



WOODLANDS
SINCE 1882

2021

**STATE OF THE
FOREST REPORT**

A YEAR LIKE NO OTHER

2021 HIGHLIGHTS & KEY STATISTICS

OVER 1,500 PEOPLE MAKING IT HAPPEN



2021 IN REVIEW

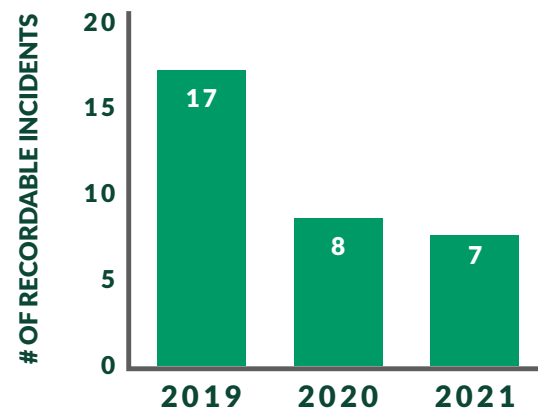
\$22 MILLION

IN INVESTMENTS IN 2021 (CAD)

\$435 MILLION

SPENT ON LOCAL SUPPLIERS IN 2021 (CAD)

HEALTH & SAFETY



OF LOST TIME INJURIES



88%

Overall Woodlands Engagement Score - Employee Engagement Survey



4,816,044

Tonnes Harvested



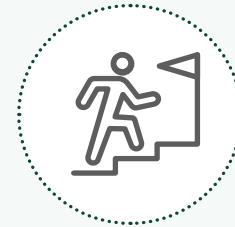
1,750,101

Tonnes Purchased



447

Full Time Employees



201

Students



76

International Recruits



800 +

Operators & Truck Drivers



Erika Popika, Forest Technician



Anil Gill, Tree Planter



Calvin Munn, Owner of CWM Logging Ltd.



WATCH OUR STORY



LEARN ABOUT OUR FOOTPRINT



irvingwoodlands.com

Covid-19 continued to impact our business and the world, but despite this, our team was able to stay healthy, cut the wood we needed to feed our mills, and supply our customers. We leveraged online meetings and digital brand initiatives to reach a wide audience and were able to thrive in many ways.

We saw advances in our trucking and harvesting technology to maximize productivity and lessen climate impact. We made partnerships with and donated to local clubs to ensure our communities could discover the gift of nature. We welcomed 76 newcomers and some of their families from seven countries around the world to settle in New Brunswick, and employed over 1,500 local contractors and employees to support our business. We planted over 15 million trees, and declared the Forest Supply Chain, of which we are a part, carbon neutral through to the end of 2021. Throughout all these achievements, we kept our minds on continuous improvement and working hard to be better every day. Our performance-driven team is what enables us to better serve our customers and our communities.

This report shows our dedication to economic performance and how that commitment coincides with social responsibility and community support.

MAP OF OPERATIONS



LEGEND

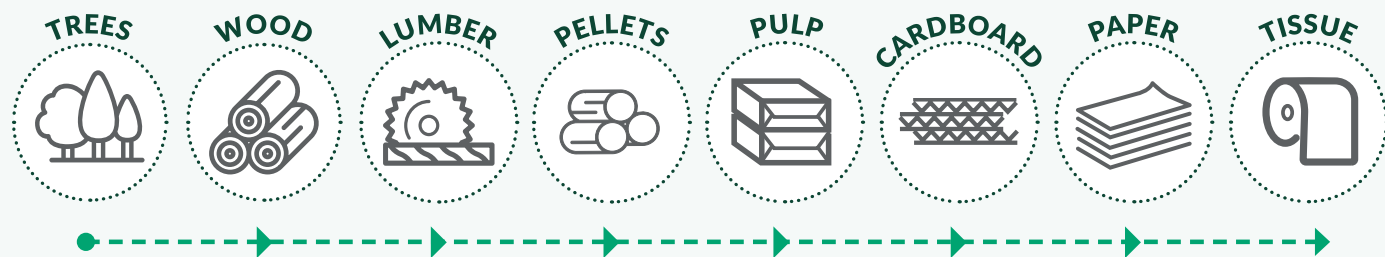
- WOODLANDS FREEHOLD LAND
- CROWN LAND LICENSE 7 (NB)
- PULP AND PAPER
- TISSUE
- SAWMILL DIVISION (including Pellet Plant and Juniper Organics)



OUR CARBON FOOTPRINT

GROWING FORESTS.
MORE VOLUME. MORE
CARBON REMOVED.

OUR FOREST SUPPLY CHAIN



Our long-term forest management practices, tree improvement programs and commitment to tree planting and producing products that store carbon result in a net removal of carbon across our Forest Supply Chain.

Scope 1,2,3
Emissions

1,715,000
MTonnes CO₂e

Removals

2,335,000
MTonnes CO₂e
Forest Growth

588,000
MTonnes CO₂e
Harvested Wood
Products

Total
**WE REMOVE
MORE
CARBON
THAN WE
EMIT!**

(1,208,000)
MTonnes CO₂e

Read the full report



JDIRVINGSUSTAINABILITY.COM

The carbon footprint of the Forest Supply Chain for calendar year 2020 has been calculated in accordance with international standard PAS2060:2014. KPMG, an independent third-party, has verified this claim to a limited assurance standard.

45 YEARS OF GROWING THE BEST TREES

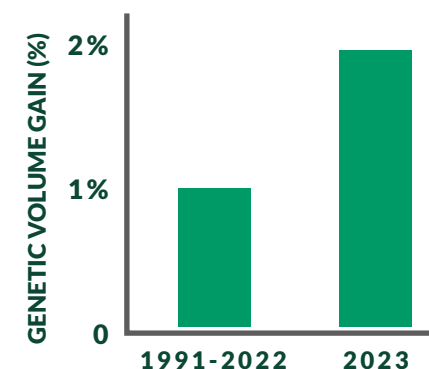
ONE OF THE
LARGEST TREE
IMPROVEMENT
PROGRAMS IN
CANADA

OUR SEEDLINGS ARE:



Driving Increased Tree Improvement

Leveraging technology and research to improve genetic volume gain by 2% each year.



At our seed orchard in Parkindale, NB, we collect cones from top-performing trees to cross-pollinate and create better trees for the next generation!



Parkindale Seed Orchard, Parkindale, NB



Jesus Jimenez, Lab Manager, Maritime Innovation Ltd.






Our team at Maritime Innovation Limited patented world first techniques to create new generations of pest-resistant trees by discovering a native fungi that provides natural protection from pests. We've treated over 170+ million seedlings with this fungi to date, resulting in an:

Increased natural tolerance to insects and disease

Healthier, stronger trees

WORLD-CLASS FOREST MANAGEMENT

INVESTING IN TODAY FOR FUTURE GENERATIONS

 <p>Site Preparation</p> <p>12,569 HA 31,058 AC</p>	 <p>Tree Planting</p> <p>7,856 HA 19,412 AC</p>	 <p>Early Competition Control</p> <p>21,568 HA 53,294 AC</p>	 <p>Plantation Cleaning</p> <p>10,279 HA 25,400 AC</p>	 <p>Pre-Commercial Thinning</p> <p>927 HA 2,291 AC</p>
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14,872,422

SEEDLINGS PLANTED IN 2021

12,693,827 SEEDLINGS PLANTED IN 2020



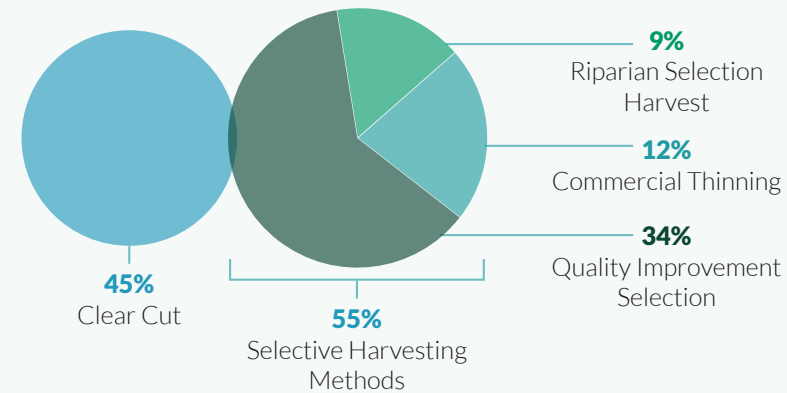
\$21 MILLION

SPENT ON SILVICULTURE INVESTMENTS IN 2021 (CAD)

\$9.6 MILLION

(FROM TOTAL \$21 MILLION SILVICULTURE INVESTMENTS)
PAID TO SILVICULTURE CONTRACTORS IN 2021 (CAD)

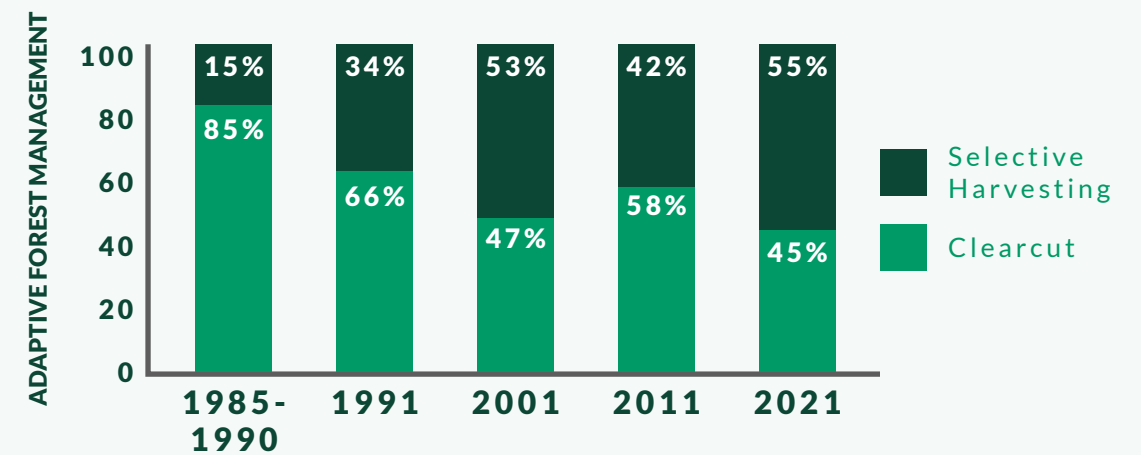
OVER 50% OF OUR HARVESTING IS WITH NON-CLEAR CUT METHODS



FOREST ROADS BUILT:
476 KM/295 MI

TOTAL ROAD NETWORK:
30,749 KM/19,107 MI

Percentage of land harvested by method over 35 years



Wood Harvested

2,086,528 tonnes on Crown L7
2,405,430 tonnes on Freehold
324,086 tonnes Purchased Stumpage



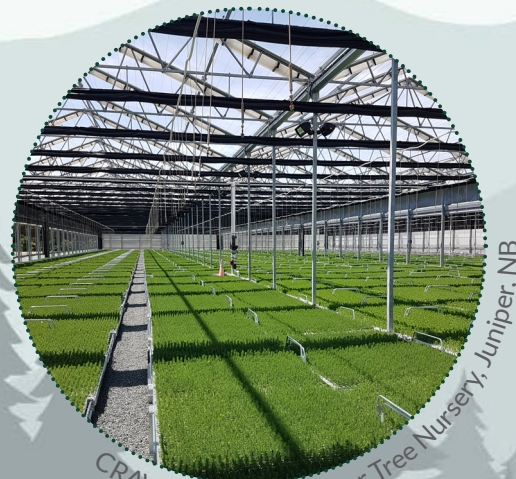
Wood Purchased
1,750,101 tonnes

TOTAL - 6,566,145 tonnes
(Crown L7, Freehold and Purchased)



2021 INVESTMENTS

- 5945 sq m (64,000 sq ft) retractable roof greenhouse system.
- It can hold up to **3 million seedlings** at one time.
- Completed in 2021 - we are **investing in expansion.**



ABOVE AND BEYOND

19 YEARS OF THIRD-PARTY FOREST CERTIFICATION

100% of land certified



100% of land certified



100% of land certified in Maine



The mark of responsible forestry



HEALTHY AND DIVERSE FORESTS

WE RELY ON THE FOREST FOR EVERYTHING WE DO

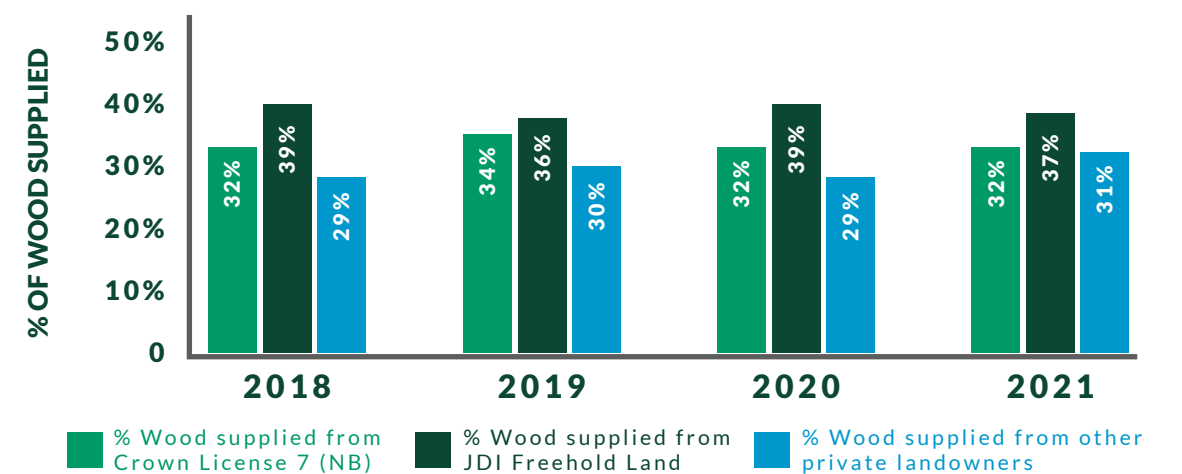
Since 1882, our approach to sustainability has been simple - if we look after the forest, the forest will look after us. This approach requires balancing the short-term needs of the business with the long-term vision required to sustain generations of forests.



IRVING WOODLANDS MANAGED FORESTS

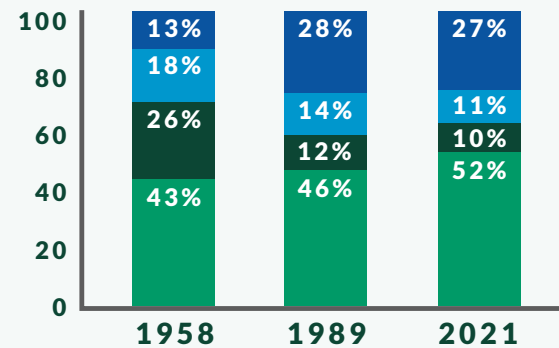
HECTARES	ACRES	
796,321	1,967,709	JDI Freehold (NB & NS)
518,256	1,280,611	JDI Freehold (ME)
1,062,471	2,625,366	Crown License 7 (NB)
2,377,048	5,873,686	Total

WOOD SUPPLY DASHBOARD



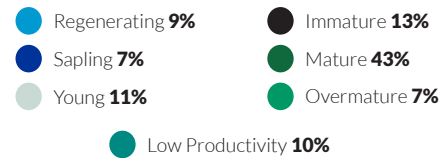
COMMITTED TO LONG-TERM BIODIVERSITY

Increasing Hardwood Forests Over Time

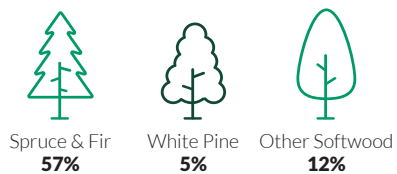


CROWN LICENSE 7 (NB)

DIVERSITY OF FOREST AGE CLASSES



DIVERSITY OF FOREST SPECIES



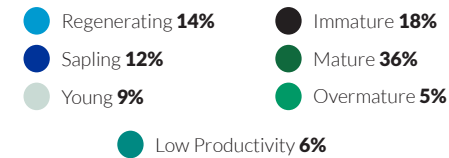
74% SOFTWOOD



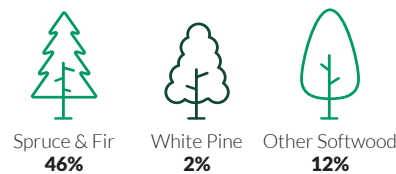
26% HARDWOOD

JDI FREEHOLD (NB, NS, ME)

DIVERSITY OF FOREST AGE CLASSES



DIVERSITY OF FOREST SPECIES



60% SOFTWOOD



40% HARDWOOD

WE CONSERVE 23% OF THE LANDS WE OWN OR MANAGE

CONSERVED LANDS	FREEHOLD	CROWN LICENSE 7 (NB)
<ul style="list-style-type: none"> UNIQUE AREAS WATER AND WETLAND BUFFERS DEER WINTERING AREAS OLD FOREST HABITATS PROTECTED NATURAL AREAS 	18%	30%
	242,643 HA	314,680 HA
	599,571 AC	777,574 AC

TOTAL CONSERVED LAND (FREEHOLD AND CROWN):
557,323 HA / 1,377,145 AC

CONTINUOUS IMPROVEMENT

KNOWLEDGE AT OUR FORESTERS FINGERTIPS



A Connected Forest

Our foresters can work wherever they are from their phones, which eliminates drive time, fuel consumption, and promotes a greater work/life balance.



Over 200 remote forestry machines report live data back to Woodlands offices



TECHNOLOGY HIGHLIGHT

LIVE DATA: Using a combination of LiDAR technology, GIS mapping, and GPS, our instant information transmission has increased our global competitiveness, efficiency, and forest management accuracy. Through live data transmission, supervisors and harvesters receive up-to-the-minute changes to forest planning from foresters.



DRIVING BUSINESS FORWARD

- We increased our fleet to 26 tri-drive configured units resulting in:



- Tri-drive program increased 73% since 2020. Each truck has an **increased payload of 15%**.
- 506,235 mtons moved with **2324 less truckloads** for the same volume of wood.
- Truck cycle times **improved 21%**, with 8,700 hours idle time eliminated and **15% less fuel consumed**.

PLAN. HARVEST. REPEAT.

Growing and securing our wood supply means we plan for the next 80 years.



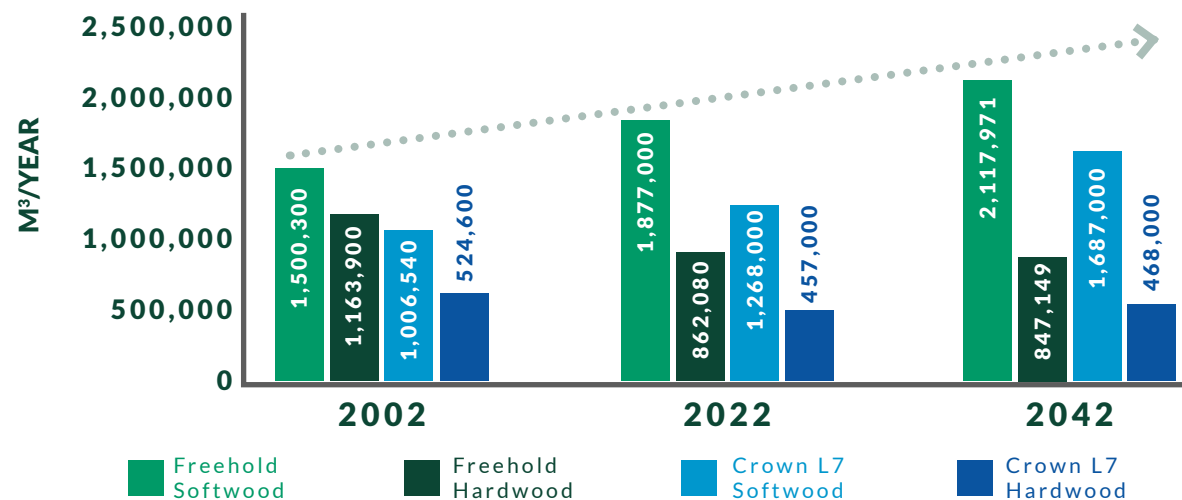
Shelterwood Harvest, Sussex, NB

IN 2021 WE HARVESTED
1.8%
OF THE FOREST.
EACH YEAR IT IS <2%

AVERAGE HARVEST OPENING SIZE

Freehold	Crown L7	Average
19.2 HA 47.5 AC	28.7 HA 70.9 AC	22.4 HA 55.3 AC

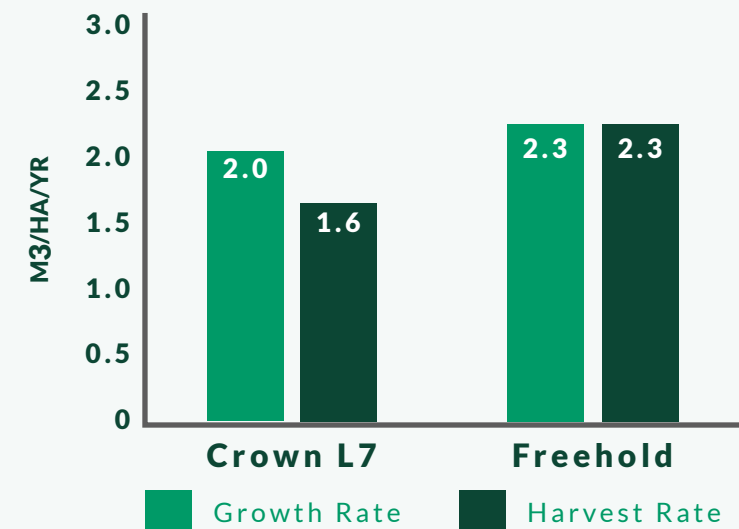
A GROWING WOOD SUPPLY



EXCELLENCE IN FOREST PROTECTION

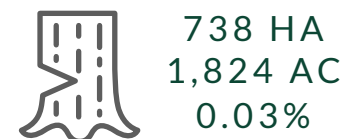
Our responsible forest harvesting and action against pests and fire protects our wood supply for generations.

GROWING MORE THAN WE HARVEST

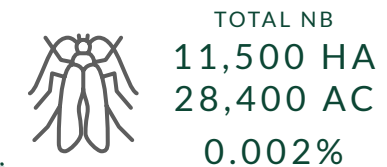


Southwest Miramichi River, Deersdale, NB

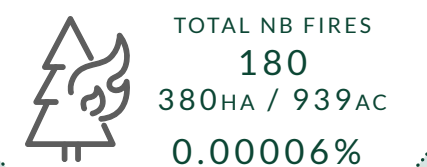
AREA DEFORESTED (NEW FOREST ROADS)



DEFOLIATION (SPRUCE BUDWORM)



AREA BURNED (FOREST FIRE)



FIREFIGHTING



4 FIXED WING AIR TANKERS



1 SPOTTER PLANE



2 HELICOPTERS



7 AIRSTRIPS



37 FIRE TRUCKS



47 PUMP UNITS



360,000+ FEET OF HOSE

COMMITTED TO LONG-TERM FOREST RESEARCH

1992-PRESENT



\$30 MILLION SPENT ON OVER 30 YEARS OF RESEARCH.

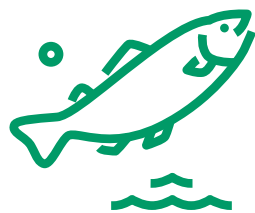
Over 20 years of the Forest Research Advisory Committee (FRAC)

In close collaboration with expert scientists, we use data to inform our best management practices as part of our commitment to Adaptive Forest Management.

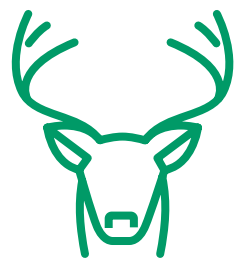


Collared yearling moose, Tracy, NB

All findings are published in independent, peer-reviewed, scientific journals.



FISH AND WATER



DEER MOVEMENT



MOOSE & WINTER TICKS



SONGBIRDS

PROTECTING WATERCOURSES WITH BEST MANAGEMENT PRACTICES

PROJECT PARTNERS



JDI partnered with scientists to determine if our forest management operations impact freshwater ecosystems.

JDI uses high-precision Wet Areas Mapping to avoid or minimize impact on water and wet area crossings.

PROJECT PARTNERS



Researchers are working to develop a modelling tool to tell when rivers become too stressed for different age classes of salmon and brook trout.

RESEARCHERS: Dr. Tommi Linnansaari, Dr. Antòin O'Sullivan

STATISTICS & FINDINGS SO FAR:

- 56 underwater cameras have been installed to determine what temperatures drive fish to cold water refuges.
- The threshold temperature at which a fish seeks cold water refuge fluctuates depending on how much time it has spent in cold water and the frequency of warmer water events.

RESULTS

- Intensity of forest management does not translate into greater environmental impacts.
- All monitored sites were classified as having good or very good biological quality.
- Some sediment ran off into streams below watercourse crossings, but the amount stayed within water quality standards.

RESEARCHER PROFILE

ANTÒIN O'SULLIVAN

from Limerick, Ireland has most recently completed a PhD in remote sensing and ecohydrology at the University of New Brunswick. His focus is on how the waterscape moves, and how this affects forests, streams, rivers, wetland ecosystems, and their flora and fauna.



Flyfisherman, Cains River, Central NB

WHITE-TAILED DEER IN THE WORKING FOREST

PROJECT PARTNERS



RESEARCHERS: (Northeast Deer Partnership): Dr. Graham Forbes (UNB), Dr. Carly Sponarski (UMaine), Joe Kennedy (NBERD), Dr. Amber Roth (UMaine), John Gilbert (WDLS), Nathan Bieber (MIF&W), Elias Ayrey (UMaine), Dr. Dave MacLean (UNB), Joe Nocera (UNB), Ian Thompson (UNB), Philip Wiebe (UNB)

RESEARCHER PROFILE



PHILIP WIEBE has been a biologist with Canadian Forest Services for over 15 years and studies the effects of forestry on forest-dwelling animals in Canada. He is currently a PhD student at the University of New Brunswick focusing on white-tailed deer. Philip hopes to help gain a better understanding of the relationship between habitat quality and population growth through animal location technology.



We maintain 135,410 HA/334,599 AC of mature coniferous deer wintering areas.

FINDINGS SO FAR:

- Deer use known routes during seasonal migration; average migration is 20-40 km.
- Summer range is in forest stands <12 meters tall and typically around 5 meters. This is common in regenerating clear cuts <15 years.
 - This suggests deer browsing is not negatively affected by silvicultural practices.
- Winter range is in dense mature conifer forests that provide cover.
- Deer take advantage of winter harvesting operations to feed from fallen treetops.

STUDY STATISTICS

- Over 100 deer GPS collared in 5 years to assess population changes and silviculture practices.
- Each collar creates up to 10,000 location points over 3 years.
- The tracking is accurate to 4.5 metres (15 feet).
- The longest tracked migration was 110 kms between summer and winter habitats.

UNDERSTANDING CLIMATE: MOOSE AND TICK INTERACTIONS

PROJECT PARTNERS



This five-year project focuses on understanding possible impacts of winter ticks, climate change, and predation on moose populations in NB and QC.

RESEARCHERS: Christian Dussault (MFFP), Jean-Pierre Tremblay (ULaval), Steeve D. Côté (ULaval), Joe Nocera (UNB), Patrick Leighton (UdeM), Christopher Fernandez-Prada (UdeM), Sandra Hamel (ULaval)

RESEARCHER PROFILE

DOUGLAS MUNN

is a wildlife biologist PhD student at the University of New Brunswick who has been involved in a 5 year moose winter tick research project with JDI. His dissertation focuses on the movement ecology of juvenile moose in QC and NB to identify possible impacts of winter ticks, climate change, and predation on moose populations. Douglas hopes to develop management strategies that address current and future factors affecting moose in Eastern Canada.



In 2022, 4 calves were equipped with video enabled collars which captured 3 months' worth of footage!

STUDY STATISTICS

- 198 calves GPS collared in 6 regions to assess population health.
- 99 were treated with an acaricide to compare tick levels.
- Preliminary results indicated that the acaricide significantly reduced number of ticks per animal.
- Survival rate of treated calves is 93%.



Up to 80,000 ticks can be found on a single moose.

FINDINGS SO FAR:

- Tick loads in 2022 were higher than 2020 (study paused in 2021).
- Drier summers correlate with lower tick counts the following fall.
- Infestations weaken moose and make them vulnerable to other diseases.
- Acaricide treatment reduces tick count.

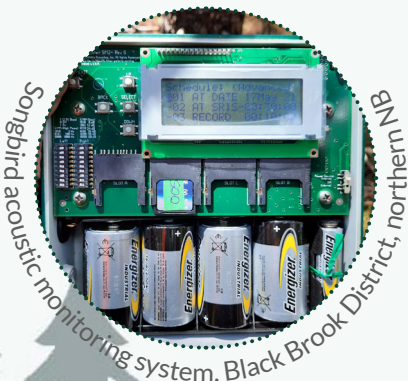
HIGH BIRD DIVERSITY AND RICHNESS IN MANAGED FORESTS

PROJECT PARTNERS



JDI partnered with scientists at Natural Resources Canada, Carleton University, and the Canadian Wildlife Service in 2016 for a five-year songbird habitat research project.

Acoustic monitoring devices were placed in multiple stands in each of the **17 dominant forest types** in Black Brook over two seasons. JDI's enhanced mapping system gives researchers the ability to know the forest landscape and learn how species use different forest types.



Songbird acoustic monitoring system, Black Brook District, northern NB



Canada warbler

GOALS OF THE STUDY

Assess songbird species presence and habitat preferences in the Black Brook district.

RESULTS

suggest that the managed landscapes of Black Brook have not changed the ability of mature forest stands to supply habitat to forest bird species. We look forward to the full results of this study.

458 SITES sampled with **90 BIRD SPECIES** identified from the recordings in the laboratory.

Initial comparison shows that the **HIGHEST DIVERSITY OF SPECIES (77)** was found in the most intensively managed forest. This is more species diversity than in Mount Carleton Provincial Park.

AWARD-WINNING CONSERVATION PROGRAM



23% of our land is set aside for conservation.



We have seen a 32% increase in the number of sites over the last 5 years.

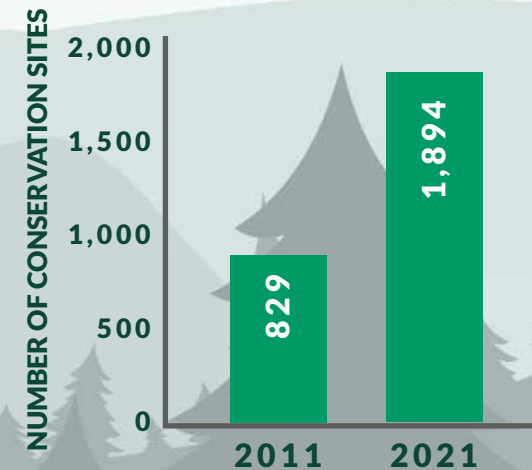


We added 156 new sites in 2021.

DISCOVER THE GIFT OF NATURE **1,894** TOTAL # OF SITES
 TOTAL HECTARES: 81,331
 TOTAL ACRES: 200,887

- 673 PLANTS
- 451 BIRDS & MAMMALS
- 243 REPTILES & INVERTEBRATES
- 186 UNIQUE FOREST STANDS
- 146 HISTORIC
- 87 AESTHETICS
- 56 LAKES & WETLANDS
- 21 FISH
- 22 GEOLOGICAL & FOSSIL
- 9 HIGH CONSERVATION FOREST

OVER 1,000 SITES ADDED IN THE LAST 10 YEARS



Fall Brook Falls, Boiestown, NB

DISCOVER THE GIFT OF NATURE

Developed a website showcasing a sampling of 20+ sites from the total 1,894

Installed 19 interactive signs at the Irving Nature Park and La Dune de Bouctouche

Fall Brook Falls:
5,000 visitors in 2021

Visit us online

JDIRVINGCONSERVATION.COM

OUR PARKS

WE MAINTAIN FOUR FREE PARKS FOR PUBLIC USE & ENJOYMENT

420,173

VISITORS TO THE PARKS IN 2021
(IRVING NATURE PARK & IRVING ECO-CENTRE: LA DUNE DE BOUCTOUCHE)



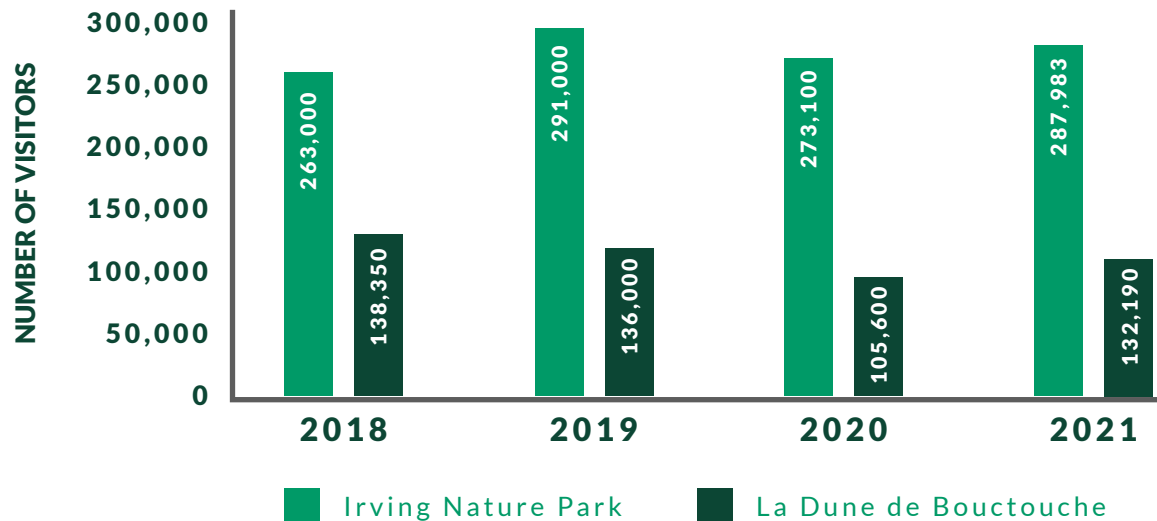
"Wolastoq" means "the beautiful river" in the language of the Wolastoqiyik people. The park was built in 2004 by J.D. Irving, Limited and overlooks the Reversing Falls rapids. The park is dotted with chainsaw-carved wood statues of historical figures, including the legendary Koluskap the Great Beaver, Samuel de Champlain, and our very own K.C. Irving.



- Free BBQs
- Public washrooms
- Accessible trails
- Guided tours
- Planned programming
- Partnerships with local ENGOs



VISITORS OVER THE YEARS



STAKEHOLDER ENGAGEMENT

LOCALLY FOCUSED ON OUR COMMUNITIES

55 STAKEHOLDER PARTNERSHIPS

4 NEW PARTNERS

64 COMMUNITY BASED PARTNERSHIPS

11 UNIVERSITY PARTNERS

12 OUTDOOR ASSOCIATIONS

3 MOTORIZED RECREATION ACTIVITIES

9 FISHING & HUNTING CLUBS

2 INDUSTRY ASSOCIATIONS

3 GOVERNMENT

12 NON-GOVERNMENT ORGANIZATIONS



158
Total Partners



9,100
People Reached



520
Stakeholder Meetings



\$203,000/80+ events
Community Donations/Events



BE A FORESTER FOR A DAY AND BOOK A TOUR WITH US

BRAND AWARENESS IN THE DIGITAL AGE:

Social media is now an essential method to reach stakeholders, provide operational information and maintain and improve brand awareness and trust.

CHECK US OUT ONLINE! ENGAGING STAKEHOLDERS THROUGH SOCIAL NETWORKING



IRVING WOODLANDS
24,000



IRVING WOODLANDS
2,400



@IRVINGWOODLANDS
800

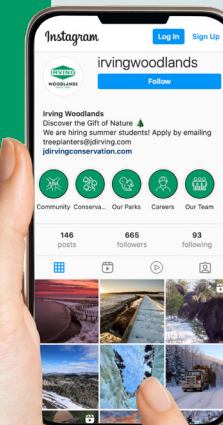
27,200 NEW FOLLOWERS IN 2021

STAKEHOLDER PROFILE



Irving Woodlands is pleased to partner with the Snowmobilers Association of Nova Scotia (SANS) to grow their network of winter recreation land, with an agreement that covers 118 kilometers of managed trails on J.D. Irving, Limited land.

Between 350 clubs across New Brunswick, Nova Scotia, and Maine, we have over 1,300 kilometers of snowmobiling trails.





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Southwest Miramichi River, Deersdale, NB