IRVING

J.D. IRVING, LIMITED

2021

J.D. IRVING, LIMITED FOREST SUPPLY CHAIN

ENVIRONMENT, SOCIAL AND GOVERNANCE REPORT

August 2022

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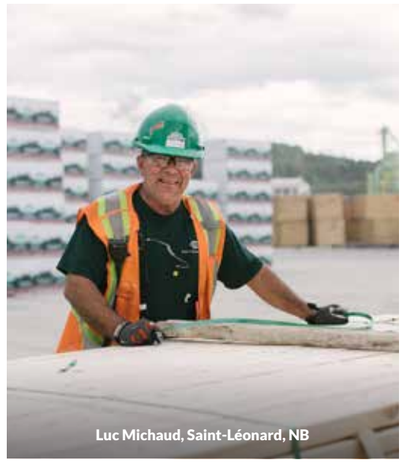
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ABOUT THIS REPORT

Since 1882, J.D. Irving, Limited and its affiliate companies (JDI) have been committed to developing and delivering quality products and service. With head offices in Saint John and Moncton, New Brunswick and 19,000 employees across the diverse family-owned operations in both Canada and the United States, JDI contributes to eight business sectors, including:

- Forestry and Forest Products
- Shipbuilding and Industrial Manufacturing
- Transportation and Logistics
- Retail and Distribution
- Construction and Equipment
- Consumer Products
- Food
- Agriculture

The JDI Forest Supply Chain[1] (Supply Chain) is made up of businesses in the Forestry and Forest Products and Consumer Products sectors. This is the Supply Chain's second annual Environment, Social and Governance Report (Report) which details ESG performance from January 1st to December 31st, 2021, across the Forest Supply Chain operations in Canada and the United States. The Supply Chain describes all forest management and forest products operations from seed to sale to customers including lumber, wood pellets, growing media, pulp, paper, consumer tissue products, diapers, and corrugating medium.

Consistent with our 2020 Report, we have aligned our reporting content to the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB) Pulp & Paper Product and Forestry Management industry specific standards, and the United Nations Sustainable Development Goals (SDGs). Consistent with our 2020 report, we have reported on several metrics from our sustainable forest management systems including the Sustainable Forestry Initiative® (SFI®) program standards, the Forest Stewardship Council® (FSC® C041515) standards and the International Organization for Standardization (ISO). For 2021, we have added disclosure related to the Task Force on Climate-Related Financial Disclosure (TCFD). All currency is in US dollars and all units of measure are in metric unless otherwise stated.

WHAT DOES ESG MEAN TO OUR STAKEHOLDERS?

"Sustainability and the planet. The responsibility we all have to take care of the earth and each other."

WHAT DOES ESG MEAN TO OUR EXECUTIVES?

"ESG to me is a set of standards on how JDI is evaluated in terms of sustainability with the environment, public perception and ethics. This is a measure of how advanced we are as an organization."

[1] Includes operations wholly or partially in various Irving entities, including J.D. Irving, Limited, Irving Pulp & Paper, Limited, Irving Paper Limited, Irving Consumer Products Limited, Irving Consumer Products, Inc., New Brunswick Railway Company, Grand River Pellets Limited, Juniper Organics Limited, Rothesay Paper Holdings Ltd., St. George Pulp & Paper Limited, St. George Power LP, Charlotte Pulp and Paper Co. Ltd., Miramichi Timber Holdings Limited, Allagash Timberlands LP, Aroostook Timberlands LLC, Maine Woodlands Realty Company, Maritime Innovation Limited, Irving Forest Products, Inc., and Forest Patrol Ltd.

[2] FSC® applies to Maine Woodlands Only

From Left to Right: J.K. Irving - Chairman, Jim Irving and Robert Irving - Co-CEOs

A MESSAGE FROM OUR CO-CEOS

Our business is growing. Sustainably.

Sustainably managed, our growing forests are the foundation of our forest products business and an ever-increasing part of the solution to combat climate change. By creating sustainable building products and investing in renewable energy, we're doing our part.

Growing healthy, diverse forests is our commitment and the legacy we will pass on to future generations. That's why we're investing in silviculture, nurseries, research and efforts to maintain biodiversity and clean water. It is also why we listen to our customers and stakeholders with an understanding that our actions extend beyond our organization.

From this strong foundation, we continue to learn and adapt to changing priorities by ensuring we have the best people, safe and well capitalized facilities, and use the best available science and technology.

This year, our ESG report highlights our team's many accomplishments. You'll see we have declared our organizational footprint of the Forest Supply Chain carbon neutral for the second year and are committed to maintaining this accomplishment. You can also read about our strategies to mitigate climate change and its effects in our first report following the guidance of the Task Force on Climate-Related Financial Disclosure. We celebrated a second tissue machine in Macon, Georgia coming online in 2021 and we have made significant investments in our sawmills, positioning ourselves to produce more sustainable and renewable building materials and forest products. And this year, as always, we're looking forward and laying out our goals to improve our environmental performance.

We often say: "if you're going to do something – do it right." That is what this is about. By focusing on these areas, we can share with our stakeholders information about our workforce and environmental performance. We also share our sustainability goals, to support our belief that a greener tomorrow starts with the work we do today.

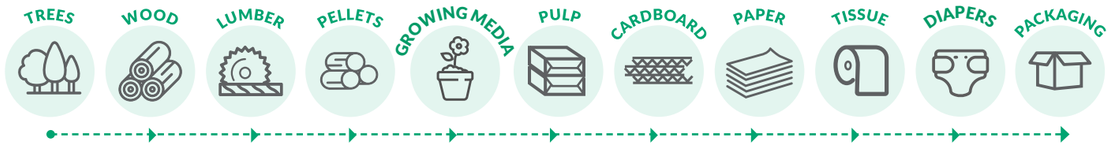
Jim Irving
Co-CEO

Robert Irving
Co-CEO

Irving Tissue Macon, GA

OUR OPERATIONS

The Supply Chain begins with the land tenure, wood supply, tree nurseries, silviculture (tree planting and tending), logging operations, sawmills, pellets, peat and gardening products, pulp, paper, corrugated medium, consumer tissue and diaper manufacturing facilities. From there, we transport our products by road, rail, and sea through our affiliated transportation businesses.



JDI FOREST PRODUCTS ARE SHIPPED TO 30 COUNTRIES AROUND THE WORLD

2021 PRODUCTION

We take great pride in sustainably managing this Supply Chain, exceeding the expectations of our customers in every facet of our business.

Our Supply Chain is designed to maximize the value from the naturally diverse forests where we operate. This allows us to maintain a healthy, diverse, and resilient forest while providing quality forest products that exceed our customers' expectations and support the communities where we live and work.

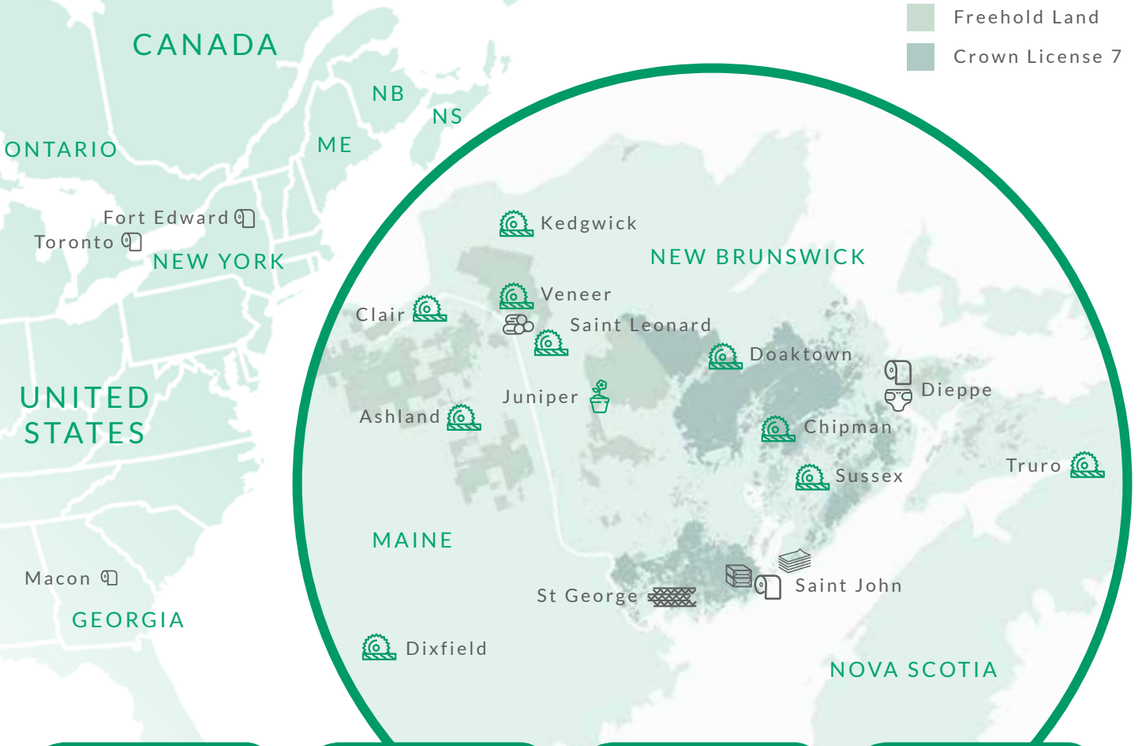
FOREST LAND (HECTARES)
2,381,405

SUSTAINABLE FORESTRY INITIATIVE SFI-00032

FSC www.fsc.org FSC® C041515 The mark of responsible forestry

ISO 14001 REGISTERED KPMG

FSC® applies to Maine Woodlands Only



TISSUE

326,327 Tonnes Produced

PRODUCTS
Bath & Facial Tissue/ Paper Towel

SUSTAINABLE FORESTRY INITIATIVE SFI-00032

DIAPERS

25,298 Tonnes Produced

PRODUCTS
Baby Diapers & Pants

PEFC Promoting Sustainable Forest Management pefccanada.org

GROWING MEDIA

21,316 Tonnes Produced

PRODUCTS
Peat moss, soils and mulches

SUSTAINABLY GROWN CERTIFIED SCS GLOBAL SERVICES VERIFLORA® PROGRAM SCS-VER-0004###

PELLETS

130,201 Tonnes Produced

PRODUCTS
Industrial Wood Pellets For Fuel/ Heat

SUSTAINABLE FORESTRY INITIATIVE SFI-00032

sbp

LUMBER

1,068,477 MFBM Produced

PRODUCTS
Structural & Appearance Grade Lumber

MLB NeLMA SUSTAINABLE FORESTRY INITIATIVE SFI-00032

PULP

338,210 Tonnes Produced

PRODUCTS
Northern Bleach Softwood & Hardwood Kraft Pulp

ISO 9001 REGISTERED KPMG ISO 14001 REGISTERED KPMG

SUSTAINABLE FORESTRY INITIATIVE SFI-00032

PAPER

388,974 Tonnes Produced

PRODUCTS
Printing Paper

ISO 14001 REGISTERED KPMG

SUSTAINABLE FORESTRY INITIATIVE SFI-00032

PEFC Promoting Sustainable Forest Management pefccanada.org

CORRUGATED

170,236 Tonnes Produced

PRODUCTS
Corrugated Medium/ Linerboard

ISO 9001 REGISTERED KPMG ISO 14001 REGISTERED KPMG

SUSTAINABLE FORESTRY INITIATIVE SFI-00032

2021 HIGHLIGHTS

$100 GIFT CARDS - SUPPORTING LOCAL

(Community Engagement)

In 2021, small businesses were facing significant challenges as a result of the ongoing COVID-19 pandemic. JDI launched a program that simultaneously recognized employee commitment while supporting local and giving back: employees in our Supply Chain were gifted a custom box of chocolates, made locally, and a $100 prepaid gift card with encouragement to support their favourite local business.

Recognized by the Saint John Chamber of Commerce as a true advocate for supporting local businesses throughout the pandemic, the company received the 2021 "Community Supporting Local Advocate" Outstanding Business Award.

REMOVING MORE CARBON THAN WE EMIT

Energy Use & GHG Emissions

JDI proudly declares our Forest Supply Chain, from seed to sale of our products, carbon neutral. In 2021, following PAS2060:2014 with limited assurance by KPMG, we completed the accounting of our 2020 Forest Supply Chain carbon footprint. Our accounting shows our supply chain has been carbon neutral for two years and we are committed to maintaining this until 2023. To learn more, please visit our Qualifying Explanatory Statement at **www.jdirvingsustainability.com**

DIVERSITY, EQUITY, & INCLUSION EXECUTIVE COMMITTEE AND THREE PANELS (DIVERSITY, EQUITY, & INCLUSION)

(Diversity, Equity, Inclusion)

To provide a more inclusive and diverse workplace, JDI created a Diversity, Equity, & Inclusion (DEI) Executive Council to ensure everyone who works here feels like they belong. We want to empower our employees to be their best. Our DEI Executive Council was created to make sure we are always listening and learning, working with our communities to be better and do better every day. During the pandemic, our Human Resources team hosted our first virtual panels to allow for open conversations around LGBTQ2+ and Indigenous history and current affairs, and celebrating women's success in non-traditional fields.

THRUAIR DRY IN MACON

(Economic Impact, Competitiveness, & Innovation)

Irving Tissue successfully started up our second ThruAir Dry machine in Macon, Georgia in late October 2021. The team completed this major project early and on budget despite the pandemic. This expansion doubled our annual ThruAir Dry capacity in Macon increasing it by 75,000 tonnes, the equivalent of 15 million cases. Our Macon plant produces premium quality household paper products including soft bath tissue and high-quality paper towel.

2021 HIGHLIGHTS

ROYALE® RECYCLABLE PAPER PACK

(Consumer Packaging)

Irving Tissue's Royale® brand was proud to be the first Canadian household paper brand to offer paper packaging to consumers. In 2021, to help Canadians reduce virgin plastic waste, Royale introduced durable paper packaging for select bathroom tissue and paper towel products that are plastic free and recyclable. This initiative supported a new goal starting in 2021 for Irving Tissue to reduce our virgin plastic footprint in product packing by 25% by 2030. This will be accomplished through innovative alternative materials which are more renewable by being more likely to be recycled, like our paper packaging, along with increased use of recycled materials.

INNOVATIVE PARTNERSHIP TURNS TISSUE WASTE INTO CEILING TILES

(Waste Reduction & Management)

In 2021, Irving Tissue's new Macon plant worked with Armstrong World Industries (AWI) to develop a sustainability partnership to improve both companies' environmental footprints. In the second quarter of 2022, the Macon plant will begin diverting a large portion of its tissue fiber waste to AWI's mineral fiber plant. This will reduce Armstrong's need to purchase recycled newsprint as an input for its ceilings. It also enables Irving Tissue to help meet a new goal of diverting 90% of our manufacturing waste from landfill by 2030. This circular manufacturing solution supports the UN Sustainable Development Goal #12: Responsible Consumption and Production for both J.D. Irving and Armstrong World Industries.

PULP & PAPER INVESTING FOR THE FUTURE

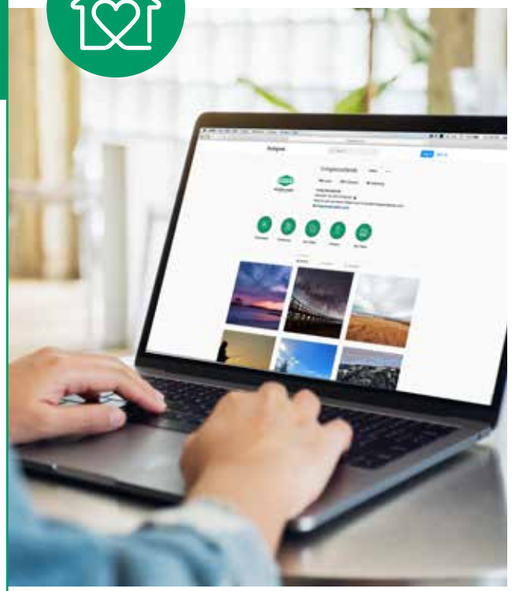
(Waste Reduction & Management)

In 2021, Lake Utopia Paper executed the largest maintenance and capital investment the mill has seen. At the peak of activity, the mill had more than 350 people on site completing 1,600 tasks over 14 days. The shutdown saw the commissioning of a new digester and dryer hood for the paper rolls. These investments will ensure that the mill continues to be a part of the circular bio-economy by recycling old cardboard containers in the region to make new corrugated medium for the paper packaging industry.

WOODLANDS LEADING THE WAY IN THE DIGITAL AGE

(Community Engagement)

Irving Woodlands connected with our stakeholders by bringing the forest to the people through social media. The project began in late 2020 to increase transparency and communications between our forestry operations and the public, highlighting the team's dedication to sustainable forest practices, conservation, and introducing our staff. By the end of 2021, across the three social platforms (Facebook, Instagram, and LinkedIn), we had amassed a following of 15,500 people from various communities and continue to strive towards sharing messaging to a wider audience.

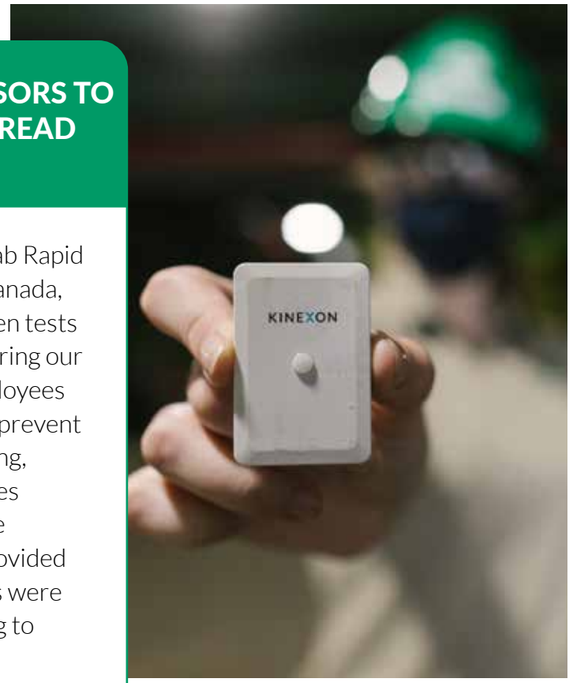


2021 HIGHLIGHTS

RAPID TESTING AND SENSORS TO PREVENT COVID-19 SPREAD

(Health and Wellness)

As a member of the Creative Destruction Lab Rapid Screening Consortium (CDL RSC) across Canada, JDI deployed more than 16,000 rapid antigen tests to detect and prevent COVID-19 from entering our workplaces. We distributed test kits to employees and set up testing clinics across our sites to prevent illness to our employees. In addition to testing, JDI leveraged technology to assist employees in maintaining physical distancing during the pandemic. 2,000 proximity sensors were provided to employees that signaled when employees were within 6 feet/2 metres of each other, helping to ensure we met COVID-19 protocols.



MAINTENANCE TEAM OF THE YEAR AWARD

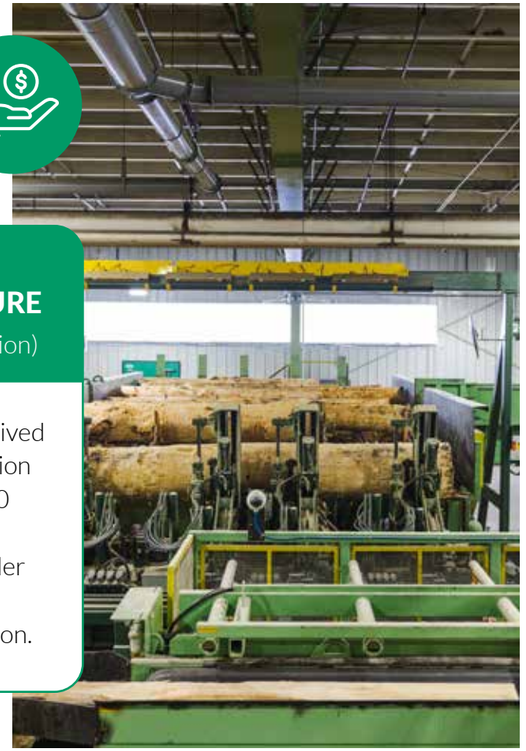
(Attracting, Developing & Retaining Talent)

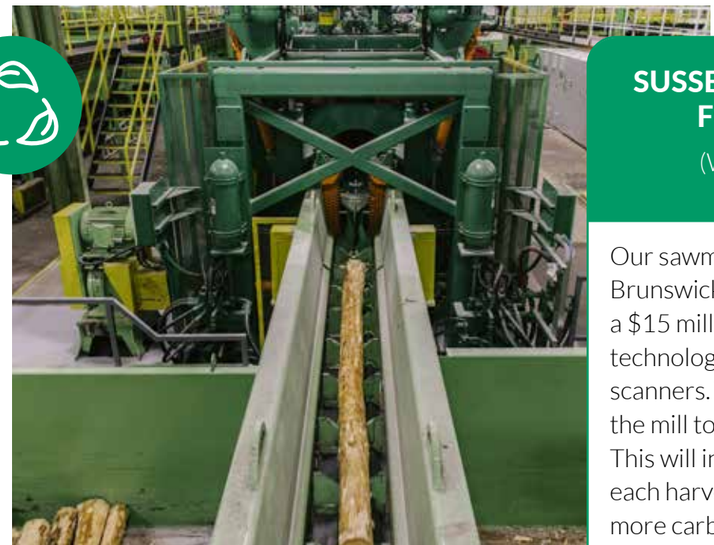
The Plant Engineering & Maintenance Association of Canada named Irving Pulp & Paper 2021's Maintenance Team of the Year, recognizing the mill as an ideal environment for maintenance professionals to develop and thrive. This award recognizes excellence in maintenance management in large organizations. It considers the environment in which the organization operates and how they impact maintenance professionals within them.

DOAKTOWN MILL – MEETING DEMANDS FOR THE FUTURE

(Economic Impact, Competitiveness, & Innovation)

Our sawmill in Doaktown, New Brunswick received a major upgrade with an investment of $35 million to expand the mill's physical footprint by 14,000 square feet. This capital project brought the sawmill, planer mill and value-added centre under one roof, and provides longevity for the mill, its employees, and the surrounding Miramichi region.





SUSSEX MILL UPGRADES FOR RECOVERY

(Waste Reduction & Management)

Our sawmill in Sussex, New Brunswick recently completed a $15 million update to improve technology to the saw line and log scanners. This investment allows the mill to improve lumber recovery. This will increase the value from each harvested tree and store more carbon in long-lived lumber products.

Brett Anderson, Head Office, Saint John, NB

SUSTAINABLE GOVERNANCE

As a private, family-owned business, a sustainable approach is embedded in our values and the way we work. This approach requires balancing the short-term needs of the business with the long-term vision required to ensure that we can rely on healthy and growing forests for generations. Forests create economic opportunities and jobs, conserve biodiversity and clean cold water, and are critical to mitigating the effects of a changing climate. Long-term management of forests provide for local communities, our stakeholders and our customers.

Over the past two years, we have formalized our sustainability strategy with the establishment of an ESG steering committee, comprised of senior corporate leaders and operating executives from each of the businesses in the Supply Chain. The committee formally meets three times annually and reports its progress directly to the co-CEOs.

CO-CEOS

ESG STEERING COMMITTEE

FORESTRY EXECUTIVE LEADERSHIP TEAM

- Woodlands
- Sawmills
- Pulp & Paper
- Tissue

CORPORATE EXECUTIVE LEADERSHIP TEAM

- Chief Financial Officer
- General Counsel
- Human Resources
- Environment, Health & Safety
- Communications
- Government relations

SUSTAINABLE GOVERNANCE

ROLES AND RESPONSIBILITIES OF THE ESG STEERING COMMITTEE

Working as a team, the ESG Steering Committee is comprised of functional expertise from the forestry executives in each of the Divisions in the Supply Chain – Woodlands, Sawmills, Pulp & Paper, and Consumer Products - and enabling process expertise from the corporate executive teams – finance, legal, human resources, safety, communications, and government relations.

Executives bring forward the expertise of their divisional leadership teams regarding sustainable forest management, manufacturing, customer needs, energy use, air and water impacts, waste, operations, and community partners. Together, they are responsible for sharing ESG related information with their leadership teams to ensure information is disseminated to all employees and linked to operating plans for execution.

Working with the divisional leadership teams, forestry executives continually identify risks and opportunities in each business. Business risks and opportunities such as costs, products, markets, capital projects, and workforce are reviewed annually and quarterly with the co-CEOs. ESG related risks and opportunities identified in each operating division are brought forward to the ESG Steering Committee and are also reviewed with the co-CEOs during annual budgeting sessions and quarterly performance reviews.

In addition, the Steering Committee is responsible for producing an annual ESG report to ensure our sustainability approach is communicated to our external partners.

THE FOUR MAJOR ESG ISSUES DISCUSSED BY THE ESG STEERING COMMITTEE IN 2021 WERE:

1 **CLIMATE CHANGE:** Climate change is top of mind to many internal and external stakeholders and government policies are rapidly increasing business costs. The Supply Chain is dependent on forests, therefore understanding the impacts of changing climate on forests is critical to sustainability. A discussion of JDI's approach to mitigating the impacts of climate change can be found in the following sections: Climate Change & Adaptation (page 96) and GHG Emissions & Energy Use (page 106).

2 **WORKFORCE AVAILABILITY:** The labour market is experiencing rapid change due to issues related to demographic shifts, an aging workforce, changing interests of the workforce, and the rural nature of our operations. Attracting and retaining talent at all levels of the organization is critical for success.

3 **LOCAL STAKEHOLDERS:** Forest policy and operating approvals are often informed at a local level. Inadequate information can lead to poor public policy. More information related to JDI's approach to local stakeholder interests in our operations and forest management are found in the following sections: Sustainable Forest Management (page 36), Forest Conservation & Biodiversity (page 52), and Air & Water Quality Management (page 72).

4 **REPORTING & TRANSPARENCY:** Stakeholder expectations for more information about business' impact on the environment and society are rapidly evolving. To satisfy stakeholder expectations for more information, the mandate of the Steering Committee is to enhance transparency in the 2021 Report and the quality of disclosure, in line with ESG reporting best practices. Over the next two years we will aim to shift reporting from sustainability reporting to robust ESG disclosure. In 2021 the following key actions were undertaken:

a. Conducted a comprehensive Stakeholder Materiality Assessment by engaging diverse stakeholders to identify Material ESG topics;
b. Added robust climate change reporting aligned with the TCFD standard;
c. Added third-party Limited Assurance to selected ESG metrics;
d. Outlined long-term sustainability goals for material topics;
e. Designed and implemented an internal management system to standardize, collect, verify and store ESG related data and information;
f. Expanded the boundary of the Supply Chain to include data and information on Irving Personal Care and Juniper Organics Limited.

DOUBLY MATERIAL TOPIC

REPORTING STANDARD

- ✓ GRI XXX-X
- ✓ SASB XXXXX
- ✓ TCFD XXX

GOVERNANCE

STRATEGIC SDGS

IMPROVING REPORTING AND TRANSPARENCY

Throughout the report, an effort has been made to clearly link each topic with a strategy or action. This includes describing how the topic relates to Materiality, ESG standards, internal policies, external assurance and long-term sustainability goals.

MATERIALITY IDENTIFICATION

DOUBLY MATERIAL TOPIC

The five topics that have been found to be most important to both internal and external stakeholders will be identified on individual pages through a badge and can be found in the top section of the analyst panel.

REPORTING STANDARD

This document is structured based on reporting standards put in place by GRI (Global Reporting Initiative), SASB (Sustainability Accounting Standards Board) and TCFD (Task Force on Climate-Related Financial Disclosures). This section relates each topic to a reporting standard.

GOVERNANCE

This topis has been subject to **LIMITED ASSURANCE** by KPMG LLP

This topic is subject to **THIRD-PARTY CERTIFICATION** under ISO, SFI and/or FSC® standards

This topic is governed by an **INTERNAL POLICY.** Internal Policies are available by request.

STRATEGIC SUSTAINABLE DEVELOPMENT GOALS (SDG)

At JDI, we believe in supporting the United Nations' efforts to achieve a better and more sustainable future for all. Of all the UN SDG, we have identified several SDG priorities most relevant to our company and to our overall mission to achieve our strategic sustainability objectives in the communities where we operate.

Mark Thibodeau & Jason Lagace, Lake Utopia Paper, Saint George, NB

Sussex Chip Plant, Sussex, NB

2021 STAKEHOLDER MATERIALITY ASSESSMENT

In our first Forest Products Sustainability Report published in 2020, we disclosed sustainability information on topics based on the Steering Committee's knowledge of the business, input from various stakeholder engagement activities, industry trends and international standards.

Our 2021 ESG priorities are guided by a robust third-party Stakeholder Materiality Assessment and continuous scanning of global trends, as well as ongoing conversations with our customers and suppliers. This was performed by Nanos Research, a recognized international public opinion research firm located in Ottawa, Ontario. During this process, a wide group of stakeholders were engaged via online surveys and one-on-one interviews to provide their input on 18 ESG topics:

JDI FOREST SUPPLY CHAIN ESG TOPICS	GRI	SASB	TCFD
Energy Use & GHG Emissions	✓	✓	✓
Air & Water Quality Management	✓	✓	✓
Sustainable Forest Management		✓	✓
Forest Conservation & Biodiversity	✓	✓	✓
Chemical Use			
Climate Change & Adaptation	✓	✓	✓
Waste Reduction & Management	✓		
Consumer Packaging	✓	✓	
Safety	✓		
Health & Wellness	✓		
Diversity, Equity & Inclusion	✓		
Attracting, Developing & Retaining Talent	✓		
Aboriginal/Indigenous Awareness & Inclusion	✓	✓	
Economic Impact, Competitiveness, & Innovation	✓		
Community Engagement	✓		
Ethics, Integrity & Values	✓		
Data Privacy & Cybersecurity	✓		
Supply Chain & Sourcing Policies	✓	✓	

2021 MATERIALITY ASSESSMENT

STAKEHOLDERS

To prioritize these topics, we interviewed 160 stakeholders across various groups and asked them to rank each topic. Internal stakeholders were asked to rank each topic in terms of impact on enterprise value. External stakeholders ranked topics from their perspective of how the Supply Chain impacts society and the environment. The results from the Materiality Assessment were reviewed and validated by the ESG Steering Committee members. Materiality will be conducted regularly (two-to-three-year intervals) to ensure we continue to understand how stakeholder priorities shift over time.

IMPACT ON SOCIETY & THE ENVIRONMENT
EXTERNAL STAKEHOLDERS

- Banking and Insurance
- Government Regulators
- Academia
- Local Communities
- NGOs and ENGOs
- Aboriginal Communities
- Customers
- Suppliers and Contractors

IMPACT ON ENTERPRISE VALUE
INTERNAL STAKEHOLDERS

- Divisional Leadership and Finance
- Human Resources
- Woodlands Leadership
- Sawmills Leadership
- Pulp & Paper Leadership
- Consumer Products Leadership

Double materiality is defined as topics that impact both society and the environment (external) and enterprise value (internal).

Maritime Innovation Limited, Sussex, NB


Southern New Brunswick Woodlands


Irving Pulp & Paper, Saint John, NB

2021 MATERIALITY ASSESSMENT

RESULTS

The Materiality Assessment identified five priority topics as most significant or having "double materiality" as both external and internal stakeholders attributed the highest level of importance to these ESG topics.

a. **Sustainable Forest Management**
b. **Ethics, Integrity & Values**
c. **Safety**
d. **Air & Water Quality Management**
e. **Forest Conservation and Biodiversity**

JDI will continue to monitor all 18 topics. To align to TCFD, this Report will include the topics of Climate Change & Adaptation and GHG Emissions & Energy Use. We will also share highlights from the year across the range of ESG topics and report additional information in the Data Tables section of this report.

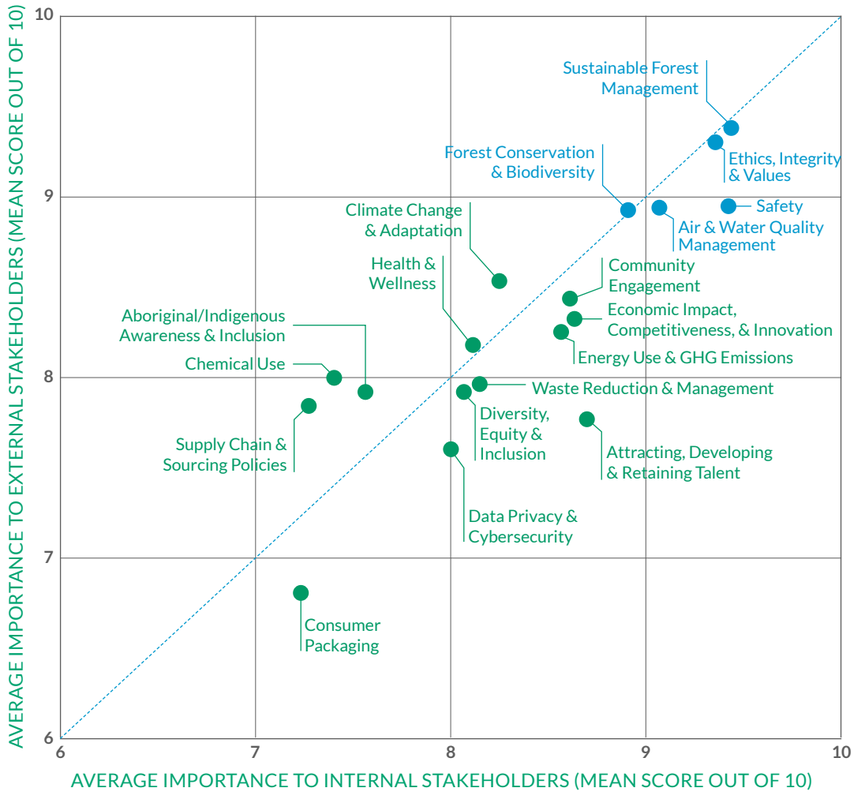
Nanos conducted interviews of 160 internal and external stakeholders of J.D. Irving, Limited between March 23rd and May 2nd, 2022. 68 of the interviews were conducted through in-depth video call interviews and 92 were conducted through an online survey. In total, 99 external stakeholders and 61 internal stakeholders participated in the research, with an estimated response rate of 55 per cent. Participants were recruited using a list provided by J.D. Irving, Limited. Interviews were conducted in English and French.

WHAT DO OUR INTERNAL STAKEHOLDERS RECOMMEND?

"I hope that it's not just a fad that is being done because other companies are doing it, so let's keep being socially responsible, I know you want to be socially responsible so I just suggest we keep going"

2021 MATERIALITY ASSESSMENT

IMPORTANCE OF ESG TOPICS MAP – COMPARING EXTERNAL AND INTERNAL STAKEHOLDER VIEWS



For both internal and external stakeholders, Sustainable Forest Management (9.4, each), Safety (9.4 and 8.9, respectively), Ethics, Integrity & Values (9.3, each), Air & Water Quality Management (9.1 and 8.9, respectively) and Forest Conservation & Biodiversity (8.9, each) are the most important ESG topics as it relates to the JDI Forest Supply Chain.

This chart shows the average importance of ESG topics for internal and external stakeholders. The line represents equal importance among internal and external stakeholders. ESG topics over the line are more important to external stakeholders than internal stakeholders and data under the line are more important to internal stakeholders than external ones. The further away from the line a data point is, the larger the difference of opinion between internal and external stakeholders.

DOUBLY MATERIAL TOPIC

REPORTING STANDARD

- ✓ GRI 205-2
- ✓ GRI 205-3
- ✓ GRI 206-1
- ✓ GRI 418-1

GOVERNANCE

- Business Code of Conduct
- IT Policy
- Safe and Respectful Workplace
- Drug & Alcohol Policy

STRATEGIC SDGS

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

DATA TABLE REFERENCE

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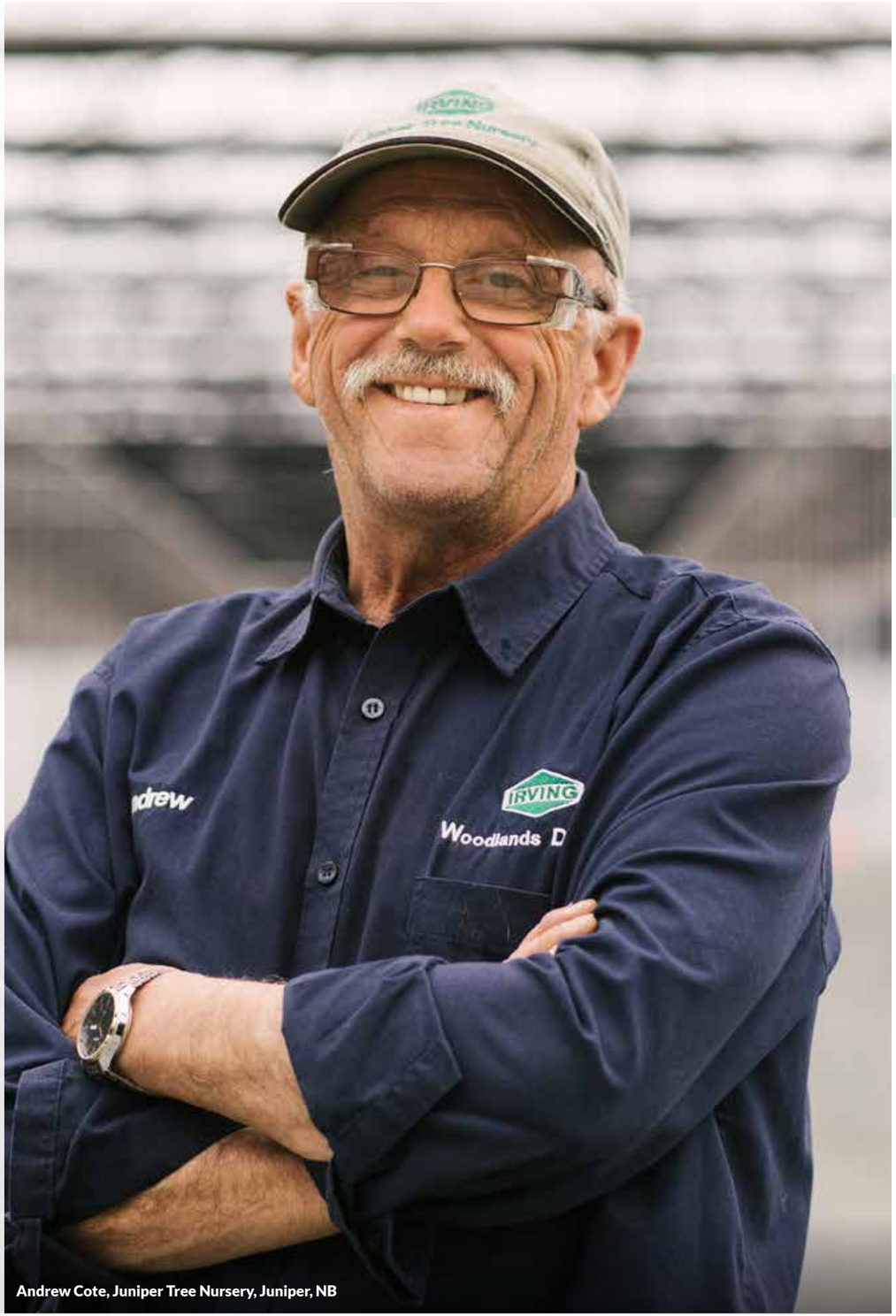


Andrew Cote, Juniper Tree Nursery, Juniper, NB

ETHICS, VALUES AND INTEGRITY

WHY DO OUR EXTERNAL STAKEHOLDERS SAY THIS IS IMPORTANT?

"Because their success as a company and their ability to contribute to society is dependent on this trust, if they don't have it then it undermines their ability to do everything that they want to do."

CUSTOMER FOCUS · PEOPLE & TEAMWORK · QUALITY PRODUCTS & SERVICE · RESULTS DRIVEN · CONTINUOUS IMPROVEMENT & INNOVATION · INTEGRITY · FAST & FLEXIBLE · HEALTH, SAFETY & ENVIRONMENT

OUR VALUES

The eight values above form the foundation of who we are and how we operate. We call this "The Irving Way." These core values also guide our thinking and approach to sustainability. Managing our operations sustainably is not new to us; it has been the hallmark of our company since the very beginning. It starts with how we manage our forests and extends to all of the products that come from them. The Irving Way reflects what we stand for and represents our ongoing commitment to our customers, with a promise that we can be counted on. The Irving Way also reflects how we interact with our employees. We measure our performance from our employees perspective annually with third-party employee engagement surveys to understand our strengths and opportunities to improve.

86 per cent of employees understand the JDI values

ETHICS, VALUES AND INTEGRITY

ETHICS AND INTEGRITY

At J.D. Irving, Limited, we apply a comprehensive approach to ethical business practices and integrity. We take a rigorous approach to governance and how we conduct ourselves, and we place the same level of expectations on our employees and suppliers to deliver on our shared value proposition. Responsibility for our governance and legal compliance is administered by our general counsel and legal department.

Every employee hired to work at our company must complete all specialized training required to meet their job function and comply with the following governance policies:

Chris Clark, Pulp & Paper, Saint John, NB

Oumaima & Abdelhak El Ouahdi, Sciere Grande Riviere, Saint-Léonard, NB

Business Code of Conduct | **Health Safety Policy** | **IT Policy** | **Safe and Respectful Workspace** | **Drug & Alcohol Policy** | **Safety Orientation**

75 per cent of employees believe all employees, regardless of differences, are treated equally.

Our business code of conduct is comprehensive and covers a wide range of topics, including conflicts of interest, gifts and gratuities, insider and other trading, relationships with competitors, anti-corruption and bribes, confidentiality, information security, respectful workplace, political activities, and Canadian anti-spam legislation.

ETHICS, VALUES AND INTEGRITY

WHISTLEBLOWING AND GRIEVANCE SYSTEM

Consistent with our values, we encourage all employees who witness any unethical behaviours or harassment at work to report directly to our anonymous whistleblower program. Our JDI Tips Line, “See Something – Say Something”, is staffed 24 hours a day, seven days a week by trained security officers from our in-house security monitoring centre. All anonymous tips are reviewed and actioned by an independent investigator. The JDI Tips Line is advertised throughout the organization on posters and through presentations by our security staff. Physical security of all buildings and assets is also managed by our professional internal security team including a team of investigators.

Joanie Soucy, Kimberly Tepper, Marie-Josee Therrien, Kayla Fox, St. Leonard, NB

ETHICS, VALUES AND INTEGRITY

ACTIONS TO IMPROVE TRANSPARENCY

Transparency is a key element to integrity and ethical behaviour. JDI is committed to sharing information with stakeholders. Following the mandate of the Steering Committee, the Supply Chain will continue to publish an ESG Report annually. We regularly meet with various stakeholder groups, provide open houses, tours and interactions with our staff. We continue to enhance our social media presence to share our performance with a wider audience. Our interactions with federal, provincial and state governments are in full compliance with rules regarding lobbying activity and are reported in the appropriate lobbyist registry.

TARGET – PUBLISH AN ESG REPORT ANNUALLY FOR THE JDI FOREST SUPPLY CHAIN.

158
Total Partners

520
Stakeholder Meetings

$3,000,000/283 events
Community Donations/Events

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.

27,200 NEW FOLLOWERS IN 2021

IRVING WOODLANDS: 24,000

IRVING WOODLANDS: 2,400

@IRVINGWOODLANDS: 800

DOUBLY MATERIAL TOPIC

REPORTING STANDARD

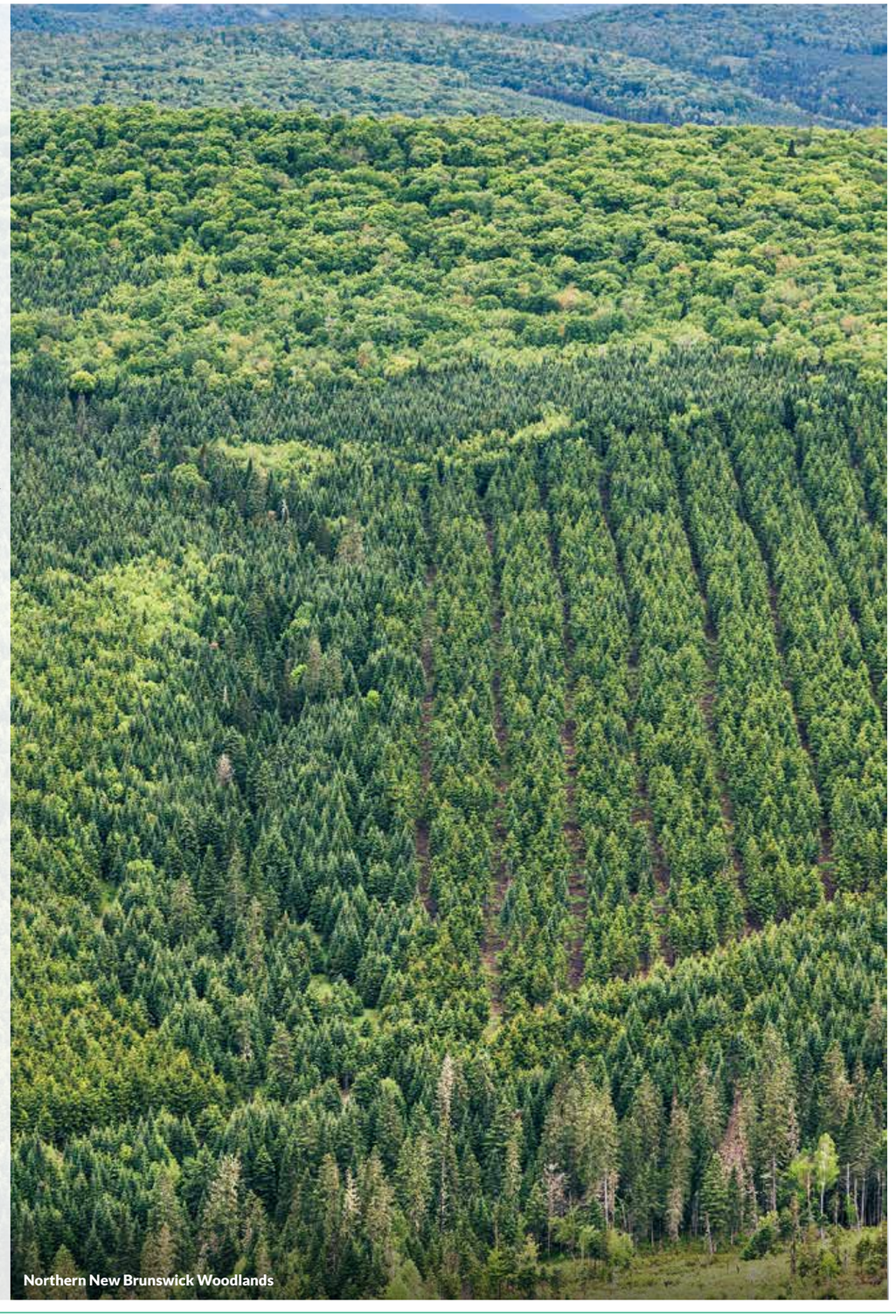
- SASB RR-FM-000.A
- SASB RR-FM-000.B
- SASB RR-FM-160A.1

GOVERNANCE

- Management Plans
- Indigenous Relations Policy
- Third Party Certifications: SFI, FSC ®
- Percentage of Forested Landbase Harvested
- Total Lands Under Irving Management

STRATEGIC SDGS

15 LIFE ON LAND



Northern New Brunswick Woodlands

SUSTAINABLE FOREST MANAGEMENT

It's all about balance.

Sustainable Forest Management is the single most important topic for both internal and external stakeholders in the Forest Supply Chain. Our generational commitment to growing sustainable forests means investing long-term and having a strong operational plan. For us, sustainable forest management means a healthy, secure, growing, and high-quality wood supply guaranteeing our supply chain never runs out of wood.

This approach is all about balance. We strive to balance operational short-term needs with the long-term vision required to provide for future generations. To balance society's needs and economics with ecology. From conserving land, to sustaining quality jobs, providing recreation opportunities and pleasing aesthetics, managing these values over time is the foundation of our sustainability framework. We take our role as stewards of the forest very seriously and strive to be good neighbors to our communities, good partners to our stakeholders and responsible suppliers to our customers. These values are rooted in caring for the forest and are the foundation of the JDI approach to sustainability found in all businesses across our Supply Chain.

Northern New Brunswick Woodlands

SUSTAINABLE FOREST MANAGEMENT

LONG TERM FOREST TENURE AND WOOD SUPPLY

Our operations in New Brunswick, Maine, and Nova Scotia are rooted in an abundance of forest lands, meaning the communities in our region are some of the most forest-dependent in North America. As the second largest private timberland owner in North America, JDI owns and manages 1.3 million hectares (3.2 million acres) of Freehold timberland and manages 1.1 million hectares (2.6 million acres) of government-owned Crown land in New Brunswick. To support these communities, we have a 25-year evergreen forest management and wood supply agreement with the province of New Brunswick and receive additional wood supply from other Crown lands with long-term tenure associated with our manufacturing operations as well as woodlot owners.

WOOD SUPPLY DASHBOARD

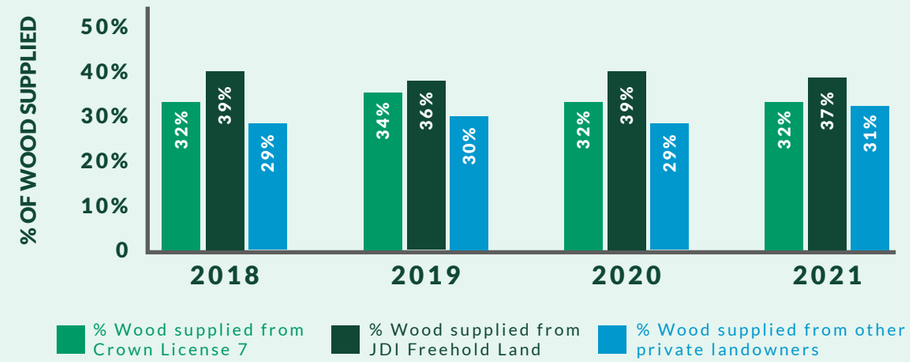


Figure 1.

LANDS UNDER IRVING MANAGEMENT

HECTARES	ACRES	
796,321	**1,967,341**	NB & NS Freehold
518,256	**1,269,733**	Maine Freehold
1,062,471	**2,625,423**	NB Crown License 7
2,377,048	**5,862,497**	**Total**

Figure 2.

A GROWING WOOD SUPPLY

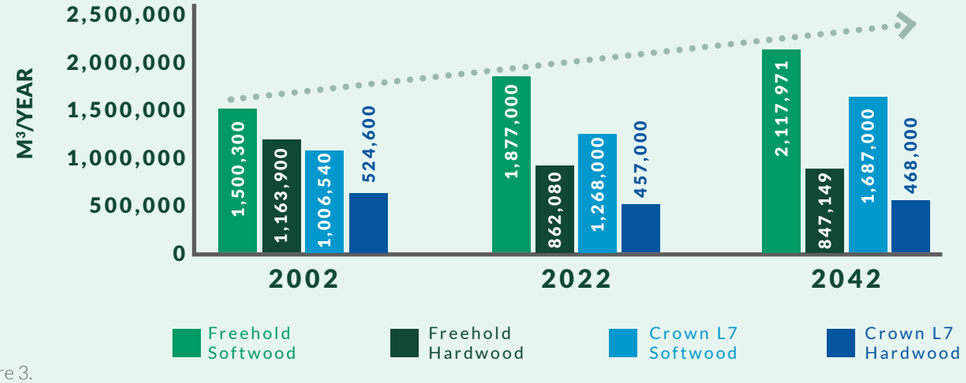


Figure 3.

CROWN LICENSE 7 HARVEST BLOCKS

CROWN LICENSE 7 MANAGEMENT PLAN


Miramichi River, NB

CROWN LICENSE 7

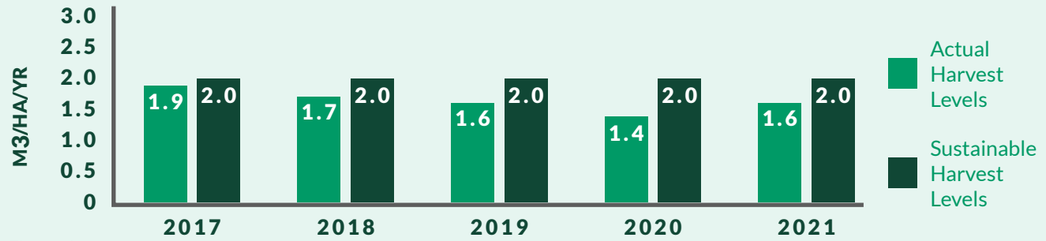


Figure 4.

FREEHOLD

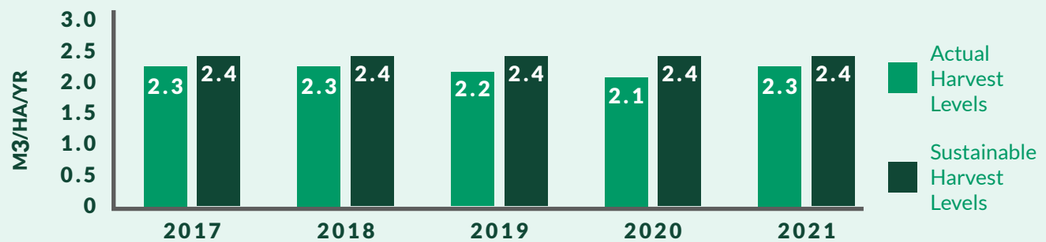


Figure 5.

SUSTAINABLE FOREST MANAGEMENT

PLANNING FOR GENERATIONS

To balance the short-term and long-term values of the forest, we rely on an 80-year forest management plan that is revised every five years. Planning for 80 years allows us to balance the range of values that flow from the forest. Revising the plan every five years allows for the incorporation of new knowledge, changing climate and shifting public values to create a flexible and adaptable long-term plan.

In addition, our forest management plan ensures we are always growing more wood than we harvest. This approach forms the foundation of our current operations and future business growth.

TARGET – MAINTAIN A 5 YEAR AVERAGE OF FOREST GROWTH AT OR ABOVE HARVEST.

Central New Brunswick Woodlands

SUSTAINABLE FOREST MANAGEMENT

IT ALL STARTS WITH A TREE

Since 1957, JDI has been an industry leader in growing and planting trees.

To-date, we have planted over a billion trees and continue to plant more every year. Our research shows planted forests grow four times more wood than naturally regenerated softwood forests. The four-times increase in yield we achieve on each planted hectare is why planting trees is critical to our strategy to grow more wood than we harvest and reduce our footprint on the lands we manage.

100 per cent of harvested areas are regenerated across the landscape.

25 per cent of harvested areas planted with six different species.

TARGET – DOUBLE THE WOOD SUPPLY ON FREEHOLD LAND BY 2050.

PLANTING TREES: 4X THE VOLUME 4X THE CARBON

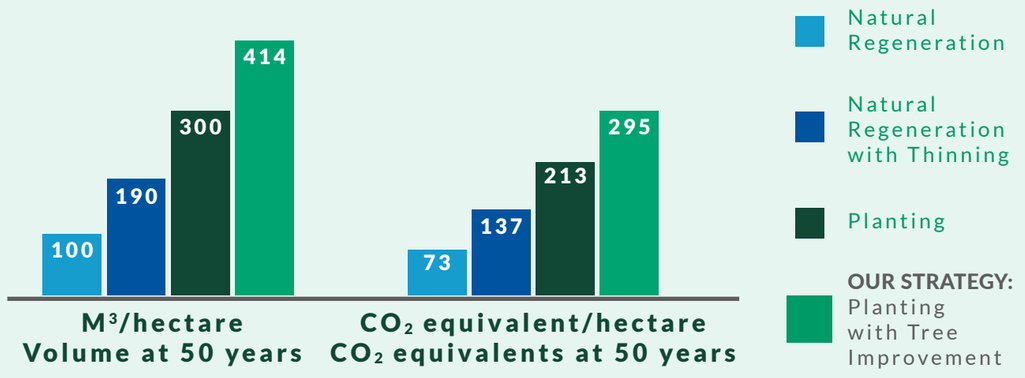


Figure 6.

$21 MILLION

SPENT ON SILVICULTURE INVESTMENTS IN 2021 (CAD)

Juniper Tree Nursery, Juniper, NB

SUSTAINABLE FOREST MANAGEMENT

OVER 60 YEARS OF FOREST RENEWAL

JDI's nursery facilities grow millions of top-quality seedlings annually. Our expert growers from across the globe have extensive experience in growing superior trees and together with our field foresters, they work to maximize the health of our planted trees across our land.

To grow the best trees, you need the best genetics found in the best seeds. Seedlings produced at our nurseries are grown from superior, field-tested seeds from our seed orchard in Parkindale, New Brunswick. For 45 years, our tree improvement program has demonstrated significant improvement in growth rates, timber quality and pest resistance.

World-class research takes place at our lab at Maritime Innovation Limited to ensure our seedlings are protected after they are planted. The staff utilize Somatic Embryogenesis (SE), a tissue culture method, to provide an efficient means to rapidly produce elite tree varieties that are selected from our breeding program.

Jesus Jimenez, Maritime Innovation Limited, Sussex, NB

Endophyte fermenters, Maritime Innovation Limited, Sussex, NB

Seed Cones, Sussex, NB

Our scientists have been studying the production of endophytes, a fungus isolated from tree needles. This fungus has been found to produce anti-infectant compounds making the plants tolerant to insects such as spruce budworm. This creates natural resilience and reduces the need for pesticides.

14,872,422

SEEDLINGS PLANTED IN 2021 (FREEHOLD AND CROWN LIC 7)

SUSTAINABLE FOREST MANAGEMENT

HARVESTING

Harvesting sustainably means harvesting less than 1.6 per cent of the forested area each year. Across the Acadian Forest, a 60-year average rotation between harvests ensures that we never run out of trees.

When trees are ready, they are harvested and transported to mills to be turned into forest products.

The choice of how and when to harvest each acre is carefully considered by our foresters. Our foresters review the species and age of the trees, soils and regeneration plans to decide if the area is fit to be clear cut or by selection harvesting methods. Before harvesting, consideration for any site-specific plant or wildlife is taken and followed by action to protect water, recreation and aesthetics. Less than 50 per cent of harvested areas are clearcut.

Southern New Brunswick Woodlands

We harvested 1.6 % of the forested landbase in 2021.

The average size of clearcut areas is 22 hectares in 2021.

Central New Brunswick Woodlands

PER CENT OF HARVESTED AREA CLEARCUT

Figure 7.

PER CENT OF FORESTED LANDS HARVESTED

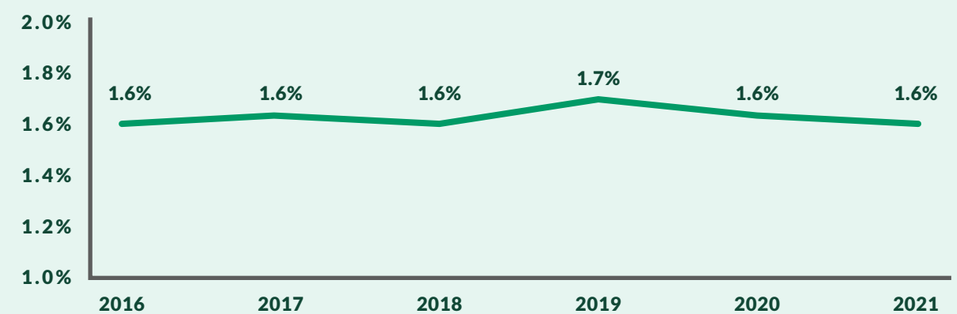


Figure 8.

Grand River Pellets, Saint-Léonard, NB

SUSTAINABLE FOREST MANAGEMENT

MAXIMIZING VALUE FROM EACH TREE

Forests in the regions where we operate take between 40 and 80 years to grow, so when we harvest and process a tree, we have a responsibility to maximize its value. We do this by using every part of the tree to its highest value – leaving minimal waste. This starts in the woods where harvesting machines use satellite-enabled technology to cut wood with millimeter precision. Our manufacturing facilities then use the latest scanning and imaging technology to maximize the yield of every single log. With advancing technologies like these, we continually strive to add value to all byproducts produced by our manufacturing operations, seeking new markets and product development lines.

Grand River Pellets is adding value by turning low value products such as sawdust and shavings from our sawmills into low carbon energy for international customers. We even sell ash from our biomass boilers to local farmers as a soil additive.

"It takes 40 years to grow a tree and 40 seconds to process it. We have a responsibility to do it right"

Lynn Arpin, Process Improvement, Sawmills Division.

SUSTAINABLE FOREST MANAGEMENT

DRIVING RESULTS THROUGH ACCOUNTABILITY

JDI has a long-standing philosophy to exceed quality standards for quality and performance. When your business is based on a sustainable natural resource, it is the socially and environmentally responsible way forward. This unwavering core value helps us find a better way, every day.

19 YEARS OF THIRD-PARTY FOREST CERTIFICATION

100% of land certified

SUSTAINABLE FORESTRY INITIATIVE
SFI-00032

100% of land certified in Maine

FSC www.fsc.org FSC® C041515
The mark of responsible forestry

Environmental management systems certified for **100%** of our land management activities

ISO 14001 REGISTERED KPMG

INTERNAL AUDIT NON-CONFORMANCES

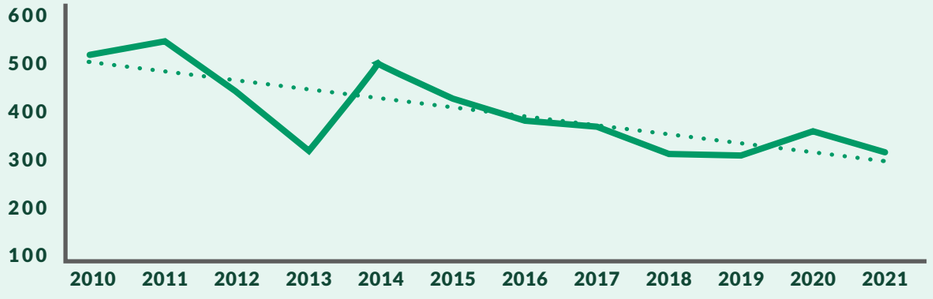


Figure 9.

On the lands we own and manage, we are committed to transparency and accountability when it comes to our management practices. As early adopters of third-party certification, we have held a Sustainable Forestry Initiative® certificate since 2003. We take our responsible management seriously. We achieve environmental certification by ensuring 100 per cent of our operations are annually and independently audited according to ISO 14001 environmental standards and certified under the Sustainable Forestry Initiative® (SFI) forest certification.

In Maine, 100 per cent of our woodlands are also certified under the Forest Stewardship Council® (FSC®C041515) program. Learn more about these certifications through the links in the margin.

Our Supply Chain works with international leaders in third party certification and assurance. Third-party audits are carried out by New Brunswick's Department of Energy and Resource Development (DNRED), the Maine Forest Service, KPMG and SCS Global Services. These third-party audits are key to our continued improvement and our efforts toward being accountable forest land managers. We prioritize regulatory requirements and go above and beyond to ensure we have an effective sustainable forest management strategy.

TARGET –
MAINTAIN THIRD PARTY CERTIFICATIONS ON ALL MANAGED LANDS.

FORESTS.ORG (SFI)

FSC.ORG

ISO.ORG

IRVING WOODLANDS HEALTHY FORESTS REPORT CARD

2021 SFI ANNUAL REPORT

DOUBLY MATERIAL TOPIC

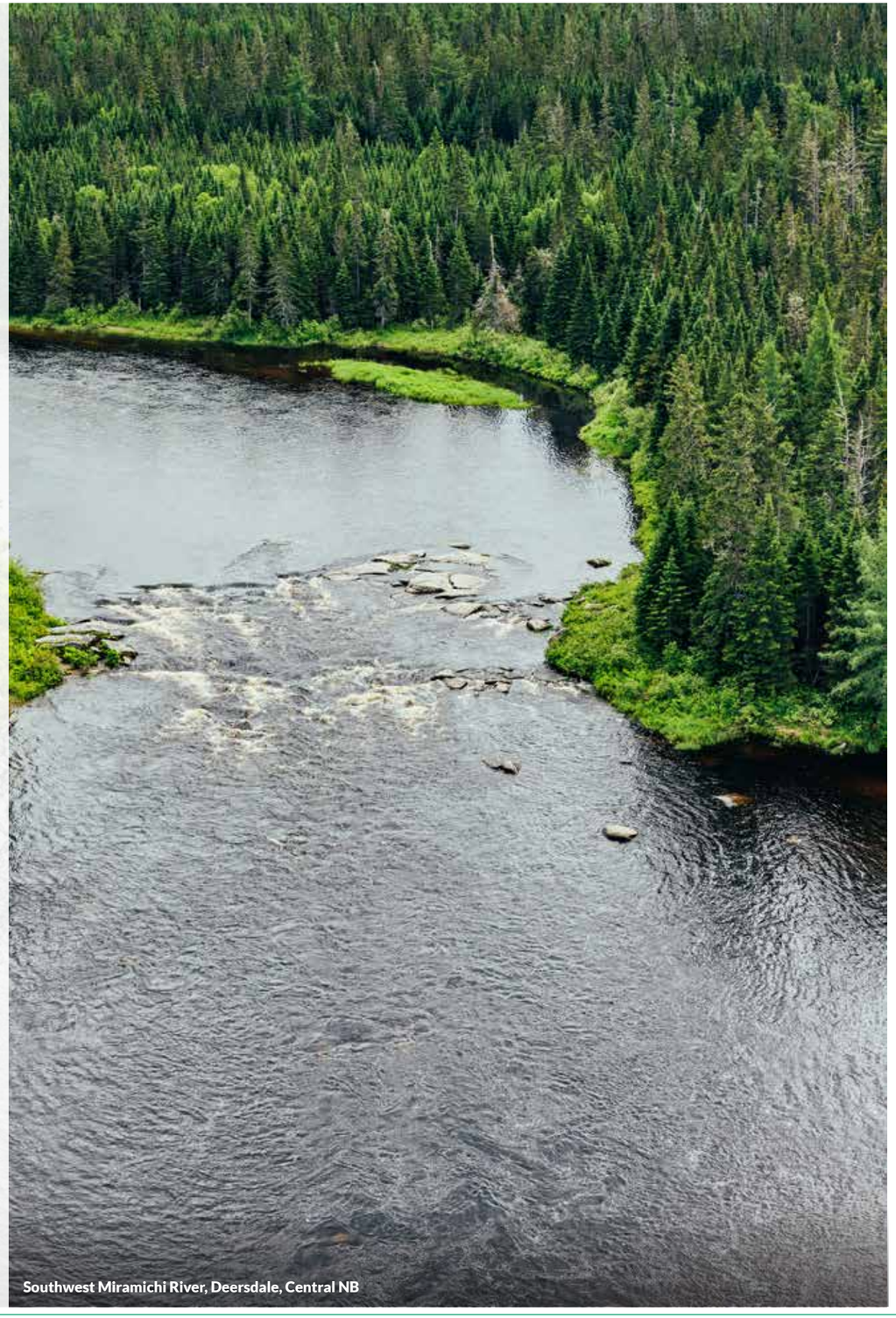
REPORTING STANDARD

- ✓ SASB RR-FM160A.2
- ✓ GRI 304-4
- ✓ GRI 304-3

GOVERNANCE

- Forest Species of Concern
- Late Successional Forest Policy
- Policy for Maintaining Diversity in Harvested Areas
- Rare Plant Pre-Screening Policy
- DWA Policy for Freehold Land
- Invasive Species Policy
- Percentage of conservation forest
- Conservation area

STRATEGIC SDGS



Southwest Miramichi River, Deersdale, Central NB

FOREST CONSERVATION AND BIODIVERSITY

Sustainable forest management is much more than a secure and growing wood supply for our customers. We must apply the same long-term thinking to conservation values to ensure that we are protecting the biodiversity in the forests we all rely on. The forest lands we own and manage extend across the vast Acadian Forest, with a patchwork of naturally diverse tree species, tree ages, and forest structures woven throughout the forest landscape. Our approach to the conservation of biodiversity cascades from a landscape approach encompassing all hectares in the entire forest, to the smallest unique site, while also considering the dynamic nature of forests over time. We tie these approaches together with our long-term commitment to funding research in partnership with universities and governments.

TARGET – MAINTAIN OUR CONSERVATION AREAS PROGRAM

Foresters describe structure as even aged and un-even aged. Both conditions occur naturally across the landscape from natural disturbances. Un-even aged conditions are created from selection harvesting methods and maintain various tree sizes and ages post-harvest

FOREST CONSERVATION AND BIODIVERSITY

MANAGING FOR CONSERVATION AND BIODIVERSITY

FOREST LEVEL	STRATEGY	TIMEFRAME
Landscape Scale	Ensure a high diversity of tree species, ages, and structure (even aged and un-even aged) across both the working and conservation forest.	Dynamic 80-year planning period.
Landscape Scale - Working Forest (77 per cent)	Conserve all water & wetlands, and site-specific habitats for rare plants, birds, mammals, & reptiles with training & standard operating procedures.	Dynamic 80-year planning period, with daily execution and annual monitoring with forest certification.
Landscape Scale - Conservation Forest (23 per cent)	Set aside a significant portion of the forest for the primary values of conservation such as riparian buffers on watercourses, deer wintering areas, and old forest.	Dynamic 80-year planning period. Conservation forest areas may move over time to maintain their conservation value at the landscape scale.
Fine Scale Protection – Conservation Areas Program	Protect a range of the most unique and special places on the landscape ranging in size from hundreds of hectares to just a few square meters.	Most often permanent protection of sites continually added special sites when identified.
Small Scale Protection and Public Access	Protect special habitats and ensure high quality recreation activities in our parks.	Permanent protection and free public access.

Cains River, Boiestown, Central NB

Manage the working forest for a diversity of tree species and ages while protecting streams, rare plants and habitat on each operation.

Setting aside 23 percent of the lands under Irving management for the primary purpose of conservation.

1,800+

Identifying the rare, interesting and unique sites in our Conservation Areas Program. To date we have more than 1,800 sites in our program.

FOREST CONSERVATION AND BIODIVERSITY

LANDSCAPE SCALE

Tree species, age, and structure distribution across the Acadian Forest is historically diverse and we are committed to continuing to uphold that diversity for generations to come. The forest includes areas of pure hardwoods, pure softwoods, mixed forests, and areas planted to native species. Forests are naturally dynamic. The forests we see today are the result of constant change from growth and mortality, and shaped by natural disturbances like fires, spruce budworm outbreaks, and more than 400 years of settlement impacting almost every hectare.

At the landscape scale, a diversity of tree species, ages, and structures creates a broad diversity of habitats. A diversity of habitats leads to diversity of plants, birds, mammals, reptiles, amphibians, insects, and fish.

CROWN LICENSE 7

DIVERSITY OF FOREST AGE CLASSES

- Regenerating **9%**
- Immature **13%**
- Sapling **7%**
- Mature **43%**
- Young **11%**
- Overmature **7%**
- Low Productivity **10%**

DIVERSITY OF FOREST SPECIES

Spruce & Fir **57%** | White Pine **5%** | Other Softwood **12%**

74% SOFTWOOD

Tolerant Hardwood **18%** | Intolerant Hardwood **8%**

26% HARDWOOD

JDI FREEHOLD (NB, NS, ME)

DIVERSITY OF FOREST AGE CLASSES

- Regenerating **14%**
- Immature **18%**
- Sapling **12%**
- Mature **36%**
- Young **9%**
- Overmature **5%**
- Low Productivity **6%**

DIVERSITY OF FOREST SPECIES

Spruce & Fir **46%** | White Pine **2%** | Other Softwood **12%**

60% SOFTWOOD

Tolerant Hardwood **31%** | Intolerant Hardwood **9%**

40% HARDWOOD

Northern New Brunswick Woodlands

Yellow-spotted salamander

Van-Brunt's Jacob's Ladder, Southern New Brunswick Woodlands

Ked Coffin, Northern Maine Woodlands

FOREST CONSERVATION AND BIODIVERSITY

THE WORKING FOREST

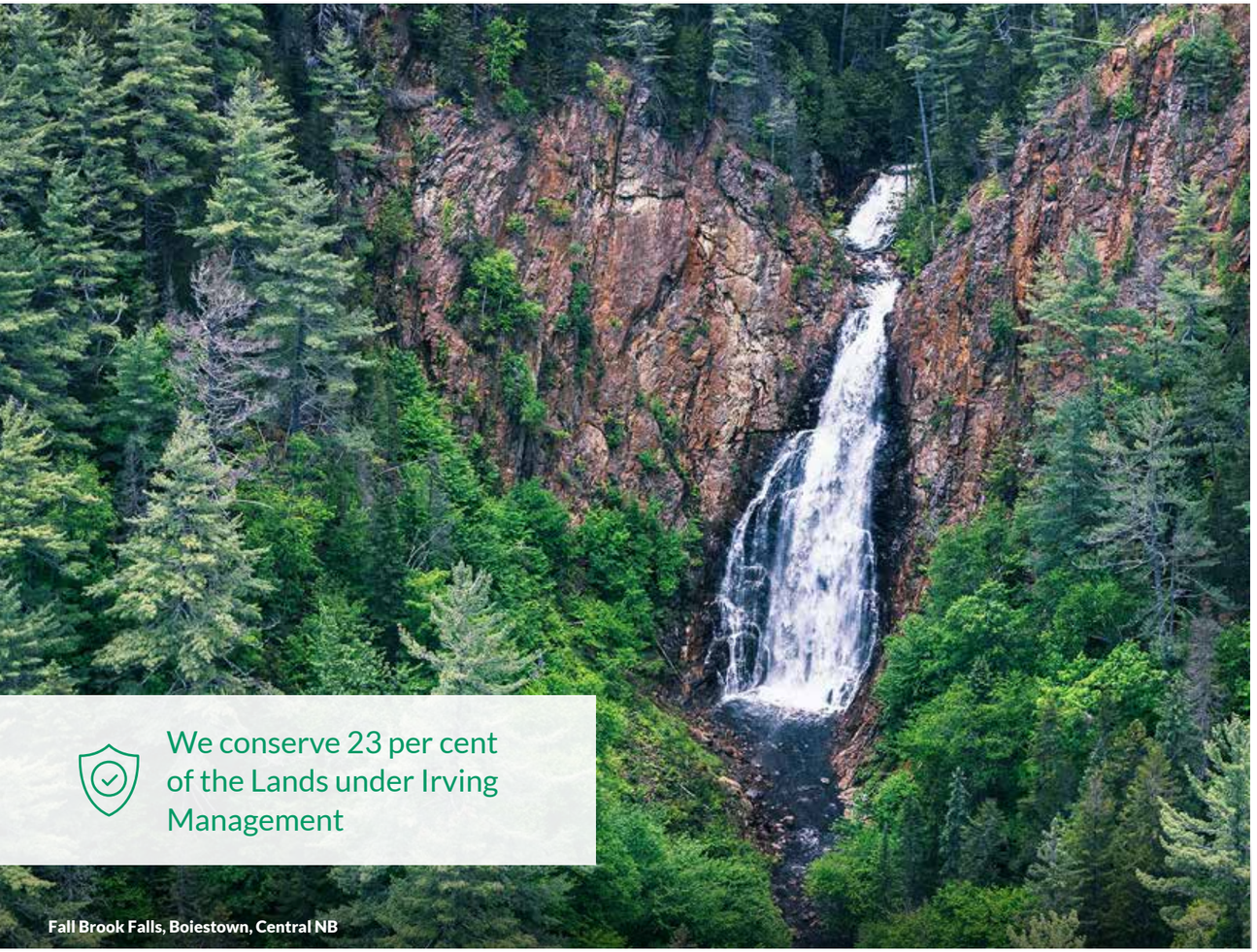
Our approach to maintaining biodiversity in the working forest is to ensure the diversity of tree species, ages, and structures remain present with long-term management planning. We also ensure that all streams, wetlands, and site-specific wildlife habitats, like large snag trees, raptor nests, and bear dens are protected in all operating areas. We train all staff and contractors annually on regulations and how to identify site-specific habitats. Using our internally developed Forest Species of Concern Guidelines we identify biodiversity concerns and best practices to ensure we conserve important features and habitats that species need.

We added 156 new conservation sites in 2021

We use a variety of harvesting and reforestation methods that create diversity at the landscape level. All harvested areas in the region naturally regenerate to softwoods, hardwoods, and mixed forest areas. Even-aged forests are created with clearcutting on less than 50 per cent of area each year. Some of these areas are planted with native species, while some are naturally regenerated. We rely extensively on natural regeneration where we use selection harvesting methods, creating forests of un-even age, and mixed species.

Naturally regenerated hardwoods are an important food source for large mammals like moose and deer. The change in the forest following harvesting creates immediate abundance in annual and perennial grasses and shrubs that did not exist in the older forest. These new plants, flowers, and berries create food sources for birds, insects, reptiles, and small mammals.

With more than 30 years of research on our Northern New Brunswick woodlands, we have learned that planted areas are significant contributors to clean water and habitat for a variety of mammals, birds, insects, and plants.



We conserve 23 per cent of the Lands under Irving Management

Fall Brook Falls, Boiestown, Central NB

TOTAL CONSERVATION AREA ON LANDS UNDER IRVING MANAGEMENT:
557,323 HAs / 1,377,150 ACs

CONSERVED LANDS	FREEHOLD	CROWN
• UNIQUE AREAS • WATER AND WETLAND BUFFERS • DEER WINTERING AREAS • OLD FOREST HABITATS • PROTECTED NATURAL AREAS	18% 242,643 HAs 599,571 ACs	32% 314,680 HAs 777,579 ACs

Figure 10.

FOREST CONSERVATION AND BIODIVERSITY

THE CONSERVATION FOREST

For the primary purpose of conservation, we set aside 23 per cent of the lands under Irving management across the landscape. With our 80-year management planning process, the locations of the conservation forest may shift over time as the forest naturally evolves, but the proportion of the forest in conservation will still be maintained. Our forest conservation areas include deer wintering areas, wetland and watercourse buffers, old forest habitats, and conserved natural areas.

To provide for species dependent on old forest, we maintain at least 10 per cent of the forest as 'old' and 3 per cent as 'very old' across softwood, hardwood, and mixed forest types. In New Brunswick, our forest lands are shared with provincial Protected Natural Areas (PNAs). We actively link our conservation lands with provincial PNAs to create connectivity for wildlife and plants.

Harvesting may occur, but only if harvesting can improve conservation outcomes. The conservation forest area may not always remain in a fixed location on the ground, rather it is designed to shift to other areas of the landscape over time, so that the conservation values we intend to promote exist across the landscape, even as the forest naturally changes.

MANAGING THE LAND FOR WHITETAILED DEER

Deer wintering areas (DWA) ensure large areas of softwoods are available for whitetail deer. In northern areas, large amounts of snow limit whitetail deer populations. Maintaining older softwood forests helps reduce the snow depth creating shelter to help whitetail deer survive harsh winters. Harvesting may occur in DWAs only if it promotes conservation outcomes, like providing a food source near the winter shelter. As older softwoods eventually succumb to natural mortality and are replaced by young forests, they no longer provide winter habitat for whitetail deer. Our foresters plan for the immature areas to eventually become new DWAs and replace today's DWAs.

Irving Nature Park, Saint John, NB

FOREST CONSERVATION AND BIODIVERSITY

CONSERVATION AREAS PROGRAM

An important sub-set of our conservation forest is our Conservation Areas Program and parks. These programs are where our most rare and unique areas are maintained. The Program currently encompasses almost 1,900 identified, logged, and conserved site-specific habitats as per the guidelines set out in the Forest Species of Concern.

DISCOVER THE GIFT OF NATURE

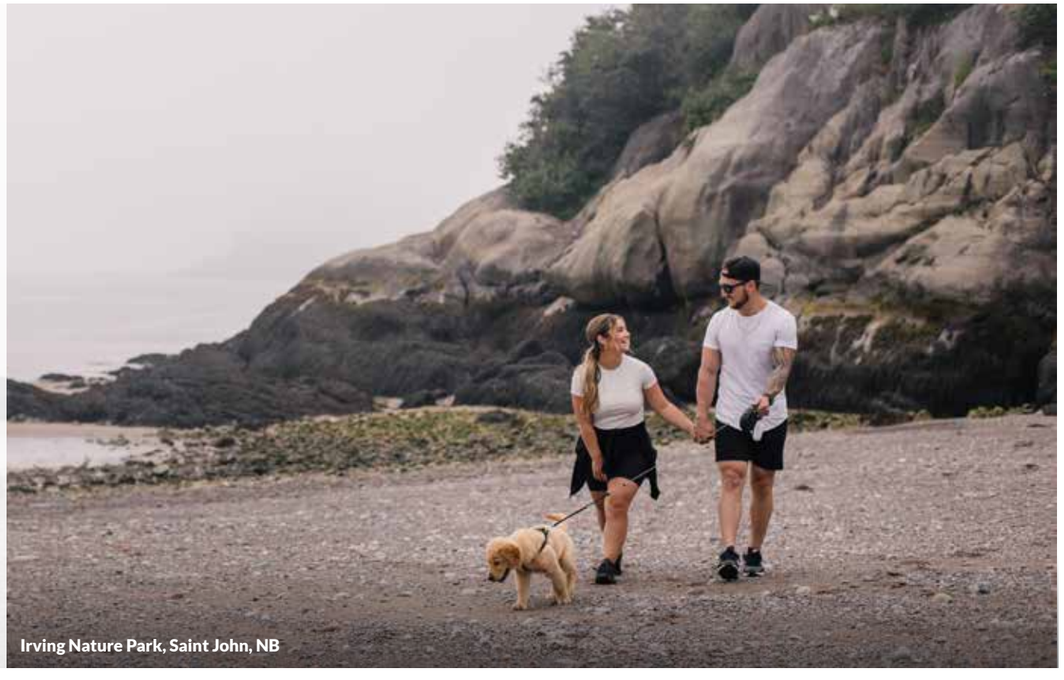
1,894 TOTAL # OF SITES
TOTAL HECTARES: 81,331
TOTAL ACRES: 200,887

- **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

69,973 ha
Old Forest Sites

JDI has set an objective to designate and maintain old forest within the working forest landscape. To date, more than 69,973 hectares (172,907 acres) have been designated towards meeting this objective.

J.D. IRVING CONSERVATION WEBSITE


Irving Nature Park, Saint John, NB

FOREST CONSERVATION AND BIODIVERSITY

DISCOVER THE GIFT OF NATURE IN OUR PARKS

J.D. Irving, Limited is pleased to offer four free nature parks for the enjoyment of the public. Each of the parks have unique features and are home to diverse wildlife and habitat. Nature parks are crucial and valuable to New Brunswick and Canada as a whole: for wildlife habitat and ecosystem protection, offering havens for people to exercise or relax, as well as a chance to learn about the surrounding environment.

In 2021, JDI launched a free program enabling visitors to the Irving Nature Park and La Dune de Bouctouche to learn more about the woods and our conservation program with the help of their smart phone. By scanning various QR codes throughout the park, visitors connect to a website with more information and photos related to our conservation program sites.

We invite you to visit www.jdirvingconservation.com to learn more about our program and visit some of our most unique natural wonders to discover the gift of nature.

IRVING NATURE PARK – A 600-acre site located in Saint John, NB has been a hub for tourism and learning since it was open to the public in 1992. This unique park is a place where everyone can experience the various ecosystems of the Bay of Fundy coastline. It is open year-round to encourage visitors to discover the gift of nature with geological treasures and many other stunning features. At the Park, you can stroll or swim along Saint's Rest Beach, enjoy a BBQ with friends and family, or go hiking and biking on one of the many trails.

LA DUNE DE BOUCTOUCHE – IRVING ECO-CENTRE: La Dune de Bouctouche was developed and opened to the public in 1997 with the intention of preserving and restoring one of the few remaining great sand dunes on the northeastern coastline of North America. Stretching 12 kilometres (7.5 miles) across Bouctouche Bay, the dune features a rich variety of marine and aquatic plants and animals, including shorebirds and other migratory birds that make the dune their habitat.

We recorded over 420,000 visitors to the Irving Nature Park and La Dune de Bouctouche in 2021.

WOLASTOQ PARK – Built in 2004, Wolastoq Park overlooks the Reversing Falls Rapids. Wolastoq means "the beautiful river" in the language of the Wolastoqiyik people who originally lived on the shores. Visitors can learn about how the lands provided the Wolastoqiyik people with food, materials, and medicines, along with transportation routes for hunting and trade. A collection of wooden statues of historical Saint John figures are placed throughout the park.

IRVING ARBORETUM – Located in Bouctouche, this park is the perfect place to observe local flora and fauna. The walking and biking trails around the park are connected to the trail system that leads to the local village and to La Dune de Bouctouche.

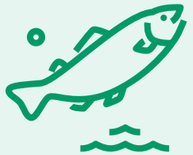
Douglas Munn, a PhD student at the University of New Brunswick, studying wildlife biology, has been involved in a five-year moose winter tick research project with JDI. His research focuses on the movement of juvenile moose in Quebec and New Brunswick to identify possible impacts of winter ticks, climate change and predation on moose populations.

Doug Munn (UNB), Southern New Brunswick Woodlands

SONGBIRDS

MOOSE & WINTER TICKS

DEER MOVEMENT



FISH AND WATER

FOREST CONSERVATION AND BIODIVERSITY

COMMITMENT TO FOREST RESEARCH: TYING IT ALL TOGETHER

Our forest conservation and biodiversity efforts are supported with forest-related research in collaboration with experts in water, plants, and wildlife.

Since 1990, we have invested $30 million in forest-based, peer-reviewed research to learn more about our areas fish, wildlife, and plants. We are a founding partner of many wildlife and forestry research projects and have collaborated with dozens of researchers and over 100 graduate students.

JDI's Forest Research Advisory Committee (FRAC) was established in 1998 to help the company bring forest managers and researchers together. FRAC's goals are to identify, advocate, and conduct research to address knowledge gaps and have our research partners' work peer-reviewed and published. Currently, we are focused on landscape level impacts on water, birds, beetles, bryophytes, moose, and deer.

Canada

New Brunswick
New Brunswick Department of Energy and Resource Development

Québec

UNB
EST. 1785
UNIVERSITY OF NEW BRUNSWICK

Université Laval

The University of Maine

McMaster University

Carleton University

University of Maine Fort Kent
Université du Maine

Université de Montréal

Maine Department of Inland Fisheries and Wildlife

CFRU
Cooperative Forestry Research Unit

Olive Sided Flycatcher

FOREST CONSERVATION AND BIODIVERSITY

SONGBIRD STUDY

Since 2016, JDI has partnered with scientists at Natural Resources Canada, Carleton University, and the Canadian Wildlife Service to conduct a five-year songbird habitat research project. The goal of this study is to assess songbird species presence and habitat preferences. A total of 458 sites were sampled with acoustic songbird monitoring devices in each of the 17 dominant forest types in Black Brook over two seasons. From the recordings in the laboratory, 90 bird species were identified.

Initial comparisons show the highest diversity of species is found in the most intensively managed forests, and preliminary results suggest that managed landscapes do not change the types of habitat important to forest bird species. We look forward to the full results of this study.

Collared moose, Tracy, NB

FOREST CONSERVATION AND BIODIVERSITY

UNDERSTANDING CLIMATE: MOOSE AND WINTER TICK INTERACTIONS

To better understand winter tick impacts on moose populations, JDI is the major private sponsor of a five-year research project in partnership with Université die Laval, Université de Montréal, the University of New Brunswick, and the provinces of New Brunswick and Quebec.

Warmer winters and shorter periods of snow cover have likely made conditions ideal for a greater number of ticks. Our researchers and partners use catch-and-release methods to collect measurements and attach GPS collars to explore what factors can lead to negative health impacts on moose populations.

As of December 2021, 106 calves were collared and monitored. Early results correlate drier summers with lower tick counts the following fall. Infestations weaken moose and make them vunerable to other diseases.

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

Collared White Tailed Deer, St. Quentin NB

FOREST CONSERVATION AND BIODIVERSITY

WHITETAIL DEER HABITAT IN THE WORKING FORESTS

We have partnered with six research and government groups to study the impacts of intensive forestry on the population of white-tailed deer. The study includes a snow model, a food model, and summer and winter habitat selection at landscape and within-home-range scales. By using data from collared animals we can predict whitetail deer population growth and how whitetail deer use the forest.

Preliminary data indicates that deer prefer locations with forest canopy height less than 12 metres, peaking at 5 metres. This habitat type would be typical of young regenerating clear cuts harvested within 15 years.

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

Atlantic Salmon, Southwest Miramichi River

FOREST CONSERVATION AND BIODIVERSITY

FRESHWATER ECOSYSTEMS

Past studies have shown that some forest management including tree removal, roads and silvicultural practices can impact freshwater ecosystems and thus compromise some of the benefits they provide. To avoid such negative impacts, best practices such as riparian buffer zones and improved stream crossing methods have been implemented.

To test the effectiveness of these best practices, researchers selected 12 streams in Black Brook that reflected a gradient in forest management intensity such as area harvested, road density and forest composition. Additionally, three unharvested catchments were selected in Mount Carleton Provincial Park as reference.

The amount of sediments entering streams was greater in more intensively managed catchments, however, stream insect communities did not seem to be impaired by forest management. A decrease in leaf litter breakdown rates was observed with increasing forest management intensity. Such a decrease results in the slowing down of the recycling of nutrients such as carbon and nitrogen. This study highlights the importance of proper road maintenance and improved best practices to keep sediments out of streams.

DOUBLY MATERIAL TOPIC

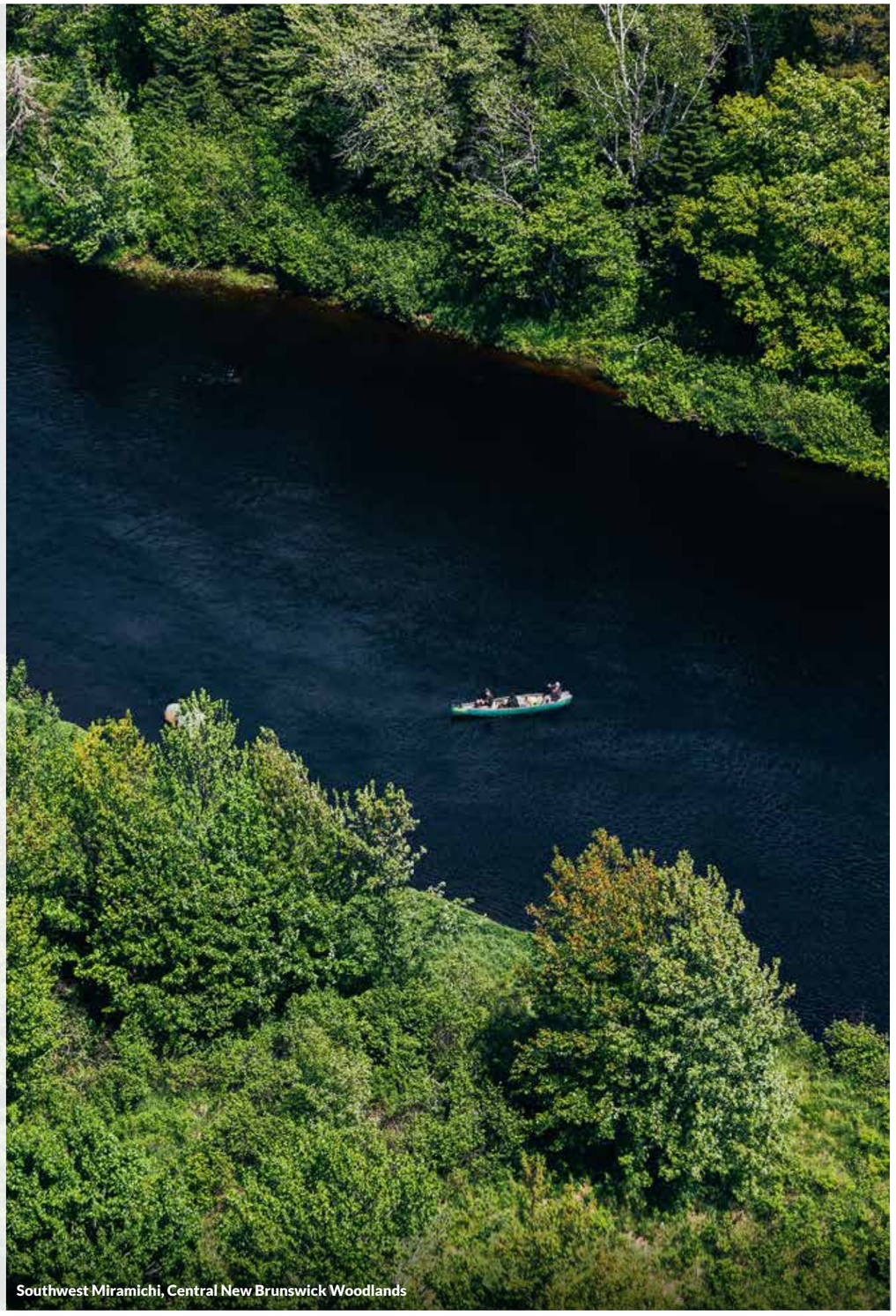
REPORTING STANDARD

- ✓ GRI 305-7
- ✓ SASB RR-PP120A.1
- ✓ GRI 303-1
- ✓ GRI 303-2
- ✓ GRI 303-3
- ✓ GRI 303-4
- ✓ GRI 303-5
- ✓ SASB RR-PP-140A.1

GOVERNANCE

JDI Environmental Policy

STRATEGIC SDGS



Southwest Miramichi, Central New Brunswick Woodlands

AIR AND WATER QUALITY MANAGEMENT

Air and water are truly shared resources.

Manufacturing operations have impact on air and water quality and our role is to meet and exceed regulations in place to protect the environment. Harvesting activities and forest road building also have the potential to impact clean water.

We have a commitment to ensuring that our operations do not damage ecosystems, impact fish, wildlife, or local communities. Using the best science and technology, we aim to constantly reduce the impact of our air and water emissions on our surrounding neighbours and ecosystems.

Our operations meet and/or exceed a wide range of industry and site-specific regulations, ensuring we operate at the highest standards. Federal, state, and provincial regulations require annual reporting and limits to be in place on our air and water emissions. Additionally, site-specific approvals and permits are issued to address any additional requirements. We prioritize ongoing compliance, continually revaluating our operations to ensure risks are being assessed and managed.

DOUBLY MATERIAL TOPIC

REPORTING STANDARD

- ✓ GRI 305-7
- ✓ SASB RR-PP120A.1

GOVERNANCE

JDI Environmental Policy

STRATEGIC SDGS

3 GOOD HEALTH AND WELL-BEING

DATA TABLE REFERENCE

PAGES 122-123

Irving Pulp & Paper, Saint John, NB

AIR AND WATER QUALITY MANAGEMENT

AIR QUALITY MANAGEMENT

The multi-sector air pollutant regulations in Canada administer restrictions on NOx emissions rates. The Pulp & Paper division is in full compliance with this regulation.

The chemical pulping sites in the Pulp & Paper Division are most vulnerable to odour, primarily caused by sulfur dioxide (SO_2) emissions from chemical pulping.

Over the years, capital investments at Irving Pulp & Paper (IPP) have virtually eliminated the potential for odour to be detected off-site during normal operation. We are proud of this achievement at IPP and are committed to minimizing odour at all sites.

PULP & PAPER DIVISION AIR EMISSIONS - SOx (Tonnes)

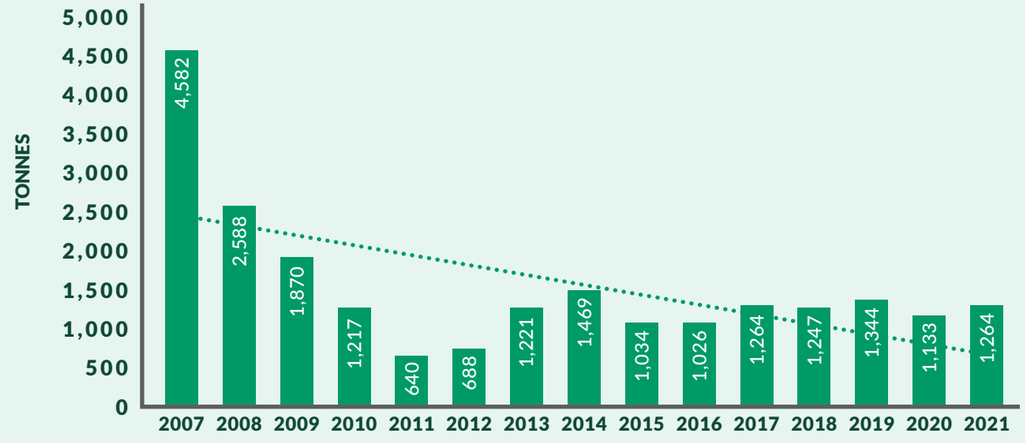


Figure 11.

Odour complaints must be logged and shared with regulators, whether they have been substantiated or not. We investigate all odour complaints or inquiries to identify whether we may have opportunities to improve.

DOUBLY MATERIAL TOPIC

REPORTING STANDARD

- ✓ GRI 303-1
- ✓ GRI 303-2
- ✓ GRI 303-3
- ✓ GRI 303-4
- ✓ GRI 303-5
- ✓ SASB RR-PP-140A.1

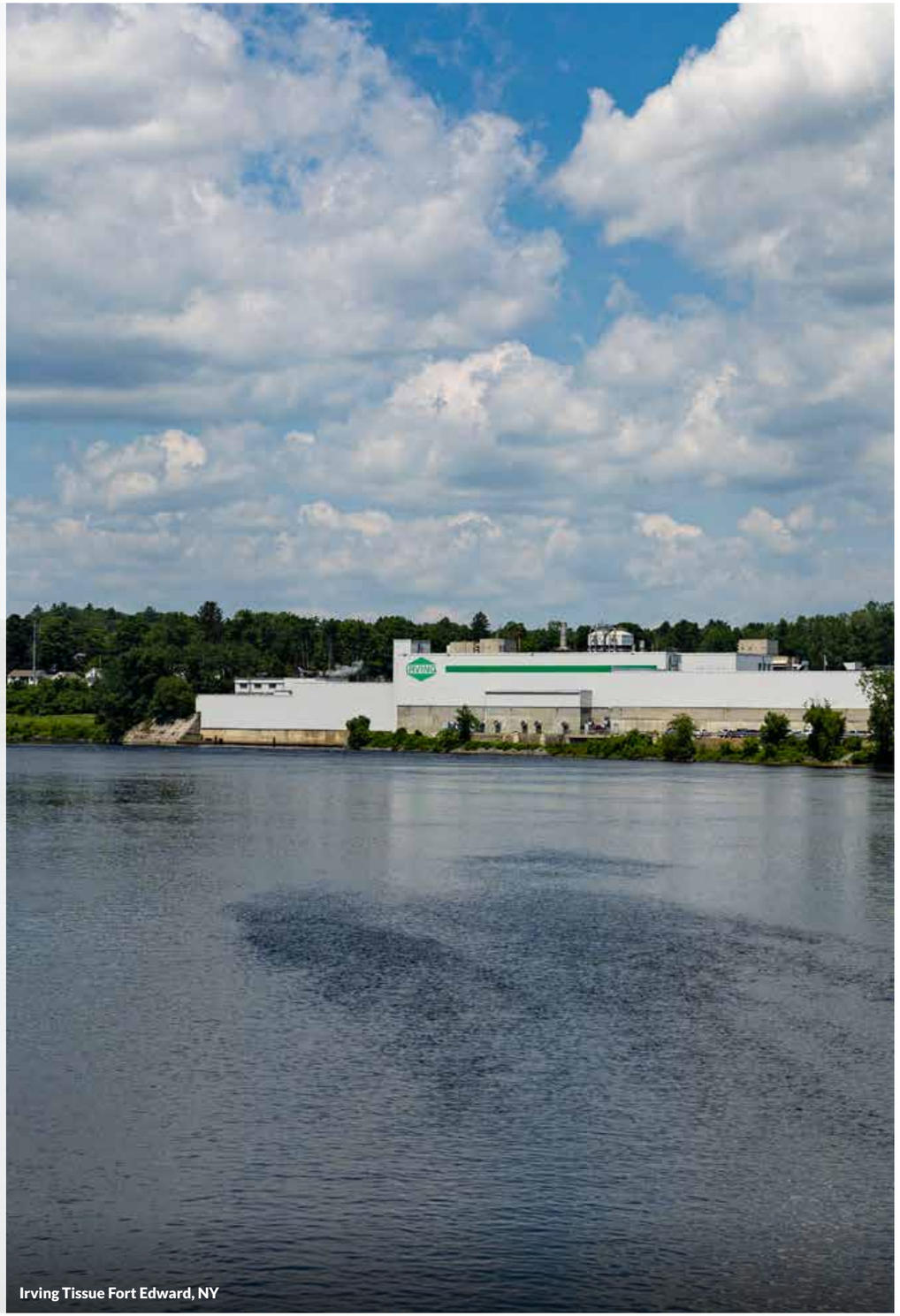
GOVERNANCE

- Best Practices for Establishing and Harvesting Buffers
- Watercourse and Wetland Alternation Certification (NBDELG)
- Soft Ground BMP
- JDI Environmental Policy

STRATEGIC SDGS

DATA TABLE REFERENCE

PAGES 124, 129-132



Irving Tissue Fort Edward, NY

AIR AND WATER QUALITY MANAGEMENT

WATER QUALITY MANAGEMENT

Our operations use and have the potential to impact hundreds of millions of litres of fresh water per year. The Pulp & Paper Division and Irving Consumer Products operations use over 64 million m3 per year of surface water, sourced from local lakes and rivers. Process water is treated and released into the environment under strict environmental controls and regulations.

Our sawmills division's wood and lumber yards have the potential to create runoff and siltation in rivers and in our Woodlands operations, forest roads frequently cross rivers and streams and we constantly work around watercourses.

Our operations are not located in regions of high water stress. Nevertheless, to prepare for a changing climate, reducing water consumption is very important to long-term sustainability.

Irving Pulp and Paper, the company's largest facility with the highest water use, is currently working on a project to improve effluent quality through enhanced treatment, with construction expected to begin in 2022. As part of the ongoing project, the fresh water use is expected to be reduced by 50 per cent.

TARGET – 50% IN WATER CONSUMPTION AT IPP

TARGET – 25% WATER REDUCTION FROM IRVING TISSUE OPERATIONS

PPD + TISSUE WATER USAGE (M³)

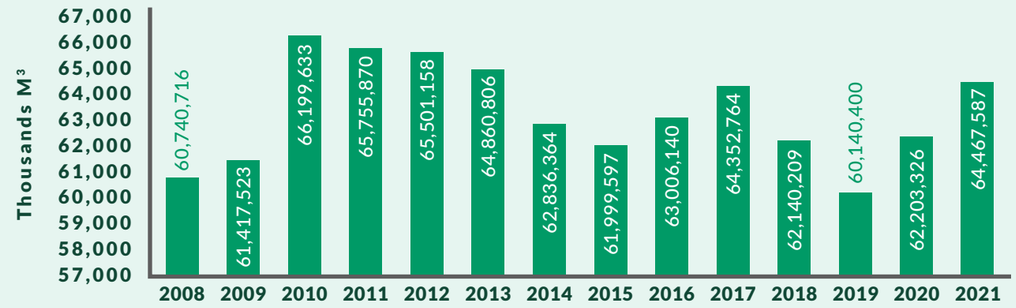


Figure 12.

PPD - WATER USAGE (M³/TONNES OF PRODUCTION) = WATER USE EFFICIENCY

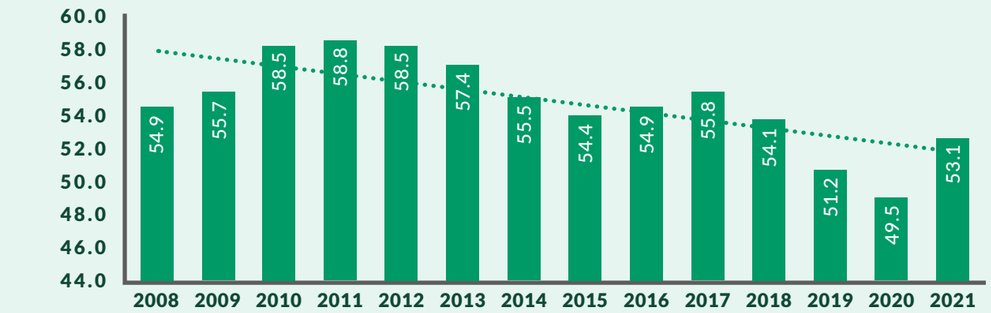


Figure 13.

TISSUE - WATER USAGE (M³/TONNES OF PRODUCTION) = WATER USE EFFICIENCY

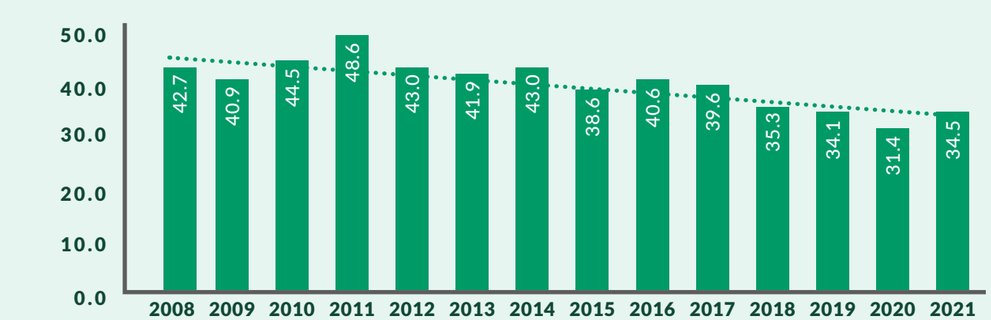


Figure 14.

AIR AND WATER QUALITY MANAGEMENT

PULP & PAPER – WATER QUALITY

Modernizations of the Pulp and Paper Effluent Regulations (PPER) have been proposed which will lead to stricter water quality discharge limits in Canada. IPP continues to develop plans to invest in a new, state-of-the-art secondary treatment facility to meet these targets. The proposed facility will enable a 75 – 80 per cent reduction in regulated emissions associated with water treatment; Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS). The Environmental Impact Assessment application has been filed with the provincial regulator for this project and we expect to begin construction of this facility in 2022.

In 2017, Lake Utopia Paper commissioned a new, state-of-the-art effluent treatment and biogas facility. This facility allows us to meet the PPER and has also allowed us to reduce fossil fuel consumption and GHG emissions by over 50 per cent through the generation and use of resulting biogas as a process fuel.

In addition to having emission limits associated with wastewater, the Pulp & Paper Division is fully engaged with environmental effect monitoring. This program requires participants to identify causes and solutions for affected environments, such as evaluating the potential impact of wastewater on local fish and fish habitat.

TARGET – ZERO WATER QUALITY NON-CONFORMANCES AT ALL INDUSTRIAL SITES

Doaktown Sawmill, Doaktown, NB

AIR AND WATER QUALITY MANAGEMENT

SURFACE WATER MANAGEMENT

Sawmills - Water Management

The log and lumber yards surrounding JDI's sawmill sites cover approximately 100 hectares (244 acres) of land, and are home to various watercourses and wetlands. To protect these waters, we manage the levels of total suspended solids (TTS) through rigorous environmental standards. By settling, filtering, or separating sediment in storm water, we can ensure all pollution is removed before releasing it back into the environment.

With the help of advanced technology, such as hyper-accurate LiDAR technology, we can understand the topography of log and lumber yards and apply rain and snowfall modeling to design infrastructure that minimizes Total Suspended Solids (TSS).

After years of sampling showing high TSS levels at our sawmill in Ashland, Maine, an effort to prevent sediments from leaving the site has been introduced with the help of the Maine Department of Environmental Protection, Irving Forest Products, and Haley Ward Engineering. Stormwater has been redirected and several new structures have been created with the goal of eliminating stormwater sampling completely.

AIR AND WATER QUALITY MANAGEMENT

SURFACE WATER MANAGEMENT

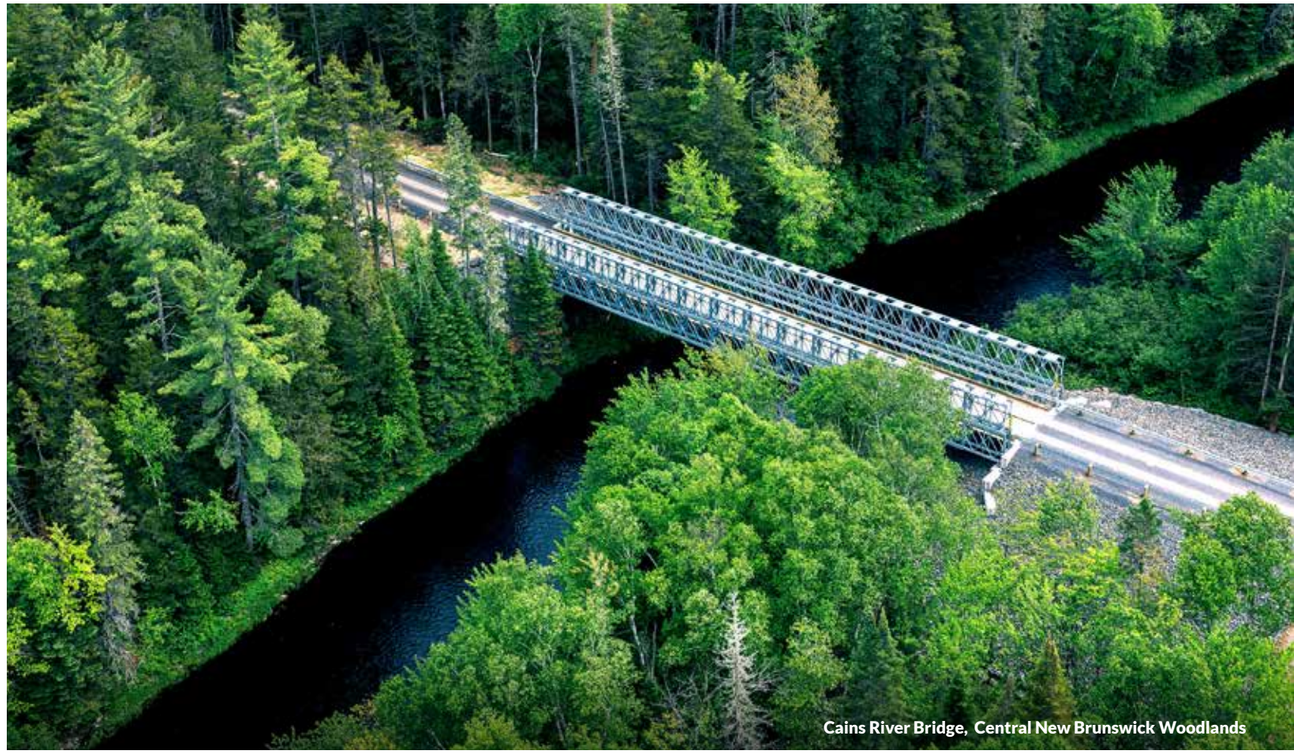
Woodlands – Water Management

Our vast forests are the source of much of our freshwater, collecting rainfall and snowmelt. This water moves along the surface and underground to small streams leading to large rivers across the landscape. Water is also stored under the surface as groundwater and in ponds, lakes, and wetlands. Because of this, our Woodlands operations interact with water every day and we have a responsibility to look after and care for the land.

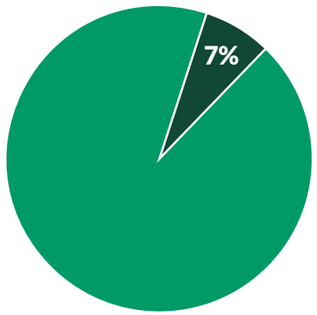
One of the tools we use to protect water are riparian buffers. All streams and water bodies in the forest, no matter how small, require a riparian buffer. Across the landscape, these riparian buffers account for more than 10 per cent of the lands we own or manage.

We focus on enhancing our water-related performance by following best practice and regulations. We report on performance through our forest certification and continually improve to proactively protect our waters for generations to come.

There are more than 30,000 kilometers of forest roads on the lands that are owned or managed by the foresters in the Woodlands Division. By implementing a new asset management tool enabled by mobile technology in 2021, we are able to identify and inventory where forest roads cross streams and prioritize action needed to keep the water clean.



Cains River Bridge, Central New Brunswick Woodlands



7 per cent of all managed lands is in water course and buffers

Figure 15.

TARGET – 100% OF ALL NEW WATER CROSSINGS COMPLIANT

Doing it right: Cains River Bridge

Completed in 2021, the Cains River bridge, located in central New Brunswick, provides safe access over a river crossing for our Woodlands team members and the environment.

Our goal is to reduce the number of log trucks on government highways which improves public safety. The bridge also reduces transportation costs by allowing larger on and off-road trucks which will decrease the number of trucks required in the future and reduce greenhouse gas emissions.

DOUBLY MATERIAL TOPIC

REPORTING STANDARD

- ✓ GRI 403-1
- ✓ GRI 403-2
- ✓ GRI 403-4
- ✓ GRI 403-5
- ✓ GRI 403-7
- ✓ GRI 403-9

GOVERNANCE

- CIR, RIR, LTIR
- Health and Safety Policy
- Safety Orientation

STRATEGIC SDGS

8 DECENT WORK AND ECONOMIC GROWTH

DATA TABLE REFERENCE

PAGES 135-138

Cody Richard, Lake Utopia Paper, Saint George, NB

SAFETY

THE JOURNEY TO "LEADING" ON SAFETY

Safety is a core company value at JDI, and we are steadfast in our commitment to continuous improvement. This includes ensuring the effectiveness of our health and safety management system, leveraging technology and analytics to set strategy, taking care of our people, and using leading indicators to ensure we have set the right path.

The right path is a risk-based approach to managing health and safety. We are prioritizing our actions based on severity and working to reduce risk in our operations.

Emily Ryan, Grand Lake Timber, Chipman, NB

SAFETY

OUR INJURY PERFORMANCE

Across the organization, we have implemented the use of the United States Occupational Safety and Health Administration (OSHA) metrics to measure, evaluate, and compare our injury statistics.

The **Recordable Incident Rate (RIR)** is the industry standard for safety performance for the number of recorded injuries per 100 workers. This is a rear-view looking metric as it measures past performance and includes injuries which require medical attention. The recorded injuries range in severity from minor to severe.

Figure 16.

Management Analysis: A continued decline in injuries over the past four years, dropping 31 per cent since 2018, with only two workers in every 100 experiencing an injury beyond first aid.

In addition to the RIR, we review Lost-Time Injury Rates (LTIR) and Critical Injury Rate (CIR) as key safety metrics to provide better context to the type and severity of injuries.

Lost-Time Injury Rates (LTIR) measure the number of injuries where employees have "lost-time" or have missed their regularly scheduled shifts due to the workplace-related injury. All lost-time injuries are Recordable Injuries – therefore, the LTIR is a sub-set of the RIR, indicating the employee could not return to work the next day. 35 per cent of Recordable injuries are lost-time injuries (0.7 LTIR).

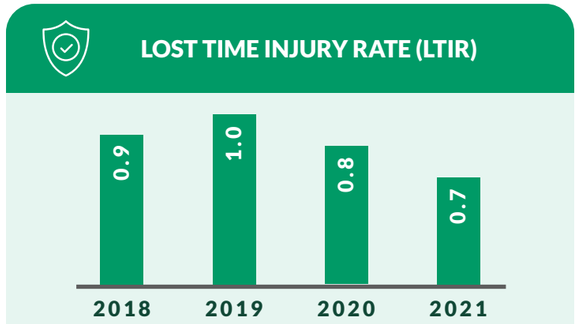


Figure 17.

Management Analysis: With a focus on Disability Management and Early and Safe Return to Work, the company is diligently working to accommodate employees and drive the shared benefit of having employees safely return to work as quickly as possible.

Stemming from a recent focus on Serious Injuries and Fatalities (SIFs), JDI adopted a **Critical Injury Rate (CIR)** of its own, using the Critical Injury definition from the Ontario Ministry of Labour as a guideline. The CIR provides an indication of the severity of the incident. Compared to Recordable Incidents, these injuries are more severe, and include concussions, fractures, and deep lacerations. Similarly, all critical injuries are Recordable Incidents. Tracking the CIR as a metric has helped the organization to focus on risk management and to identify areas of high-risk potential and severity to cause significant injury. Our attention has shifted to ensuring action plans are initiated to prevent high-severity and critical injuries.

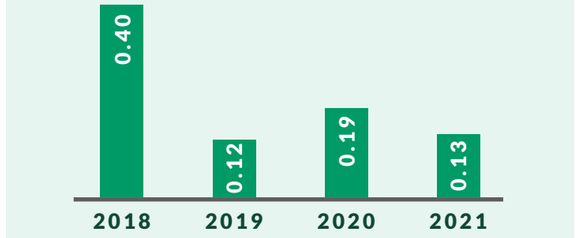


Figure 18.

Management Analysis: Of the 2.0 RIR, 6.5 per cent of these injuries are critical and higher risk and higher severity. This is why we are focused on managing and reducing risk, to ensure we prevent our most severe injuries.

TARGET – CRITICAL INJURY RATE OF ZERO


Irving Pulp & Paper, Saint John, NB

Irving Tissue Toronto, ON

Irving Paper, Saint John, NB

SAFETY

PULP, PAPER AND TISSUE MILLS RECOGNIZED AS SAFEST IN CANADA

Pulp & Paper Canada has been benchmarking safety performance of mills since 1926. The Safest Mill in Canada program recognizes the outstanding safety records of participating mills based on rate of injuries to its workers. In 2021, two JDI mills were in the top four for their size: Irving Tissue, Toronto (#2) and Irving Pulp and Paper (#4). Two other JDI mills, Irving Paper and Lake Utopia Paper join them as four of our pulp, paper and tissue mills made the top 20. Creating a safety caring culture is a key strategy in delivering on JDIs commitment to ensuring the protection of employees, the public and the environment.

SAFETY

THE TRANSITION TO LEADING METRICS

Actively Identifying and Reducing Risk

JDI began to also look to "leading" safety indicators as a more holistic approach to safety performance and a better predictor of the effectiveness of the safety management system. We believe a more detailed breakdown of injury data provides better insight into the severity and impact of the injury, rather than only looking at the Recordable Injury Rate. We want to better understand the risk of injuries we have yet to be exposed to.

That is why JDI has shifted our focus to the effectiveness of our safety management systems as part of our journey. This involves the management of all aspects of safety in our workplaces: compliance to regulations, providing safety training, documenting systems and procedures, and initiative-taking steps to prevent injuries. Proactive safety management includes looking at where potential injuries can happen and engaging our team to identify hazards and report near misses. In 2020, we launched a corporate internal Safety Management System Maturity Assessment and evaluated our sites and operations against best practices in health and safety management.

The Safety Management System Maturity Assessment is driving to a higher caliber of safety management. This is a JDI created tool to evaluate our management system effectiveness and to highlight action plans to make system improvements. Our management system will assist on our journey to being world-class in safety standards and expand our focus beyond injury performance to the types of prevention initiatives to ensure success into the future.

Jacques Richard and Mike Ritzhaupt, Irving Tissue Dieppe, NB

"When we have good safety performance, it says an awful lot about the attitude of the management, and the company, and the engagement scores, and everything else… because when we are safe, it means everything else is being looked after properly."

Jim Irving, Co-CEO

Julia Hill, Grand Lake Timber, Chipman, NB

SAFETY

HAZARD IDENTIFICATION PARTICIPATION RATE

Employee engagement and participation in health and safety are not only best practices, but they are also crucial features of the Safety Management System. When employees and their supervisors participate in the safety system, they take responsibility for their own health and safety, actively working to improve health and safety in the workplace.

Employees identify workplace hazards, dangerous conditions, potential problems that could cause injury, safety observations, and near misses. The rate calculates the percentage of employees that communicate a condition to their supervisor each period. The goal is to increase employee participation and proactively identify and correct conditions that can result in injury . By tracking 'hazard ID' submitted by employees, our goal is to reach 100 per cent participation each period.

In 2017, this program was first launched within the Sawmills Division and has now become one of the key measures our organization uses to track how we are doing at managing safety. Most importantly, it is an indicator of how our employees view and contribute to safer workplaces.

SAFETY

THE SAWMILLS "X" FACTOR – A CASE STUDY

The Sawmills Division was the pilot to start the process of focusing on hazard identification. Since starting the process of hazard identification, safety observations of unsafe conditions, and near miss reporting, the Sawmills Division employees have increased the volume and quality of hazards identified each period. Supervisors are discussing hazards as part of their daily communications with their employees and are actively requesting employees to look for and report hazards and unsafe conditions.

By increasing the focus on hazards and near misses, the Sawmills have shifted the attention to leading activities and actions taken to prevent injuries, as opposed to acting after injuries have happened. The trend lines on each path form an "X" at the point where the two trend lines converge.

The case study, an example within our own operations, is evidence that a focus on leading safety indicators has a positive impact in driving a reduction in Recordable Incidents.

THE "X" AXIS - SAWMILLS DIVISION - JAN 2018 TO NOV 2019

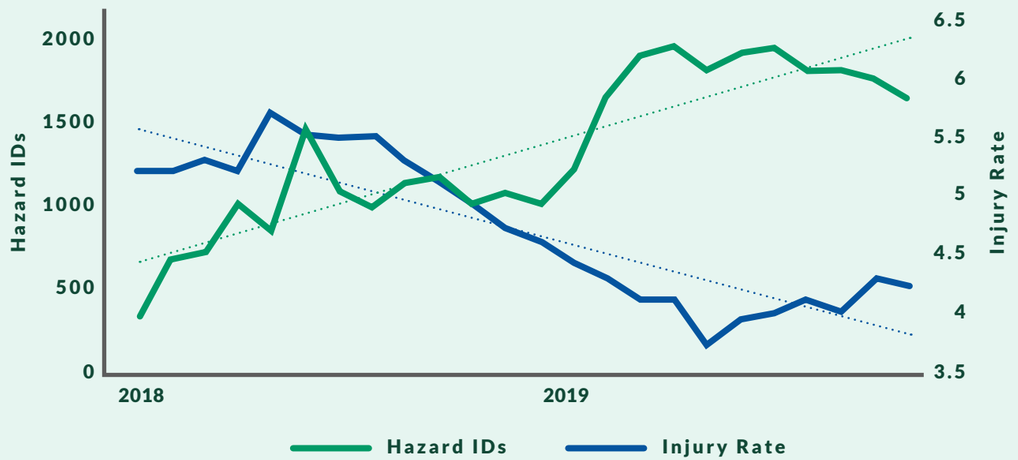


Figure 19.

Irving Pulp & Paper, Saint John, NB

SAFETY

RISK ASSESSMENT PRIORITIZATION INDEX (RAPI)

To help manage reported hazards, JDI has implemented the Risk Assessment Priority Index (RAPI), a prioritization method to ensure that higher risk hazards are given higher priority. Hazards identified by employees are ranked by their risk and potential for serious injury. The most severe hazards or unsafe conditions, Critical Hazard IDs, are identified and assigned corrective action.

By focusing on identifying hazards with potential to cause injury and prioritizing those hazards that can create severe injury by using RAPI, we are actively working to reduce risk in our operations. RAPI is about removing the risk of injury before the injury happens - a leading activity to ensure focused prevention activities.

SAFETY

TRAINING COMPLIANCE – LEADING METRIC

Health and safety training is a leading indicator for safety management systems. JDI has a managed process for ensuring employees are assigned, scheduled, and receive training for both regulatory compliance and safety training. JDI measures percentage of training completed according to assignments. This ensures that we meet regulatory requirements and that training information for our employees is kept current. Our organization provides health and safety training to equip our people with the needed knowledge to identify hazards, implement controls to reduce risk, and how to use the safety systems that are in place.

REPORTING STANDARD

- ✓ SASB RR-FM-450A.1
- ✓ SASB RR-PP-140A.2
- ✓ TCFD - Strategy and Risk Management

GOVERNANCE

ESG STEERING COMMITTEE

STRATEGIC SDGS

Deersdale, NB

CLIMATE CHANGE AND ADAPTATION

Proactively adapting to climate change

Climate change is an existential threat to society and our Forest Supply Chain is well positioned to make a positive impact. Understanding climate change is proactively built into strategy. With decades of experience, forest owners recognize there are shorter winters, changes in precipitation, new forest pests, and shifts in species composition. The trees planted today will be harvested in a different climate, just as the climate differs today from when our predecessors were planting 60 years ago.

A changing climate can present risks to our Supply Chain which will impact costs, future wood supply and operations, and cause damage to infrastructure. However, change in the climate can also present opportunities to improve forest growth and a heightened demand for renewable forest products and energy.

The Steering Committee, through proactive interaction with subject matter experts in the Divisional Leadership Teams, identify assess and manage physical and transitional risks and opportunities in the Supply Chain. These are identified internally by subject matter experts in the divisional teams through their own experience and continued engagement with external researchers from various disciplines like forest management, hydrology, genetics, silviculture, pest and wildfire management, and various engineering fields. Guided by the best available science and engineering advice, the members of the individual Forestry Executive Leadership Teams direct the investment of capital and human resources into tools and technologies to mitigate the impacts of climate change and react to opportunities.

Creating resiliency to climate change is part of sustainable forest management, the foundation of of which is our adaptable 80-year management plan, which is revised every 5 years. This planning process has built-in flexibility to account for gradual changes in tree composition or growth, or sudden event-driven changes like wildfires.

45 years of tree improvement to understand which trees are genetically best suited to different climates.

Investment in training and technology to ensure the best trees grow on the right sites.

Maintain tree growth with intensive silviculture practices to keep the best trees free from competition.

CLIMATE CHANGE AND ADAPTATION

PHYSICAL RISKS WITH CLIMATE CHANGE IN THE FOREST SUPPLY CHAIN

In the forest products industry, the most significant physical risk from climate change is changes to wood supply. These changes could occur gradually over time with species shifts or suddenly due to events such as wildfire, pest outbreaks, or windthrow.

The Woodlands team continues to engage with expert researchers to understand the physical risk associated with a changing climate. A recent analysis on forests in New Brunswick[1] provides insight into the gradual species shifts that could impact the softwood wood supply under various scenarios. The Report indicates "RCP[2] 2.5 and RCP 4.5 were not expected to result in significant impacts to timber supplies over time." In the most probable scenario, RCP 4.5, any timber softwood supply decline can be mitigated by site-specific decisions around planted species.

SCENARIO	TEMPERATURE	COMMENT
RCP 2.5	<2 C	Unlikely - best case scenario
RCP 4.5	2 - 3 C	Most probable scenario
RCP 8.5	4 - 5 C	Unlikely - worst case scenario

[1]Van Lantz, McMongale, Henniger, Sharma, Withey, Ochuodho. December 2021. DRAFT MANUSCRIPT - Forest Succession, management, and the economy under a changing climate: coupling economic and forest management models to assess impacts and adaption options.

Figure 20.

We continue to monitor and engage with local researchers to build an understanding of climate-related impacts to our forests and potential future adaptation strategies.

Physical risk is not limited to forest growth and long-term wood supply. Infrastructure at manufacturing sites, forest access roads, and industrial processes that are water dependent, like papermaking, are all subject to risks associated with changing precipitation. This could mean too much precipitation causing flooding or too little precipitation, increasing risk of wildfires and impacting papermaking operations requiring significant surface water.

Shifts in temperature can also impact our wood supply, leading to increased strength and frequency of winds, including Atlantic hurricanes. It also impacts shifts in seasons such as shorter and/or warmer winters, potentially impacting logging operations in the region that require careful scheduling (e.g., poorly drained areas are suitable for operation in frozen conditions only, roads built from clays or silty soils are only accessible during dry summers or frozen conditions).

While these risks will likely present themselves over the medium- to long-term, they have the potential to disrupt operations and increase costs.

Table 4-1 on page 100 outlines current physical risks identified by our approach and our strategy to mitigate them.

[2]Representative Concentration Pathway (RPC) is the IPCC greenhouse gas concentration level that describes alternative climate warming scenarios. 2.5, 4.5, and 8.5 are estimates of the watts per square metre of warming, which relate to an increased Celsius temperature.

Lee Cove from Irving Pulp & Paper, Saint John, NB

Doing it right: Lee Cove Flood Mitigation

Climate change will impact infrastructure because of rising sea levels and/or an increase in river flooding events. In both 2018 and 2019, the Saint John River experienced significant flooding that intruded into the IPP mill operation. To address this, IPP has proceeded with the Lee Cove Flood Mitigation project, a raised rock berm to protect the IPP operation from future flooding by the neighbouring Saint John River and Bay of Fundy. Started in 2020, this project will be fully complete in the spring of 2022.

CLIMATE CHANGE AND ADAPTATION

TABLE 4-1. Physical Risks of Climate Change and Mitigation Strategies in the Forest Supply Chain

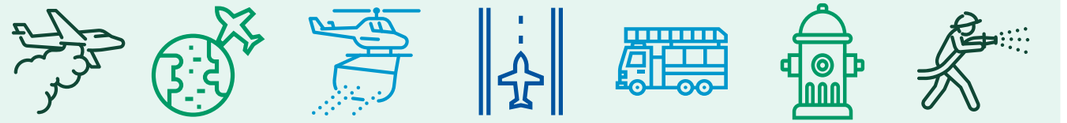
PHYSICAL RISKS	RISK DESCRIPTION	STRATEGIES TO MITIGATE RISKS
Risk: Changes in precipitation and sea levels **Impact:** • Production disruption • Increased capital cost **Timeframe:** Medium to long-term	• Increase in flooding along rivers impacts sawmills and pulp and tissue mills that were traditionally located near rivers. • Sea level rise could impact pulp mills (Irving Pulp & Paper) near the Bay of Fundy. • Increase in intensity and frequency of rainfall events could impact stream crossings, cross drain culverts and drainage ditches on forest access roads. • Increased droughts will impact the surface water supply for pulp, paper, and tissue manufacturing operations, which are heavily reliant on an available supply of surface water.	• Assessment and upgrading of infrastructure to prevent flooding at manufacturing facilities. IPP started the Lee Cove Flood Mitigation project in 2020 to be completed in 2022. • Using technology to complete an inventory of stream crossings, culverts, and ditches to assess functionality and replacement schedule. • Since 2016, new and replacement stream crossings are designed with 1.2 times the 100-year flood prediction. • Irving Pulp & Paper will begin construction on a new environmental treatment plant in 2022 that is estimated to reduce freshwater consumption by 50 per cent. • Irving Pulp & Paper conducted a full water use assessment and conservation plan that will reduce water consumption and water use intensity with each planned upgrade.
Risk: Gradual changes to forest growth and species distribution **Impact:** Reduced wood supply – volume or by species/product **Timeframe:** Long-term	• Potential to impact the distribution of tree species in the Acadian Forest at the landscape scale; in particular, the boreal conifer species like balsam fir and black spruce that are important to lumber and pulp and paper production. • Potential drought periods will impact tree growth and species distribution on specific sites with higher water stress (excessively well-drained sites or shallow soils).	• Active monitoring and detection program for changes in growth and yield, or species shifts. • Following the guidance of locally driven research on expected tree species distribution under a range of climate scenarios. • Maintenance of multiple age classes and species combinations across the landscape, with 75 per cent natural regeneration. • Tree improvement program allowing for the selection of resilient parents and individuals. • Shortened planted area rotations (40 years) to reduce the risk of longer-term changes to tree growth and yield. • Active research on drought resiliency by adapting densities and water use. • Species and site matching with intensive silviculture practices • Adaptable 80-year management planning process reforecast every 5 years. • Shifting to deeper rooted species to increase drought tolerance and wind resistance.
Risk: Increase in catastrophic events – wildfire, forest pests and windthrow **Impact:** Reduced wood supply **Timeframe:** Medium to Long-Term	• An increase in frequency or severity of wildfires will impact short and long-term wood supply across all landowners (freehold, Crown and private). Planted conifers on freehold and Crown are highly susceptible to wildfire. • Interface wildfires could impact infrastructure and homes in rural communities that support operations, sawmills, wood yards, and remote logging camps. • Changing temperature impacting the climate's suitability to new forest pests (insects or disease) or increased stress on trees raises susceptibility to existing forest pests. • Increased strength and frequency of winds increases the risk of landscape-scale catastrophic blowdown events where significant patches of forest could be blown over in single events and/or risk of single tree blowdown events over the course of multiple high-wind events.	Investments in infrastructure, tools, and training to ensure safe and aggressive wildfire response: • Airstrip upgrades completed in 2021. • Plan to upgrade Woodlands' fire trucks started in 2021. • Plan to purchase new and larger single engine air tankers. • New monitoring aircraft purchased in 2021 • 2020 MOU with New Brunswick Department of Natural Resources on fire response and enhancing JDI training to national standards. • Investments in mechanized firefighting to reduce reliance on human resources initiated in 2020. • Forest fuel mapping. • Maintaining awareness of new forest pests. • Species and site matching with intensive silviculture practices. • Participation in the Natural Resources Canada-led Spruce Budworm Early Intervention Strategy Program, with the potential to apply lessons learned to new forest pests. • Annual monitoring and detection of stressed trees and mortality, windthrow and blowdown. • Immediate salvage harvesting of catastrophic losses with an adaptable management plan. • 80-year management planning process re-forecasted every 5 years.
Risk: Seasonal weather pattern shifts **Impact:** Increased Operating costs or decreased working capital (inventory) **Timeframe:** Long-term	• Shifting and variable seasonal weather patterns in the fall and winter could require higher inventory levels (decreased working capital and increased costs through wood yards). • Road construction standards may need to be adapted to provide more all-weather access, which increases cost.	• Active monitoring and detection for medium-term shifts in seasonal patterns. • Forest road maintenance investments to manage water and poor surfacing materials. • Technology and best practices to increase the durability of forest roads (geotextiles, surfacing materials, construction techniques). • Adapting harvesting techniques or technology for poorly drained sites to reduce negative environmental impacts (e.g., rutting).

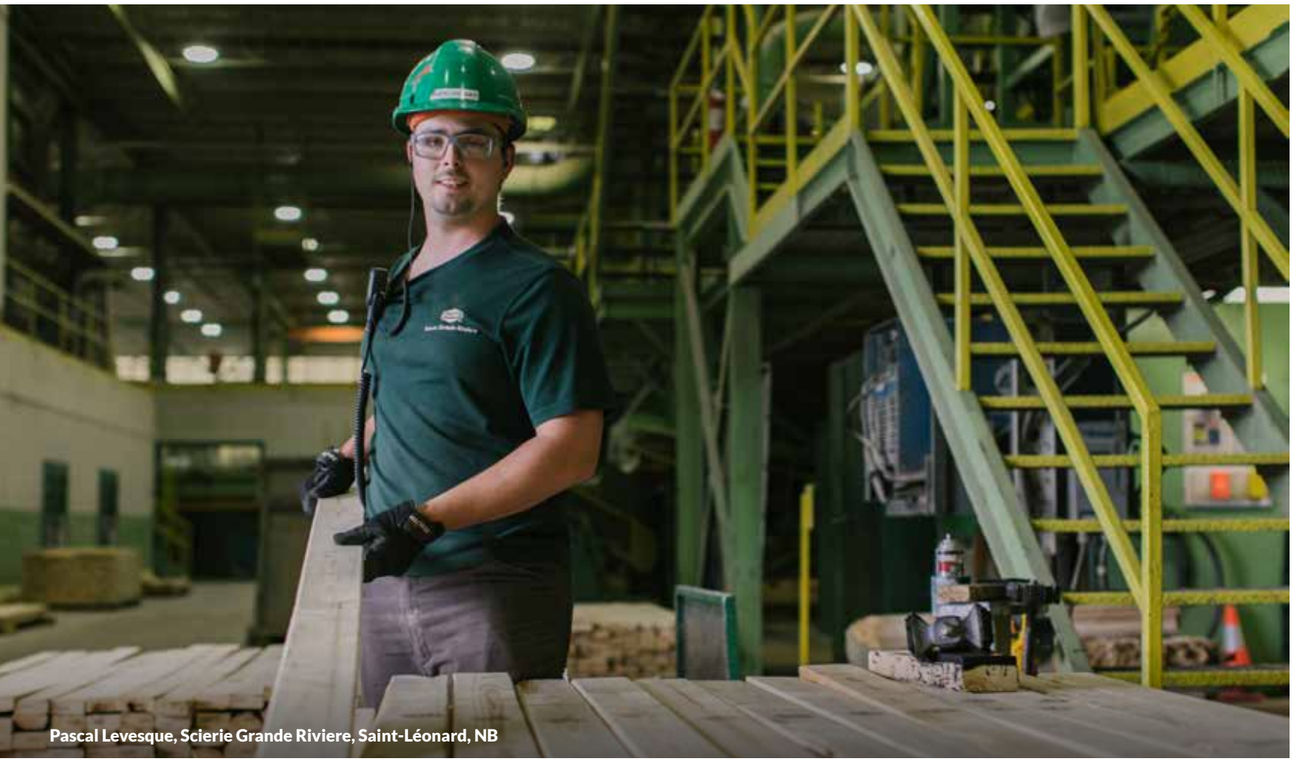
Joint Training Day. Forest Patrol Ltd. (JDI) and Forest Protection Limited (NB), Juniper NB

CLIMATE CHANGE AND ADAPTATION

PROTECTING OUR FORESTS

Managing and growing healthy and productive forests takes time and significant investment. Natural threats such as fire and insects jeopardize the hard work our forest managers have invested into our forests. Therefore, we invest annually to ensure our staff are trained to fight fire and identify forest pests in the field. We also maintain our own forest firefighting equipment so we can quickly mitigate the impacts of forest fires across our managed lands. We own an extensive fleet of our own aircraft, airstrips, and fire trucks, because a fast and aggressive response to forest fires keeps our forests protected and carbon stored in trees.





Pascal Levesque, Scierie Grande Riviere, Saint-Léonard, NB

CLIMATE CHANGE AND ADAPTATION

OPPORTUNITIES

A changing climate, government policies, and changes in consumer behaviours associated with a concern for the environment could also result in opportunities for the Supply Chain. Beginning with a healthy diverse forest and as part of a well-capitalized, modern manufacturing base, our Supply Chain can respond to increased tree growth and the increasing demand for renewable forest products and energy.

TABLE 4-2. Opportunities from Climate Change in the Forest Supply Chain

OPPORTUNITIES	DESCRIPTION OF OPPORTUNITY	STRATEGY TO EXECUTE
Increased demand for renewable building products	The demand for renewable and low carbon building products to replace concrete and steel will benefit lumber producers. This includes traditional lumber products in addition to mass timber, engineered wood products and panels for construction.	• Focus on silviculture practices that increase sawlog production, such as species site matching, aggressive early competition control techniques and commercial thinning. • Increase investments in sawmill technology focused on improving recovery. • Match future sawmill growth to the growing wood supply. • Investigate innovative building products.
Increased demand for renewable packaging products	Demand for alternatives to single-use plastics will continue to grow. There is the opportunity to produce more renewable alternatives or to wrap finished consumer goods with paper.	• Increase Kraft pulp production. Kraft pulp can be used in various applications, including producing renewable packaging. • Reduce plastic waste in consumer goods packaging by switching to paper packaging. • Increase the quality of corrugating medium products.
Increased demand for renewable energy	The growing wood supply and growing forest products manufacturing opportunities increases the amount of residual biomass that could be converted for energy (e.g., more bark, lignin, sawdust, shavings, unused forest residues).	• Opportunities to produce more green electricity from waste steam at Irving Pulp & Paper. • Opportunities to utilize excess hot water from Irving Pulp & Paper. • Increase wood pellet production from sawmill residues. • Investigate opportunities for wind power on Freehold lands. • Opportunity to use surplus bark (hog fuel) for new green energy production.
Increased CO2 levels will increase tree growth	Trees and plants require CO2 to grow, and higher atmospheric concentrations may increase tree growth. Using a long-term history of tree improvement, drought and pest resilient trees can be identified and planted.	• Use the long-term tree improvement program to select trees for traits associated with warmer climates to increase growth. • Creating a long-term management plan that ensures growth exceeds harvest. • Continuing to manage a balance of age class structure, with healthy, fast growing, younger trees making up 40 per cent of the landscape.

REPORTING STANDARD

- ✓ SASB RR-PP-110A.1
- ✓ SASB RR-PP-110A.2
- ✓ GRI 305-1, 305-2, 305-3, 305-4
- ✓ TCFD - Metrics and Targets
- ✓ PAS2060:2014

GOVERNANCE

- Scope 1, 2, & 3 Emissions and Removals
- ESG Steering Committee

STRATEGIC SDGS

13 CLIMATE ACTION

DATA TABLE REFERENCE

PAGES 120-122

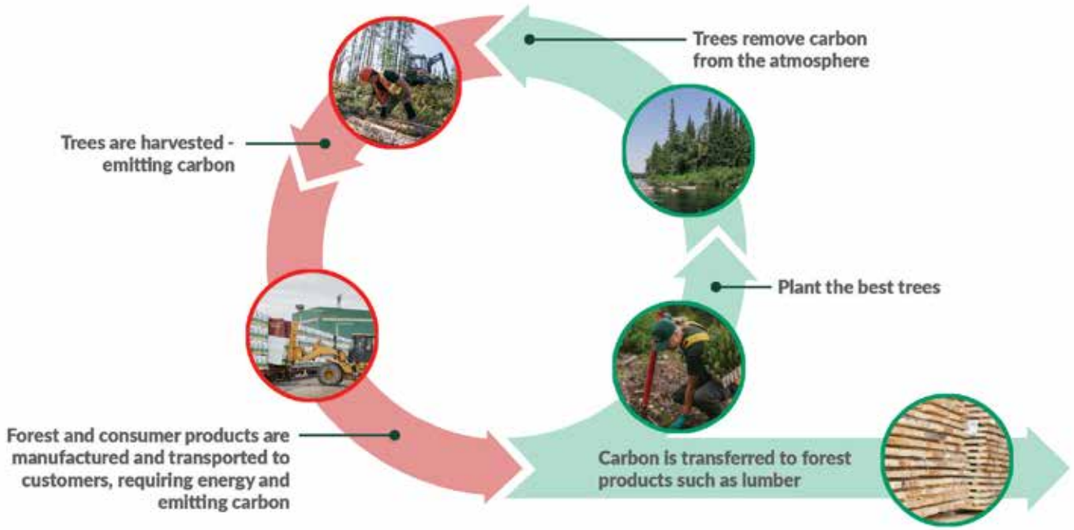
Northern New Brunswick Woodlands

GHG EMISSIONS AND ENERGY USE

Understanding and reducing our greenhouse gas footprint is a shared priority for both us and our external partners. We value being positive corporate citizens in our community.

We recognize forest products manufacturing is an energy intensive business and as such has the potential to release significant GHG emissions from manufacturing facilities and upstream and downstream transportation. Nevertheless, forests and forest products also remove significant quantities of GHG from the atmosphere and can store these emissions long-term in forest products like lumber to help balance our footprint.

In addition to the Physical Risks outlined in the previous section, the Supply Chain is subject to Transition Risks as governments take measures to reduce the impacts of climate change by regulating a reduction in GHG emissions. These efforts and policies have added and will continue to add inflationary costs to all aspects of the Supply Chain.



Irving Paper Limited, Saint John, NB

GHG EMISSIONS AND ENERGY USE

TRANSITION RISK – INFLATIONARY COSTS

The Steering Committee has identified and assessed that government policies that place a price on carbon or regulate the use of fossil fuels will increase the cost of both direct and indirect energy like electricity. These policies will also increase indirect costs associated with the upstream and downstream Supply Chain and transportation using fossil fuels. It is not possible to pass all these costs onto customers. Therefore, the Steering Committee has directed a robust accounting of the carbon footprint in the Supply Chain to enable the understanding of risk and opportunities. In addition, the Steering Committee has oversight into initiatives to decarbonize through fuel switching, fuel efficiency, and green energy generation. These initiatives are directed by the members of the Forestry Executive Leadership Teams and the Vice President of Energy.

NB ELECTRICITY GENERATION PROFILE

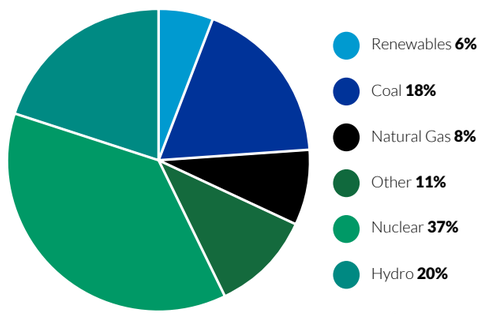


Figure 21.

TABLE 4-3. Transition Risks in the Forest Supply Chain

TRANSITION RISK	RISK DESRIPTION	STRATEGIES TO MITIGATE RISKS

Risk: Federal Carbon Tax Policy – Canada
 	
Impact: Increased Cost
 	
Timeframe: Short-Term
	• The Canadian federal price on carbon will move from $40 in 2021 to $170 per tonne in 2030, impacting large emitters under an Output Based Pricing System (IPL, IPP, LUP, ITC-TO), and all other fossil fuels via a retail fuel tax.
	• Cost increases are expected in the Supply Chain, small and medium manufacturing, and freight to customers (where there is no ability to offset emissions and no alternative energy source available (e.g., logging, transportation). These policies will have significant upward pressure on costs that cannot always be passed on to end users.
		• Robust accounting of the Forest Supply Chain carbon footprint to identify sources of GHG emissions and prioritize risks and opportunity to mitigate.
		• Fuel efficiency initiatives (short-term)
		• Reduction in equipment idling.
		• Switching to higher payload trucking configurations (tridem drive trucks).
		• Switching from energy-intensive full tree harvesting and in-woods chipping systems.
		• Increase the use of rail freight.
		• Tools, technology, and best practices to improve productivity.
		  ◦ Fuel switching (medium-term)
		• Hybrid or electrification of mill yard equipment.
		  ◦ Fuel efficiency initiatives at large industrial sites (pulp, paper, and tissue) (short-term)
		• Energy efficiency audits in tissue mills to increase productivity and increase re-use of heat and steam.
		• Fuel switching at IPL to purchase steam from nearby electrical generation facility, rather than consuming natural gas to generate steam.
		• Increase capacity at IPP to utilize more black liquor and other biomass sources.

Risk: Federal Climate Policy – electricity generation **Impact:** Increased Cost **Timeframe:** Medium-Term	• Federal climate policy mandating the closure of coal fired electricity generation creates significant uncertainty to the NB and NS electricity supply and increased cost structure. Increasing electricity costs will have significant impact on high electricity users like Irving Paper Limited.(Figure 21.) • Significant debt loads at NB Power limit the ability to transition fossil fuel generating stations, add distribution associated with renewable energy, and maintain existing hydro and nuclear facilities. Electricity costs are highly likely to rise.	• Use surplus electricity from IPP capacity improvements. • Exploration of wind power investments

GHG EMISSIONS AND ENERGY USE

ROBUST ACCOUNTING OF OUR CARBON FOOTPRINT

The first step in understanding our exposure to these transitionary risks is to understand our carbon footprint and energy use. We can then target opportunities to reduce our GHG footprint through fuel efficiency or fuel switching. We are also positioned to increase removals across our Supply Chain by increasing forest growth and the production of solid wood products which transfer CO_2 captured in trees to lumber.

Understanding and reducing our carbon footprint began with our Pulp & Paper operations in the 1990s. JDI has had internal measurement and reporting in place for Scope 1 and 2 emissions since 2008 across the Supply Chain. Emissions have been reduced by more than 8 per cent, with a focus on fuel switching to Biogenic fuels and producing electricity with waste steam.

In 2013, we participated in a study with the University of New Brunswick's Dr. Chris Hennigar to model the carbon balance from forestry activities, manufacturing facilities and forest products to end of life. The study showed that our forestry business would absorb more carbon than it emits over the next 50 years.

FOREST SUPPLY CHAIN SCOPE 1 & 2 EMISSIONS SINCE 2008[1]

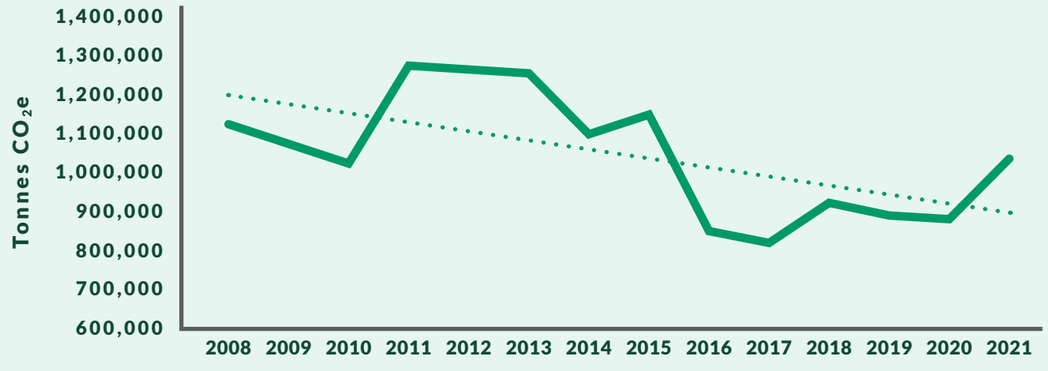


Figure 22.

[1] Emissions prior to 2020 were not independently reviewed.

Lake Utopia Paper, Saint George, NB

GHG EMISSIONS AND ENERGY USE

REPORTING TO THE PAS2060:2014 STANDARD

To report our 2021 greenhouse gas footprint, we followed the internationally recognized PAS2060:2014 standard, the Greenhouse Gas Protocol - Corporate Accounting and Reporting Standard (Revised Edition), GHG Protocol Scope 2 Guidance, The Corporate Value Chain (Scope 3) Accounting and Reporting Standard, and the Carbon Budget Model for the Canadian Forest Sector (CBM-CFS3). We produced our first Qualifying Explanatory Statement (QES) for 2020 emissions and removals for the organizational Boundary of the integrated Forest Supply Chain identified in the QES and this process was repeated to account for 2021.

The QES for the organizational Boundary was made public in 2022 with a Declaration of Achievement of Carbon Neutrality. Our QES received limited assurance from KPMG.

In 2021, the Boundary of the organization was expanded to include emissions for Irving Personal Care and Juniper Organics Limited.

The Declaration of Achievement of Carbon Neutrality (Declaration) for 2020 and 2021 encompasses activities within the financial control of JDI in three major categories in the Supply Chain:

- Direct and Indirect Emissions:
  - Scope 1 Direct GHG emissions
  - Scope 2 Indirect GHG emissions associated with purchased energy
  - Scope 3 Indirect GHG emissions from activities in the Supply Chain,
- Net Forest removal from freehold forests.
- Net transfer of carbon dioxide to Harvested Wood Products.

IN ADDITION TO THE ACCOUNTING OF GHG EMISSIONS AND REMOVALS, THE QES DESCRIBES THE FOLLOWING:

- A detailed description of the activities that make up the Supply Chain.
- Disclosure of Biogenic carbon emissions.
- Net Forest removal from Crown License 7.
- Exclusions of non-material GHG emissions and rationale.
- Analysis and discussion of inherent uncertainty associated with estimating and accounting for GHG emissions.
- Planned short-term reductions in the Carbon Footprint.

JDI is committed to maintaining Carbon Neutrality within the Boundary from the year 2021 until the end of 2023.

In 2023, JDI will repeat this process under PAS2060:2014 and disclose its 2022 Carbon Footprint in the Supply Chain in an updated QES.

TARGET – MAINTAIN CARBON NEUTRALITY IN THE FOREST SUPPLY CHAIN THROUGH 2023 PER PAS2060:2014

Planting Trees and Reducing our Carbon Footprint

We can reduce our carbon footprint by reducing emissions or increasing removals through growing forests and long-lived forest products like lumber. We believe we need to do all three actions to have the greatest impact. Tree planting is the foundation of our commitment to growing more wood than we harvest. We have recently made capital investments in our nurseries to increase our seedling output so that we can plant an additional 6 million trees each year on freehold land by 2025.

FREEHOLD TREE PLANTING LEVELS

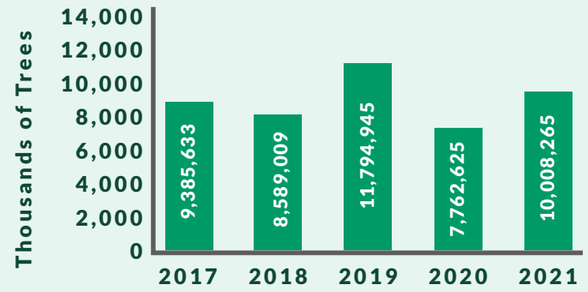


Figure 23.

TARGET – INCREASE TREE PLANTING LEVELS ON FREEHOLD LAND TO 16M TREES BY 2025

Reducing Emissions Through Fuel Efficiency

Irving Woodlands has taken steps to keep more trucks off the road, ensure safety and reduce GHG emissions by configuring twenty-six tri-drive trucks allowing each truck to haul 15 per cent more payload. This means 2,324 fewer truckloads. This will also reduce unloading times eliminating 8700 hours of wasted idling time. Adding it all up this will lead to a 15 per cent reduction in fuel consumption.

GHG EMISSIONS AND ENERGY USE

TABLE 4-4. 2020 AND 2021 GREENHOUSE GAS EMISSIONS AND REMOVALS

TYPE	DETAIL - EMISSION/REMOVAL	2020 TONNES CO_2e	2021 TONNES CO_2e	CHANGE
Scope 1	Direct Fuels	391,000	453,000	+16%
Scope 2	Indirect Electricity	510,000	586,000	+15%
Scope 3	Upstream and Downstream Supply Chain	909,000	998,000	+10%
Sub-Total: Direct and Indirect Emissions		**1,809,000**	**2,037,000**	**+13%**
Transfer	Net transfers (to) / from HWP	(588,000)	(546,000)	-7%
Removal	Net Forest Growth and Land Use – Freehold	(2,335,000)	(2,477,000)	+6%
Sub-Total: HWP Transfer plus Net Forest Growth (Removal)		**(2,923,000)**	**(3,023,000)**	**+3%**
Total: Net Forest Supply Chain Emissions/(Removal)		**(1,113,000)**	**(986,000)**	**-11%**

Figure 24.

The Forest Supply Chain expects to continue to maintain Carbon Neutrality through the following actions:

- Reducing CO_2e emissions in Supply Chain manufacturing operations under JDI financial control within the boundry (sawmills, wood pellet, horticultural products, Kraft pulp, paper, corrugating medium, Tissue, and diaper manufacturing facilities).
- Investment in Supply Chain manufacturing facilities, which increase CO_2 transferred and stored into Harvested Wood Products.
- Sustainable forest management, resulting in improved forest growth and increased CO_2 removals by the forest on JDI-owned Freehold lands in the provinces of New Brunswick, Nova Scotia, and the state of Maine.

Additional details of divisional level Scope 1, 2 and 3 emissions are in the Data Tables on page 120-122.

The full details of our carbon footprint, accounting methodology, biogenic carbon emissions, uncertainty analysis, exclusions and carbon footprint management plan can be found at www.jdirvingsustainability.com in the Qualifying Explanatory Statement for the Supply Chain.

Sciere Grande Riviere, Saint-Léonard, NB

READ OUR QES

GHG EMISSIONS AND ENERGY USE

2020 AND 2021 GREENHOUSE GAS EMISSIONS AND REMOVALS

To address changes to absolute emissions due to an expanding Boundary or business growth, greenhouse gas emissions are also reported on an intensity basis.

FOREST SUPPLY CHAIN SCOPE 1 & 2 EMISSIONS INTENSITY SINCE 2008

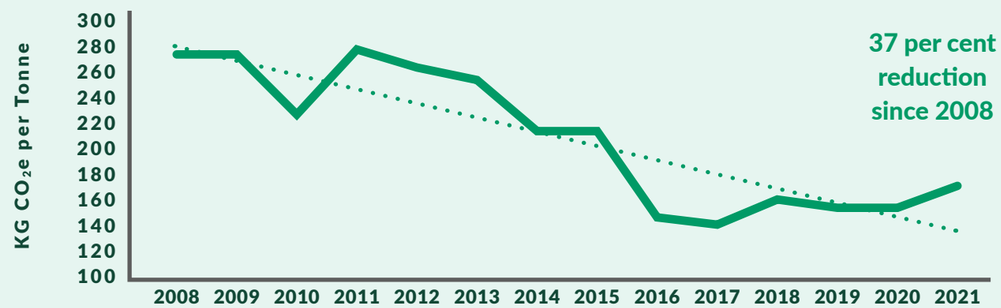


Figure 25.

APPENDIX

OUR TARGETS

TOPIC	TARGET
Ethics, Values and Integrity	Publish an ESG Report annually for the JDI Forest Supply Chain.
Sustainable Forest Management	Double the wood supply on Freehold land by 2050.
Sustainable Forest Management	Maintain a five-year average of Forest Growth at or Above Harvest.
Sustainable Forest Management	Maintain third-party certification on all managed lands.
Forest Conservation and Biodiversity	Maintain our Conservation Areas Program.
Air and Water Quality Management	50 per cent reduction in water consumption at IPP.
Air and Water Quality Management	25 per cent water reduction from Irving Tissue operations.
Air and Water Quality Management	Zero water quality non-conformances at all industrial sites.
Air and Water Quality Management	100 per cent of all new water crossings compliant.
Safety	Critical Injury Rate of zero.
GHG Emissions and Energy Use	Maintain Carbon Neutrality in the Forest Supply Chain through 2023 following PAS2060:2014.
GHG Emissions and Energy Use	Increase tree planting levels on Freehold land to 16 million by 2025.
Consumer Packaging	Reduce virgin plastic intensity by 25 per cent.
Waste Reduction and Management	Reduce manufacturing waste to landfill in Irving Tissue by 90per cent by repurposing to beneficial uses.

APPENDIX

TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURE REFERENCE TABLE

Alignment to the Disclosure required by the TCFD is incorporated throughout the Report. The table below references the Disclosure required by the TCFD and where this information is located.

Table 5-1. TCFD reference guide

TCFD CATEGORY	GUIDANCE	REPORT SECTION	PAGE
Governance	a. Describe the board's oversight of climate-related risks and opportunities.	Sustainability Governance	19
	b. Describe management's role in assessing and managing climate-related risks and opportunities.	Sustainability Governance	19-20
Strategy	a. Describe climate-related risks and opportunities the organization has identified over the short term, medium term, and long term.	Climate Change & Adaptation GHG Emissions & Energy Use	100 - 101 105 109
	b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	Climate Change & Adaptation GHG Emissions & Energy Use	100 - 101 109
	c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including at 2 °C or lower scenario.	Climate Change & Adaptation	98 - 101
Risk Management	a. Describe the organization's processes for identifying and assessing climate related risks.	Sustainability Governance	20
	b. Describe the organization's processes for managing climate related risks.	Sustainability Governance	20
	c. Describe how processes for identifying and managing climate-related risks are integrated into the organization's overall risk management.	Sustainability Governance Climate Change & Adaptation	19-20 97

Juniper Tree Nursery, Juniper, NB

TCFD CATEGORY	GUIDANCE	REPORT SECTION	PAGE
Metrics and Targets	a. Disclose the metrics used by the organization to assess climate-related risk and opportunity in line with its strategy and risk management process.	Data Tables: Environment – GHG Emissions Biogenic CO_2 Emissions GHG Emission Intensity Energy Energy Intensity Water Water Intensity Trees Planted Forest Harvest & Growth Rates	120 - 127 129-133 40
	b. Disclose Scope 1, Scope 2 and if appropriate Scope 3 greenhouse gas emissions and the related risks.	GHG Emissions & Energy Use: Table 4-4 2020 and 2021 GHG Emissions and Removals Figure 25 GHG Intensity	114 120 - 122
	c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	GHG Emissions & Energy Use: Reporting to the PAS2060:2014 Standard	112 - 113

APPENDIX

DATA TABLES

Data	Measurement	2019	2020	2021	Footnote
ENVIRONMENT					
GREENHOUSE GAS EMISSIONS					
Scope 1 Emissions, Total	**t CO_2e**	**343,691**	**390,851**	**453,067**	
by division					
Woodlands and Sawmills	t CO_2e	25,728	31,616	47,634	a
Woodlands	t CO_2e	-	6,588	9,932	a
Sawmills	t CO_2e	25,728	25,028	37,702	b, c
Pulp and paper	t CO_2e	200,896	165,710	171,776	
Irving Pulp & Paper, Limited	t CO_2e	69,934	62,747	66,769	
Irving Paper Limited	t CO_2e	95,895	82,075	84,647	
Lake Utopia Paper Limited	t CO_2e	35,067	20,888	20,360	
Irving Personal Care	t CO_2e	-	67	76	d, q
Irving Tissue	t CO_2e	117,068	192,989	233,581	e
Scope 2 Emissions (location-based), Total	**t CO_2e**	**549,222**	**509,797**	**585,656**	
by division					
Woodlands and Sawmills	t CO_2e	54,002	52,852	61,926	a
Woodlands	t CO_2e	-	453	979	a
Sawmills	t CO_2e	54,002	52,399	60,946	b, c
Pulp and paper	t CO_2e	418,471	323,093	379,049	
Irving Pulp & Paper, Limited	t CO_2e	3,046	3,799	18,088	
Irving Paper Limited	t CO_2e	377,555	287,399	322,883	
Lake Utopia Paper Limited	t CO_2e	37,870	31,895	38,078	
Irving Personal Care	t CO_2e	-	5,020	5,653	d, q
Irving Tissue	t CO_2e	76,749	128,556	139,028	e
Scope 3 Emissions, Total	**t CO_2e**	**-**	**908,572**	**998,229**	
by division					
Woodlands	t CO_2e	-	135,917	150,753	
Sawmills	t CO_2e	-	122,730	140,292	
Pulp and paper	t CO_2e	-	283,920	242,926	
Irving Pulp & Paper, Limited	t CO_2e	-	-	79,216	f
Irving Paper Limited	t CO_2e	-	-	127,917	f
Lake Utopia Paper Limited	t CO_2e	-	-	35,318	f
Irving Personal Care	t CO_2e	-	89,714	101,029	d, q
Irving Tissue	t CO_2e	-	276,291	363,228	g
Scope 1, 2 and 3 Emissions, Total	**t CO_2e**	**-**	**1,809,220**	**2,036,952**	
by division					
Woodlands and Sawmills	t CO_2e	-	343,115	400,605	
Woodlands	t CO_2e	-	142,958	161,664	
Sawmills	t CO_2e	-	200,157	238,941	
Pulp and paper	t CO_2e	-	772,723	793,752	
Irving Pulp & Paper, Limited	t CO_2e	-	-	164,073	
Irving Paper Limited	t CO_2e	-	-	535,447	
Lake Utopia Paper Limited	t CO_2e	-	-	93,756	
Irving Personal Care	t CO_2e	-	94,801	106,758	
Irving Tissue	t CO_2e	-	597,836	735,837	
Scope 1 and 2 Emissions, Total	**t CO_2e**	**892,913**	**900,648**	**1,038,723**	
by division					
Woodlands and Sawmills	t CO_2e	79,730	84,468	109,560	a
Woodlands	t CO_2e	-	7,041	10,911	a
Sawmills	t CO_2e	79,730	77,427	98,649	b, c
Pulp and paper	t CO_2e	619,367	488,803	550,825	
Irving Pulp & Paper, Limited	t CO_2e	72,980	66,546	84,857	
Irving Paper Limited	t CO_2e	473,450	369,474	407,530	
Lake Utopia Paper Limited	t CO_2e	72,937	52,783	58,438	
Irving Personal Care	t CO_2e	-	5,087	5,729	d, q
Irving Tissue	t CO_2e	193,817	321,545	372,609	e
(REMOVAL)/EMISSION FROM HARVESTED WOOD PRODUCTS					
(Removal)/Emission from Lumber	t CO_2e	-	(441,977)	(428,170)	
(Removal)/Emission from Paper	t CO_2e	-	224	(15,751)	
(Removal)/Emission from Pulp	t CO_2e	-	23,510	(12,846)	
(Removal)/Emission from Tissue	t CO_2e	-	(154,464)	(105,020)	
(Removal)/Emission from Corrugating Medium	t CO_2e	-	(14,827)	15,436	
FOREST CARBON EMISSIONS AND (REMOVAL)					
(Removal)/Emission from Freehold	t CO_2e	-	(2,335,282)	(2,476,710)	
(Removal)/Emission from Crown License 7	t CO_2e	-	(2,448,668)	(1,556,092)	
NET CARBON FOOTPRINT					
Net Carbon Footprint	t CO_2e	-	(1,113,596)	(986,109)	h
BIOGENIC CO_2 EMISSIONS					
Biogenic CO_2 Emissions, Total		**1,052,585**	**1,551,518**	**1,340,180**	
by division	t CO_2	-	-	-	
Woodlands	t CO_2	-	-	-	
Sawmills	t CO_2	-	436,937	237,911	
Pulp and paper	t CO_2	1,052,585	1,114,581	1,102,269	
Irving Pulp & Paper, Limited	t CO_2	974,291	1,035,198	1,018,256	
Irving Paper Limited	t CO_2	-	-	-	
Lake Utopia Paper Limited	t CO_2	78,294	79,383	84,013	
Irving Personal Care	t CO_2	-	-	-	
Irving Tissue	t CO_2	-	-	-	

Data	Measurement	2019	2020	2021	Footnote
GREENHOUSE GAS EMISSIONS INTENSITY					
Scope 1 emissions intensity, Total	**kg CO_2e / t product**	**37.0**	**42.9**	**35.9**	
by divison					
Woodlands and Sawmills	kg CO_2e / t product	2.3	2.9	4.2	
Woodlands	kg CO_2e / t product	-	1.0	1.5	
Sawmills	kg CO_2e / t product	5.6	5.6	7.9	
Pulp and paper	kg CO_2e / t product	217.8	181.1	191.4	
Irving Personal Care	kg CO_2e / t product	-	3.0	3.0	
Irving Tissue	kg CO_2e / t product	463.9	566.1	715.8	
Scope 2 emissions intensity, Total	**kg CO_2e / t product**	**59.1**	**55.9**	**46.4**	
by division					
Woodlands and Sawmills	kg CO_2e / t product	11.8	4.9	5.4	
Woodlands	kg CO_2e / t product	-	0.1	0.1	
Sawmills	kg CO_2e / t product	11.8	11.7	12.7	
Pulp and paper	kg CO_2e / t product	453.8	353.2	422.4	
Irving Personal Care	kg CO_2e / t product	-	223.5	223.5	
Irving Tissue	kg CO_2e / t product	304.1	377.1	426.0	
Scope 3 emissions intensity, Total	**kg CO_2e / t product**	**-**	**99.7**	**79.1**	
by division					
Woodlands and Sawmills	kg CO_2e / t product	-	23.9	25.6	
Woodlands	kg CO_2e / t product	-	-	23.0	
Sawmills	kg CO_2e / t product	-	27.5	29.2	
Pulp and paper	kg CO_2e / t product	-	310.4	270.7	
Irving Personal Care	kg CO_2e / t product	-	3,993.7	3,993.5	
Irving Tissue	kg CO_2e / t product	-	810.5	1,113.1	
Scope 1 and 2 Emissions intensity, Total	**kg CO_2e / t product**	**96.0**	**98.8**	**82.4**	
by division					
Woodlands and Sawmills	kg CO_2e / t product	17.4	7.9	9.6	
Woodlands	kg CO_2e / t product	-	1.1	1.7	
Sawmills	kg CO_2e / t product	17.4	17.4	20.6	
Pulp and paper	kg CO_2e / t product	671.6	534.3	613.8	
Irving Personal Care	kg CO_2e / t product	-	226.5	226.5	
Irving Tissue	kg CO_2e / t product	768.0	943.2	1,141.8	
Scope 1, 2 and 3 Emissions intensity, Total	**kg CO_2e / t product**	**-**	**198.5**	**161.5**	
by division					
Woodlands and Sawmills	kg CO_2e / t product	-	27.1	35.3	
Woodlands	kg CO_2e / t product	-	22.5	24.6	
Sawmills	kg CO_2e / t product	-	44.9	49.8	
Pulp and paper	kg CO_2e / t product	-	844.7	884.5	
Irving Personal Care	kg CO_2e / t product	-	4,220.1	4,220.0	
Irving Tissue	kg CO_2e / t product	-	1,753.7	2,254.9	

Data	Measurement	2019	2020	2021	Footnote
OTHER AIR EMISSIONS					
Nitrous oxide (NOx), Total	**Tonnes**	**1719**	**1724**	**1774**	
by division					
Woodlands	Tonnes	-	-	0	
Sawmills	Tonnes	287	255	300	
Pulp and paper	Tonnes	1339	1372	1292	
Irving Pulp & Paper, Limited	Tonnes	982	1034	963	
Irving Paper Limited	Tonnes	179	181	180	
Lake Utopia Paper Limited	Tonnes	178	158	149	
Irving Personal Care	Tonnes	-	-	0	
Irving Tissue	Tonnes	95	145	182	
Sulphur dioxide (SOx), Total	**Tonnes**	**1344**	**1130**	**1259**	
by division					
Woodlands	Tonnes	-	-	0	
Sawmills	Tonnes	114	75	247	
Pulp and paper	Tonnes	1229	1054	1011	
Irving Pulp & Paper, Limited	Tonnes	776	575	465	
Irving Paper Limited	Tonnes	12	7	23	
Lake Utopia Paper Limited	Tonnes	441	472	523	
Irving Personal Care	Tonnes	-	-	0	
Irving Tissue	Tonnes	1	1	1	
Particulate matter (PM), Total	**Tonnes**	**2009**	**1953**	**2145**	
by division					
Woodlands	Tonnes	-	-	0	
Sawmills	Tonnes	1856	1795	1923	
Pulp and paper	Tonnes	152	156	209	
Irving Pulp & Paper, Limited	Tonnes	127	131	184	
Irving Paper Limited	Tonnes	6	5	6	
Lake Utopia Paper Limited	Tonnes	19	21	20	
Irving Personal Care	Tonnes	-	-	0	
Irving Tissue	Tonnes	0.9	1.1	13	
Volitile Organic Compounds (VOCs), Total	**Tonnes**	**826**	**796**	**1033**	**i**
by division					
Woodlands	Tonnes	-	-	0	
Sawmills	Tonnes	530	496	546	
Pulp and paper	Tonnes	296	299	310	
Irving Pulp & Paper, Limited	Tonnes	207	214	209	
Irving Paper Limited	Tonnes	46	44	45	
Lake Utopia Paper Limited	Tonnes	43	41	55	
Irving Personal Care	Tonnes	-	-	0	
Irving Tissue	Tonnes	1	1	178	

Data	Measurement	2019	2020	2021	Footnote
ENVIRONMENTAL COMPLIANCE					
Odour Complaints, Total	**#**	**9**	**19**	**22**	
by division					
Woodlands	#	-	-	0	
Sawmills	#	-	-	0	
Pulp and paper	#	9	19	22	
Irving Pulp & Paper, Limited	#	2	5	5	
Irving Paper Limited	#	0	0	0	
Lake Utopia Paper Limited	#	7	14	17	
Irving Personal Care	#	0	0	0	
Irving Tissue	#	0	0	0	
Environmental Fines/Convictions, Total	**#**	**0**	**0**	**0**	
by division					
Woodlands	#	0	0	0	
Sawmills	#	0	0	0	
Pulp and paper	#	0	0	0	
Irving Pulp & Paper, Limited	#	0	0	0	
Irving Paper Limited	#	0	0	0	
Lake Utopia Paper Limited	#	0	0	0	
Irving Personal Care	#	-	-	0	
Irving Tissue	#	0	0	0	
BOD non-compliances, Total	**#**	**0**	**0**	**0**	
by division					
Woodlands	#	-	-	0	
Sawmills	#	-	-	0	
Pulp and paper	#	0	0	0	
Irving Pulp & Paper, Limited	#	0	0	0	
Irving Paper Limited	#	0	0	0	
Lake Utopia Paper Limited	#	0	0	0	
Irving Personal Care	#	-	-	0	
Irving Tissue	#	0	0	0	
TSS non-compliances, Total	**#**	**0**	**0**	**0**	
by division					
Woodlands	#	-	-	0	
Sawmills	#	-	-	0	
Pulp and paper	#	0	0	0	
Irving Pulp & Paper, Limited	#	0	0	0	
Irving Paper Limited	#	0	0	0	
Lake Utopia Paper Limited	#	0	0	0	
Irving Personal Care	#	-	-	0	
Irving Tissue	#	0	0	0	
Trout toxicity failiures, Total	**#**	**1**	**4**	**2**	
by division					
Woodlands	#	-	-	0	
Sawmills	#	-	-	0	
Pulp and paper	#	1	4	2	j
Irving Pulp & Paper, Limited	#	1	2	0	
Irving Paper Limited	#	0	0	0	
Lake Utopia Paper Limited	#	0	2	2	
Irving Personal Care	#	-	-	0	
Irving Tissue	#	0	0	0	
Water Discharge non-compliances, Total	**#**	**1**	**4**	**2**	
by division					
Woodlands	#	-	-	0	
Sawmills	#	-	-	0	
Pulp and paper	#	1	4	2	
Irving Pulp & Paper, Limited	#	1	2	0	
Irving Paper Limited	#	0	0	0	
Lake Utopia Paper Limited	#	0	2	2	
Irving Personal Care	#	-	-	0	
Irving Tissue	#	0	0	0	
ENERGY					
Direct and indirect energy consumption, Total	**Gigajoules**	**28,167,715**	**29,672,145**	**30,300,043**	
by division					
Woodlands	Gigajoules	-	-	93,662	a
Sawmills	Gigajoules	3,874,360	3,519,995	4,035,984	
Pulp and paper	Gigajoules	19,580,592	19,260,219	19,011,666	
Irving Pulp & Paper, Limited	Gigajoules	11,621,985	11,750,122	11,508,674	
Irving Paper Limited	Gigajoules	5,958,323	5,582,466	5,638,266	
Lake Utopia Paper Limited	Gigajoules	2,000,284	1,927,631	1,864,726	
Irving Personal Care	Gigajoules	-	-	70,405	
Irving Tissue	Gigajoules	4,712,763	6,891,931	7,088,325	
Direct Energy Consumption, Total	**Gigajoules**	**21,381,159**	**22,404,948**	**23,088,480**	
by division					
Woodlands	Gigajoules	-	-	81,467	a
Sawmills	Gigajoules	3,257,645	2,910,345	3,354,040	
Pulp and paper	Gigajoules	14,938,643	14,786,960	14,322,296	
Irving Pulp & Paper, Limited	Gigajoules	11,535,880	11,697,525	11,284,131	
Irving Paper Limited	Gigajoules	1,839,867	1,603,420	1,630,380	
Lake Utopia Paper Limited	Gigajoules	1,562,896	1,486,014	1,407,785	
Irving Personal Care	Gigajoules	-	-	230	
Irving Tissue	Gigajoules	3,184,871	4,707,643	5,330,447	
Indirect Energy Consumption, Total	**Gigajoules**	**6,786,556**	**7,267,197**	**7,211,562**	
by division					
Woodlands	Gigajoules	-	-	12,195	a
Sawmills	Gigajoules	616,715	609,650	681,944	
Pulp and paper	Gigajoules	4,641,949	4,473,259	4,689,370	
Irving Pulp & Paper, Limited	Gigajoules	86,106	52,596	224,543	

Data	Measurement	2019	2020	2021	Footnote
Irving Paper Limited	Gigajoules	4,118,456	3,979,046	4,007,886	
Lake Utopia Paper Limited	Gigajoules	437,388	441,617	456,941	
Irving Personal Care	Gigajoules	-	-	70,175	
Irving Tissue	Gigajoules	1,527,892	2,184,288	1,757,878	
Electrical Energy Produced on Site, Total	**Gigajoules**	**862,846**	**884,528**	**1,192,200**	
by division					
Woodlands	Gigajoules	-	-	0	
Sawmills	Gigajoules	13,956	11,737	26,560	
Pulp and paper	Gigajoules	865,242	927,684	735,359	
Irving Pulp & Paper, Limited	Gigajoules	865,242	927,684	735,359	
Irving Paper Limited	Gigajoules	0	0	0	
Lake Utopia Paper Limited	Gigajoules	0	0	0	
Irving Personal Care	Gigajoules	0	0	0	
Irving Tissue	Gigajoules	0	7,549	430,281	
Percentage of Energy from Electric grid, Total	**%**	**23.9**	**22.4**	**23.8**	
by division					
Woodlands	%	-	-	13.0	a
Sawmills	%	15.9	17.3	16.9	
Pulp and paper	%	23.7	23.2	24.7	
Irving Pulp & Paper, Limited	%	0.7	0.4	2.0	
Irving Paper Limited	%	69.1	71.3	71.1	
Lake Utopia Paper Limited	%	21.9	22.9	24.5	
Irving Personal Care	%	-	-	99.7	d
Irving Tissue	%	32.4	31.7	24.8	
Percentage of Energy from Renewable Sources, Total	**%**	**60.4**	**57.3**	**68.34**	
by division					
Woodlands	%	-	-	3.3	a
Sawmills	%	82.2	80.6	76.9	
Pulp and paper	%	63.2	63.2	65.7	
Irving Pulp & Paper, Limited	%	90.1	91.0	89.2	
Irving Paper Limited	%	19.4	18.5	19.00	
Lake Utopia Paper Limited	%	51.4	63.4	62.0	
Irving Personal Care	%	-	-	25.7	d
Irving Tissue Saint John Mill	%	55.8	54.0	54.7	
Percentage of Energy from Own Electrical Generation, Total	**%**	**3.1**	**3.0**	**3.9**	
by division					
Woodlands	%	-	-	0.0	a
Sawmills	%	0.36	0.33	0.66	
Pulp and paper	%	4.4	4.8	3.9	
Irving Pulp & Paper, Limited	%	7.4	7.9	6.4	
Irving Paper Limited	%	0.0	0.0	0.0	
Lake Utopia Paper Limited	%	0.0	0.0	0.0	
Irving Personal Care	%	-	-	0.0	d
Irving Tissue Saint John Mill	%	0.0	0.0	0.0	

Data	Measurement	2019	2020	2021	Footnote
ENERGY INTENSITY					
Direct energy consumption intensity, Total	**Gigajoules / t product**				
by divison					
Woodlands	Gigajoules / t product	-	-	0.01	a
Sawmills	Gigajoules / t product	0.71	0.65	0.70	
Pulp and paper	Gigajoules / t product	16.20	16.16	15.96	
Irving Personal Care	Gigajoules / t product	-	-	0.01	d
Irving Tissue	Gigajoules / t product	13.17	15.63	18.09	
Indirect energy consumption intensity, Total	**Gigajoules / t product**				
by divison					
Woodlands	Gigajoules / t product	-	-	0.00	a
Sawmills	Gigajoules / t product	0.13	0.14	0.14	
Pulp and paper	Gigajoules / t product	5.03	4.89	5.23	
Irving Personal Care	Gigajoules / t product	-	-	2.77	d
Irving Tissue	Gigajoules / t product	6.32	7.25	5.97	
Direct and indirect energy consumption intensity, Total	**Gigajoules / t product**				
by divison					
Woodlands	Gigajoules / t product	-	-	0.01	a
Sawmills	Gigajoules / t product	0.85	0.79	0.84	
Pulp and paper	Gigajoules / t product	21.23	21.05	21.18	
Irving Personal Care	Gigajoules / t product	-	-	2.78	d
Irving Tissue	Gigajoules / t product	19.49	22.88	24.06	
WASTE					
Total weight of waste generated, Total	**Tonnes**	**223,438**	**245,537**	**293,508**	
by division					
Woodlands	Tonnes	-	-	0	a
Sawmills	Tonnes	113,103	120,336	108,841	
Pulp and paper	Tonnes	103,532	103,872	164,607	
Irving Pulp & Paper, Limited	Tonnes	25,272	24,449	78,307	
Irving Paper Limited	Tonnes	57,370	52,764	52,656	
Lake Utopia Paper Limited	Tonnes	20,890	26,659	32,954	
Irving Personal Care	Tonnes	-	-	841	d
Irving Tissue	Tonnes	5,420	19,765	19,219	
Total hazardous waste generated, Total	**Tonnes**	**413**	**608**	**474**	
by division					
Woodlands	Tonnes	-	-	0	a
Sawmills	Tonnes	43	35	49	
Pulp and paper	Tonnes	16	10	2	
Irving Pulp & Paper, Limited	Tonnes	16	10	1	
Irving Paper Limited	Tonnes	0	0	0	
Lake Utopia Paper Limited	Tonnes	0	0	0	

Data	Measurement	2019	2020	2021	Footnote
Irving Personal Care	Tonnes	-	-	0	d
Irving Tissue	Tonnes	355	563	421	
Total non-hazardous waste generated, Total	**Tonnes**	**221,643**	**243,365**	**293,036**	
by division					
Woodlands	Tonnes	-	-	0	a
Sawmills	Tonnes	113,060	120,301	108,792	
Pulp and paper	Tonnes	103,517	103,862	164,605	
Irving Pulp & Paper, Limited	Tonnes	25,256	24,439	78,306	
Irving Paper Limited	Tonnes	57,370	52,764	52,656	
Lake Utopia Paper Limited	Tonnes	20,890	26,659	32,954	
Irving Personal Care	Tonnes	-	-	841	d
Irving Tissue	Tonnes	5,066	19,202	18,798	
Total weight of waste sent to landfill, Total	**Tonnes**	**84,385**	**114,137**	**104,955**	
by division					
Woodlands	Tonnes	-	-	0	a
Sawmills	Tonnes	78,944	95,388	90,805	
Pulp and paper	Tonnes	3,669	3,640	4,475	
Irving Pulp & Paper, Limited	Tonnes	854	503	1,001	
Irving Paper Limited	Tonnes	578	476	279	
Lake Utopia Paper Limited	Tonnes	2,237	2,661	2,506	
Irving Personal Care	Tonnes	-	-	841	d
Irving Tissue	Tonnes	1,772	15,108	8,834	
Total weight of waste diverted from disposal, Total	**Tonnes**	**137,257**	**129,228**	**188,081**	
by division					
Woodlands	Tonnes	-	-	0	a
Sawmills	Tonnes	34,116	24,913	17,986	
Pulp and paper	Tonnes	99,847	100,222	160,130	
Irving Pulp & Paper, Limited	Tonnes	24,402	23,936	77,305	
Irving Paper Limited	Tonnes	56,792	52,288	52,377	
Lake Utopia Paper Limited	Tonnes	18,653	23,998	30,448	
Irving Personal Care	Tonnes	-	-	0.31	d
Irving Tissue	Tonnes	3,294	4,094	9,964	
Percentage of non-hazardous sent to landfill, Total	**%**	**38.07**	**46.90**	**35.82**	
by division					
Woodlands	%	-	-	0.00	a
Sawmills	%	69.82	79.29	83.47	
Pulp and paper	%	3.54	3.50	2.72	
Irving Pulp & Paper, Limited	%	3.38	2.06	1.28	
Irving Paper Limited	%	1.01	0.90	0.53	
Lake Utopia Paper Limited	%	10.71	9.98	7.60	
Irving Personal Care	%	-	-	99.96	d
Irving Tissue	%	34.97	78.68	46.99	

Data	Measurement	2019	2020	2021	Footnote
Percentage of non-hazardous waste diverted from disposal, Total	**%**	**61.93**	**53.10**	**64.18**	
by division					
Woodlands	%	-	-	0.00	a
Sawmills	%	30.18	20.71	16.53	
Pulp and paper	%	96.46	96.50	97.28	
Irving Pulp & Paper, Limited	%	96.62	97.94	98.72	
Irving Paper Limited	%	98.99	99.10	99.47	
Lake Utopia Paper Limited	%	89.29	90.02	92.40	
Irving Personal Care	%	-	-	0.04	d
Irving Tissue	%	65.03	21.32	53.01	

WASTE INTENSITY

Total waste weight intensity	**kgs / t product**				
by divison					
Woodlands and Sawmills	kgs / t product	-	-	9.6	a
Woodlands	kgs / t product	-	-	0.0	a
Sawmills	kgs / t product	24.7	27.0	22.7	
Pulp and paper	kgs / t product	112.3	113.5	183.4	
Irving Personal Care	kgs / t product	-	-	33.3	d
Irving Tissue	kgs / t product	22.4	65.6	65.2	

WATER

Water withdrawn, surface water, Total	**Thousand cubic meters (m^3)**	**60,140**	**62,203**	**64,468**	
Water consumption, Total	**Thousand cubic meters (m^3)**	**60,140**	**62,203**	**64,468**	
by division					
Woodlands	Thousand cubic meters (m^3)	-	-	0	
Sawmills	Thousand cubic meters (m^3)	-	-	0	
Pulp and paper	Thousand cubic meters (m^3)	51,545	51,486	53,523	
Irving Pulp & Paper, Limited	Thousand cubic meters (m^3)	32,548	33,470	35,005	
Irving Paper Limited	Thousand cubic meters (m^3)	12,854	12,135	12,302	
Lake Utopia Paper Limited	Thousand cubic meters (m^3)	6,143	5,880	6,217	
Irving Personal Care	Thousand cubic meters (m^3)	-	-	0	d
Irving Tissue	Thousand cubic meters (m^3)	8,595	10,718	10,944	
Water discharge, Total	**Thousand cubic meters (m^3)**	**62,756**	**64,243**	**66,920**	
by division					
Woodlands	Thousand cubic meters (m^3)	-	-	0	
Sawmills	Thousand cubic meters (m^3)	-	-	0	
Pulp and paper	Thousand cubic meters (m^3)	54,166	54,017	56,718	
Irving Pulp & Paper, Limited	Thousand cubic meters (m^3)	35,329	36,237	38,332	
Irving Paper Limited	Thousand cubic meters (m^3)	12,439	11,655	11,910	
Lake Utopia Paper Limited	Thousand cubic meters (m^3)	6,399	6,125	6,476	
Irving Personal Care	Thousand cubic meters (m^3)	-	-	0	d
Irving Tissue	Thousand cubic meters (m^3)	8,590	10,226	10,202	

Data	Measurement	2019	2020	2021	Footnote
Production using elemental chlorine-free bleached pulp, %	**%**	**100%**	**100%**	**100%**	
by division					
Woodlands	%	-	-	-	
Sawmills	%	-	-	-	
Pulp and paper	%	100%	100%	100%	
Irving Personal Care	%	-	-	-	
Irving Tissue	%	100%	100%	100%	
Water discharges BOD, Total	**Tonnes**	**3,438**	**3,373**	**3,421**	
by division					
Woodlands	Tonnes	0	0	0	
Sawmills	Tonnes	0	0	0	
Pulp and paper	Tonnes	2,997	2,777	2,848	
Irving Pulp & Paper, Limited	Tonnes	2,070	1,796	1,850	
Irving Paper Limited	Tonnes	708	670	675	
Lake Utopia Paper Limited	Tonnes	219	311	323	
Irving Personal Care	Tonnes	-	-	0	
Irving Tissue	Tonnes	440	595	572	
Water discharges COD, Total	**Tonnes**	**19,877**	**20,842**	**20,851**	
by division					
Woodlands	Tonnes	0	0	0	
Sawmills	Tonnes	0	0	0	
Pulp and paper	Tonnes	18,903	19,839	19,385	
Irving Pulp & Paper, Limited	Tonnes	9,187	8,563	8,344	
Irving Paper Limited	Tonnes	2,459	2,441	1,865	
Lake Utopia Paper Limited	Tonnes	7,257	8,835	9,176	
Irving Personal Care	Tonnes	-	-	0	
Irving Tissue	Tonnes	974	1,003	1,466	
Water discharges TSS, Total	**Tonnes**	**7,536**	**7,442**	**7,132**	
by division					
Woodlands	Tonnes	0	0	0	
Sawmills	Tonnes	0	0	0	
Pulp and paper	Tonnes	6,154	5,878	5,932	
Irving Pulp & Paper, Limited	Tonnes	2,186	2,133	2,186	
Irving Paper Limited	Tonnes	3,656	3,333	3,350	
Lake Utopia Paper Limited	Tonnes	313	412	395	
Irving Personal Care	Tonnes	-	-	0	
Irving Tissue	Tonnes	1,382	1,564	1,200	
AOX emissions, Total	**Kg**	**56,491**	**81,207**	**56,601**	
by division					
Woodlands	Kg	0	0	0	
Sawmills	Kg	0	0	0	
Pulp and paper	Kg	56,491	81,207	56,601	
Irving Pulp & Paper, Limited	Kg	56,491	81,207	56,601	
Irving Paper Limited	Kg	0	0	0	
Lake Utopia Paper Limited	Kg	0	0	0	
Irving Personal Care	Kg	-	-	0	
Irving Tissue	Kg	0	0	0	
Significant spills, Total	**#**	**0**	**0**	**0**	
by division					
Woodlands	#	-	-	0	
Sawmills	#	0	0	0	
Pulp and paper	#	0	0	0	
Irving Pulp & Paper, Limited	#	0	0	0	
Irving Paper Limited	#	0	0	0	
Lake Utopia Paper Limited	#	0	0	0	
Irving Personal Care	#	-	-	0	
Irving Tissue	#	0	0	0	

WATER INTENSITY

Water consumption intensity, Total	**Cubic meters (m^3)/t product**				
by division					
Woodlands	Cubic meters (m^3)/t product	-	-	0.0	
Sawmills	Cubic meters (m^3)/t product	-	-	0.0	
Pulp and paper	Cubic meters (m^3)/t product	55.9	56.3	59.6	
Irving Pulp & Paper, Limited	Cubic meters (m^3)/t product	95.3	96.6	103.5	
Irving Paper Limited	Cubic meters (m^3)/t product	32.2	31.8	31.6	
Lake Utopia Paper Limited	Cubic meters (m^3)/t product	33.8	31.5	36.5	
Irving Personal Care	Cubic meters (m^3)/t product	-	-	0.0	
Irving Tissue	Cubic meters (m^3)/t product	35.6	35.6	37.1	
Water discharge intensity, Total	**Cubic meters (m^3)/t product**				
by division					
Woodlands	Cubic meters (m^3)/t product	-	-	0.0	
Sawmills	Cubic meters (m^3)/t product	-	-	0.0	
Pulp and paper	Cubic meters (m^3)/t product	58.7	59.0	63.2	
Irving Pulp & Paper, Limited	Cubic meters (m^3)/t product	103.4	104.5	113.3	
Irving Paper Limited	Cubic meters (m^3)/t product	31.2	30.6	30.6	
Lake Utopia Paper Limited	Cubic meters (m^3)/t product	35.2	32.8	38.0	
Irving Personal Care	Cubic meters (m^3)/t product	-	-	0.0	
Irving Tissue	Cubic meters (m^3)/t product	35.5	33.9	34.6	
Water discharges BOD intensity, Total	**kg/t product**				
by division					
Woodlands	kg/t product	0.0	0.0	0.0	
Sawmills	kg/t product	0.0	0.0	0.0	
Pulp and paper	kg/t product	3.3	3.0	3.2	
Irving Pulp & Paper, Limited	kg/t product	6.1	5.2	5.5	
Irving Paper Limited	kg/t product	1.8	1.8	1.7	
Lake Utopia Paper Limited	kg/t product	1.2	1.7	1.9	
Irving Personal Care	kg/t product	-	-	0.0	
Irving Tissue	kg/t product	1.8	2.0	1.9	

Data	Measurement	2019	2020	2021	Footnote
Water discharges COD intensity, Total	**kg/t product**				
by division					
Woodlands	kg/t product	0.0	0.0	0.0	
Sawmills	kg/t product	0.0	0.0	0.0	
Pulp and paper	kg/t product	20.5	21.7	21.6	
Irving Pulp & Paper, Limited	kg/t product	26.9	24.7	24.7	
Irving Paper Limited	kg/t product	6.2	6.4	4.8	
Lake Utopia Paper Limited	kg/t product	39.9	47.3	53.9	
Irving Personal Care	kg/t product	-	-	0.0	
Irving Tissue	kg/t product	4.0	3.3	5.0	
Water discharges TSS intensity, Total	**kg/t product**				
by division					
Woodlands	kg/t product	0.0	0.0	0.0	
Sawmills	kg/t product	0.0	0.0	0.0	
Pulp and paper	kg/t product	6.7	6.4	6.6	
Irving Pulp & Paper, Limited	kg/t product	6.4	6.2	6.5	
Irving Paper Limited	kg/t product	9.2	8.7	8.6	
Lake Utopia Paper Limited	kg/t product	1.7	2.2	2.3	
Irving Personal Care	kg/t product	-	-	0.0	
Irving Tissue	kg/t product	5.7	5.2	4.1	
AOX emissions intensity, Total	**g/t product**				
by division					
Woodlands	g/t product	0.0	0.0	0.0	
Sawmills	g/t product	0.0	0.0	0.0	
Pulp and paper	g/t product	61.3	88.8	63.1	
Irving Pulp & Paper, Limited	g/t product	165.4	234.3	167.4	
Irving Paper Limited	g/t product	0.0	0.0	0.0	
Lake Utopia Paper Limited	g/t product	0.0	0.0	0.0	
Irving Personal Care	g/t product	-	-	0.0	
Irving Tissue	g/t product	0.0	0.0	0.0	

MATERIAL

Volume of input materials, Total	**tonnes**	**6,308,467**	**6,323,488**	**6,522,151**	
by division					
Woodlands	tonnes	-	-	0	
Sawmills	tonnes	4,628,659	4,551,880	4,732,064	
Pulp and paper	tonnes	1,423,707	1,443,464	1,394,676	
Irving Pulp & Paper, Limited	tonnes	754,408	783,528	758,480	
Irving Paper Limited	tonnes	453,148	436,759	437,182	
Lake Utopia Paper Limited	tonnes	216,151	223,176	199,014	
Irving Personal Care	tonnes	-	25,298	0	d
Irving Tissue	tonnes	335,743	418,366	395,411	
Volume of input materials intensity, Total	**tonnes materials/tonne product**	**1.009**	**1.016**	**0.517**	
by division					
Woodlands	tonnes materials/tonne product	-	-	0.000	
Sawmills	tonnes materials/tonne product	1.012	1.020	0.986	
Pulp and paper	tonnes materials/tonne product	1.544	1.578	1.554	
Irving Pulp & Paper, Limited	tonnes materials/tonne product	2.208	2.261	2.243	
Irving Paper Limited	tonnes materials/tonne product	1.137	1.146	1.124	
Lake Utopia Paper Limited	tonnes materials/tonne product	1.189	1.194	1.169	
Irving Personal Care	tonnes materials/tonne product	-	-	0.000	d
Irving Tissue	tonnes materials/tonne product	1.330	1.227	1.212	
Volume of recycled input materials, Total	**tonnes**	**55,971**	**55,567**	**49,648**	
by division					
Woodlands	tonnes	-	-	-	
Sawmills	tonnes	-	-	-	
Pulp and paper	tonnes	55,971	55,567	49,648	
Irving Pulp & Paper, Limited	tonnes	-	-	-	
Irving Paper Limited	tonnes	-	-	-	
Lake Utopia Paper Limited	tonnes	55,971	55,567	49,648	
Irving Personal Care	tonnes	-	-	-	
Irving Tissue	tonnes	-	-	-	
Product with at least 25% post-consumer recycled content, Total	**%**				
by division					
Woodlands	%	-	-	-	
Sawmills	%	-	-	-	
Pulp and paper	%	-	-	-	
Irving Pulp & Paper, Limited	%	-	-	-	
Irving Paper Limited	%	-	-	-	
Lake Utopia Paper Limited	%	73.36	69.00	67.50	
Irving Personal Care	%	-	-	-	
Irving Tissue	%	-	-	-	
Wood fiber sourced and harvested					
Total wood fiber harvested and procured	**Tonnes**	**6,605,190**	**6,367,009**	**6,566,093**	
Trees planted	**# of Seedlings**	**18,804,112**	**12,693,827**	**15,368,438**	
Recycled input materials/fibre procured	**tonnes**	**63,739**	**57,436**	**49,648**	

LAND CERTIFICATIONS

Percentage of resource holdings SFI certified	**%**	**100**	**100**	**100**
Percentage of resource holdings ISO14001 certified	**%**	**100**	**100**	**100**
Percentage of resource holdings FSC certified	**%**	**20**	**20**	**20**

BIODIVERSITY CONSERVATION

Land under Irving Management	**Hectares**	**2,387,018**	**2,389,974**	**2,377,048**
Area of freehold land, Total	**Hectares**	**1,324,539**	**1,327,503**	**1,314,577**
Area of JDI freehold land CAN	**Hectares**	**801,158**	**801,723**	**796,321**

Data	Measurement	2019	2020	2021	Footnote
Area of JDI freehold land US	**Hectares**	**523,381**	**525,780**	**518,256**	
Area of crown land, Total	**Hectares**	**1,062,479**	**1,062,471**	**1,062,471**	
Area of crown land managed, CAN	**Hectares**	**1,062,479**	**1,062,471**	**1,062,471**	
Conservation areas on JDI land	**Hectares**	**-**	**253,894**	**242,643**	**k**
Conservation areas on JDI land	**%**	**-**	**19**	**18**	
Conservation areas on Crown land	**Hectares**	**-**	**318,600**	**314,680**	
Conservation areas on Crown land	**%**	**-**	**30**	**30**	
Total conservation area managed	**Hectares**	**-**	**572,494**	**557,323**	
Total conservation area managed	**%**	**-**	**24**	**23**	
Total unique areas managed	**# of unique areas**	**1,627**	**1,739**	**1,894**	
Number of species at risk within operational areas	**#**	**44**	**44**	**35**	
SOCIAL					
EMPLOYMENT					
Full-time equivalent employees, Total	**FTE**	**5,146**	**4,925**	**5,547**	**l**
by division					
Woodlands	FTE	606	540	447	
Sawmills	FTE	1,626	1,522	1578	
Pulp and paper	FTE	840	820	1024	
Irving Personal Care	FTE	-	-	173	
Irving Tissue	FTE	1,480	1,473	1409	
Permanent employees by gender, Total	**#**	**3,960**	**4,057**	**4,574**	
Total number of female permanent employees, Total	#	457	475	612	
Total number of male permanent employees, Total	#	3,480	3,519	3,859	
Total number of permanent employees with an unspecified gender, Total	#	23	63	103	
Temporary employees by gender, Total	#	10	28	37	
Temporary employees, Female	#	0	3	9	
Temporary employees, Male	#	8	21	26	
Temporary employees, Gender unspecified	#	2	4	2	
by region					
Permanent employees, CAN	#	3,025	3,095	3,478	
Temporary employees, CAN	#	9	23	33	
Permanent employees , US	#	935	962	1,095	
Temporary employees, US	#	1	3	4	
Full-time employees by gender, Total	**#**	**3937**	**4034**	**4,561**	

Data	Measurement	2019	2020	2021	Footnote
Total number of female full-time employees, Total	#	446	466	610	
Total number of male full-time employees, Total	#	3,467	3,501	3,847	
Total number of full-time employees with an unspecified gender, Total	#	24	67	104	
Part-time employees by gender, Total	**#**	**34**	**51**	**50**	
Total number of female part-time employees, Total	#	11	12	11	
Total number of male part-time employees, Total	#	22	39	38	
Total number of part-time employees with an unspecified gender, Total	#	1	0	1	
Employee Engagement, Total	**%**	**82**	**83**	**80**	
by division					
Woodlands	%	85	90	88	
Sawmills	%	79	79	78	
Pulp and paper	%	76	77	78	
Irving Pulp & Paper, Limited	%	63	63	73	
Irving Paper Limited	%	80	83	83	
Lake Utopia Paper Limited	%	81	81	72	
Irving Forest Services	%	-	-	87	
Irving Personal Care	%	-	-	82	
Irving Tissue	%	75	86	79	
Total number of new employee hires	%	665	491	1124	
Total rate of new employee hires	%	13	10	24	
Total employee turnover number	%	506	457	850	
Total employee turnover rate	%	10	10	18	
OCCUPATIONAL HEALTH & SAFETY					
Number of fatalities that occurred in a location, Totals	**#**	**0**	**0**	**0**	
by division					
Woodlands	#	0	0	0	
Sawmills	#	0	0	0	
Pulp and paper	#	0	0	0	
Irving Pulp & Paper, Limited	#	0	0	0	
Irving Paper Limited	#	0	0	0	
Lake Utopia Paper Limited	#	0	0	0	
Irving Forest Services	#	0	0	0	
Irving Personal Care		-	-	0	
Irving Tissue	#	0	0	0	
Head office	#	0	0	0	
Plant Sites	#	0	0	0	

Data	Measurement	2019	2020	2021	Footnote
Number of critical injuries that occurred in a location, Totals	**#**	**6**	**9**	**7**	
by division					
Woodlands	#	0	0	1	
Sawmills	#	5	6	3	
Pulp and paper	#	1	2	1	
Irving Pulp & Paper, Limited	#	0	0	1	
Irving Paper Limited	#	1	1	0	
Lake Utopia Paper Limited	#	0	1	0	
Irving Forest Services	#	0	0	0	
Irving Personal Care	#	-	-	0	
Irving Tissue	#	0	1	2	
Head office	#	0	0	0	
Plant Sites	#	0	1	2	
Rate of critical injuries that occurred in a location, Totals	**Rate**	**0.12**	**0.19**	**0.13**	
by division					
Woodlands	Rate	0.00	0.00	0.15	
Sawmills	Rate	0.27	0.34	0.17	
Pulp and paper	Rate	0.10	0.22	0.10	
Irving Pulp & Paper, Limited	Rate	0.00	0.00	0.26	
Irving Paper Limited	Rate	0.32	0.32	0.00	
Lake Utopia Paper Limited	Rate	0.00	0.66	0.00	
Irving Forest Services	Rate	0.00	0.00	0.00	
Irving Personal Care	Rate	-	-	0.00	
Irving Tissue	Rate	0.00	0.07	0.13	
Head office	Rate	0.00	0.00	0.00	
Plant Sites	Rate	0.00	0.08	0.14	
Number of Recordable injuries that occurred in a location, Totals	**#**	**140**	**101**	**104**	
by division					
Woodlands	#	17	8	7	
Sawmills	#	87	59	63	
Pulp and paper	#	20	19	10	
Irving Pulp & Paper, Limited	#	8	3	3	
Irving Paper Limited	#	10	7	4	
Lake Utopia Paper Limited	#	2	8	3	
Irving Forest Services	#	0	1	0	
Irving Personal Care	#	-	-	3	
Irving Tissue	#	16	15	21	
Head office	#	0	0	0	
Plant Sites	#	16	15	21	
Rate of Recordable injuries that occurred in a location, Totals	**Rate**	**2.8**	**2.1**	**2.0**	
by division					
Woodlands	Rate	2.6	1.3	1.1	
Sawmills	Rate	4.7	3.3	3.5	
Pulp and paper	Rate	2.1	2.1	1.0	
Irving Pulp & Paper, Limited	Rate	2.1	0.8	0.8	
Irving Paper Limited	Rate	3.2	2.3	1.3	
Lake Utopia Paper Limited	Rate	1.3	5.3	1.9	
Irving Forest Services	Rate	0.0	1.0	0.0	
Irving Personal Care	Rate	-	-	1.6	
Irving Tissue	Rate	1.1	1.0	1.3	
Head office	Rate	0.0	0.0	0.0	
Plant Sites	Rate	1.3	1.1	1.5	
Number of Lost Time injuries that occurred in a location (students are included), Totals	**#**	**51**	**40**	**34**	
by division					
Woodlands	#	7	2	2	
Sawmills	#	35	24	19	
Pulp and paper	#	7	8	5	
Irving Pulp & Paper, Limited	#	3	2	1	
Irving Paper Limited	#	3	3	2	
Lake Utopia Paper Limited	#	1	3	2	
Irving Forest Services	#	0	0	0	
Irving Personal Care	#	-	-	0	
Irving Tissue	#	2	6	8	
Head office	#	0	0	0	
Plant Sites	#	2	6	8	
Rate of Lost Time injuries that occurred in a location (students are included), Totals	**Rate**	**1.0**	**0.8**	**0.7**	
by division					
Woodlands	Rate	1.1	0.3	0.3	
Sawmills	Rate	1.9	1.4	1.0	
Pulp and paper	Rate	0.7	0.9	0.5	
Irving Pulp & Paper, Limited	Rate	0.8	0.6	0.3	
Irving Paper Limited	Rate	1.0	1.0	0.6	
Lake Utopia Paper Limited	Rate	0.6	2.0	1.3	
Irving Forest Services	Rate	0.0	0.0	0.0	
Irving Personal Care	Rate	-	-	0.0	
Irving Tissue	Rate	0.	0.4	0.5	
Head office	Rate	0.0	0.0	0.0	
Plant Sites	Rate	0.2	0.5	0.6	
Average of % of Employees Reporting a Hazard ID in a Financial Period, Totals	**Rate**	**28.97**	**34.34**	**44.46**	
by division					
Woodlands	Rate	36.56	35.50	76.91	
Sawmills	Rate	59.16	61.00	85.13	
Pulp and paper	Rate	2.28	1.65	4.30	

Data	Measurement	2019	2020	2021	Footnote
Irving Pulp & Paper, Limited	Rate	-	-	2.49	
Irving Paper Limited	Rate	-	-	1.18	
Lake Utopia Paper Limited	Rate	-	-	17.03	
Irving Forest Services	Rate	-	-	2.76	
Irving Personal Care	Rate	-	-	16.71	
Irving Tissue	Rate	16.00	18.00	21.22	
Head office	Rate	-	-	0.13	
Plant Sites	Rate	-	-	25.28	

TRAINING AND EDUCATION

Number of employees participating in the Leadership Development Training	#	-	428	905	
Hours of Leadership Development Training	hours	-	3,388	4,949	
Spend on Leadership Development Training	$ CAD	-	45,825	188,293	

DIVERSITY & INCLUSION

by gender					
Percentage of women in executive positions	%	2.4	4.8	7.3	
Proportion of female employees, Total	%	13.3	13.3	13.0	
Proportion of male employees, Total	%	86.1	85.0	84.0	
Proportion of employees with an unspecified gender, Total	%	0.6	1.7	2.0	
by age group					
Proportion of employees that are less than 30 years old, Total	%	17.5	18.2	19.0	
Proportion of employees that are 30-50 years old, Total	%	48.7	49.1	32.0	
Proportion of employees that are over 50 years old, Total	%	33.8	32.7	49.0	

ECONOMIC

PRODUCTION

Production, Total	**tonnes**	**9,299,784**	**9,115,747**	**12,612,398**	
by division					
Woodlands	tonnes	6,605,190	6,367,009	6,566,093	
Woodlands harvested	tonnes	4,625,883	4,966,807	4,815,992	
Woodlands purchased	tonnes	1,979,307	2,166,381	1,750,101	
Sawmills	tonnes	4,574,169	4,462,613	4,797,260	
Sawmills, Lumber	tonnes	1,520,049	1,493,039	1,488,878	
Sawmills, Lumber	MFBM	1,160,253	1,139,636	1,068,477	
Sawmills, Residuals	tonnes	3,011,922	2,867,092	3,156,864	
Sawmills, Pellets	tonnes	42,198	102,483	130,201	m
Sawmills, Juniper Organics	tonnes	11,031	14,053	21,316	m
Pulp and paper	tonnes	922,182	914,809	897,420	
Irving Pulp & Paper, Limited	tonnes	341,621	346,611	338,210	
Irving Paper Limited	tonnes	398,705	381,266	388,974	
Lake Utopia Paper	tonnes	181,856	186,932	170,236	
Irving Personal Care	tonnes		22,464	25,298	d, q
Irving Tissue - Converted	tonnes	252,363	340,891	326,327	
Irving Tissue - Paper	tonnes	241,781	301,239	294,667	

ECONOMIC PERFORMANCE

Capital Investment, USD, Total	**$ millions USD**	**398**	**478**	**501**	
by division					
Woodlands	$ millions USD	20	16	25	
Sawmills	$ millions USD	49	49	66	
Pulp and paper	$ millions USD	67	116	149	
Irving Tissue & Irving Personal Care	$ millions USD	259	296	259	
Head Office	$ millions USD	2	1	2	
Spend on local suppliers, USD, Total	**$ millions USD**	**1,164**	**1,215**	**1,532**	
by division					
Woodlands	$ millions USD	365	325	394	
Sawmills	$ millions USD	231	216	280	
Pulp and paper	$ millions USD	271	324	422	
Irving Tissue & Irving Personal Care	$ millions USD	260	309	392	
Head Office	$ millions USD	38	41	44	

WAGES AND EMPLOYEE BENEFIT

Total spend on employee wages and benefits	$ millions CAD	1,108	1,140	1,236	n
Direct, Indirect and Induced jobs	FTE	16,273	16,479	17,814	
Employment income from Direct, Indirect and Induced jobs, including the impact of payments to Forestry contractors	$ millions USD	859	879	969	
Median total compensation for female employees, CAN	CAD/year	54,939	56,000	58,424	n
Median total compensation for male employees, CAN	CAD/year	69,604	70,674	72,997	n
Median total compensation for employees with an unspecified gender, CAN	CAD/year	62,830	69,482	71,497	
Median total compensation for female employees, US	USD/year	44,554	48,959	49,264	
Median total compensation for male employees, US	USD/year	53,355	56,805	58,793	

Data	Measurement	2019	2020	2021	Footnote
Median total compensation for employees with an unspecified gender, US	USD/year	39,356	42,916	-	
Ratio of median salary women to men, CAN	-	0.79	0.79	0.80	
Ratio of median salary women to men, US	-	0.84	0.86	0.84	
Defined contribution plan percentage of salary contributed by salary employee, Total	**%**	**5**	**5**	**5**	
by division					
Woodlands	%	5	5	5	
Sawmills	%	5	5	5	
Pulp and paper	%	5	5	5	
Irving Personal Care	%	-	-	5	
Irving Tissue	%	5	5	5	
Defined benefit plan percentage of salary contributed by employer, Total	**%**	**5**	**5**	**5**	
by division					
Woodlands	%	5	5	5	
Sawmills	%	5	5	5	
Pulp and paper	%	5	5	5	
Irving Personal Care				5	
Irving Tissue	%	5	5	5	
Median entry level wage ratio for female employees, Total, CAN	-	1.6	1.6	2.12	
Median entry level wage ratio for male employees, Total, CAN	-	1.6	1.6	2.35	
Median entry level wage ratio for employees with an unspecified gender, Total, CAN	-	1.6	2.1	1.94	
Median entry level wage ratio for female employees, Total, US	-	1.6	1.6	2.21	
Median entry level wage ratio for male employees, Total, US	-	1.7	1.7	2.36	
Median entry level wage ratio for employees with an unspecified gender, Total, US	-	2.3	2.0	-	

Data	Measurement	2019	2020	2021	Footnote
GOVERNANCE					
Number of countries	#	2	2	2	
Number of facilities, Total	**#**	**21**	**21**	**23**	
by division					
Woodlands	#	-	-	-	
Sawmills	#	13	12	12	
Pulp and paper	#	3	3	3	
Irving Personal Care	#	-	-	1	
Irving Tissue	#	4	5	5	
Corporate administration	#	2	2	2	
Percentage of total employees covered by collective bargaining agreements	%	43	43	40	
Substantiated complaints from outside parties regarding breach of customer privacy and loss of customer data	#	0	0	0	
Complaints from regulatory bodies regarding breach of customer privacy and loss of customer data	#	0	0	0	
Total number of identified leaks, thefts, or losses of customer data.	#	0	0	0	
Governance body members that received communication on the organization's anti-corruption policies and procedures, Total	**%**	**100**	**100**	**100**	
Governance body members that received communication on the organization's anti-corruption policies and procedures, CAN	%	100	100	100	
Governance body members that received communication on the organization's anti-corruption policies and procedures, US	%	100	100	100	
Total number and nature of confirmed incidents of corruption	#	0	0	0	
Number of legal actions pending or completed during the reporting period regarding anti-competitive behavior and violations of anti-trust and monopoly legislation in which the organization has been identified as a participant.	#	0	0	0	

Data	Measurement	2019	2020	2021	Footnote
OTHER					
University and college partnerships	#	-	21	21	
Community based partnerships	#	-	119	119	
Outdoor associations	#	-	13	12	
Motorized Recreation	#	-	2	3	
Stakeholder based group Partnerships	#	-	53	55	
Non Government Organizations	#	-	13	13	
Government organizations	#	-	5	5	
Fishing and Hunting Clubs	#	-	9	9	
Industry Associations	#	-	26	26	
# of Partner meetings	#	-	411	520	
New Partners	#	-	4	5	
Scholarships	CAD/year	-	-	95,250	o
Stakeholder/Social media presence	# of followers	-	67,198	16,000	p
Stakeholder/Social media engagement	# of Posts	-	2,267	576	p
Stakeholder/Social media engagement	# of Engagements	-	348,854	66,870	p
Charitable Donations	CAD/year	-	3,045,286	3,047,821	o
Events/ Initiatives Sponsored	#	85	62	283	
Employee time volunteered	hours	-	-	1,484	

APPENDIX

FOOTNOTES AND 2021 CHANGES

a. Woodlands is reporting GHG emissions independently in 2021. A portion Woodlands GHG emissions were reported under Sawmills Division in previous years. Woodlands/Sawmills emissions will be reported for year over year comparison purposes in addition to the new independent Woodlands and Sawmills disclosure.

b. Juniper Organics Limited (JOL) added in 2021, managed under Sawmills. Was not considered to be in the Forest Supply Chain in prior years.

c. Grand River Pellets (GRP) emission are included in 2021.

d. Irving Personal Care (IPC) added in 2021. Was not considered to be in the Forest Supply Chain in prior years.

e. Second tissue machine in Macon, GA commissioned in Q3 2021.

f. Scope 3 detail by mill not available in prior years.

g. Additional Scope 3 for Consumer Products Packaging added in 2021.

h. Net carbon foot print includes Freehold land removal only.

i. Volatile Organic Compound reporting was added in 2021 to align to SASB reporting requirements.

j. Both recorded non-compliances resulted from the same single incident.

k. Area reduced by land sale.

l. Full Time Equivalent (FTE) employees is calculated for using a new standard definition. Human Resources has developed standard definitions for all metrics and workflows to calculate metrics to improve consistency in future years.

m. Only production in 2021 is used to calculate intensity metrics. 2019 and 2020 for comparison only.

n. Standardized definitions and workflows have been defined to calculate payroll related metrics to improve consistency and reproduceable results in 2021.

o. Standardized definitions and workflows have been defined to calculate donations and scholarships to improve consistency and reproduceable results. Donations and Scholarships from the JDI Forest Supply Chain only.

p. All JDI reported in 2020. Only Woodlands reported in 2021.

q. Internal GHG accounting policy requires restated base year emissions if the boundary changes by more than 5%. IPC emissions restated for 2020 as per policy.

APPENDIX

INDEPENDENT PRACTITIONERS' LIMITED ASSURANCE REPORT

KPMG LLP
Telephone (604) 691-3000
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Independent Practitioners' Limited Assurance Report

To the management of J.D. Irving, Limited

We have been engaged by the management of J.D. Irving, Limited (the "Company") to undertake a limited assurance engagement, in respect of the year ended December 31, 2021, on certain quantitative performance information disclosed in the J.D. Irving, Limited Forest Supply Chain Environment, Social and Governance Report for the year ended December 31, 2021 (the "Report") as described below.

Subject Matter Information and Applicable Criteria

The scope of our limited assurance engagement, as agreed with management, comprises the following performance information (the "Subject Matter Information"):

Subject Matter Information	Reported amount and units	Page number in the Report	Basis of Presentation
Net Forest Supply Chain Removal (Greenhouse Gases)	986,000 Tonnes CO_2e	Page 114	The World Resources Institute / World Business Council for Sustainable Development Greenhouse Gas Protocol - Corporate Accounting and Reporting Standard Revised Edition; GHG Protocol Scope 2 Guidance, An amendment to the GHG Protocol Corporate Standard; The Corporate Value Chain (Scope 3) Accounting and Reporting Standard as applicable to Scope 3 emission categories 1-9; and, The Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3) for sequestered carbon.
Lands under Irving management	2,377,048 hectares	Page 39	The area of the freehold land and Crown land managed by Irving as at December 31, 2021.
Percentage of the forested landbase harvested	1.6%	Page 46	The area harvested during 2021 as a percentage of the freehold and Crown forested landbase managed by Irving as at December 31, 2021.
Conservation area	557,323 hectares	Page 60	The area of freehold land and Crown land managed by Irving which is maintained for the primary purpose of conservation as at December 31, 2021.
Percentage of conservation forest	23%	Page 60	The conservation forest area as a percentage of of the freehold land and Crown land managed by Irving as at December 31, 2021.
Rate of recordable injuries	2.0 per 200,000 hours	Page 86	The total number of employee recordable injuries during 2021 multiplied by 200,000 and divided by total hours worked.
Rate of Lost Time injuries	0.7 per 200,000 hours	Page 87	The total number of employee lost time injuries during 2021 multiplied by 200,000 and divided by total hours worked.
Rate of critical injuries	0.13 per 200,000 hours	Page 87	The total number of employee critical injuries during 2021 multiplied by 200,000 and divided by total hours worked.

The Subject Matter Information, contained within the Report on the pages noted in the table above, has been determined by management on the basis of the Company's assessment of the material issues contributing to their Environmental, Social and Governance performance and most relevant to their stakeholders.

Other than as described in the preceding paragraph, which sets out the scope of our engagement, we did not perform assurance procedures on the remaining information included in the Report, and accordingly, we do not express a conclusion on this information.

There are no mandatory requirements for the preparation, publication or assurance over the Subject Matter Information. As such, the Company applies the criteria described under Basis of Presentation above in calculating the reported amounts as well as their own internal reporting guidelines and definitions which can be found in the Report (collectively the "Applicable Criteria").

Management's responsibilities

Management is responsible for the preparation and presentation of the Subject Matter Information in accordance with the Applicable Criteria, current as at the date of our report as well as determining the appropriateness of the use of the applicable criteria.

Management is also responsible for determining the Company's objectives in respect of Environmental, Social and Governance ("ESG") performance and reporting and for establishing and maintaining appropriate performance management and internal control systems from which the reported performance information is derived.

Practitioners' Responsibilities and Professional Requirements

Our responsibility in relation to the Subject Matter Information is to perform a limited assurance engagement and to express a conclusion based on the work performed. We conducted our engagement in accordance with International Standard on Assurance Engagements ("ISAE") 3000 (Revised) *Assurance Engagements other than Audits or Reviews of Historical Financial Information* and ISAE 3410 *Assurance Engagements on Greenhouse Gas Statements*, issued by the International Auditing and Assurance Standards Board. ISAE 3000 and 3410 require that we plan and perform our procedures to obtain the stated level of assurance, in accordance with the applicable criteria.

Independence, quality control and competence

We have complied with the independence and other ethical requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

The firm applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

The engagement was conducted by a multidisciplinary team which included professionals with suitable skills and experience in both assurance and in the applicable subject matters.

Assurance approach

We planned and performed our work to obtain all the evidence, information and explanations we considered necessary in order to form our conclusion as set out below. A limited assurance engagement consists of making inquiries, primarily of persons responsible for the preparation of the Subject Matter Information and applying analytical and other evidence gathering procedures to the Subject Matter Information, as appropriate. Our procedures included:

- Inquiries with relevant staff at the corporate and site level to understand the data collection and reporting processes for the Subject Matter Information;
- Assessment of the suitability and application of the Applicable Criteria in respect of the Subject Matter Information
- Where relevant, performance of walkthroughs of data collection and reporting processes for the Subject Matter Information;
- Comparison of a sample of the reported data for the Subject Matter Information to underlying data sources;
- Inquiries of management regarding key assumptions and, where relevant, the re-performance of calculations on a sample basis;

J.D. Irving, Limited
Limited Assurance Report
August 12, 2022

- Walkthrough of data collection and reporting processes, interviews with senior management and relevant staff for a sample of facilities; and,
- Reviewing the presentation of the Subject Matter Information in the Report to determine whether it is consistent with our overall knowledge of, and experience with, the ESG performance of the Company.

The extent of evidence gathering procedures performed in a limited assurance engagement is less than that for a reasonable assurance engagement, and therefore a lower level of assurance is obtained.

We believe the evidence we obtained is sufficient and appropriate to provide a basis for our conclusion.

Inherent limitations

Non-financial information, such as that supporting the Subject Matter Information, is subject to more inherent limitations than financial information, given the nature of the subject matter and the methods used for determining such information. The absence of a significant body of established practice on which to draw allows for the selection of different but acceptable measurement techniques, which can result in materially different measurements and can impact comparability. The nature and methods used to determine such information, as well as the measurement criteria, may change over time.

Our conclusion

Based on the procedures performed, nothing has come to our attention that causes us to believe that, for the year ended December 31, 2021, the Subject Matter Information, as described above and disclosed in the J.D. Irving, Limited Forest Supply Chain Environment, Social and Governance Report for the year ended December 31, 2021, has not been prepared and presented, in all material respects, in accordance with the Applicable Criteria as at the date of our report.

KPMG LLP

Chartered Professional Accountants, Licensed Public Accountants
August 12, 2022
Vancouver, BC Canada

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