damage?	none	blowdown	frost	none	blowdown	frost
		broken tops	salt		broken tops	salt	
7	Does this stand have old growth/climax characteristics? (For reference see NSDNR's <i>Interim Old Forest Policy</i>)	yes		no			

Landowner Objectives for Stand: The following diagram illustrates potential landowner objectives for a stand.

PRESCRIPTION OBJECTIVE	Alternative treatments to achieve prescription objectives		
	Heavy Removal 100% to 80% of Merchantable Volume	Moderate Removal 60% to 40% of Merchantable Volume	Light Removal Less than 40% * of Merchantable Volume
Promotion of Regeneration	Clearcut Overstory Removal Seedtree	Shelterwood Strip/Patch Cut	Selection Cut Commercial Thinning Crop Tree Release
Promotion of Existing Tree Quality	n/a	n/a	Selection Cut Commercial Thinning Crop Tree Release
Maintenance of Forest Cover	n/a	Shelterwood Strip/Patch Cut	Selection Cut Commercial Thinning Crop Tree Release

* 30% in moderate or higher exposure

Landowner Objectives/Issues to be Considered:

PART 1 STAND ASSESSMENT - This section provides a brief description of the stand including the trees to be harvested (merchantable) and the younger trees that may be growing beneath (regeneration). To complete this section the user needs to traverse the stand area to get a feel for the stand characteristics.

MERCHANTABLE PORTION - (Please circle or write in appropriate response)

1	Forest Ecosystem Classification units. (Determine which ecosystem units describe the stand. Each unit is associated with management interpretations which should be reviewed to aid further stand assessment and decision making. See FEC Guide)	Vegetation Type		Soil Type			
2	Does the stand contain trees of similar ages? OR Does the stand contain trees of different ages? Please circle	Evenaged					
		Unevenaged					
		Long-lived Species		Short-lived Species			
3	What is the stand's merchantable species composition? (Rate scoring on the largest % of species)	Species 1	Species 2	Species 3	Species 4		
		%	%	%	%		
4	Is the current stand volume increasing, staying constant or decreasing?						
5	Is there evidence of insect or disease damage?	none	insect	disease	none	insect	disease
6	Is there evidence of physical damage?	none	blowdown	frost	none	blowdown	frost
		broken tops		salt	broken tops		salt
7	Does this stand have old growth/climax characteristics? (For reference see NSDNR's <i>Interim Old Forest Policy</i>)	yes no					

8	Are there any special tree species present? Specify				
9	Slope	relatively flat	moderate	steep	
10	Aspect/Wind Exposure	north	east	south	west
		very exposed	moderately exposed	protected	
REGENERATION PORTION		Species 1	Species 2	Species 3	Species 4
11	Is there sufficient established and desirable regeneration to restock the site? List by species.				
		%	%	%	%
12	Is a desirable seed source available?	yes no			
PART 2 NON-TIMBER ASSESSMENT - This section will assist the user in determining if there are any non-timber factors that could influence the choice of harvest method. Generally this will include factors within the site or in the surrounding area . Each of the features identified on the site should be circled to provide a record of what has been considered.					
13	Are there any features within or adjacent to the stand?	dwelling boundary line well (water supply)			
		valued viewscape no significant features other(specify)			
14	Are there any features of cultural/heritage/archeological significance?	old foundation stone walls burial site aboriginal site			
		no features other			
15	Are there recreational features in use?	trails campsite/picnic fishing recreational access			
		wildlife viewing tree stand no features other			
16	What water resource issues need to be considered?	watercourse lake pond water table no features			
		other			
17	Wildlife habitat issues eg. any habitat defined as critical or desired by landowner	nesting area deer wintering area cavity trees			
		wetland no features coarse woody debris other			
18	Are any non-timber forest products present? List				
PART 3 Scoring of Harvest Prescriptions - this section enables the user to score the harvest prescriptions based on their ability to accomodate stand, non timber, economic and operating conditions.					

In part 3, the user rates each of the harvesting options against the Part 1 - Stand Assessment and the Part 2 - Non-Timber Assessment to determine the extent to which the harvest option will have a negative, positive or neutral impact .

Interpreting the rankings:

For each of the treatments the rankings should be totaled. The score only provides a relative weighting of one prescription against the other.

In other words, if shelterwood harvest scores a +6 and clearcut a +4 then the shelterwood harvest has the greater potential to address the stand development parameters outlined in the decision key. It could therefore be considered as a more suitable prescription than the clearcut option.

The objective of the scoring is to provide a list of prescriptions which the landowner and contractor can discuss and finalize based on landowner objectives and contractor constraints.

SILVICULTURE TREATMENT/HARVEST OPTIONS

Nova Scotia is part of the Acadian Forest Region. The natural Acadian forest is characterized by stands of trees having various sizes, ages, and mixtures of species. Late successional species including red spruce, white pine, hemlock, sugar maple and yellow birch predominate.

Land use practices over the past four hundred years have altered forest development in Nova Scotia. Many forest stands are now even aged and contain more early successional tree species including balsam fir, white spruce, larch, red maple, white birch, and poplar.

This section contains a brief description of various harvesting prescriptions, and the appropriate forest conditions for their application.

The following prescriptions are listed by the age class structure that they tend to create. For more information on the following prescriptions, there are several resources listed in the background information section.

The age class structure of a stand refers to the relative ages of the trees making up the stand. *Even-aged* stands generally result from stands composed of trees that began growing at about the same time. *Uneven-aged* stands refer to stands that have trees of various ages from juvenile to mature present on the same site.

EVEN-AGED

CLEARCUT SYSTEM

Clearcutting can be used to prepare a site for the establishment of a new even aged stand. Regeneration can be achieved naturally by sprouting and seeding or by artificial means such as planting or direct seeding. This system is most applicable in stands dominated by shorter lived, lower value species such as white spruce, fir and the intolerant hardwoods. If applied in forests with longer lived species such as red spruce, cut sizes can be reduced to allow for natural seeding from adjacent stands.



Two variations on this prescription are possible in the Acadian forest – strip cutting and patch cutting. These variations will tend to decrease the cut size, promote better natural regeneration and favor some wildlife species.

SEED TREE SYSTEM

This system promotes natural regeneration of a site by leaving a number of trees standing, ranging from 15 to 35 per hectare. They should be good quality and wind-firm to provide seed for the next crop. The seed trees may be harvested after the stand has been regenerated if this can

be accomplished without damaging the natural regeneration. This system can be applied in stands that contain dominant white pine, yellow birch, white ash and sugar maple.

SHELTERWOOD SYSTEM

Shelterwood harvesting involves the removal of the overstory in several stages over a few years. The new stand is established under the cover of the existing forest. This treatment is most applicable where low light conditions and cool temperatures are required for regeneration of the forest. Sites where shelterwood is an applicable prescription generally have tight crown closure with little advanced regeneration and can be composed of shade-tolerant species such as white pine, red spruce, Eastern hemlock, sugar maple and yellow birch.



UNEVEN-AGED

THE SELECTION SYSTEM

The selection system is used where the primary goal is to restore or maintain the structure and composition of the Acadian Forest Region. The objective is to retain forest cover, improve overall stand quality and maintain an uneven-aged stand condition with natural regeneration of shade-tolerant tree species. Tree removal is typically done at regular intervals of 5 to 20 years and involves the removal of individual trees or small groups of trees. This system simulates one of the natural disturbance patterns present in the Acadian forest where old mature trees would die or blow down and would be replaced by younger trees.

Two types of selection harvesting commonly used are single tree or group selection.

SINGLE TREE SELECTION

This treatment focuses on the removal of individual trees from the stand at regular intervals. The resulting stand will be composed of trees with a range of ages and sizes, although this can take several entries to accomplish.

GROUP SELECTION

The objective of this treatment is to create small gaps where natural regeneration of shade-tolerant tree species can become established. To accomplish this, canopy openings should not exceed twice the average stand height. Group selection can be used to create an uneven-



aged forest, or to maintain a forest that is already in an uneven-aged condition.

MAKING THE DECISION

The ultimate decision on what to do with the forest rests with the landowner, however it is a good practice for the contractor to present the landowner with several prescriptions that could address their objectives and recognize the values present in their forest.

Once the landowner has considered possible harvesting options and selected an appropriate treatment, it is important to carefully plan the harvest. The following practices apply to all harvesting systems.

PLANNING THE HARVEST

STANDARD PRACTICES

- Harvest planning should consider wildlife habitat, aquatic ecosystems, and the provision of snags and downed woody material. See Wildlife Habitat BMP's.
- The harvest prescription selected should consider landowner objectives, natural disturbance patterns and stand specific conditions.
- The area to be harvested should be identified on the ground and flagged.
- Special Management Zones should be identified and flagged.
- Harvesting operations should be planned with consideration for natural regeneration, taking care to protect advanced regeneration when present.
- Wood extraction trails should be located to minimize environmental impact.
- Harvesting should maximize the production of high value products while minimizing waste, within market constraints.
- Consider harvest timing to accommodate environmental conditions and markets.
- Location of extraction trails, landings, and crossings should be planned to minimize impact on watercourses.
- Locations for piling wood should be identified and should consider local hazards and constraints (for example power lines, traffic flows, right of ways and other uses for the area).
- Where selection cuts are prescribed, advance marking of at least some of the trees should be considered.
- Consider impacts of harvesting on viewscales and other landowners.

ENHANCED PRACTICES

- Locate harvest boundaries along naturally occurring features (stand types, topography).
- Consult a Depth to Water Table (wet areas) Map to determine potentially sensitive areas.
- Inform adjacent landowners of pending harvest operations.
- Consult the Nova Scotia Forest Ecosystem Classification guide to determine soil characteristics of the site when considering the harvesting of forest products, including: boles, slash, limbs and tops.

HARVESTING OPERATIONS

STANDARD PRACTICES

- Implement operations plan as written.
- Be aware of and follow Nova Scotia Occupational Health and Safety Regulations on all harvesting sites.
- Be aware of and follow Fire Protection Regulations for fire prevention during fire season.
- Avoid rutting by keeping machinery away from soft or wet ground and using brush matting where required.
- Remove all garbage from the site and properly dispose of hazardous materials (including petroleum products).
- Optimize utilization by minimizing stump height and processing trees to acceptable minimum top size.
- Use caution and proper procedures in the handling and storage of harmful substances.
- Keep all boundaries, roads and recreational trails free of debris.
- Never allow machinery or debris to enter a watercourse.
- Avoid operating during excessively wet periods to minimize rutting, soil compaction and erosion.
- Avoid damaging advanced regeneration.
- Avoid damaging roads, culverts and ditches with forwarding and harvesting machinery.
- Refuel and service machinery at least 30 metres away from a watercourse and on bare mineral soil.
- Repair damage done to forwarder/skid trails and access roads.



POST HARVEST ACTIVITIES

STANDARD PRACTICES

- Record information on volume harvested.
- Complete self performance checklist.
- Repair any damage to roads and environment.
- Ensure that landowner is satisfied with the operation.
- Ensure all roadside wood is promptly removed from site.
- Supply owner with final sketch or GPS map of harvest area and outline process for ensuring regeneration occurs, including the re-vegetation of landings.
- Contractor should supply the landowner with a list of silviculture contractors that can provide reforestation services.

ENHANCED PRACTICES

- The contractor should ensure the harvested site has a regeneration survey completed within 3 years and arrange for the appropriate silviculture treatment to ensure optimum reforestation.
- Practice due diligence by taking digital photographs of pre/post site and road conditions.
- Recommend contacts for follow-up silviculture treatments.

ENSURING A SAFE OPERATION: BEST MANAGEMENT PRACTICES

Nova Scotia's Occupational Health and Safety Act provides for the promotion, co-ordination, administration and enforcement of occupational safety and health. Occupational health and safety involves five essential elements:

- Prevention
- Internal responsibility
- External support (training)
- Enforcement (monitoring)
- Response to changing needs (updating procedures)

FPANS Stewardship Principle 5
--

Forest operations raise unique challenges for contractors and operators. The nature of forest work, the variation in environmental conditions and stand conditions, coupled with the use of mechanized equipment can create dangerous work situations for both the contractor as well as visitors to the site. The following practices are considered mandatory and are described more fully in the latest edition of "Forest Professional."

STANDARD PRACTICES

- Personal protective equipment (PPE) appropriate to the operation must be worn by the forest worker. Equipment must be approved as outlined in the "Forest Professional" and be kept in good repair.
- Develop a procedure and record keeping system for competency training for all employees.
- Contractors must understand and conduct operations in accordance with the Nova Scotia Occupational Health and Safety Act and regulations, codes of practice and other applicable acts and/or regulations.
- Contractors must undertake periodic visual checks of any employee working under hazardous conditions (including working alone) and develop effective policies and procedures to address the risk.
- First aid supplies and services must be made available as required by Occupational Health and Safety regulations, including a valid remote location plan.
- Safe operating practices must be adhered to for the operation of equipment used in a forest operation. Some examples might include:
 - Forwarding wood on steep slopes
 - Chainsaw operation, etc.
- Harvesting and road construction practices must be used as outlined in the latest edition of the "Forest Professional".

ENHANCED PRACTICES

- Each contractor should have an Occupational Health and Safety Program in place.
- Contractors should participate in third-party audits of their Occupational Health and Safety Program.
- Job sites should be posted to indicate that work is in progress.

FUEL AND OIL STORAGE AND HANDLING

Storing, using and transporting petroleum products is a responsibility that all contractors and their employees must consider as a significant requirement of their jobs. Any amount of spilled or released petroleum product has the potential to contaminate surrounding soils if not properly contained and disposed of in an approved manner. If these products penetrate ground water they can travel for hundreds of meters affecting household water supplies, destroying wildlife and habitat.

The following are basic conditions contractors and/or employees must be aware of to reduce the risk of an adverse environmental incident:

STANDARD PRACTICE

- Applicable legal requirements will be met or exceeded as per regulations when working with controlled products.
- Develop and implement an Emergency Response Plan that includes training and drills for expected emergencies and includes proper use of spill kits and their disposal.
- Any movement of a fuel tank over 450 litres on a site will be done by a person with current Transportation of Dangerous Goods (TDG) training.
- A method for disposal of used fuel and oils in accordance with provincial regulations is to be used and documented.
- Every effort must be made to ensure spill kits are restocked after use.
- Perform and document monthly visual inspections of storage tanks.

ENHANCED PRACTICE

- Where possible, environmentally friendly products will be substituted for more hazardous fuels and oil.
- Install automatic shut-off valves on hydraulic equipment.

FUELING AND LOCATION OF STORAGE TANKS AND FACILITIES

STANDARD PRACTICE

- Off road fueling, fuel storage sites and facilities will be on reasonably level ground, free of large rocks or exposed bedrock, and will be located at least 30 metres from any defined watercourse, wetland, pond, or lake.

- Fuel may be stored and transported in a small means of containment (less than 450 litres – slip tanks) providing that the means of containment is designed, filled, closed, secured, and maintained to ensure that there will be no accidental release of the product during transport.
- Fuel being stored and transported in a means of containment greater than 450 litres must meet the requirements of section 5.12 of the Transportation of Dangerous Goods Act and Regulations.
- All fuel tanks must have proper TDG and WHMIS placards.
- Each operation will be equipped with a large spill kit. Each machine will have a supply of absorbent material.
- When being moved on a public highway, a tank must be properly mounted on a licensed and inspected trailer.
- Ensure lube oil, grease, antifreeze and other controlled products are kept inside a secure and locked structure when no one is on site.



ENHANCED PRACTICES

- Each machine must have access to an adequate supply of absorbent material for spills.
- Each fuelling location should have a “Plug & Dyke” kit.

FUEL STORAGE TANKS AND PUMPS CHECKLIST

Contractors/employees will make routine checks/inspections of the following items on fuel storage tanks and pumps:

- All transportation tanks must be secured to the truck or trailer.
- Pumps, discharge hoses and drain plugs are well maintained and kept free of leaks.
- Ensure nozzle is in place and in good repair on automatic shut-off nozzles. When refueling, an operator must be at the nozzle at all times, regardless of the type of nozzle, except when using a hand pump.



- All fuel discharge hoses must have a nozzle.
- All hand pumps must be equipped with automatic shut-off nozzles.
- All pumps are fitted with a secure and sturdy locking mechanism and are kept locked when not in use.
- Electrical leads to the fuel pump must be well maintained with no breaks in the wire insulation and be properly connected to the power source.
- Gravity flow pumps should not be used in any situation.

HYDRAULIC OIL SYSTEMS

Contractors/employees will check and ensure that the hydraulic systems on all forestry equipment are well maintained and controls are in place when lines are disconnected for repairs. Proper procedures must be followed to minimize loss of hydraulic oil into the environment.

OIL SPILLAGE DURING SERVICE AND REPAIRS

Every effort will be made to prevent the loss of fuel, motor oil, hydraulic oil, gear oil, and other deleterious material into the environment through the collection of these fluids during service and repairs. When a small amount of fluid spillage is unavoidable an oil proof barrier in combination with oil absorbing material will be used to prevent soil and water contamination.

ENVIRONMENTAL EMERGENCY NUMBER - 1-800-565-1633

A spill of more than 100 liters (22 gal) will be reported to the Nova Scotia Environment.

Judgement must be exercised when reporting spills lower than the stated amounts. (i.e. spills on or near drinking water sources or other sensitive areas should be reported regardless of the amount).

PERFORMANCE MONITORING: BEST MANAGEMENT PRACTICES

Performance should be continuously monitored and adjusted in order to ensure that best management practices are being adhered to and that established objectives are being met. A system of recording performance is useful. It provides the contractor with a tool to assist them in completing a thorough performance review as well as documentation which can be supplied to wood purchasers or landowners to illustrate compliance with best management practices.

The following checklists will make it easy for the contractor to determine if the operation meets best management practices and to identify where improvements are required.

STANDARD PRACTICES

- It is recommended that the contractor complete the checklist at three stages of operation:
 1. Before the operation starts.
 2. During the operation.
 3. Post operation.
- Only those practices that are relevant to the operation need be assessed. This program will enable the contractor to identify practices or areas which need improvement early in the operation.

ENHANCED PRACTICES

- Provide landowner with completed checklists.
- Maintain paper copy for future reference and provision to wood purchasers.

BUSINESS: BEST MANAGEMENT PRACTICES

Whether you are a contractor or landowner operating on your own land, you are a small business. The success of your business is dependent upon management of your operation and/or woodlot. The management aspect is as important as the operation and repair of your equipment.

STANDARD PRACTICES

- Develop a business plan that provides direction over the short term and long term for your business. The plan should include revenue, expenses and annual cash flow as well as a 3 to 5 year forecast. Equipment replacement plans should be reviewed and updated annually.
- Consult an accountant to ensure that your books are properly set up and provide the information you will need to manage your business.
- Develop a record keeping system that provides you the information to manage your business such as equipment maintenance and repair, parts inventory, wood sold and wood inventory on landing, production, operating costs, staff expenses, training, and your safety program.
- Track operating costs at least monthly to ensure you have a good understanding of your per unit costs and the factors that affect them.
- Use contracts for operations such as stumpage purchases, silviculture work and road building.
- When negotiating contracts or selling forest products, you have to know all your costs, including capital, operating expenses, payroll, taxes, insurances, overhead and a reasonable rate of return.
- Have a human resource plan that identifies staffing needs, recruitment, training, retention and dismissal.
- Have adequate insurances such as liability, equipment, vehicle and Workers Compensation to protect yourself and your business. Landowners should require proof of adequate insurance.
- Stay current on forest products markets, specifications and prices and be prepared to respond to changes in the market place.
- Be registered as applicable with appropriate government agencies such as Revenue Canada, Joint Stocks, WCB.
- Join and participate in an appropriate professional organization(s).

ENHANCED PRACTICES

- Research emerging technologies to assist in managing your business such as GIS/GPS, various operational software that optimizes production.
- Research emerging forest products markets.
- Participate in continuing education programs.
- Encourage employees to participate in an appropriate professional organization(s).

SELF PERFORMANCE CHECKLISTS

DEVELOPING LANDOWNER AGREEMENTS: BEST MANAGEMENT PRACTICES

BEFORE MEETING THE LANDOWNER:

	Standard	Enhanced
• Information gathered on the woodlot; maps, air photos etc.	<input type="checkbox"/>	
• Information provided to landowner on forest operations	<input type="checkbox"/>	
• Portfolio made available with photographs of previous work		<input type="checkbox"/>

DISCUSSED DURING THE LANDOWNER INTERVIEW:

	Standard	Enhanced
• Landowner's objectives	<input type="checkbox"/>	
• Forest management alternatives – harvesting, silviculture, non-timber	<input type="checkbox"/>	
• Survey to determine landowner objectives administered		<input type="checkbox"/>

WOODLOT ASSESSMENT

	Standard	Enhanced
• Inventory of forest products	<input type="checkbox"/>	
• Observations of wildlife and habitat recorded	<input type="checkbox"/>	
• Watercourses identified	<input type="checkbox"/>	
• Other operating constraints identified (areas of human interest, etc.)	<input type="checkbox"/>	
• Special Management Areas identified (i.e. significant habitat, old growth, endangered plants, designated wetlands etc.)	<input type="checkbox"/>	
• Opportunities to work together with other landowners identified	<input type="checkbox"/>	
• Assessment of broader woodlot values conducted		<input type="checkbox"/>
• Document any observed invasive exotic plant or animal species		<input type="checkbox"/>
• Potential for prescriptions other than clearcutting identified		<input type="checkbox"/>
• Completed Landowner – Decision Support Tool		<input type="checkbox"/>

OPERATION PLAN INCLUDES

	Standard	Enhanced
• Landowner objectives	<input type="checkbox"/>	
• A map showing boundary line and areas of operation	<input type="checkbox"/>	
• Description of vegetation on areas of operation (tree species and size)	<input type="checkbox"/>	
• Area to be treated, prescription, method and system to be used	<input type="checkbox"/>	
• Special management areas identified	<input type="checkbox"/>	
• Watercourses and wetlands identified	<input type="checkbox"/>	
• Forest/Wildlife requirements identified	<input type="checkbox"/>	
• Stream crossings and method of crossing noted	<input type="checkbox"/>	
• Forest stand characteristics from inventory		<input type="checkbox"/>
• Consultations with forestry professional to assist in development of plan		<input type="checkbox"/>
• Forest inventory data included		<input type="checkbox"/>
• Brief description of prescription type		<input type="checkbox"/>
• Potential locations of wildlife management features		<input type="checkbox"/>

NEGOTIATION AND AGREEMENT WITH LANDOWNER

	Standard	Enhanced
• Operation plan reviewed with the landowner	<input type="checkbox"/>	
• Method of payment agreed upon	<input type="checkbox"/>	
• Revisions incorporated to meet landowner needs	<input type="checkbox"/>	
• Visit area(s) of operation with landowner		<input type="checkbox"/>
• Provide landowner with contract or lease		<input type="checkbox"/>
• Register contract with lawyer		<input type="checkbox"/>
• Provide performance bond		<input type="checkbox"/>

ROAD CONSTRUCTION: BEST MANAGEMENT PRACTICES

PLANNING AND LAYOUT

	Standard	Enhanced
• Owner objectives and approval of road location determined	<input type="checkbox"/>	
• Fragile/sensitive areas avoided	<input type="checkbox"/>	
• All required permits in place	<input type="checkbox"/>	
• Sight distance/aesthetics considered		<input type="checkbox"/>

CONSTRUCTION

	Standard	Enhanced
• Ditches/culverts adequate – road well drained	<input type="checkbox"/>	
• Erosion control has been implemented	<input type="checkbox"/>	
• Site clean of garbage and machinery	<input type="checkbox"/>	
• Road sides seeded or brush mats installed		<input type="checkbox"/>
• Document work with digital photography		<input type="checkbox"/>
• Annual inspection and maintenance plan		<input type="checkbox"/>
• Watercourse alteration certified		<input type="checkbox"/>

TEMPORARY STREAM CROSSINGS

	Standard	Enhanced
• Installed in accordance with guidelines	<input type="checkbox"/>	
• Removed the temporary crossing	<input type="checkbox"/>	

WILDLIFE HABITAT: BEST MANAGEMENT PRACTICES

	Standard	Enhanced
• Working knowledge of species at risk	<input type="checkbox"/>	
• Document species at risk research actions	<input type="checkbox"/>	
• Species at risk protection measures included in plan	<input type="checkbox"/>	
• Wildlife features identified and considered	<input type="checkbox"/>	
• Landowner objectives considered	<input type="checkbox"/>	
• Landscape level issues considered		<input type="checkbox"/>
• Late successional Acadian forest left intact		<input type="checkbox"/>

DEVELOPING A VARIETY OF FOREST HABITATS – HARVEST DESIGN

	Standard	Enhanced
• Harvest prescription appropriate	<input type="checkbox"/>	
• Harvest area less than 50 ha.	<input type="checkbox"/>	
• Corridors installed where required	<input type="checkbox"/>	
• Wind-firm trees and snags left within corridors	<input type="checkbox"/>	
• Special management areas addressed	<input type="checkbox"/>	
• Blocks –irregular shaped to increase edge habitat	<input type="checkbox"/>	
• NS Wildlife Habitat and Watercourse Protection Regulations followed	<input type="checkbox"/>	
• Harvest prescriptions to promote a variety of age classes, tree species and vegetation types		<input type="checkbox"/>
• Widest buffer possible left		<input type="checkbox"/>

HARVESTING BEST MANAGEMENT PRACTICES

HARVESTING OPERATIONS

	Standard	Enhanced
• Followed operations plan	<input type="checkbox"/>	
• Followed NS Occupational Health and Safety regulations	<input type="checkbox"/>	
• Followed Fire Protection Regulations	<input type="checkbox"/>	
• Avoided rutting	<input type="checkbox"/>	
• Proper procedure followed in handling and storage of harmful substances	<input type="checkbox"/>	
• Garbage/equipment removed from site	<input type="checkbox"/>	
• Avoided damaging advanced regeneration	<input type="checkbox"/>	
• Repaired damaged trails and roads	<input type="checkbox"/>	

POST HARVEST ACTIVITIES

• Harvested volume recorded	<input type="checkbox"/>
• Self performance checklist completed	<input type="checkbox"/>
• Damaged roads and environment repaired	<input type="checkbox"/>
• Landowner satisfaction verified	<input type="checkbox"/>
• Roadside wood removed	<input type="checkbox"/>

- | | | |
|--|--------------------------|--------------------------|
| • Provided GPS map of harvested area with outline process for regeneration | <input type="checkbox"/> | |
| • Provided list of silviculture contractors | <input type="checkbox"/> | |
| • Ensure a regeneration survey is completed | | <input type="checkbox"/> |
| • Pre/post site and road conditions photos taken | | <input type="checkbox"/> |
| • Follow-up silviculture treatments contacts supplied | | <input type="checkbox"/> |

ENSURING A SAFE OPERATION

- | | Standard | Enhanced |
|--|--------------------------|--------------------------|
| • Personal protective equipment worn and kept in good repair | <input type="checkbox"/> | |
| • Employee competency training procedures and record keeping system developed | <input type="checkbox"/> | |
| • NS Occupational Health and Safety Act and other applicable act/regulations followed | <input type="checkbox"/> | |
| • Performed visual checks on employees at risk and developed policies and procedures to address the risk | <input type="checkbox"/> | |
| • Followed the practices of the latest edition of the “Forest Professional” | <input type="checkbox"/> | |
| • Occupational Health and Safety program in place | | <input type="checkbox"/> |
| • Participated in third-party audits | | <input type="checkbox"/> |
| • Posted work in progress on job sites | | <input type="checkbox"/> |

FUEL AND OIL STORAGE AND HANDLING

- | | Standard | Enhanced |
|---|--------------------------|--------------------------|
| • Met applicable legal requirements | <input type="checkbox"/> | |
| • Developed and implemented an Emergency Response Plan | <input type="checkbox"/> | |
| • Used fuel and oils recorded and disposed of in accordance with provincial regulations | <input type="checkbox"/> | |
| • Spill kits must have sufficient supplies to accommodate size of operation | <input type="checkbox"/> | |
| • Environmentally friendly products used | | <input type="checkbox"/> |
| • Automatic shut-off valves installed | | <input type="checkbox"/> |

FUELING AND LOCATION OF STORAGE TANKS AND FACILITIES

	Standard	Enhanced
• Not closer than 30m from any defined watercourse	<input type="checkbox"/>	
• Met requirements of the Transportation of Dangerous Goods Act and Regulations	<input type="checkbox"/>	
• Proper TDG and WHMIS placards	<input type="checkbox"/>	
• Tanks properly mounted on a licensed and inspected trailer	<input type="checkbox"/>	
• Stored products locked in structure when no one is on site	<input type="checkbox"/>	
• Machines have absorbent material for spills		<input type="checkbox"/>
• Fueling locations have a “Plug & Dyke” kit		<input type="checkbox"/>

FUEL STORAGE TANKS AND PUMPS

	Standard	Enhanced
• Transportation tanks secured	<input type="checkbox"/>	
• Pumps, discharge hoses and drain plugs maintained with no leaks	<input type="checkbox"/>	
• Nozzles kept in good repair	<input type="checkbox"/>	
• Fuel discharge hoses have nozzles	<input type="checkbox"/>	
• Hand pumps equipped with automatic nozzles	<input type="checkbox"/>	
• Pumps locked when not in use	<input type="checkbox"/>	
• Electrical leads to fuel pump maintained	<input type="checkbox"/>	
• Gravity flow pumps not used	<input type="checkbox"/>	

ADDITIONAL RESOURCES

Nova Forest Alliance - www.novaforestalliance.com

- At a Glance: A Guide to Identifying and Managing Nova Scotia Hardwoods
- Forest Ecosystem Classification of Nova Scotia's Model Forest
- Woodlot Info Shop Website – www.woodlotinfo.ca

Woodlot Management Home Study Program - Nova Scotia Department of Natural Resources - <http://www.gov.ns.ca/natr/education/woodlot/>

- Introduction – Getting More from Your Woodlot
- Principles of Forest Stewardship
- Introduction to Silviculture (Module 1)
- Harvesting Systems (Module 2)
- Thinning for Value (Module 3)
- Wildlife and Forestry (Module 4)
- Stand Establishment (Module 5)
- Chain Saw Use and Safety (Module 6)
- Woodlot Ecology (Module 7)
- Wood Utilization & Technology (Module 8)
- Woodlot Recreation (Module 9)
- Managing Woodlot Finances: Planning and Investment Guide (Module 10A)
- Managing Woodlot Finances: Income Tax and Estate Planning Guide (Module 10B)
- Roads and Trails: Planning it Right from the Start (Module 11)
- Small Scale Harvesting Equipment – What's Right For You? (Module 12)
- Non Timber Forest Products: Growing Opportunities (Module 13)

Nova Scotia Forest Practices Pamphlets - Nova Scotia Department of Natural Resources

- Your Forest Management Plan (Pamphlet 1)
- Building Woodland Roads (Pamphlet 2)
- Forest Surveys and Boundary Lines (Pamphlet 3)
- Safe Felling (Pamphlet 9)
- Safety From Stump to Roadside (Pamphlet 10)
- Harvesting Systems Clearcut Method (Pamphlet 13)
- Harvesting Systems Selection Method (Pamphlet 14)
- Harvesting Systems Seed Tree Method (Pamphlet 15)
- Harvesting Systems Release Cutting (Pamphlet 16)

Nova Scotia Department of Natural Resources

- Integrated Resource Management Pamphlet and Video
- Selling Standing Timber
- Forest Sustainability Regulations – Information leaflet FOR-3
- Woodlot Roads/Stream Crossing Manual

- Forestry/Wildlife Guidelines
- More Wildlife on Your Woodlot
- Forestry Field Handbook
- Hardwood Thinning Manual
- Shelterwood Harvesting Manual
- Merchantable Thinning Manual - Softwoods

Logging for Wildlife – *Nova Scotia Forestry Association*

A True Picture – Taking Inventory of Your Woodlot – *Eastern Ontario Model Forest*

The SFM Essentials – An Introduction to the Sustainable Forest Management Standards – *Canadian Standards Association*

The Forest Professional – Guidelines for the Stewards of Tomorrow’s Forests – Occupational Health and Safety Division – *Nova Scotia Department of Labour*

Registered Professional Foresters Association of Nova Scotia – www.rpfans.ca

Forest Products Association of Nova Scotia – www.ffans.ca

Nova Scotia Forest Technicians Association – www.nsfta.ca

Canadian Institute of Forestry – Nova Scotia Section - http://www.cif-ifc.org/site/nova_scotia

Green Pages Directory – DvL Publishing – www.countrymagazines.com/greenpages.shtml

LIST OF LEGAL REQUIREMENTS

PROVINCIAL LEGISLATION

- Occupational Health and Safety Act
 - Occupational Health and Safety First Aid
 - Occupational Safety General
 - Workplace Hazardous Materials Information System
 - Occupational Health (enforced under this act)
- Dangerous Goods Transportation Act
 - Dangerous Goods Transportation
- Endangered Species Act
 - Species at Risk List
- Environment Act
 - Activities Designation
 - Approvals Procedure
 - Dangerous Goods Management
 - Emergency Spill
 - Environmental Assessment
 - Motive Fuel and Oil Approval
 - NS Environmental Assessment Board
 - On-site Sewage Disposal Systems
 - PCB Management
 - Pesticide
 - Petroleum Management
 - Protected Water Areas
 - Used Oil
 - Solid Waste-Resource Management
 - Sulphide Bearing Material Disposal
 - Water and Wastewater Facility
- Forests Act
 - Forest Fire Protection
 - Forest Sustainability
 - Registration and Statistical Returns
 - Wildlife Habitat and Watercourse Protection
- Labour Standards Code
 - General Labour Standards Code
 - Minimum Wage Order
 - General
 - Logging and Forest Operations

- Land Registration Act
 - Land Registration General
- Off-highway Vehicles Act
 - Off-Highway Vehicles Trails Designation
 - Off-highway Vehicle Infrastructure Fund
 - Off-highway Vehicle Insurance
 - Off-highway Vehicles Closed Courses
 - Off-highway Vehicles Designated Trails and Trail Permits
 - Off-highway Vehicles Fees
 - Off-highway Vehicles General
 - Off-highway Vehicles Safety and Training
 - Off-highway Vehicles Vulnerable Areas Licensing
- Special Places Protection Act
 - See Site Specific Designations and Regulations
- Wilderness Areas Protection Act
- Wildlife Act
 - General Wildlife
 - Wildlife Management Area
- Workers' Compensation Act
 - Workers' Compensation General

FEDERAL LEGISLATION

- Canada Labour Code
 - Canada Occupational Health and Safety
- Canadian Environmental Assessment Act
 - Comprehensive Study List
 - Exclusion List
 - Inclusion List
- Canadian Environmental Protection Act
 - Environmental Emergency
- Canada Wildlife Act
 - Wildlife Area
- Fisheries Act
- Forestry Act

- Timber Regulations
- Migratory Bird Convention Act
 - Migratory Birds
 - Migratory Bird Sanctuary
- National Fire Code
- Navigable Waters Protection Act
 - Navigable Waters Works
- Pest Control Products Act
 - Pest Control Products
- Plant Protection Act
- Species at Risk Act
- Transportation of Dangerous Goods Act
 - Transportation of Dangerous Goods

USEFUL PHONE NUMBERS

Association for Sustainable Forestry 902-895-1179

Canadian Forest Service – Atlantic Forestry Centre – Fredericton 506-452-3500

Christmas Tree Council of Nova Scotia 902-895-6914

Department of Fisheries and Oceans 1-800-782-3058

Environment Canada - Environmental Protection Branch 902-426-7231

Forest Products Association of Nova Scotia 902-895-1179

Forest Safety Society of Nova Scotia 902-895-1107

Nova Forest Alliance 902-639-2921

Nova Scotia Department of Fisheries and Aquaculture Inland Fisheries 902-485-5056

Nova Scotia Department of Natural Resources

Central Region 902-893-5631

Eastern Region 902-563-3370

Western Region 902-527-5984

Nova Scotia Environment and Labour

Environmental Monitoring and Compliance Toll Free: 1-877-936-8476

Labour Standards Toll Free: 1-888-315-0110

Occupational Health and Safety Toll Free: 1-800-952-2687

Nova Scotia Forestry Association 902-895-1179

Sustainable Forestry Initiative 1-800-631-3657 (to report noncompliant forestry operations with regards to sustainable forestry)

Emergency Numbers

Fuel Spill Emergency 1-800-565-1633

Medical Emergency – 911

Forest Fire or Game Infraction Reporting 1-800-565-2224