STRONG ROOTS
SUSTAINABLE FUTURE

2017 Outcome Based Forestry in Maine
IRVING WOODLANDS IN MAINE

We grow more wood than we harvest every year

2.95 Million trees planted in 2017

A team of 30+ forestry professionals

1.255 Million Acres in Maine

Over 70 Years of operations in Maine

SFI LEADERSHIP IN CONSERVATION AWARD

“J.D. Irving stands out as a research leader that engages universities and conservation partners year after year. As Canada marks its 150th anniversary we are pleased to recognize J.D. Irving, Limited, whose roots in forestry go back 135 years.”

Kathy Abusow, President and CEO of SFI Inc.
September 2017

Irving Woodlands
JDI Sawmill
Freehold Land
2017 ECONOMIC IMPACT
Forestry & Forest Products in Maine

Over 2,700 Jobs
(direct, indirect and induced)

Over $100 Million
in total wages
(direct, indirect and induced)

Over $100 Million
in local Maine purchases

$87 Million
in Capital Investment
(2012-2016)

Providing a dependable and sustainable WOOD SUPPLY
to numerous customers throughout the State of Maine
CONSERVATION & RESEARCH
Voluntary Conservation Efforts in the North Maine Woods

Additionally, Irving Woodlands has set an objective to designate and maintain old forest within the working forest landscape – to date, more than 25,540 hectares (63,108 acres) have been designated towards meeting this objective.

25,540 ha
Old Forest Sites

122,000 Acres
of deer wintering habitat

94,000 Acres
of watercourse buffers

RESEARCH PARTNERS
Our (voluntary) Forest Research Advisory Committee includes UMaine scientist Dr. A. Weiskittel as well as Mr. A. Whitman from Manomet.

Dr. A. Weiskittel is the Irving Chair in Forest Ecosystem Management at UMaine.

Dr. Neil Thompson is the Irving Chair in Applied Forest Management at UMaine Fort Kent.

Irving Woodlands, LLC has been a long term and active member of the Cooperative Forestry Research Unit.
The Largest White-Tail Deer Research Project in the Region

MORE THAN JUST TREES

This white-tailed deer research project is the largest ever of its kind in the region with JDI as the major funding partner.

8 Partners in Canada and the U.S.

Over 100 deer in Maine and New Brunswick monitored with precise GPS collars

The Largest White-Tail Deer Research Project in the Region
In 2017 we updated our management plan for the 1,255,000 acres that we own in Northern Maine. This forest management plan aligns with the criteria and objectives outlined within the Maine Forest Service’s (MFS) Outcome Based Forestry (OBF) law. We are confident that our new plan can be implemented to meet the desired outcomes of the OBF agreement that we entered into with the MFS. This agreement requires that our operations be implemented in a manner that is ecologically sustainable, economically viable and socially responsible.

Outcome Based Forestry requires economic, social and environmental assessment.

www.maine.gov/dacf/mfs/policy_management/outcome_based_forestry.html

Our OBF agreement obligates us to maintain independent third party certifications for our woodlands and relieves us from certain provisions of the Maine Forest Practices Act (FPA). Today, our woodland’s are certified to meet the standards of the Forest Stewardship Council® (FSC® C041515) and the Sustainable Forestry Initiative® (SFI®) forest certification systems. Under this agreement the FSC US Forest Management standards have been aligned (with additional indicators) with all federal and state laws.

Final OBF assessment is determined by a governor appointed panel of technical experts who report to the director of the MFS. The accompanying table provides a quick reference comparison between OBF and the Maine FPA and the benefits that have been achieved thus far. A summary of our forest management plan and our SFI and FSC certification reports are both publicly posted on our website.

<table>
<thead>
<tr>
<th>OBF</th>
<th>COMPARISON BETWEEN OBF AGREEMENT AND FPA</th>
<th>FPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>State of Maine, Based Technical Experts Review</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Independent 3rd Party Certification Required</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Provisions to Improve Timber Supply and Quality</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Provisions to Protect Forest Health</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Provisions to Conserve Biological Diversity</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Provisions to Consider Economic and Social Obligations</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Reduced Administrative Work for Landowner and MFS Staff</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Increased Reporting Transparency</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Required for all harvests</td>
<td>Only required for clearcuts</td>
</tr>
<tr>
<td>Required</td>
<td>Science Based Harvest Prescriptions</td>
<td></td>
</tr>
<tr>
<td>Required</td>
<td>Regeneration of Clearcuts</td>
<td>Required</td>
</tr>
<tr>
<td>250 acres</td>
<td>Maximum Clearcut Size Allowable</td>
<td>250 acres</td>
</tr>
<tr>
<td>Landowner can manage with scientifically based silviculture prescriptions</td>
<td>Clearcut Separation Zone Requirements</td>
<td>May only be harvested according to prescriptive standards in rule</td>
</tr>
<tr>
<td>Buffering between clearcuts can utilize natural landscape features</td>
<td></td>
<td>Minimum 250 foot separation zones with short term 1:1 acreage requirement</td>
</tr>
<tr>
<td>Yes</td>
<td>*Required Compliance to All Local, State &amp; Federal Regulations to Protect Water and Wildlife and Protected Resources (i.e. DEP, LUPC, MFS, AWW, Local Ordinances, etc.)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*The State of Maine has established laws that protect the wildlife, waters and unique natural resources in our State that are above and beyond the FPA. All of the laws protecting our natural resources remain intact and are still subject to compliance under OBF.
BENEFITS OF OUTCOME BASED FORESTRY

- Less road building (40% reduction)
- Operate on less of the landbase – less fragmentation of the forest
- Science-based harvest prescriptions = better management
- Salvaging mortality due to wind damage and disease, improving forest health and reducing forest loss due to mortality
- More efficient operations
- A competitive wood supply for Maine mills
- No increase in percentage of clear cutting

“Under outcome based forestry my machines spend less time on a low-bed and this has helped me improve my bottom line.”

Jeremy Fournier – Ironwood Logging
Eagle Lake, ME (7 employees)
Independent 3rd party verification of our forest management is important for public credibility and confidence. Under our OBF agreement with the MFS, we are required to maintain independent 3rd party certification (aligned with all state and federal laws) for all of our Maine Lands with oversight and endorsement of auditing results by a governor appointed panel of experts.

In 2017, our operations were audited to the standards of the Sustainable Forestry Initiative (SFI) and ISO 14001 as well as the principles and criteria of the Forest Stewardship Council (FSC) – US Forest Management Standards. Auditors found our sustainable forest management system to be in conformance to the SFI program and that the ISO 14001 Environmental Management System (EMS) was being effectively implemented and that overall conformance to the applicable FSC standards was achieved. No corrective action requests were issued by auditors for FSC indicators under the US Forest Management Standards.

Our FSC and SFI certifications require us to minimize and strive to reduce our use of chemical pesticides.

Expert panel findings for 2017 can be found on the Maine Forest Service’s website for Outcome Based Forestry. The following graphs depict focal areas for auditors in 2017.
Numerous examples of effectively protected riparian areas and waterbodies were observed during the field audit.

A number of vernal pools were observed during the field audit to be well protected under the Company’s Vernal Pool Policy.

JDI planners do an effective job of tailoring the silviculture system(s) being prescribed to the stand characteristics (species composition, structure, condition, age(s), etc.), site characteristics (fertility, trafficability) and broad management objectives pertaining to a particular stand. In addition to clearcut systems, a variety of partial cutting silviculture systems are prescribed and implemented by the Company.

Forest Stewardship Certification (FSC) 100% of Maine holdings
Certification Non-Conformances (FSC, SFI & ISO 14001) 0
Volunteer Conservation areas on JDI land # of unique areas set aside 256 sites / 19,733 acres

SAFE
www.fsc.org
FSC-C041018
The mark of responsible forestry
SUSTAINABLE FORESTRY INITIATIVE
SFI-COC0027
ISO 14001
registration KPMG
ZERO Non-conformance
In 2017, our foresters implemented an operating plan that was designed to meet our sustainable forest management strategy as outlined in our management plan under OBF. Operations were conducted under complex environmental, market and economic conditions this past season. The flexibility afforded by OBF to properly plan and execute operations to meet the daily challenges that our people face was a tremendous asset in closing a successful operating year.

**Silviculture – Growing a Healthy Forest**

- Over 23 million trees planted since 2009

**Sustainable Harvesting of Forest Products**

- 100% of Annual Allowable Cut (SF,CE,HWD)
- 100% of Annual Allowable Cut (SF,CE,HWD)

**MAINE WOODLANDS**

Planning 80 years ahead for the environment and to ensure healthy forests for generations to come.
As part of our commitment to improve the health, growth and long term yield from our lands, we continuously monitor forest health, development and growth and yield (often in cooperation with the MFS). Monitoring is achieved through staff training and observation, stakeholder consultation and input, regular aerial reconnaissance, and an intensive ground sampling program that measures growth and yield dynamics for long term planning needs. The following provides a sample of our 2017 monitoring program.

### Forest Surveys

<table>
<thead>
<tr>
<th>Year</th>
<th>Survival %</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>97%</td>
<td>Survival issues are mostly related to weather.</td>
</tr>
<tr>
<td>2nd year</td>
<td>87%</td>
<td>Survival issues are related to competition, and weather.</td>
</tr>
<tr>
<td>5th year</td>
<td>4,300 acres</td>
<td>were surveyed and were found to be free from significant competition.</td>
</tr>
<tr>
<td>10th year</td>
<td>3,258 acres</td>
<td>were surveyed and found to have significant natural competition that now requires intermediate thinning treatments.</td>
</tr>
<tr>
<td>HCVF</td>
<td>7 areas</td>
<td>No management activities occurred in or adjacent to any HCVF. No significant changes have occurred within the designated areas. Old trees continue to show signs of stress and dieback. Insect and disease damage is still evident. No evidence of fire.</td>
</tr>
<tr>
<td>Invasive Species Monitoring</td>
<td>All</td>
<td>Glossy Buckthorn, Garlic Mustard and Dog Strangling Vine are invasive species of particular concern, at this time monitoring has not detected evidence of establishment in the woodlands.</td>
</tr>
<tr>
<td>Insect Monitoring</td>
<td>92 plots</td>
<td>Irving foresters assisted MFS personnel with insect monitoring, primarily looking for spruce budworm activity (see: MFS website for regional results of findings).</td>
</tr>
</tbody>
</table>

In addition to monitoring forest health and growth, we are obligated and required to measure our impact on the environmental and social aspects of our operations. We strive to protect our environment with programs to improve operations, lessen our impacts on water resources and improve our handling of dangerous goods such as fuel. Operations improvement is the focus of our daily work. It covers all of our operations from planning to reforestation of harvest areas. Programs to improve operations include sustainability of wood supply, public education and communication in forest management affairs, soil conservation by controlling equipment rutting, conservation of biodiversity by protection of habitat, respecting forest cover type distribution and site specific and forest level habitat protection.

Water protection programs include managing our use of dangerous goods near water, careful planning and management of riparian areas, management of siltation from harvest areas, proper installation and maintenance of watercourse crossings, and strict control of activities within municipal water supply areas. These programs all follow existing government regulations and are part of all staff and contractors’ daily routines.

The environmental and social impact of our operations is monitored by following an Environmental Management System (EMS) that allows us to record, monitor and respond to incidents as they are reported. Our EMS system is based on a “top to bottom” communication system. Corporate leadership to our regional team flows through the operations. Staff meetings are regular, and operational issues in the form of Incident’s and Non- conformances are discussed between staff and contractors every week. All incidents and non-conformances are entered into a database where corrective actions are reported, prioritized and tracked to monitor trends for determining where we are off plan and where improvements need to be made.

In 2017, improvement was below expectation for equipment rutting, wood waste and road construction. Action plans have been established to assist in meeting established targets. In 2017, 7 public complaints were received and action plans to address those concerns were completed.
Meeting with and formally addressing stakeholder concerns is part of our 3rd party certification requirements. We have met both formally and informally with individuals and organizations in an effort to incorporate responsible ideas, guidance, suggestions, information/data, positive comments, complaints and concerns into our management planning process.

In 2017 we also met with the following:

- Numerous Individuals
- Local Town Boards
- Aboriginal Groups
- Sportsmen Organizations
- Technical Schools
- Other Landowners
- Numerous Forestry Organizations
- Sportsmen Forest Landowner Alliance
- Maine Snowmobile Association Clubs
- ATV Clubs
- North Maine Woods
- Allagash Wilderness Waterway
- Maine Forest Service
- Fish River Lakes Association

<table>
<thead>
<tr>
<th>Organization</th>
<th>Nature of Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine Natural Areas Program</td>
<td>Gathering spatial information on any recent finds of Maine’s rare and invasive plants as well as providing the state with details on staff finds. This is done annually.</td>
</tr>
<tr>
<td>Maine Inland Fisheries &amp; Wildlife</td>
<td>Gathering spatial information on recent finds of Maine endangered/threatened fauna species and provide details to the State on any JDI staff finds. This is done annually. Spent time with MIFW staff in the field to confirm the use of a number of Great Blue Heron colonies. Regular discussions on issues such as deer and moose management, heron colonies, etc.</td>
</tr>
<tr>
<td>Maine Heritage Preservation Commission</td>
<td>Gathering spatial information on any recent archaeological finds.</td>
</tr>
<tr>
<td>University of Maine (Presque Isle)</td>
<td>Discuss operational constraints on our harvesting equipment that will be in the vicinity of an historic native site.</td>
</tr>
<tr>
<td>New England Wildflower Society (NEWFS)</td>
<td>NEWFS provides Irving Woodlands, LLC with detailed information on the status of particular rare plant sites on our land in northern Maine.</td>
</tr>
<tr>
<td>Manomet Center for Conservation Sciences</td>
<td>Advice on rare/uncommon forest communities and late successional forests.</td>
</tr>
<tr>
<td>Penobscot Environmental Consulting</td>
<td>Advice on retaining and recording legacy trees.</td>
</tr>
<tr>
<td>SFI Fisheries Improvement Network (FIN)</td>
<td>Maine Forest Products Council / SFI led group consisting of Landowners, State and ENGO groups dedicated to improving fish habitat state-wide.</td>
</tr>
<tr>
<td>Maine Stream Connectivity Network</td>
<td>Regulator, landowner ENGO group formed to improve fish and aquatic connectivity on Maine watercourses.</td>
</tr>
<tr>
<td>MFPC Wildlife Technical Committee</td>
<td>Landowner group who discuss fish &amp; wildlife issues, usually with state regulators and user groups like SAM.</td>
</tr>
<tr>
<td>Cooperative Forest Research Unit (CFRU)</td>
<td>UMaine researcher-landowner sponsored body which develops and researches a variety of forestry and wildlife interaction issues.</td>
</tr>
<tr>
<td>Maine Department of Environmental Protection</td>
<td>Issues concerning invasive forest plant species.</td>
</tr>
</tbody>
</table>
Irving Woodlands, LLC continues to provide historic, traditional recreational opportunities. Both inside and outside the North Maine Woods framework of Aroostook County, there is a well developed culture that provides public access to private land for engaging in traditional recreational uses. The working relationships developed with both individuals and groups from this sector has been mutually beneficial to all. Continued support of traditional uses such as hunting, fishing, trapping and hiking on our lands are welcome.
INVESTING IN MAINE

WE ARE COMMITTED TO CONTINUOUSLY IMPROVING EVERY ASPECT OF OUR MANAGEMENT AND OPERATIONS.

We want to be partners and good neighbors and we continue to actively work to support our state, our communities, workers, contractors, suppliers and customers.

- In 2017 we worked with 30 commercial outfitters offering outdoor experiences in our woodlands
- Cooperative working relations with over 650 camp leases
- Recruiting, developing and training people internally, from our university system and our communities

2017 INVESTMENTS IN GROWING HEALTHY FORESTS

- 2,950,000 trees planted
- 4,800 acres of pre-commercial forest thinning
- $2,500,000 silviculture investments in 2017

ADDITIONAL PROJECTS UNDERWAY

- Increased spruce budworm monitoring levels
- Recruitment of contractors and specialized equipment for working in the forest
- Development of a new management plan utilizing next generation data and analysis
- Development and use of precision forestry tools

We’re Hiring!

Sawmills Operations 2018 -2020
126 Forecasted Hires
(staff, hourly and student)

We’re Also Recruiting
17 Contractors
96 Contractor Operators
OUTCOME BASED FOREST SUSTAINS A VALUE-CHAIN OF JOBS THROUGHOUT MAINE

HEALTHY FORESTS • GROWING JOBS • VIBRANT COMMUNITIES

Outcome based forestry means a competitive wood supply to many non-Irving mills in the state, including:

- Columbia Forest Products
- Corinth Pellets
- JM Huber
- Katahdin Forest Products
- Louisiana Pacific
- Maibec Lumber
- Maine Woods Company
- Northeast Pellets
- Portage Wood Products
- Premium Log Yards
- Re-Energy Ashland
- Re-Energy Fort Fairfield
- Woodland Pulp LLC
- WT Gardner Chipmills