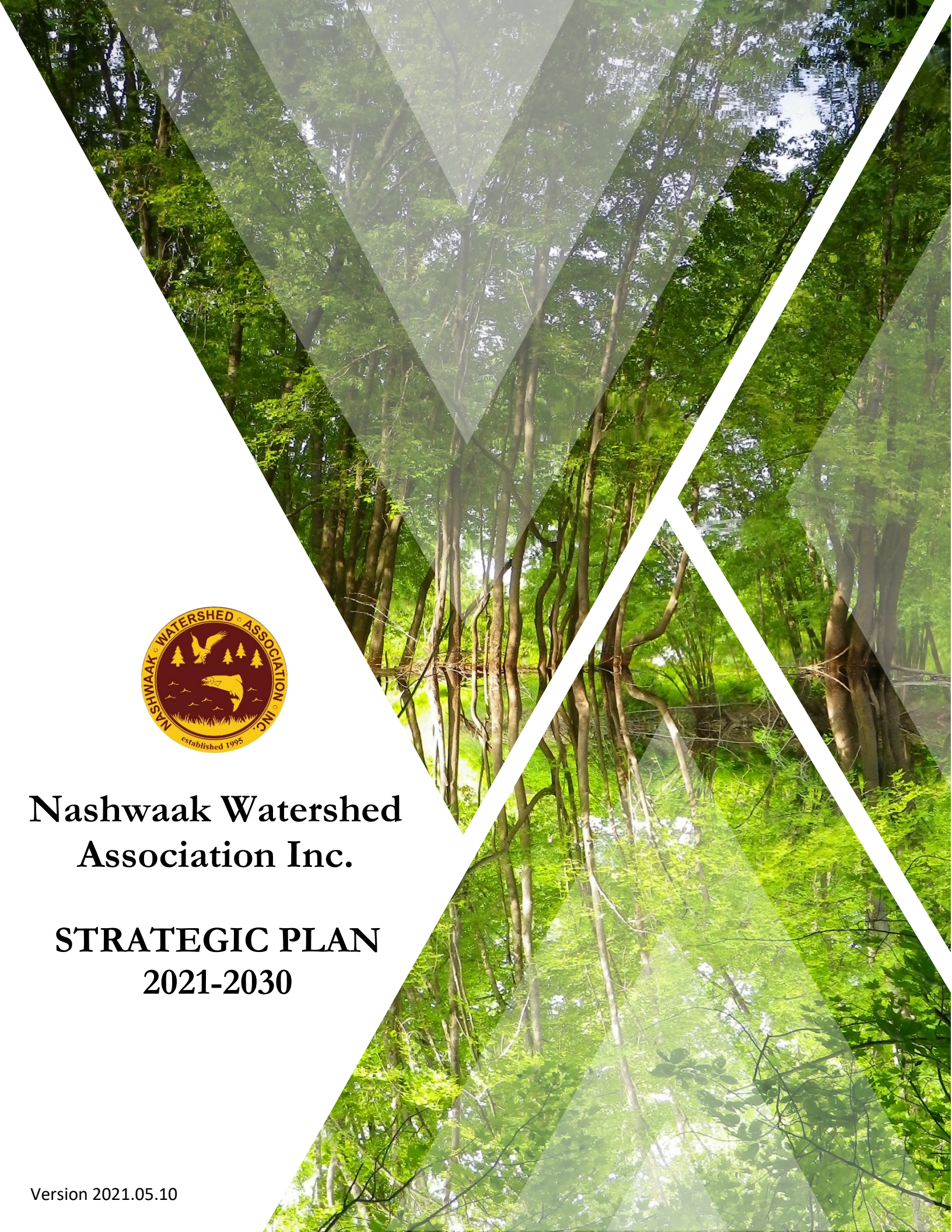

Nashwaak Watershed Association Inc.

STRATEGIC PLAN 2021-2030

Version 2021.05.10

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Strategic Plan Purpose and Approach

The Nashwaak Watershed Association Inc. (NWAI) was established in 1995 as a not-for-profit organization, whose mission is to promote, conserve, and restore the Nashwaak ecosystem by using science-based methods, community collaboration, and advocacy for the watershed and its inhabitants. This 10-year strategic plan was developed to identify priority strategies that the NWAI will undertake between 2021-2030. The strategic planning process follows the Conservation Standards (v.4.0), which is an adaptive management framework to systematically plan, implement, and monitor conservation initiatives to better learn what works, what does not work, and why to adapt and improve the practice of conservation over time.

NWAI Vision

The Nashwaak Watershed Association envisions people caring for a clean, healthy, and beautiful Nashwaak River watershed that supports and connects people and wildlife for years to come.

Strategic Planning Team

Name	Organization	Role
Marieka Chaplin	Nashwaak Watershed Association Inc.	NWAI Executive Director
Jillian Hudgins	Nashwaak Watershed Association Inc.	NWAI Project Coordinator
Natalie Deseta	Nashwaak Watershed Association Inc.	NWAI Restoration and Outreach Coordinator
Ian Lodge	Nature Trust of New Brunswick	NWAI Board Member
Peter Toner	St. Thomas University	NWAI President, Board Member
Stephanie Merrill	Global Institute for Water Security	NWAI Vice-President, Board Member
Julia Carpenter	LuminUltra Technologies Inc.	NWAI Board Member
Ian Smith	Retired Parks NB Program Manager	Education Consultant
Ian Lodge	Nature Trust of New Brunswick	NWAI Board Member
Josh Noseworthy	Global Conservation Solutions	NWAI Board Member; Process Facilitator

Potential Partner Organizations

Organization Name	Role And Primary Interest
Community Forests International	Leads programs for sustainable forest management / restoration
Ducks Unlimited Canada	Expertise in wetland design and restoration
Environment and Climate Change Canada	Partner / funder for various conservation initiatives
Government of New Brunswick	Partner / funder for various conservation initiatives
J.D. Irving Limited	Large landowner in the watershed
Maliseet Nation Conservation Council	Engaging indigenous communities in NA and conservation concerns
Nature Trust of New Brunswick	Land trust
New Brunswick Invasive Species Council	Provides coordination, outreach and tools on IAS
New Brunswick Dept. of Natural Resources	Partner / funder for various conservation initiatives
World Wildlife Fund	Leads assessments and collaboration in the St. John River watershed
Canadian Wildlife Federation	Partner on aquatic barrier removal and remediation

Scope

The Nashwaak Watershed

Biodiversity Targets

Target	Target Health[1]
Floodplain Forest	**Poor**
Riparian Zone	**Fair**
Wetlands	**Very Good**
Acadian Forest	**Fair**
Aquatic Habitat	**Good**

Very Good	Ecologically desirable status; requires little intervention for maintenance.
Good	Within acceptable range of variation; some intervention required for maintenance.
Fair	Outside acceptable range of variation; requires human intervention.
Poor	Restoration is difficult; may result in extirpation without intervention.

Floodplain Forest

Floodplain forests primarily occur in the lower watershed, providing habitat for a wide variety of wildlife, as well as important ecosystem services to local communities (e.g. flood mitigation). Conserving and restoring floodplain forest benefits several "nested targets" in the watershed, including Silver Maple, Bur Oak, Butternut, Red and Black Ash, Wood Turtle, soil fauna, birds, mammals, invertebrates, understory plants, backwater swales and vernal pools.

Riparian Zone

For the purpose of this plan, the riparian zone represents lands directly adjacent to rivers, streams and lakes throughout the watershed. Conserving and restoring the riparian zone benefits numerous "nested targets" in the watershed, including river banks, sand and gravel bars, Wood Turtle, shrub communities, Silver Maple, Bur Oak, Butternut, White, Red and Black Ash, and Kingfisher.

Wetlands

For the purpose of this strategy, wetlands refer to non-floodplain (i.e. upland) areas where the water table saturates the soil surface either permanently or periodically. Conserving and restoring wetlands benefits numerous "nested targets" in the watershed, including birds, mammals, insects, soil fauna, Wood Turtle, benthic communities, plant communities, and Black Ash.

Acadian Forest

Acadian forest refers to upland forest communities comprised of long-lived, shade-tolerant tree species, which are increasingly becoming rare across the landscape. Conserving and restoring Acadian forest benefits numerous "nested targets" in the watershed, such as old growth and the wildlife that depend on it, soil fauna, and White Ash.

Aquatic Habitat

Aquatic habitat refers to the Nashwaak river and it's tributaries. Conserving and restoring aquatic habitat benefits numerous "nested targets" in the watershed, such as native fish communities, benthic invertebrates, Wood Turtle, water, American Eel, lakes, cold-water refugia, Atlantic Salmon, and substrate features.

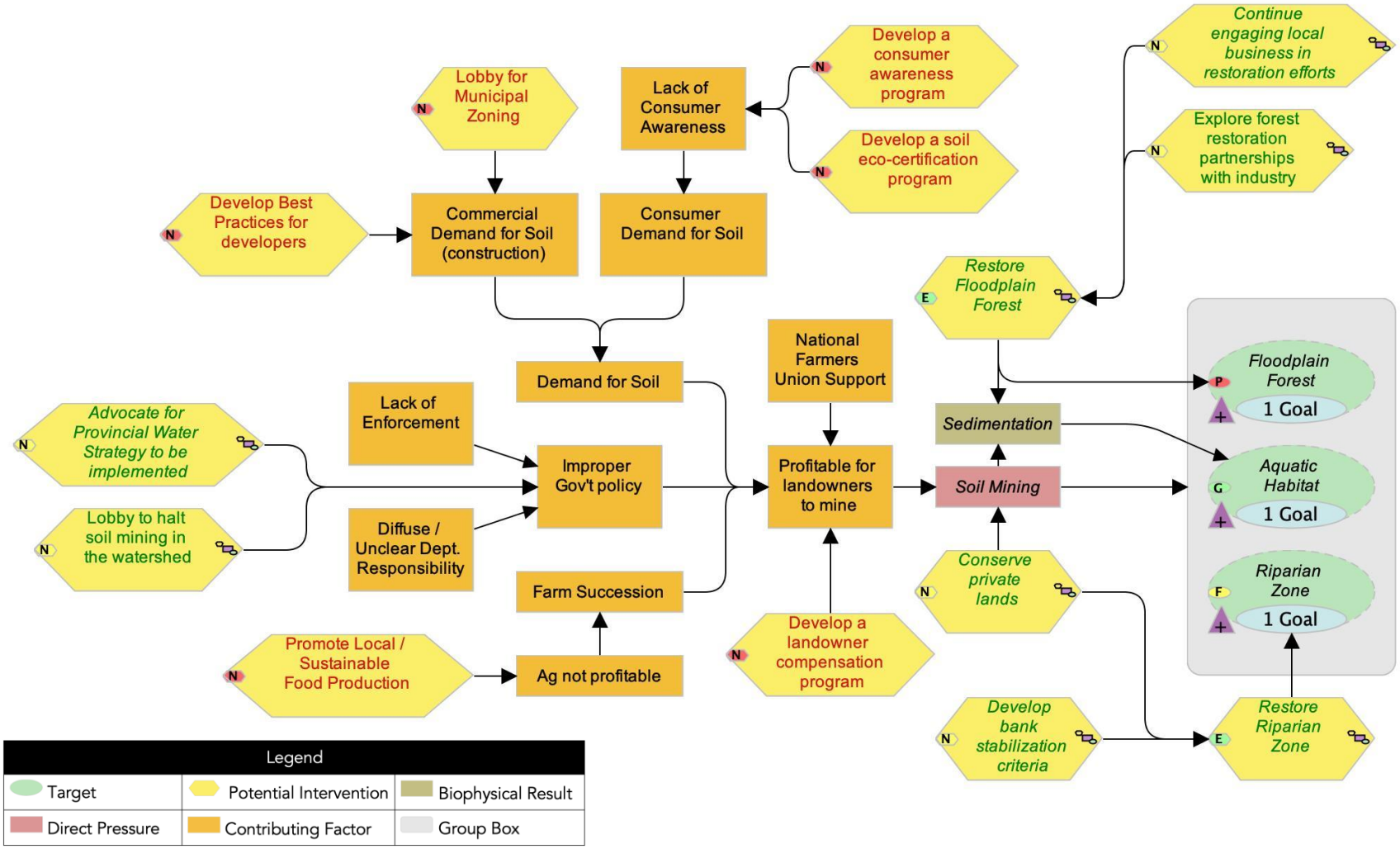
[1] See Appendix A for detailed target health assessments

Direct Threats

Threats \ Targets	Floodplain Forest	Riparian Zone	Wetlands	Acadian Forest	Aquatic Habitat	Summary Rating
Sisson Mine	Very High	Very High	Medium	Medium	Very High	**Very High**
Unsustainable Forestry		Low	Low	High	High	**High**
Invasive Species	Low	Low	Medium	Very High	High	**High**
Agriculture	High	Low			Medium	**Medium**
Urbanization	Medium	Medium	Medium	Medium	Low	**Medium**
Commercial / Industrial Development			Medium	Medium	Medium	**Medium**
Aquatic Barriers		Low	Low		High	**Medium**
Roads	Medium		Low	High	Medium	**Medium**
Soil Mining	Low	Low			Medium	**Low**
Microplastics					Medium	**Low**
Sewage					Medium	**Low**
Illegal Dumping	Low	Low	Low	Low	Low	**Low**
Poaching	Low	Low	Low		Low	**Low**
Bank Hardening	Low	Low			Low	**Low**
Recreational Activities	Low	Low	Low	Low	Low	**Low**
Summary Rating:	**High**	**High**	**Medium**	**High**	**Very High**	**Very High**

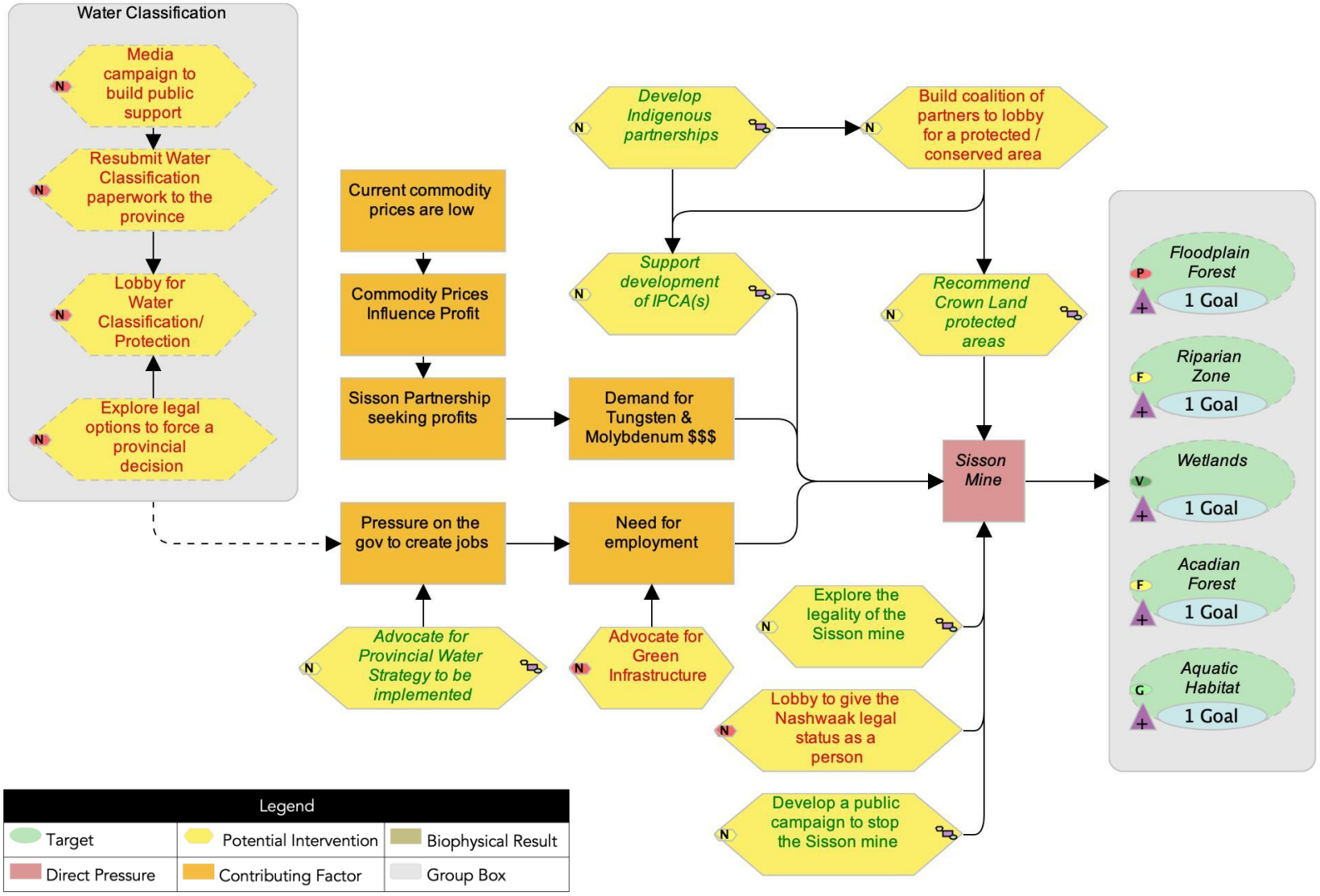
Situation Analyses[2]

Situation Analysis #1: Soil Mining

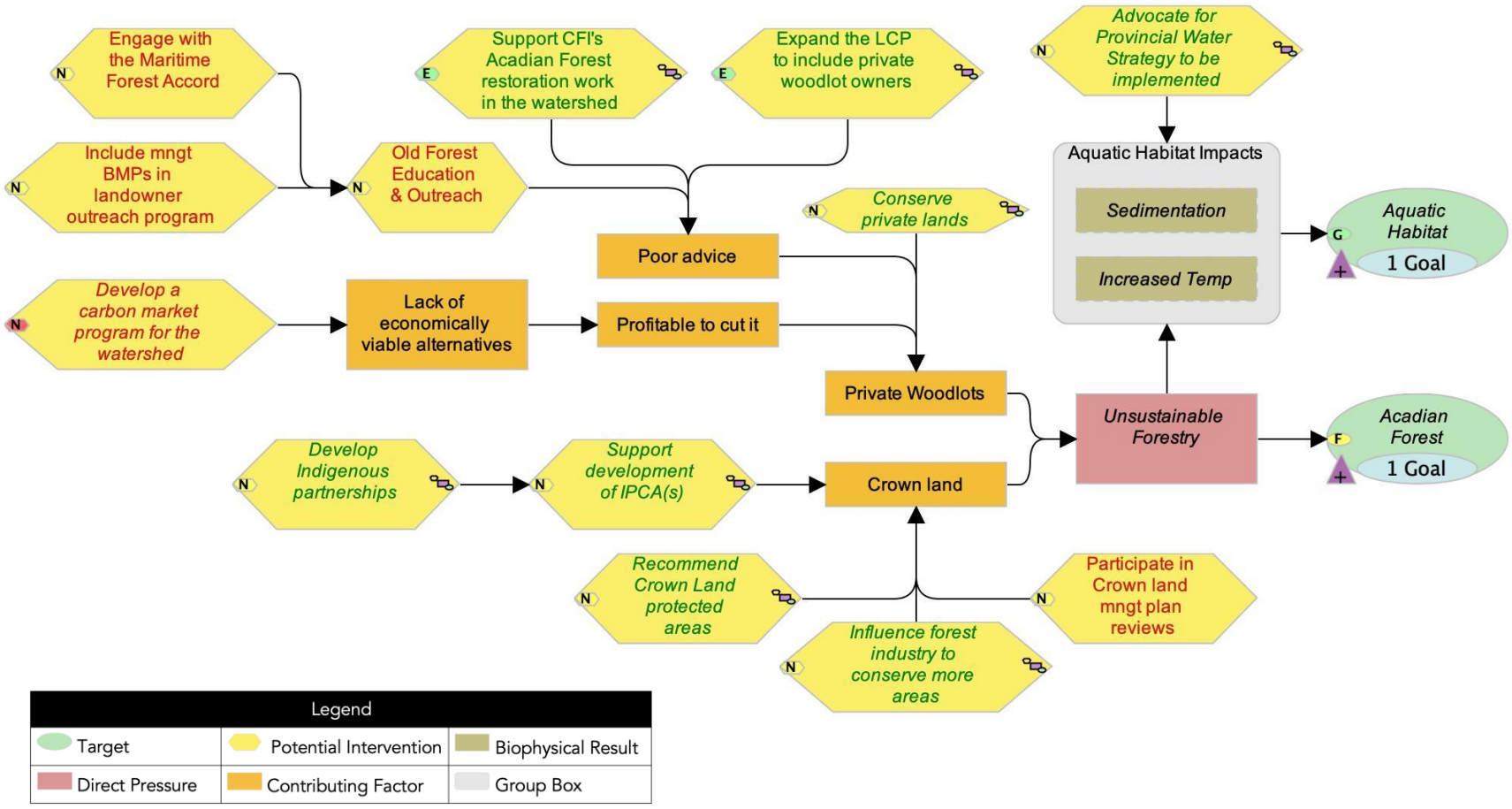


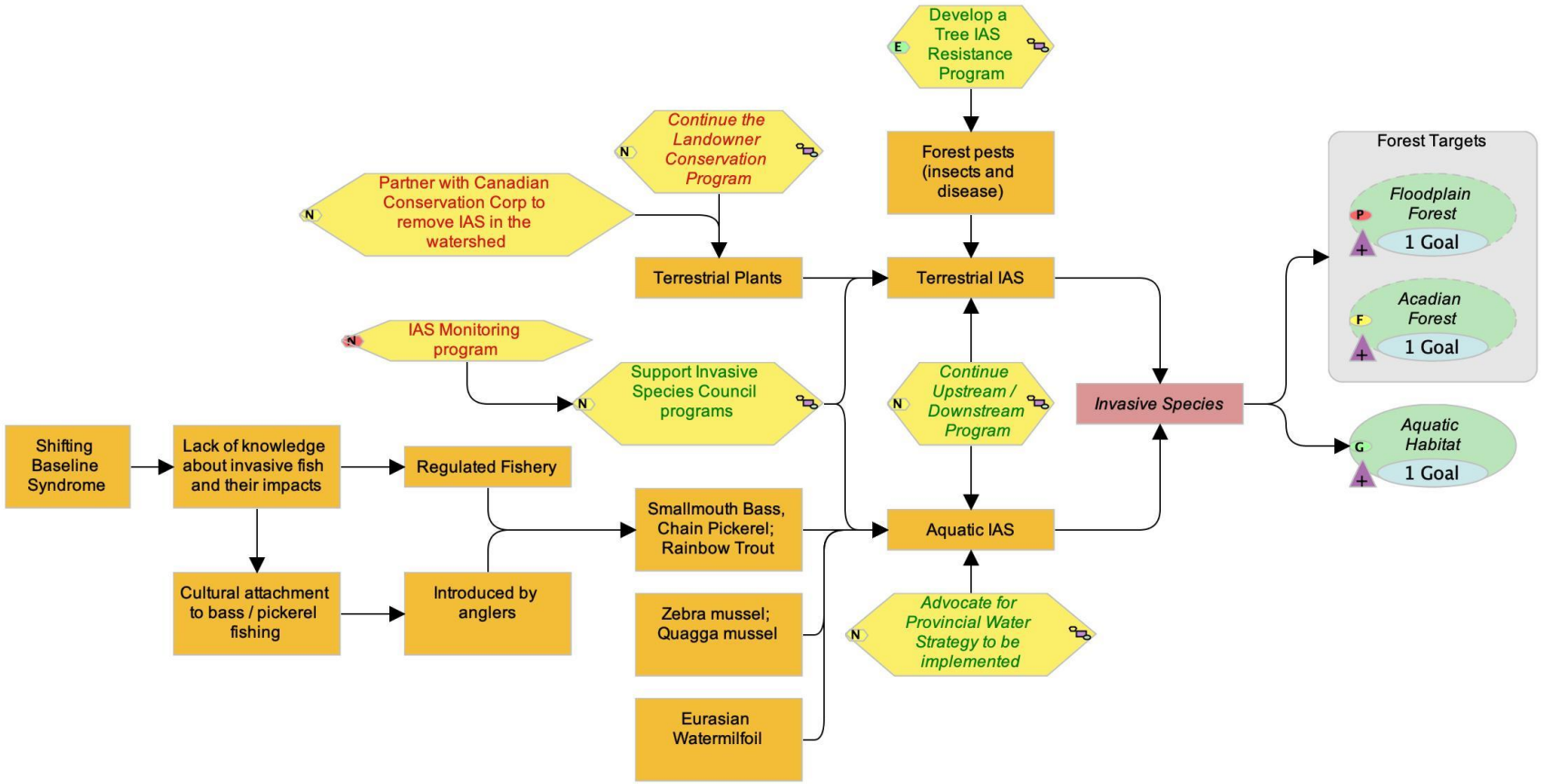
[2] Green text represents the interventions that the NWAI will pursue for implementation; red text represents interventions that will not be implemented.

Situation Analysis #2: Sission Mine

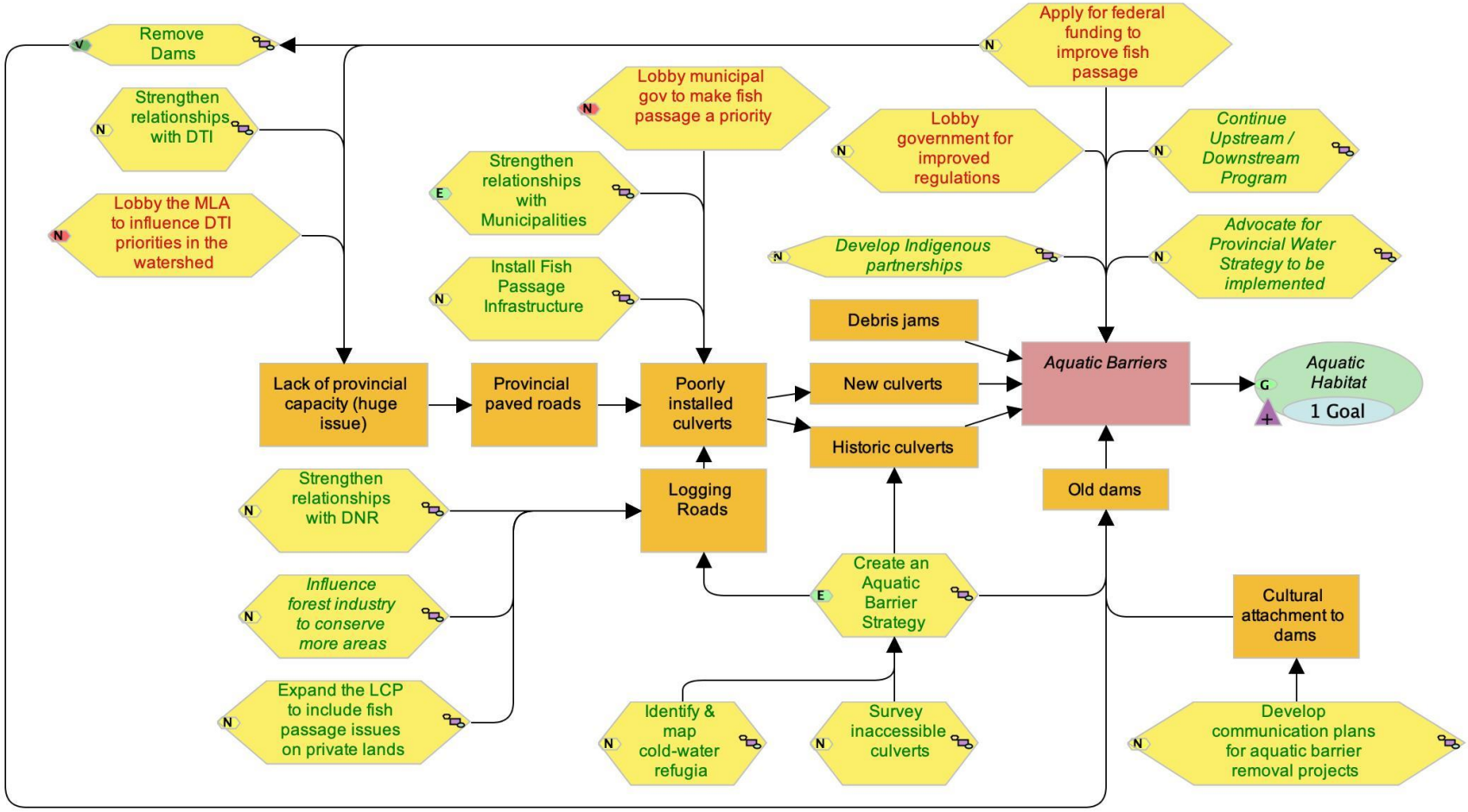


Situation Analysis #3: Unsustainable Forestry



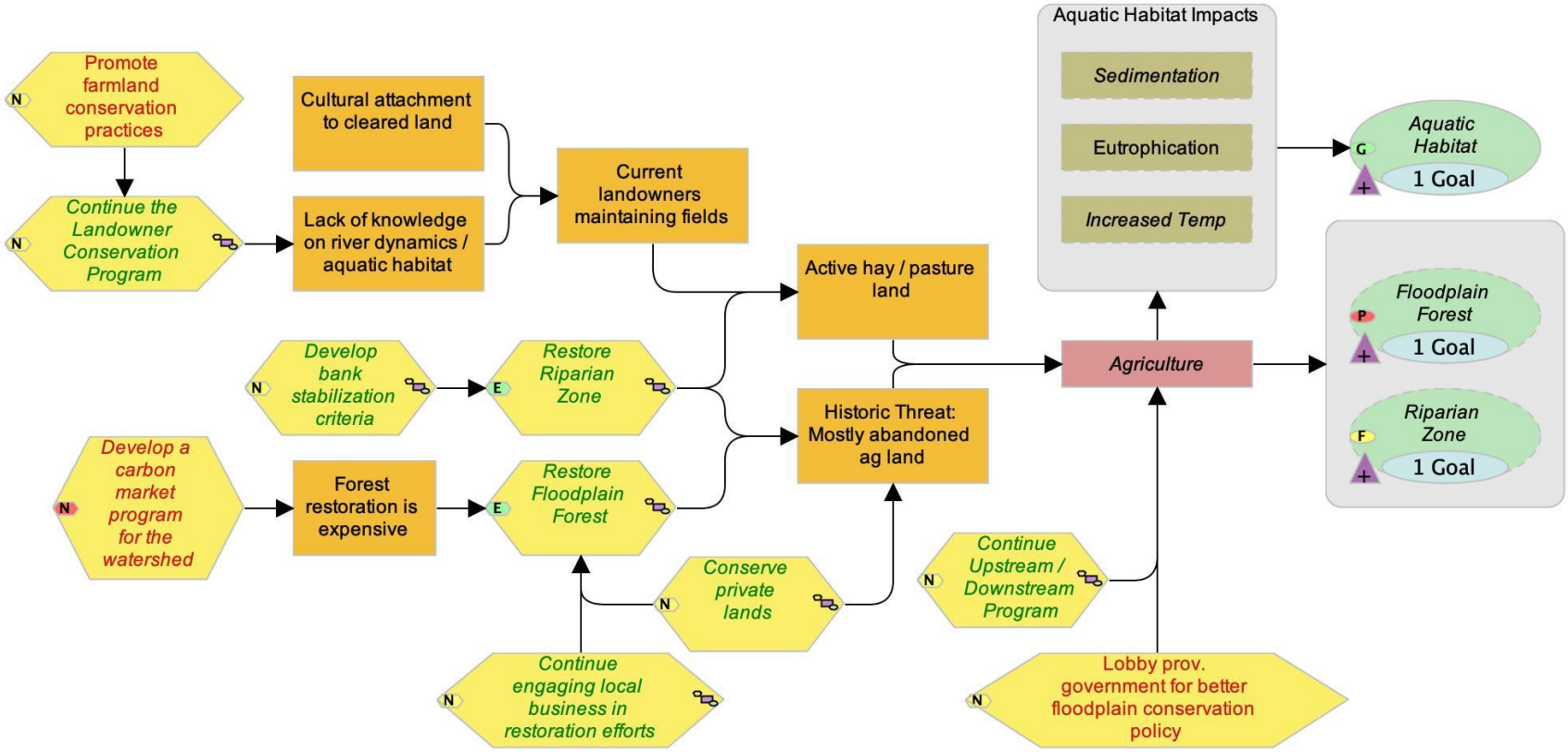

Develop a Tree IAS Resistance Program
Continue the Landowner Conservation Program
Partner with Canadian Conservation Corp to remove IAS in the watershed
Forest pests (insects and disease)
Terrestrial Plants
Terrestrial IAS
IAS Monitoring program
Support Invasive Species Council programs
Continue Upstream / Downstream Program
Invasive Species
Forest Targets
Floodplain Forest
1 Goal
Acadian Forest
1 Goal
Aquatic Habitat
1 Goal
Shifting Baseline Syndrome
Lack of knowledge about invasive fish and their impacts
Regulated Fishery
Smallmouth Bass, Chain Pickerel; Rainbow Trout
Aquatic IAS
Cultural attachment to bass / pickerel fishing
Introduced by anglers
Zebra mussel; Quagga mussel
Advocate for Provincial Water Strategy to be implemented
Eurasian Watermilfoil
Legend
Target
Potential Intervention
Biophysical Result
Direct Pressure
Contributing Factor
Group Box

Situation Analysis #5: Aquatic Barriers



Legend		
Target	Potential Intervention	Biophysical Result
Direct Pressure	Contributing Factor	Group Box

Situation Analysis #6: Agriculture



Goals

#	Target	Goal
1	Floodplain Forest	By 2030, the extent of floodplain forest in the Nashwaak Watershed will increase from 21% to 25% (i.e. from 368ha to 439ha)
2	Riparian Zone	By 2030, the percent of natural cover within a 30m buffer of streams and rivers will meet or exceed 93%.
3	Wetlands	By 2030, the total area of wetlands will meet or exceed 89% of the historic wetland extent in the Nashwaak Watershed.
4	Acadian Forest	By 2030, the total area of mature Acadian forest will meet or exceed 22% of forest in the Nashwaak Watershed.
5	Aquatic Habitat	By 2030, the total length of streams and rivers in the Nashwaak Watershed that are unobstructed by barriers will increase by 110 km.

Strategies and Interventions

Strategy 1: Restore Priority Ecosystems

This strategy focuses on restoring floodplains, riparian ecosystems, and mature Acadian forest to create wildlife habitat and to generate ecosystem service benefits to local communities.

ID	Intervention	Details	Feasibility	Impact	Effectiveness
1.1	Restore Floodplain Forest	Floodplain Forest restoration efforts will focus on abandoned farmland and areas that were previously soil mined; Consider building support by including a SAR lens (Wood Turtle, forest birds, etc.) in funding applications. This intervention is also linked to outplanting IAS-resistant trees (see intervention 1.5).	High	High	**Effective**
1.2	Restore Riparian Zone	This intervention primarily involves planting willows and other shrubs / trees within the riparian buffer zone where land was historically cleared to the waters edge. It may also include bioengineered bank stabilization projects prior to planting where erosion is severe (see Intervention 1.8).	Very High	High	**Effective**

ID	Intervention	Details	Feasibility	Impact	Effectiveness
1.3	Continue engaging local businesses in restoration efforts	This intervention is designed to engage the business community in outdoor immersion activities (e.g. tree planting), with a secondary aim of raising unrestricted funds for restoration work through donations.	Very High	Medium	**More information required**
1.4	Continue the Landowner Conservation Program	Continue encouraging landowners to reforest in the riparian zone, plant native species (e.g. rain gardens); and if applicable, facilitate bank stabilization projects (see Intervention 1.8).	High	Medium	**More information required**
1.5	Develop a Tree Resistance Program	In recognition of numerous invasive forest pests that are threatening several tree species throughout the region, this intervention aims to use existing platforms (e.g. iNaturalist) to map resistant trees as seed sources for local nurseries, which can then be outplanted by NWAI and partners. At minimum, tree species should include White Elm (Dutch elm disease), Butternut (butternut canker), White, Black and Red Ash (Emerald Ash Borer), and Beech (Beech bark disease).	High	High	**Effective**
1.6	Support CFI's Acadian Forest restoration work in the watershed	Rather than the NWAI expanding into upland forest restoration work, this intervention aims to improve the Acadian Forest target by working with Community Forests International toward expanding their work into the Nashwaak Watershed.	High	High	**Effective**
1.7	Explore forest restoration partnerships with industry	Explore partnership opportunities with J.D. Irving Ltd to support the NWAI in large-scale tree growing / planting efforts.	Very High	Medium	**More information required**
1.8	**Knowledge Gap**: Develop bank stabilization criteria	This intervention is designed to help determine where bank stabilizations should be focused in the watershed (e.g. major sources of sedimentation? protecting cold-water refugia? protecting NWAI planted areas? etc.). The aim is to develop a decision support tool, as well as to establish how to measure the effectiveness of bank stabilization projects.	Medium	Medium	**More information required**

Strategy 2: Increase Protected and Conserved Lands

This strategy focuses on increasing the amount of protected and conserved areas within the watershed. The NWAI has made a strategic decision not to become a land trust in the short-term. As such, implementing this strategy will rely on strong partnerships with existing owners and managers.

ID	Intervention	Details	Feasibility	Impact	Effectiveness
2.1	Conserve private lands	Continue to pursue conservation easements with the City of Fredericton to conserve city-owned lands that the NWAI is actively restoring, as well as pursuing a partnership with land trust(s) to facilitate purchasing private lands to: (1) conserve floodplain properties that the NWAI would then restore (see Intervention 1.1), and (2) conserve remaining mature Acadian Forest to contribute to the goal of no net loss.	Medium	Very High	**More information required**
2.2	Recommend Crown Land protected areas	Submit recommendations to the province for new Crown Land protected areas to conserve remaining mature Acadian Forest. Additionally, staff will reach out to Larry Wuest about a previously-proposed PNA to determine whether this should also be submitted as a recommendation.	Very High	Medium	**More information required**
2.3	Support development of IPCA(s)	Provide continued support to Indigenous partners in designating one or more IPCAs in the watershed to decrease the threats of unsustainable forestry and the Sisson mine. NWAI staff have discussed the concept of an IPCA in the proposed mine footprint with the Wolastoqey Nation and it was well received.	Very High	Medium	**More information required**
2.4	Influence forest industry to conserve more areas	Explore partnership opportunities with J.D. Irving Ltd and other industrial forest companies working in the watershed to conserve mature Acadian Forest and other rare ecosystems (e.g. JDI Unique Areas program; increasing buffers around cold-water refugia, etc.).	Very High	Medium	**More information required**
2.5	Expand the Landowner Conservation Program to include private woodlot owners	Engage with private woodlot owners in the watershed by providing best management practices on how to conserve and sustainably manage Acadian Forest. This intervention may also link to intervention 3.2, which aims to assist in restoring Acadian Forest in private lands.	High	High	**Effective**

Strategy 3: Remove Barriers to Fish Passage

This strategy is intended to build on the success of the existing aquatic barrier remediation program, with emphasis on formalizing a strategy, exploring low-cost solutions, and creating a dam-free watershed.

ID	Intervention	Details	Feasibility	Impact	Effectiveness
3.1	Create an Aquatic Barrier Strategy	An Aquatic Barrier Strategy for the watershed aims to, (1) prioritize critical barriers to focus on for removal / remediation, (2) identify ways to improve the NWAI capacity to remediate barriers, (3) identify partners and expected outcomes from partnerships (see interventions 3.6–3.9), (4) identify multi-year funding opportunities (e.g. include a SAR lens to access federal funds?), and (5) develop a plan for tackling Key Knowledge Gaps (see Intervention 3.10 and 3.11).	Very High	High	**Effective**
3.2	Install Fish Passage Infrastructure	Given the high costs of upgrading road-stream crossings, explore low-cost solutions to removing aquatic barriers, such as by installing fish passage infrastructure.	Medium	High	**More information required**
3.3	Remove Dams	Continue working with partners to remove the Campbell Creek dam, and determine whether the "Irving Dam" is a barrier to fish passage and whether its removal should be an NWAI priority.	Very High	Very High	**Very Effective**
3.4	Expand the Landowner Conservation Program to include fish passage issues on private lands	Engage with landowners to improve fish passage on private lands. Options may include providing free passage assessments, providing best practice information for upgrading existing road-stream crossings and/or influencing crossings along new roads, and assisting with priority barrier removals / installing fish passage infrastructure	Medium	Medium	**More information required**
3.5	Develop communication plans for aquatic barrier removal projects	In recognition of the cultural and historical attachment that some members of the public feel toward dams, this activity aims to acknowledge the cultural / historical values of the Campbell Creek dam, as well as the benefits of removing the dam (see intervention 3.3). This intervention will also apply to other barrier removal and remediation projects in the future.	Very High	Medium	**More information required**
3.6	Strengthen relationships with DTI	Continue building trust with DTI by finding new ways to partner together and to celebrate successful projects, such as by establishing a pilot project for a an open-bottom culvert in the watershed.	Very High	Medium	**More information required**

ID	Intervention	Details	Feasibility	Impact	Effectiveness
3.7	Strengthen relationships with DNR	Explore partnership opportunities with DNR to address aquatic barrier removal / remediation on Crown Land within the watershed	Very High	Medium	**More information required**
3.8	Strengthen relationships with Municipalities	Continue partnering with the City of Fredericton on aquatic barrier removal / remediation projects (e.g. Campbell Creek dam). Explore whether similar partnerships could be developed with other municipalities in the watershed (e.g. Stanley).	High	High	**Effective**
3.9	Develop Indigenous Partnerships	Explore partnership opportunities with the Wolastoqey Nation to identify potential aquatic barrier removal / mitigation projects.	Medium	Medium	**More information required**
3.10	**Knowledge Gap**: Survey inaccessible culverts	Determine how best to locate and survey road-stream crossings that are difficult to access. One option may be to use existing LiDAR data to identify obvious barriers (i.e. hanging culverts).	High	Medium	**More information required**
3.11	**Knowledge Gap**: Identify & map cold-water refugia	Mapping cold-water refugia throughout the watershed will help inform planning efforts, Explore a potential project with BGC Engineering and/or Anton O'Sullivan at CDI to map cold-water refugia.	Very High	Medium	**More information required**

Strategy 4: Educate and Advocate for a Healthier Watershed

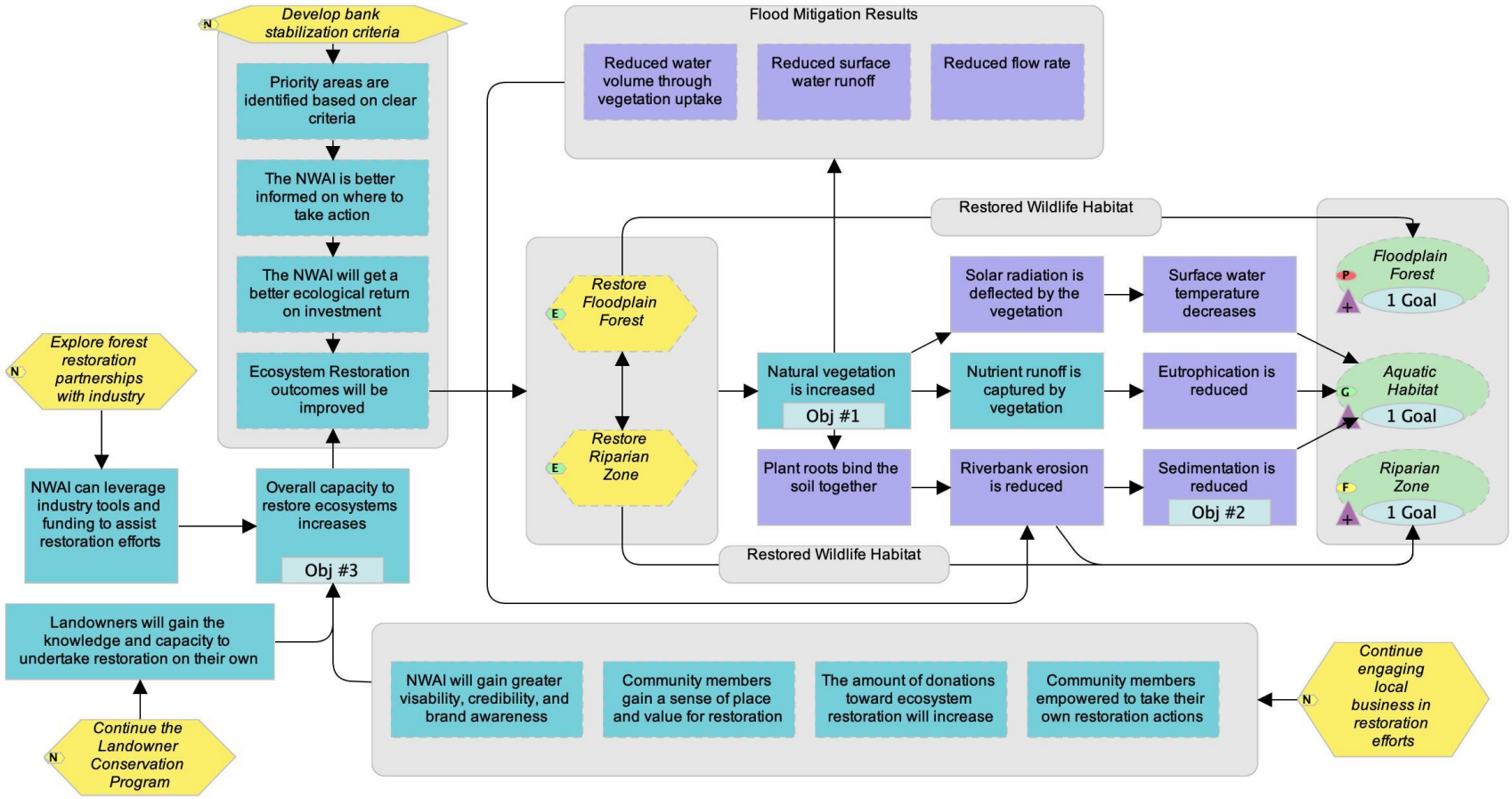
This strategy focuses on influencing government decision making and building public support for better environmental policies and practices within the watershed.

ID	Intervention	Details	Feasibility	Impact	Effectiveness
4.1	Advocate for Provincial Water Strategy to be implemented	Continue to support the watershed caucus in lobbying the government to implement and enforce the provincial water strategy.	Very High	Medium	**More information required**
4.2	Lobby to halt soil mining in the watershed	Lobby the provincial government to halt soil mining in the watershed by, (1) continue working to convene a meeting with various provincial government departments to discuss options around soil mining, (2) developing a letter template for NWAI staff, board and members to send to local MLA, and (3) support the AANB's proposed changes to the Agriculture Act so that topsoil mining will no longer be recognized as an ag practice, and (4) use social media to bring attention to soil mining impacts.	Very High	Medium	**More information required**

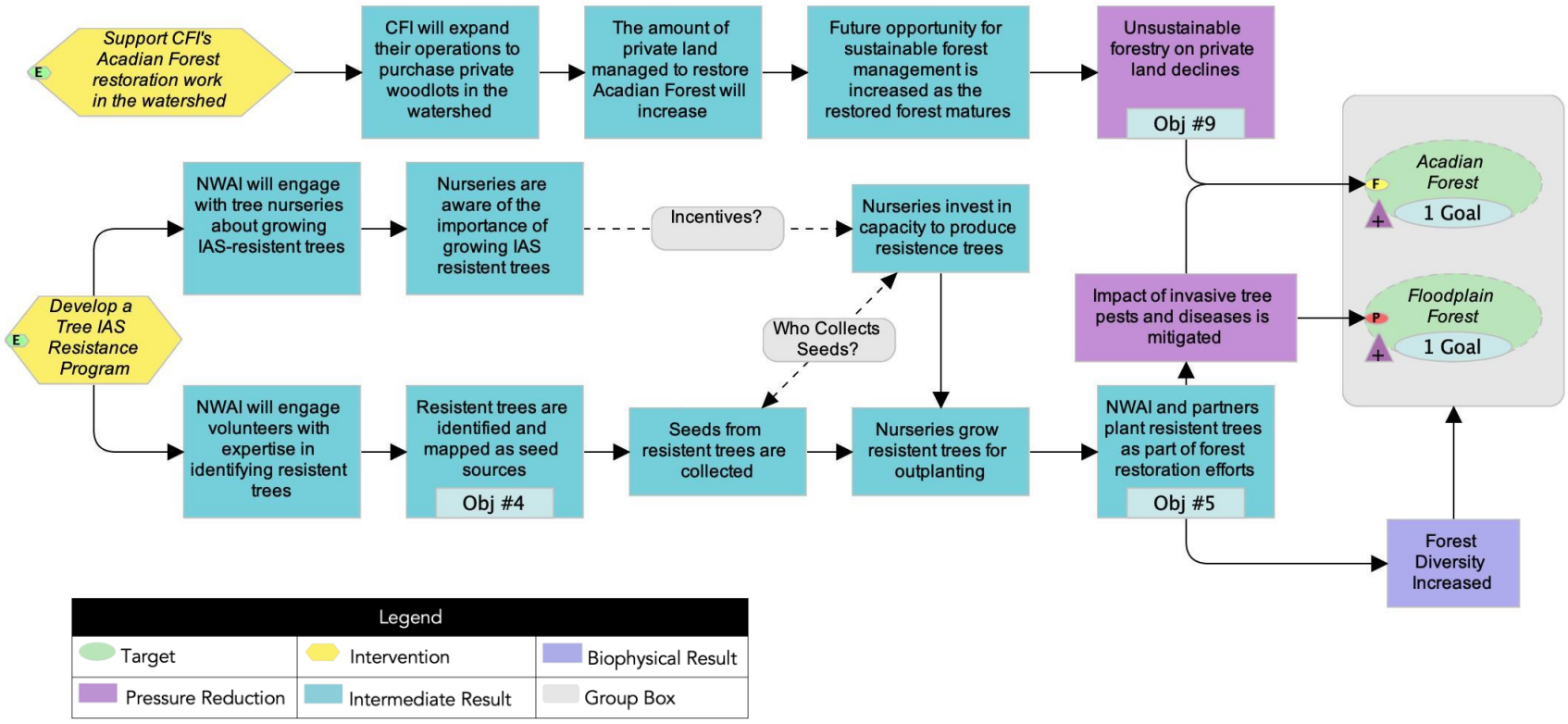
ID	Intervention	Details	Feasibility	Impact	Effectiveness
4.3	Continue Upstream / Downstream Program	Continue working with grade school children to improve environmental awareness within the watershed through outdoor immersion and showcasing (e.g. tree planting activities). Educational topics should include (but are not limited to) the importance of old growth forest, the impacts of aquatic barriers, and the importance of restoring floodplains and riparian areas.	High	Medium	**More information required**
4.4	Support Invasive Species Council programs	Help the Invasive Species Council disseminate information to watershed visitors and residents, and potentially assist with any monitoring and/or prevention programs that they initiate. Example projects may include installing signage at boat launches, engaging with tubing companies to promote best practices, landowner training workshops to identify, prevent and control IAS, and disseminating information to the public about terrestrial and aquatic IAS and their prevention methods. The success of this intervention is dependent on the council implementing projects that result in tangible outcomes related to tackling IAS in the watershed, and the NWAI will need to periodically assess this to determine whether additional action is required.	Very High	Medium	**More information required**
4.5	Develop a public campaign to stop the Sisson mine	If the Sisson mine project becomes active again, create a campaign to put public pressure on elected officials to stop the mine being developed. The campaign should focus on both the environmental and long-term economic consequences of the mine. The campaign may include, but is not limited to, social media, NWAI newsletter, AGM, community events, public reports, website updates, and a publicly accessible digital library of information about the mine.	Medium	Medium	**More information required**
4.6	**Knowleedge Gap**: Explore the legality of the Sisson mine	It is currently unknown whether a legal case can be built against the Sisson mine as it relates to the 40 conditions required by the Province. This intervention involves gathering information to help inform whether a legal case could be built, including, (1) the current status of the mine, (2) the EIA expiration date, (3) potential partners in building a legal case, (4) who the Indigenous representatives are that the proponent needs to engage with, and (5) whether a community consultation committee was created.	High	Medium	**More information required**

Theories of Change and Objectives

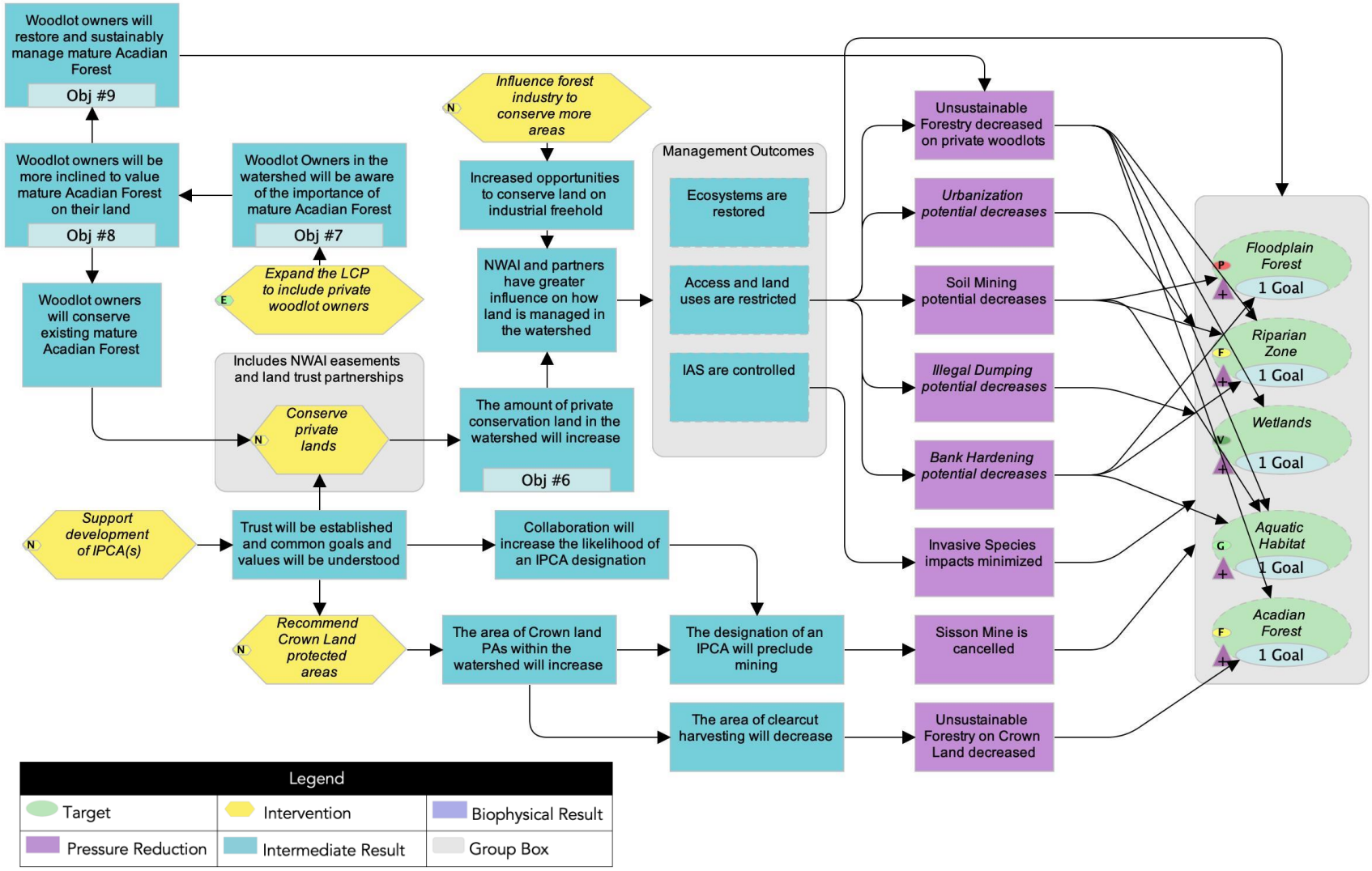
Strategy 1 Theory of Change: Restore Priority Ecosystems



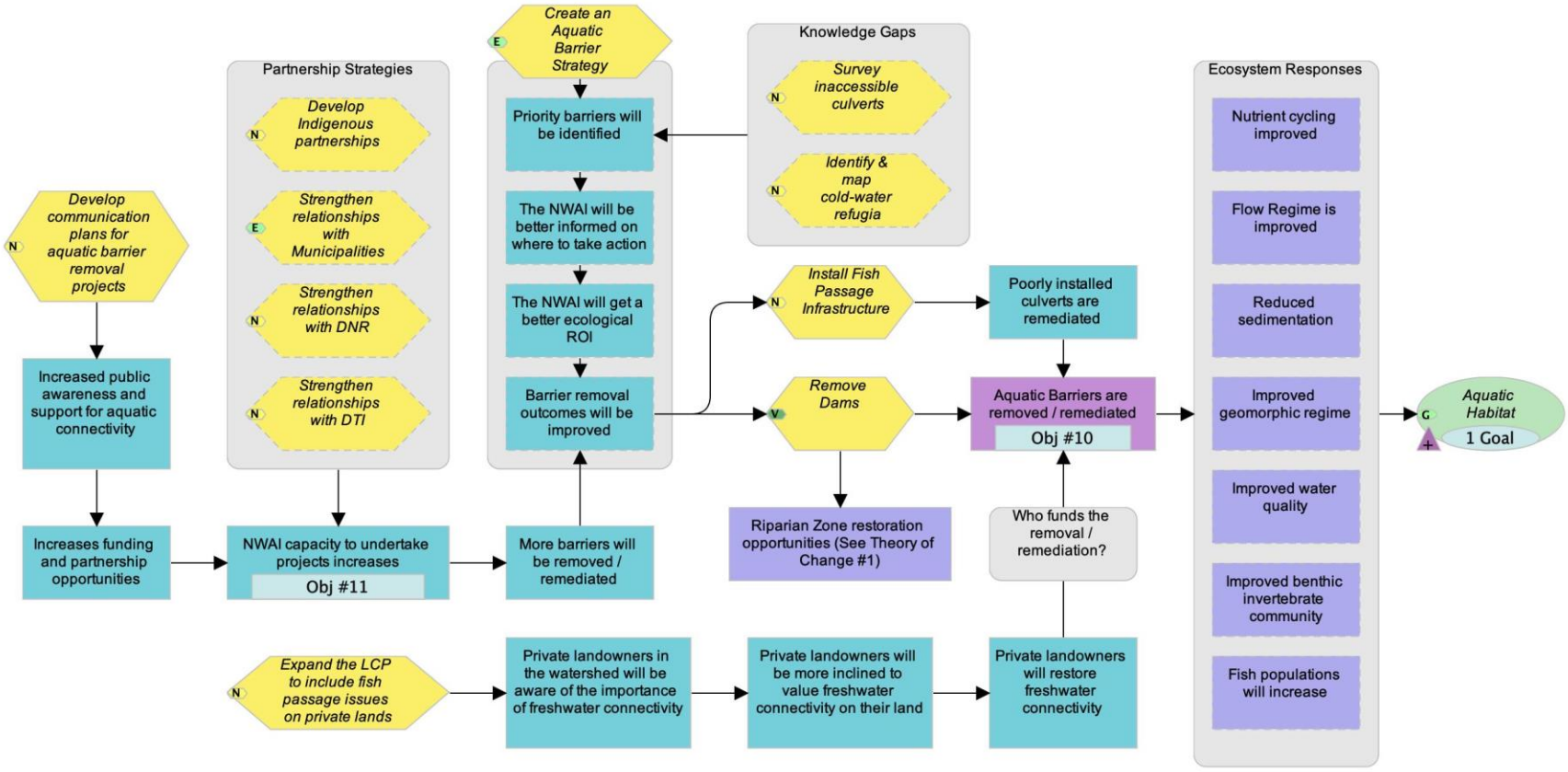
Strategy 1 Theory of Change: Restore Priority Ecosystems (continued)



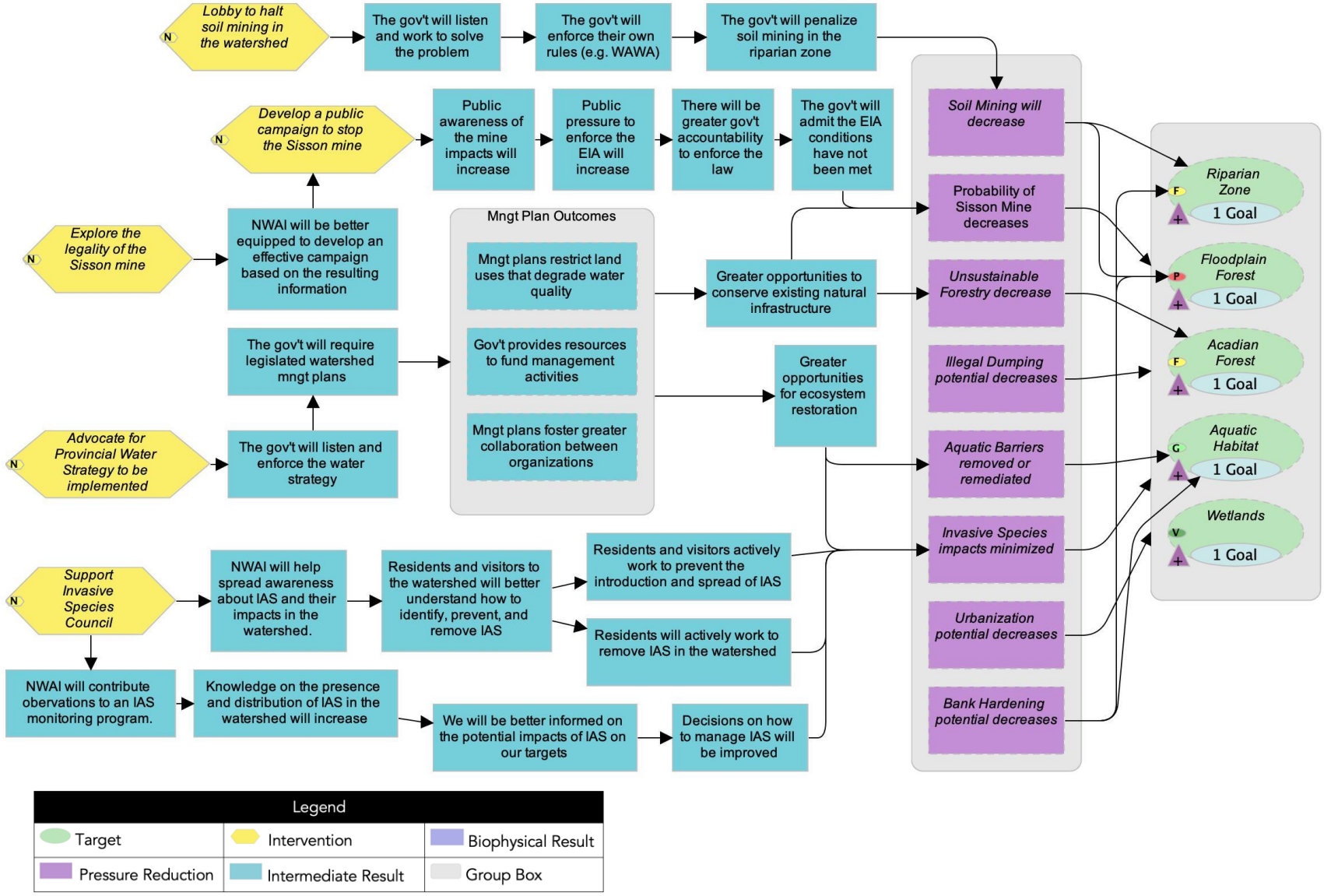
Strategy 2 Theory of Change: Increase Protected and Conserved Lands



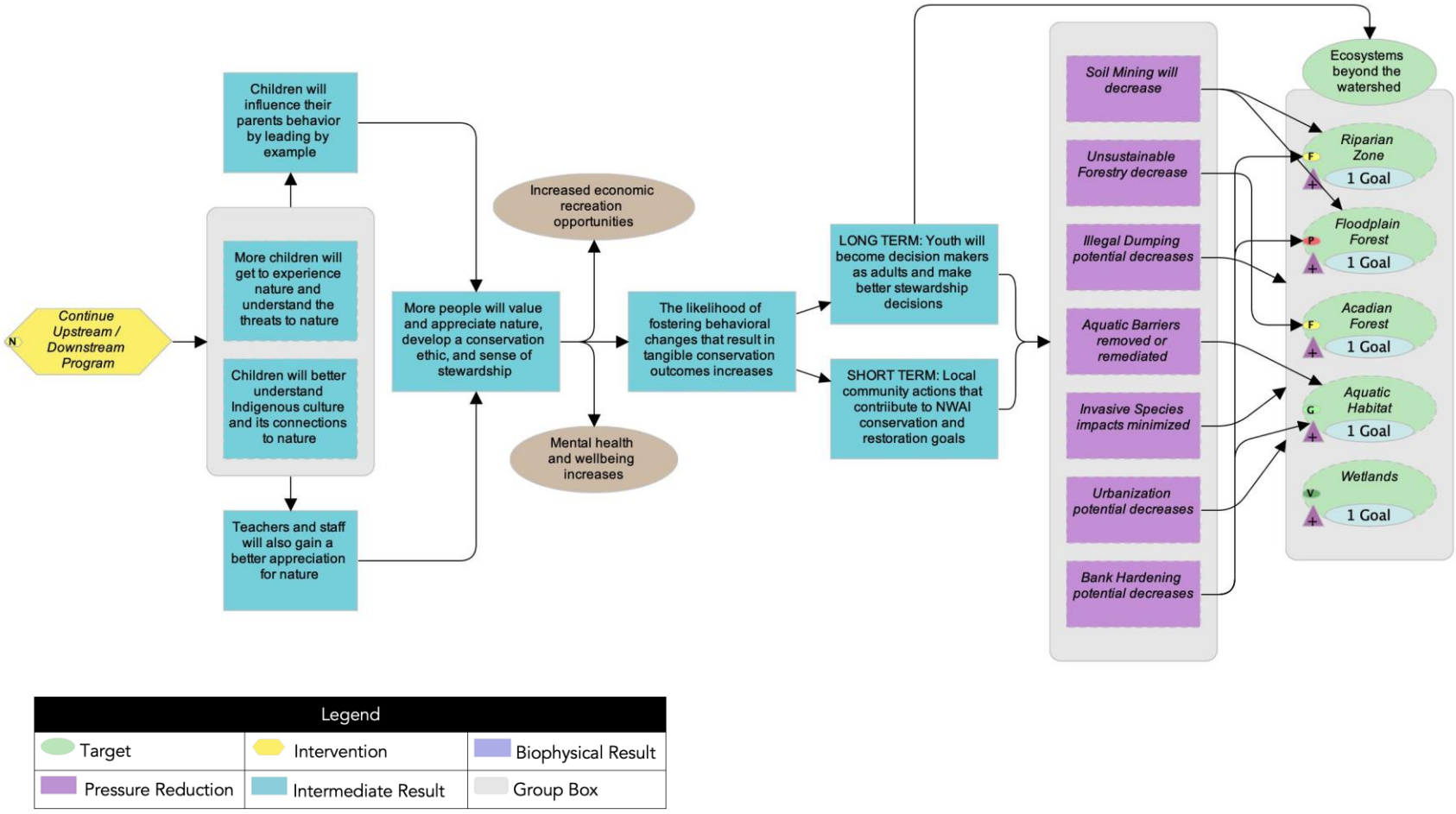
Strategy 3 Theory of Change: Remove Barriers to Fish Passage



Strategy 4 Theory of Change: Educate and Advocate for a Healthier Watershed



Strategy 4 Theory of Change: Educate and Advocate for a Healthier Watershed (continued)



Objective #	Objective
1	By 2025, a minimum of 20 hectares of floodplain forest and riparian zones will be restored
2	By 2025, the amount of soil entering streams and rivers in restored riparian zones has declined by 50% or more
3	By 2025, 5 new businesses and/or community organizations will be engaged in NWAI restoration activities.
4	By 2025, a minimum of 100 IAS-resistant trees have been identified and mapped as part of the Tree Resistance Program
5	By 2030, a minimum of 5,000 IAS-resistant trees have been planted by NWAI and partners
6	By 2025, the amount of private conservation land in the watershed has increased by a minimum by 62 ha (i.e. from 10.4 ha to 72.4 ha; the 62ha represents Marysville and Neils Flats).
7	By 2030, a minimum of 50 private woodlot owners have been engaged in the LCP
8	By 2030, a minimum of 10 private woodlot owners self-identify as valuing mature Acadian Forest as a direct result of the LCP
9	By 2030, a minimum of 5 private woodlot owners are engaged in sustainable forest management as a direct result NWAI and partner engagement
10	By 2030, the percent of fish-passable road-stream crossings in the Nashwaak Watershed will increase by 3% (i.e. 13 road-stream crossing barriers remediated)[3]
11	By 2025, the proportion of barrier removal / remediation projects undertaken through cost-sharing partnerships is >25%

The planning team decided not to develop objectives for Strategy 4 due to the tenuous assumptions around our ability to influence government decision makers, change human behavior through the upstream/downstream program, and measure interim outcomes for lobbying and advocacy. However, these will be reassessed in future iterations of the strategic plan, with the aim of developing objectives and measurable indicators.

[3] This value is a placeholder until a barrier prioritization analysis is conducted to determine the optimal number of barriers that, if removed or remediated, would achieve Goal #5 of opening up 110km of streams and rivers.

Funding Sources

Funding Source	Estimated % Of Total Budget	Restrictions On Fund Use
NB Wildlife Trust Fund	8%	Funding must link to benefiting wildlife – possibly use to fund restoration
NB Environmental Trust Fund	25%	Funding must match the annual priorities of the fund
DFO	10%	DFO is currently funding work that benefit SAR
ECCC	20%	Eco-Action: community involvement is a priority. Atlantic Ecosystems Initiative: project must be of benefit to larger geographic area and involve partners
WWF-Canada	20%	Wolostoq River, aquatic SAR
Tree Canada	2%	Tree planting, coroporate
ASCF	7%	Atlantic Salmon projects
Wildlife Habitat Canada	8%	Waterfowl and wetlands
Total:	**100%**	

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Appendix A: Target Health Assessments

Floodplain Forest Health = Poor

			Indicator Ratings			
Target	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Floodplain Forest	Geographic Extent	Extent of Historic Floodplain Forest (%)	<25%	25-50%	51-75%	>75%
		Current Status:	21%			

Calculated as the current floodplain forest extent divided by the historic extent in the watershed (1,754 ha) using the provincial Historic Flood shapefile (all historically flooded area is assumed to have been floodplain forest.

			Indicator Ratings			
Target	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Floodplain Forest	Floodplain Forest Intactness	Average Patch Size (ha)	< 20 ha	20-35 ha	35-75 ha	>75 ha
		Current Status:	3.9 ha			

The lower limit of 20 ha of mature forest was used by Anderson et al. (2006) to meet their forest patch criteria; 35 and 75 ha were identified by Betts & Forbes (2005) for Greater Fundy. Only 2 patches out of 93 exceeded the "Poor" threshold of 20ha, both of them between the confluence of the St. John River The Marysville Flats.

			Indicator Ratings			
Target	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Floodplain Forest	Floodplain Connectivity	TNC Connectivity Index	0-25	25-50	51-75	75-100
		Current Status:	14			

A measure of connectivity across the historic floodplain forest area of the watershed. Details on how Local Connectedness is calculated can be found in Anderson et al. (2016).

Riparian Zone Health = Fair

			Indicator Ratings			
Target	KEA	Indicator	Poor	Fair	Good	Very Good
Riparian Zone	Riparian Condition	Natural cover (%) within a 30m buffer of streams and rivers	<25%	25-50%	51-75%	>75%
		Current Status:				93%

Total area in 30m buffers = 11,298 ha. Total area affected by ag, development and plantations = 767 ha.

			Indicator Ratings			
Target	KEA	Indicator	Poor	Fair	Good	Very Good
Riparian Zone	Riparian Intactness	Natural cover (%) within the Active River Area	<25%	25-50%	50-75%	>75%
		Current Status:				85%

Total Active River Area = 13,796 ha. Total area affected by ag, development and plantations = 2,098 ha. Details on the Active River Area can be found in Nussey & Noseworthy (2020).

			Indicator Ratings			
Target	KEA	Indicator	Poor	Fair	Good	Very Good
Riparian Zone	Geomorphic Condition	% of river banks "In Regime or Stable" condition	<25%	25-50%	51-75%	>75%
		Current Status:	16%			

Value taken directly from Parish Aquatic Services (2016): Nashwaak River Geomorphic Assessments

Wetlands Health = Very Good

			Indicator Ratings			
Target	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Wetlands	**Geographic Extent**	**Historic extent of wetlands still remaining (%)**	**<40%**	**40-60%**	**61-80%**	**>80%**
		Current Status:				**89%**

To estimate the historic extent of wetlands, a transfer function was used. It was found that 12.4% of the watershed has been developed or converted to agriculture, and there are currently 6,521 ha of wetlands in the watershed. If we assume a loss equal to development (12.4%), the historic wetland extent would have been 7,330 ha. Therefore, the current wetland extent represents 89% of the historic extent present in the watershed prior to development. The 40% threshold for poor was taken from: Environment Canada (2013). How much Habitat is Enough?

			Indicator Ratings			
Target	**KEA**	**Indicator**	**Poor**	**Fair**	**Good**	**Very Good**
Wetlands	**Intactness**	**Natural cover (%) within a 100m buffer of wetlands**	**<25%**	**25-50%**	**51-75%**	**>75%**
		Current Status:				**90%**

Total area in 100m buffers = 20,071 ha. Total area affected by ag, development and plantations = 2,045 ha.

Acadian Forest Health = Fair

			Indicator Ratings			
Target	KEA	Indicator	Poor	Fair	Good	Very Good
Acadian Forest	Geographic extent of mature forest	Total area (ha) of mature Acadian forest	<40%	40-60%	60-80%	80-100%
		Current Status:	22%			

80% threshold for 'Good' based on Mosselor et al. (2003) paper. Total forested area = 153,471 ha; Old forest = 34,091 ha. Used Global Forest Watch (Hanson et al., 2013) to include clearcuts up to 2018.

			Indicator Ratings			
Target	KEA	Indicator	Poor	Fair	Good	Very Good
Acadian Forest	Acadian Forest Intactness	Percent area of Mature Forest in patches >75 ha	<25%	25-50%	51-75%	>75%
		Current Status:		38%		

The 75 ha threshold was identified by Betts & Forbes (2005) as good for most old forest species. Old forest = 34,091 ha and 12,868 ha of mature forest are in patches >75ha.

			Indicator Ratings			
Target	KEA	Indicator	Poor	Fair	Good	Very Good
Acadian Forest	Acadian Forest Connectivity	TNC Local Connectedness Index	0-25	25-50	51-75	75-100
		Current Status:			51%	

A measure of connectivity across the entire forested area of the watershed. Details on how Local Connectedness is calculated can be found in Anderson et al. (2016).

Aquatic Habitat Health = Good

			Indicator Ratings			
Target	KEA	Indicator	Poor	Fair	Good	Very Good
Aquatic Habitat	Water Quality	Avg NWAI Water Quality Index Value	0-64	65-79	80-94	95-100
		Current Status:				95.05

Taken from 2019 Water Quality Report for the watershed (NWAI 2020). The bottom two WQI rating categories were combined to the represent the Poor rating definition. The current status is the 2019 average across the 12 monitoring sites.

			Indicator Ratings			
Target	KEA	Indicator	Poor	Fair	Good	Very Good
Aquatic Habitat	Free-flowing Status	Linear % of free-flowing streams / rivers	0-25%	25-50%	50-75%	75-100%
		Current Status:				77%

Total length of streams that are not obstructed by dams (1,229 km) divided by total length of streams in the watershed (1,597 km).

			Indicator Ratings			
Target	KEA	Indicator	Poor	Fair	Good	Very Good
Aquatic Habitat	Aquatic Connectivity	% of fish-passable road-stream crossings	0-25%	25-50%	50-75%	75-100%
		Current Status:		35%		

Current value based on an assessment of 168 culverts surveyed between 2017-2019 within the watershed.