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Comité consultatif de l'environnement Kativik
Kativik Environmental Advisory Committee

Lundi le 31 janvier 2011

M. Pierre Arcand
Ministre
Ministère du Développement durable,
de l'Environnement, et des Parcs
Édifice Marie-Guyart, 30e étage
675, boulevard René-Lévesque Est
Québec (Québec) G1R 5V7

Objet : Plan nord

Monsieur le Ministre,

Dans le cadre de sa participation à l'ambitieux projet que représente le Plan Nord, le Comité consultatif de l'environnement Kativik (CCEK) souhaite vous féliciter pour votre initiative portant sur la création d'une table de concertation sur la conservation. Le CCEK souhaite suivre de près les travaux de cette table de concertation en raison de ses impacts potentiels sur le milieu social et environnemental dans le territoire régi par la Convention de la Baie James et du Nord québécois (CBJNQ)

Comme vous le savez, la Convention établit les principes qui doivent être pris en compte lors de l'élaboration de stratégies, lois, règlements ou politiques qui touchent le Nunavik. L'article 23.2.3 mentionne que: *« Toutes les lois fédérales et provinciales applicables qui sont d'application générale concernant la protection de l'environnement et du milieu social s'appliquent dans la Région, dans la mesure où elles ne sont pas incompatibles avec les dispositions de la Convention,... ».*

C.P. 930, Kuujjuaq (Québec) J0M 1C0
Tél. : (819) 964-2961, poste 2287 • Téléc. : (819) 964-0694
Courriel : keac-ccek@krg.ca

En tant qu'interlocuteur privilégié des gouvernements en vertu de la CBJNQ, le CCEK souhaite, dès maintenant, souligner certaines préoccupations relatives à la décision de « *soustraire 50% du territoire de toutes activités industrielles* ». Essentiellement, le CCEK s'interroge sur la façon dont sera comptabilisé le 50% ainsi que sur les critères qui seront utilisés pour définir ce que sont les « activités industrielles ».

À titre d'exemple, le CCEK se questionne sur l'inclusion ou non des terres de catégorie 1 et 2 des Inuits, telles que définies dans la CBJNQ, dans le calcul du 50% du territoire soustrait à toute activité industrielle. Le calcul ne devrait-il pas porter que sur les terres de catégorie 3, soit les terres du domaine public de l'État?

Nous croyons également que la définition « d'activités industrielles » aurait avantage à être clarifiée. À cet égard, nous vous invitons à consulter les définitions de la CBJNQ (chapitre 23, annexe 1 et 2) où il est question de projets de développement. Bien que ces listes devraient bénéficier d'une mise à jour, elles demeurent actuelles, pour leur majeure partie.

Le CCEK espère grâce à votre appui être en mesure de continuer à suivre de près l'évolution de ce dossier important pour le développement durable au Nunavik et d'y apporter sa contribution. Un lien direct et officiel avec les personnes en provenance du Nunavik et présentes à la table de concertation sur la conservation serait fortement souhaitable.

Nous vous prions de bien vouloir agréez, Monsieur le Ministre, nos salutations distinguées.

Le président,

Claude Abel

C.P. 930, Kuujjuaq (Québec) J0M 1C0
Tél. : (819) 964-2961, poste 2287 • Téléc. : (819) 964-0694
Courriel : keac-ccek@krg.ca

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Comité consultatif de l'environnement Kativik
Kativik Environmental Advisory Committee

Kuujjuaq, le 31 janvier 2011

Madame Diane Jean
Sous-ministre
Ministère du Développement durable,
de l'Environnement et des Parcs
Édifice Marie-Guyart, 30^{e} étage
675, boulevard René-Lévesque Est,
Québec (Québec) G1R 5V7

OBJET : ***Brûlage des matières résiduelles au Nunavik***

Madame la Sous-ministre,

Par la présente, je souhaite donner suite à la lettre que votre prédécesseur, Mme Madeleine Paulin, avait adressée au Comité consultatif de l'environnement Kativik (CCEK) le 9 juillet 2009, dans laquelle elle suggérait de lui faire part des modes alternatifs d'élimination au brûlage des matières résiduelles au Nunavik, applicables aux communautés nordiques québécoises.

Le brûlage des matières résiduelles dans les dépotoirs au Nunavik s'avère être de moins en moins une méthode de gestion des déchets appropriée pour l'ensemble des villages nordiques, et cela, plus particulièrement pour les plus importantes communautés nordiques (Kuujjuaq, Puvirnituq, Inukjuaq et Salluit). Ces communautés sont aux prises avec un problème d'augmentation des volumes de déchets qui dépassent les capacités de brûlage efficace dans leur dépotoir. Les contraintes climatiques et géophysiques particulières à chaque communauté influent directement sur les problèmes associés au brûlage obligatoire hebdomadaire (exposition de la population aux fumées, présence d'animaux sauvages) ainsi que sur les solutions à envisager.

Aussi, en ce qui concerne la gestion des matières résiduelles, ces communautés sont à la recherche d'alternatives au brûlage obligatoire qui tiendraient compte des particularités et possibilités propres à chaque communauté. Dans certains villages, la méthode de recouvrement (sol brut et résidus de construction) des matières solides peut être envisagée comme une solution de remplacement au brûlage des déchets alors que dans

d'autres l'incinération peut être une option à explorer. Ces alternatives mériteraient toutefois d'être testées par des projets pilote avant d'être retenues et mises en place. Actuellement, les communautés souhaitent développer des alternatives et des projets pilotes sans contrevenir à l'obligation de brûlage hebdomadaire contenue dans la réglementation applicable aux communautés du Nunavik.

Dans ce contexte, le CCEK recommande au gouvernement du Québec de modifier l'article 99 du Règlement sur l'enfouissement et l'incinération de matières résiduelles afin d'assouplir l'obligation de brûler de manière hebdomadaire les matières résiduelles combustibles en autorisant d'autres méthodes de traitement des matières résiduelles. Par ailleurs, il ne s'agit pas d'interdire le brûlage des matières résiduelles au Nunavik car cette méthode demeure efficace dans la majorité des villages nordiques, mais de tenir compte des particularités des villages. Les différentes alternatives au brûlage pourraient être identifiées dans le plan de gestion des matières résiduelles du Nunavik, actuellement en cours d'élaboration.

Veuillez agréer, Madame la Sous-ministre, l'expression de mes sentiments les meilleurs.

Le président,

Claude Abel

C.P. 930, Kuujjuaq (Québec) J0M 1C0
Tél.: (819) 964-2961, poste 2287 • Téléc.: (819) 964-0694
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Comité consultatif de l'environnement Kativik
Kativik Environmental Advisory Committee

Jeudi le 27 janvier 2011

Conférence régionale des élus Nord-du-Québec
Administration régionale Kativik
C.P. 9
Kuujjuaq (QC)
J0M 1C0

Sujet : Consultation publique sur l'aménagement durable des forêts

Le CCEK

Le Comité consultatif de l'environnement Kativik (CCEK) est consulté par les gouvernements du Québec et du Canada et par les municipalités nordiques, à titre d'interlocuteur privilégié et officiel, lorsqu'ils élaborent des lois et des règlements concernant la protection de l'environnement et du milieu social dans le territoire régi par la Convention de la Baie-James et du Nord québécois (CBJNQ) et situé au nord du 55e parallèle. Le CCEK a notamment pour fonction de surveiller, par l'échange de points de vue et de renseignements, l'application du chapitre 23 de la CBJNQ.

Intérêt pour le sujet

De par son mandat, le CCEK s'intéresse aux stratégies et règlements traitant de l'environnement au Nunavik dont la gestion des forêts. Ainsi, en 2004 le CCEK a produit et soumis un avis à la Commission d'étude sur la gestion de la forêt publique québécoise (voir les recommandations à l'annexe). Le CCEK a ensuite poursuivi ses démarches démontrant son intérêt pour les forêts du Nunavik en s'impliquant dans la réalisation d'une étude sur l'évaluation du potentiel économique de deux territoires forestiers au nord du 55 e parallèle.

Réponses et commentaires sur la stratégie d'aménagement des forêts et modalités proposées pour le futur règlement sur l'aménagement durable des forêts

Stratégie question N°8 : Quels points de la stratégie devraient être améliorés?

Les forêts du Nunavik

Comme le document s'applique à toutes les forêts du domaine de l'état, nous souhaitons nous assurer que les dispositions prises dans le cadre de la stratégie notamment au défi #1 (Une gestion forestière qui intègre les intérêts, les valeurs et les besoins de la population québécoise et des nations autochtones), puissent être mises en œuvre, lorsque pertinentes, dans les forêts du Nunavik. La portion méridionale du Nunavik est partiellement couverte de forêts parmi lesquelles se trouvent des îlots de forêts exceptionnelles et importantes pour les communautés autochtones. Certains secteurs de ces forêts (sites de sépultures, sites à valeurs traditionnelles, etc.) voir certaines de ces forêts devraient pouvoir bénéficier de protection comme la surveillance contre les incendies mais surtout contre les coupes forestières ou les activités minières. Afin d'améliorer cette situation, il devient important que le Nunavik se munisse d'un plan d'aménagement de ses forêts et participe activement aux processus de planification intégrée des ressources et du territoire. Cette portion forestière du territoire québécois doit être reconnue.

Les autochtones; partie intégrante de la population québécoise

Bien que distinctes, les communautés autochtones font partie de la population québécoise. Ainsi, nous suggérons d'apporter quelques modifications pour ne pas laisser sous entendre le contraire.

Par exemples, dans le document de consultation à la page10, premier paragraphe :
« Le milieu forestier revêt une grande importance dans la vie des québécois et des nations autochtones, … » pourrait se lire plutôt comme suit :
« Le milieu forestier revêt une grande importance dans la vie des québécois et ce, particulièrement, pour les nations autochtones, … »

Également au Défi #1, orientation #1, page10:
« *…accentuer le dialogue avec la population et les communauté autochtones sur la gestion…* » pourrait se lire plutôt comme suit :
« *…accentuer le dialogue avec la population, notamment avec les communautés autochtones...* »

Conclusion

Les membres du CCEK félicitent les efforts entrepris pour améliorer la gestion des forêts en misant sur le développement d'une gestion durable. La stratégie sur l'aménagement durable des forêts, comme les propositions de modalités pour le futur règlement qui s'y rattachent, démontrent bien la volonté d'améliorer la conservation des forêts.

Nous sommes confiants que ces changements seront garants d'améliorations pour la conservation du patrimoine forestier des Québécois, notamment des communautés autochtones du Nunavik.

Le président,

Claude Abel

Annexe

Recommandations extraient de l'avis du CCEK à l'attention de la Commission d'étude sur la gestion de la forêt publique québécoise, octobre 2004.

1-Le Comité consultatif de l'environnement Kativik (CCEK) recommande à la Commission la création d'un groupe de recherche qui aurait comme but de rassembler et de compléter les connaissances actuelles sur la ressource forestière du Nunavik. Ce groupe veillerait à faire l'analyse et l'intégration des connaissances nécessaires (efficacité du reboisement, qualité du sol, récoltes après feu, etc.) pour protéger et conserver la matière ligneuse du Nunavik.

2-Avant l'obtention des résultats issus de la recommandation précédente -sauf pour utilisation personnel- Le CCEK recommande à la Commission de suspendre toutes activités (coupe, récolte de bois, etc.) qui pourraient contribuer au déclin de la ressource forestière du Nunavik. Cette recommandation devrait être tenue tant que les effets de ces activités ne seront pas connus et qu'il n'existera pas de plan de gestion permettant le retour intégrale, dans un délais raisonnable, de la situation avant le déclin de la ressource forestière et des écosystèmes qui lui sont associés.

3- Le plan de gestion des forêts au-delà du 55è parallèle doit respecter le principe de conservation, le droit d'exploitation des ressources fauniques des inuits reconnus au Chapitre 24 de la *Convention de la Baie-James et du Nord québécois* (CBJNQ) et doit respecter les dispositions de la CBJNQ en matière de protection environnementale (Chapitre 23).

Vallée-Jonction le dimanche 23 janvier 2011

Comité consultatif de l'environnement Kativik
C.P. 930
Kuujjuaq (QC)
G0S 3J0

Objet : *Demande de permission pour travailler au MDDEP*

Chers membres,

En novembre 2010, j'ai accepté avec plaisir un engagement de travail d'un an pour remplacer Mme Stéphanie Benoît comme secrétaire exécutive au sein du CCEK.

Au début du mois de janvier 2011, j'ai reçu une offre d'embauche pour occuper un poste d'analyste aux affaires autochtones dans l'équipe du Ministère du Développement durable, de l'Environnement et des Parcs du Québec, Direction des évaluations environnementales, Service des projets industriels et nordiques.

Cet emploi m'est offert que pour 2 jours par semaines (14h) jusqu'en janvier 2012. Cette opportunité pourrait me mener à une tâche complète l'an prochain. C'est pourquoi, je souhaite accepter cet emploi. Toutefois, je désire honorer mes engagements envers le CCEK. Ainsi, j'ai obtenu l'autorisation du MDDEP de m'absenter sans salaire 1 semaine sur 6 en vue de pouvoir me rendre au Nunavik tel que je m'y étais engagé auprès du CCEK. Lors de mes séjours au Nunavik, je travaillerai à temps plein pour le CCEK.

Je m'engage donc à effectuer un minimum de 30h par semaine pour le CCEK. Ces heures seront effectuées majoritairement les lundi, mardi et mercredi. Je comprends que ce changement puisse vous apporter certaines craintes quant à la charge de travail à fournir pour le bon fonctionnement du CCEK, mais sachez que je tiens à ce que le CCEK puisse répondre à ces obligations et suis confiante que mon travail sera satisfaisant. Pour s'assurer de votre satisfaction à l'égard de mon travail, je vous invite à réévaluer la situation régulièrement. Je demeurerai à l'écoute de tous vos commentaires et prendrai le temps d'en discuter avec vous, à votre convenance.

Recevez mes salutations cordiales,

Nathalie Girard

Subject: RE : réunion du CCEK le 25 février 2011
Date: Thursday, January 20, 2011 8:01 AM
From: diane.myrand@mddep.gouv.qc.ca <diane.myrand@mddep.gouv.qc.ca>
To: Nathalie Girard <ngirard@krg.ca>

Développement durable,
Environnement et Parcs
Québec

Merci beaucoup Madame Girard,

Je communique l'information à mes deux collègues et note l'information à mon agenda.

Bonne fin de journée et au plaisir de vous rencontrer en février.

Diane Myrand, ing., M. Sc.
Hydrogéologue
418-521-3885 poste 4806

-----Message d'origine-----
De : Nathalie Girard [mailto:NGirard@krg.ca]
Envoyé : 19 janvier 2011 14:59
À : Myrand, Diane
Objet : réunion du CCEK le 25 février 2011

Bonjour Mme Myrand,
À moins d'avis contraire, nous vous attendrons à la salle 2376 du pavillon Abitibi Price de l'Université Laval le vendredi 25 février 2011 à 10h30. D'ici là, si vous avez des questions n'hésitez pas à me contacter. Je m'assure que nous aurons un technicien pour nous aider à faire la connexion entre votre ordinateur et le système de projection pour votre présentation power point.
Merci!

Nathalie Girard
Secrétaire exécutive / Executive secretary
Comité consultatif de l'environnement Kativik
Kativik Environmental Advisory Committee
C.P. 930, Kuujjuaq, Québec, J0M 1C0
(819) 964-2961 ext. 2287
(418) 253-5334 ou / or (418) 369-8703
www.keac-ccek.ca

Subject: RE : modification du Règlement sur l'eau potable
Date: Thursday, January 20, 2011 8:54 AM
From: carole.jutras@mddep.gouv.qc.ca <carole.jutras@mddep.gouv.qc.ca>
To: Nathalie Girard <ngirard@krg.ca>
Cc: "caroline.robert@mddep.gouv.qc.ca" <caroline.robert@mddep.gouv.qc.ca>

Développement durable,
Environnement et Parcs
Québec

Bonjour madame Girard,

Il me fait plaisir de répondre favorablement à votre demande. La consultation publique sur le projet de modification du Règlement sur la qualité de l'eau potable devait en principe se terminer le 23 janvier mais, compte tenu du congé des Fêtes, nous recevrons les commentaires jusqu'au 6 février 2011. Prenez note qu'aucune autre prolongation ne sera possible. Merci de votre collaboration pour respecter ce délai.

Mes salutations cordiales.

Carole Jutras
Chef du Service des eaux municipales
Direction des politiques de l'eau
Ministère du Développement durable, de l'Environnement et des Parcs
Édifice Marie-Guyart, 8e étage, b. 42
675, boul. René-Lévesque Est
Québec (Québec) G1R 5V7
Téléphone : (418) 521-3885, p. 4032
Télécopieur : (418) 644-2003
Courriel : carole.jutras@mddep.gouv.qc.ca

-----Message d'origine-----
De : Nathalie Girard [mailto:NGirard@krg.ca]
Envoyé : 19 janvier 2011 18:37
À : Jutras, Carole
Objet : modification du Règlement sur l'eau potable

Bonjour Madame Jutras,

Au nom du Comité consultatif de l'environnement Kativik, j'aimerais savoir s'il est possible d'obtenir une extension pour vous remettre nos commentaires au sujet de la modification du Règlement sur l'eau potable. Afin de terminer nos recherches auprès de divers intervenants, de peaufiner nos commentaires pour s'assurer de vous remmetre un document qui représente bien la situation particulière du Nunavik, nous souhaiterions ontenir dans la mesure du possible, un sursis de deux semaines, soit une remise le 4 février.

En l'attente de votre réponse, veuillez agréez, Madame, mes salutations

distinguées.

Nathalie Girard
Secrétaire exécutive / Executive secretary
Comité consultatif de l'environnement Kativik
Kativik Environmental Advisory Committee
C.P. 930, Kuujjuaq, Québec, J0M 1C0
(819) 964-2961 ext. 2287
(418) 253-5334 ou / or (418) 369-8703
www.keac-ccek.ca

RE: processus de révision de la LCÉE

ENVI@parl.gc.ca [ENVI@parl.gc.ca]

Vous avez transféré ce message le 2011-01-19 13:00.

Date d'envoi : 19 janvier 2011 11:49
À : Nathalie Girard
Cc : CarriSu@parl.gc.ca

Bonjour Mme Girard,

Tel que mentionné dans un échange de courriel avec vous en décembre dernier, je ne peux pas prévoir à quel moment et/ou le processus que le Comité choisira pour entreprendre la révision de la LCÉE, mais elle peut s'avérer de courte durée.

Il n'y a pas de documents (avis ou autres) mis à la disposition des gens intéressés par la révision de cette loi. Un des moyens d'avoir des informations sur les grandes orientations est peut-être de communiquer soit avec le ministère de l'environnement et/ou organisations responsables de mettre en œuvre cette loi - souvent des gens comme vous qui ont une position à savoir ce qui pourrait être amélioré ou les membres des différents partis politiques au sein du Comité.

Auriez-vous commencer à préparer vos propos dans un mémoire? Si oui, je vous encourage d'envoyer votre mémoire (ENVI@parl.gc.ca) s'il est prêt afin qu'on puisse le faire traduire et circuler aux membres du Comité. Entretemps, je vous suggère de suivre nos travaux via le site internet suivant :

http://www2.parl.gc.ca/

http://www2.parl.gc.ca/CommitteeBusiness/CommitteeMeetings.aspx?Cmte=ENVI&Language=F&Mode=1&Parl=40&Ses=3

Vous pouvez également suivre nos délibérations (si les réunions sont publiques) avec le lien suivant : http://parlvu.parl.gc.ca

Je vous remercie de l'intérêt apporté au comité permanent de l'environnement et du développement durable.

Guyanne L. Desforges
Procedural Clerk / Greffière à la procédure
Standing Committee on Environment and Sustainable Development /
Comité permanent de l'environnement et du développement durable
131 rue Queen street, 6th Floor / 6e étage
Office 34 / Bureau 34
Tel. / Tél. : 613 992-5023
Fax. / Téléc. : 613 996-1626

-----Original Message-----
From: Nathalie Girard [mailto:NGirard@krg.ca]
Sent: January 3, 2011 8:30 PM
To: ~Environment & Sustainable Development/Environnement et développement durable
Subject: processus de révision de la LCÉE

Bonjour,
Le Comité consultatif de l'environnement Kativik (CCEK) souhaitent remettre un avis au sujet de la révision de la Loi canadienne d'évaluation environementale. Les membres du CCEK souhaite savoir, d'une part, s'il y a, actuellement, des documents ou des avis mis à la disposition des gens intéressés par la révision de cette Loi. D'autre part, dans la mesure du possible, les membres souhaitent avoir l'état d''avancement du processus et des détails sur les grandes orientations.
Dans l'attente de vos renseignements, je vous prie d'accepter mes salutations distinguées.

Nathalie Girard
Secrétaire exécutive
Comité consultatif de l'environnement Kativik
(418) 253-5334
cellulaire:(418) 369-8703
ngirard@krg

Subject: Discussions avec le comité exécutif du CCEK
Date: Tuesday, January 18, 2011 3:10 PM
From: Boulanger,Francois [CEAA] <Francois.Boulanger@ceaa-acee.gc.ca>
To: keac-ccek <keac-ccek@krg.ca>
Cc: "marie-josee.Lizotte@mddep.gouv.qc.ca" <marie-josee.Lizotte@mddep.gouv.qc.ca>, "Lafreniere,Marie-Eve [CEAA]" <Marie-Eve.Lafreniere@ceaa-acee.gc.ca>

Bonjour Madame Girard,

Madame Lizotte, directrice de la direction des évaluations au MDDEP et moi-même voudrions discuter au plus tôt avec le comité exécutif du CCEK concernant l'établissement du budget pour son secrétariat pour l'année 2011-2012.

Notre objectif est d'échanger sur les besoins du CCEK pour l'année prochaine et de confirmer le plus tôt possible ce budget. Par ailleurs nous serions aussi intéressés de discuter des besoins à venir pour les trois à cinq années à venir.

Cette discussion peut avoir lieu en personne par vidéoconférence ou par téléconférence.

Prière de m'appeler pour que l'on établisse une date au plus tôt.

Bonne journée

François Boulanger

Directeur régional / Regional Director

(418) 649-6438 / Télécopieur - facsimile : (418) 649-6443

Agence canadienne d'évaluation environnementale / 1141, Route de l'Église, 2e étage, CP 9514, succ. Ste-Foy,

Québec (Québec), G1V 4B8

Canadian Environmental Assessment Agency / 1141 Route de l'Église, 2nd floor, Box *9514, station. Ste-Foy,*

Québec (Québec), G1V 4B8

Gouvernement du Canada / Government of Canada

Subject: Documents sur la révision de la LCEE
Date: Friday, January 7, 2011 12:37 PM
From: Graeme Morin (CCEBJ-JBACE) <graeme.morin@ccebj-jbace.ca>
To: Nathalie Girard <ngirard@krg.ca>
Cc: "'Marc Jetten (CCEBJ-JBACE)'" <marc.jetten@ccebj-jbace.ca>

Bonjour Mme Girard,

Vous trouverez les documents de référence que j'utilise pour le développement de mon document, ci-joint. J'aimerais m'excuser à l'avance : plusieurs de ces documents sont en anglais car c'est ma lange maternelle.

Graeme Morin
Analyste en environnement / Environmental Analyst
Comité consultatif pour l'environnement de la Baie James
James Bay Advisory Committee on the Environment
383, Rue St-Jacques, Bureau C-220
Montréal, Québec
Canada H2Y 1N9
Tel.: 514-286-4400
Fax: 514-284-0039
Courriel / Email: graeme.morin@ccebj-jbace.ca <mailto:graeme.morin@ccebj-jbace.ca>

Minister of the Environment

Ministre de l'Environnement

Ottawa, Canada K1A 0H3

DEC 2 2 2010

Comité consultatif
de l'environnement Kativik
reçu le
7 janv. 2011

Mr. Claude Abel
Chairperson
Kativik Environmental Advisory Committee
P.O. Box 930
Kuujjuaq, Quebec
J0M 1C0

Dear Mr. Abel:

I am responding to your letter of November 5 addressed to the former Minister of the Environment, indicating the Kativik Environmental Advisory Committee's interest in participating in the review of the *Canadian Environmental Assessment Act* (the Act).

There is a legislative requirement that a comprehensive review of the Act be undertaken by a parliamentary committee. As you are aware, the conduct of this review has been referred to the House of Commons Standing Committee on Environment and Sustainable Development (the Standing Committee).

The members of the Standing Committee will determine the timing and scope of the review, as well as opportunities for interested parties to present their views. I am not a member of the Standing Committee and do not have a role in determining how the review will be conducted. The Standing Committee has not yet provided details about how it intends to proceed.

Information about the Standing Committee can be found on its Web site at *http://www2.parl.gc.ca/CommitteeBusiness/CommitteeHome.aspx?Cmte=ENVI&Language=E&Mode=1&Parl=40&Ses=3* .

I note that you would like to submit a position paper in the context of the review of the Act. Correspondence regarding participation in the review, including submission of a paper, should be directed to the Standing Committee through the committee clerk, Ms. Guyanne L. Desforges, 131 Queen Street, Sixth Floor, House of Commons, Ottawa, Ontario, K1A 0A6, Tel.: 613-992-5023, Fax: 613-996-1626, ENVI@parl.gc.ca

.../2

I look forward to this review as an important opportunity to examine options to further improve federal environmental assessment. I encourage you to bring your views to the attention of the Standing Committee for its consideration.

Sincerely,

John Baird, P.C., M.P.

NEW MILLENNIUM
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BY MAIL

9 December, 2010

TO: Ms Stéphanie Benoit
Executive Secretary
Kativik Environmental Advisory Committee
C. P. 930
Kuujjuaq, Québec
J0M 1C0

Dear Ms Benoit,

Please find enclosed one hard and one soft copy of the following report:

- Groupe Hémisphères and Groupe Synergis. May 2010. *Research into Compensation Measures for Fish Habitat, DSOP, Final Technical Report, Unofficial Translation.* Submitted to New Millennium Capital Corp.

Yours truly,

Mireille Pilotte

Research Associate

NEW MILLENNIUM
CAPITAL CORP.

DIRECT-SHIPPING ORE PROJECT

UNOFFICIAL TRANSLATION

Research into Compensation Measures for Fish Habitat, DSOP
Final Technical Report

BY : Groupe Hémisphères and Groupe Synergis

May 2010

UNOFFICIAL ENGLISH TRANSLATION

New Millennium Capital Corp.

Research into Compensation Measures for Fish Habitat, DSOP

Final Technical Report

May 2010

HEMISPHERES
le groupe

SYNERGIS

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Guillaume Hubert	Biologist, B.Sc. Biol, Field Research

GROUPE HÉMISPHÈRES

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Hugo T. Robitaille	Biologist, M.Sc. Env, Project Director
Myrtille Husson	Project Manager, BAA, Management and Review
Attila Andrasi	Geomatician, Graduate Degree in cartography

Collaboration

Peter-Paul Mameanskum	Guide, field assistant and relations with First Nations

(See also the personal communications in the reference section.)

REVIEW AND PUBLISHING		
Number	**Date**	**Modification or publication note**
00	03-02-2010	Preliminary technical report
01	31-03-2010	Final technical report
02	27-04-2010	Final technical report
03	13-05-2010	Final technical report

Cover illustrations
Foreground: Littoral of Joan Lake
Background: Spawning area in Goodwood Lake

This document should be cited as:

Groupe Hémisphères (May 2010) *Research into Compensation Measures for Fish Habitat, DSOP.* Final technical report submitted to New Millennium Capital Corp., 64 p. and 1 appendix

TABLE OF CONTENTS

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LIST OF ABBREVIATIONS AND SYMBOLS

^{0}C	Celsius
cm	centimetre
DFO	Department of Fisheries and Oceans Canada
DO	Dissolved oxygen
DSOP	Direct-Shipping Ore Project
ha	hectare
HMP	Habitat Management Program
km	kilometre
km^2	square kilometre
m	metre
m/s	metre per second
m^2	square metre
MDDEP	Ministère du Développement durable, de l'Environnement et des Parcs
mg/L	milligramme per litre
mm	millimetre
MRNF	Ministère des Ressources naturelles et de la Faune
n.a	non applicable
NHWM	natural high water mark
pH	potential hydrogen
µmhos/cm	micromhos per centimetre
w	watershed

GLOSSARY

Emissary
Stream flowing out of a lake or a glacier (GDT)

Migration sill
Small structures that create low falls and small pools. (FFQ, 1996)

Tributary
Streams and rivers flowing into a larger water course (Brochu et Michel, 1994).

1 INTRODUCTION

The first goal of conservation is to ensure that the current productive capacity of existing habitats is maintained by applying the no net loss *guiding principle. Under this principle,* Habitat Management Program (HMP) *staff work with proponents to ensure their project proposals avoid harm or impacts to fish and fish habitat. If however, fish habitat losses are unavoidable, the productive capacity can be compensated by replacing or enhancing fish habitat.* (MPO, 2007)

In order to adequately address the *no net loss* principle, Groupe Hémisphères and Groupe Synergis carried out surveys of the aquatic environment (Groupe Hémisphères et Groupe Synergis, janvier 2010) so as to identify the characteristics of fish habitat within the areas that might be disturbed by the infrastructure of the DSOP. A second field campaign was carried out from August 24 to September 6, 2009 to study the sites that could be used as compensatory habitat for fish so as to respect the *no net loss* principle of DFO.

A pre-selection of compensatory areas was carried out at a first meeting between Groupe Hémisphères and Groupe Synergis in August 2009. The goal was to select lakes and water courses in which fish habitat could be increased to compensate for any loss of such habitat caused by the DSOP. As far as possible, such lakes and water courses were to be selected within the watersheds potentially affected by the DSOP and had to be easily accessible for the fishermen of the local communities. Conversations between Peter-Paul Mameanskum and some members of the local First Nations took place on November 29, 2009 to take into account the concerns of the local community with respect to compensatory habitat for fish.

The lakes that were selected are presented in Table 1. All the tributaries and emissaries of the selected lakes were also surveyed. The only compensatory water course located in Newfoundland-Labrador was Joan Brook (JB). Figure 1 shows the location of all the lakes and water courses included in the survey on compensatory habitat for fish in the study area.

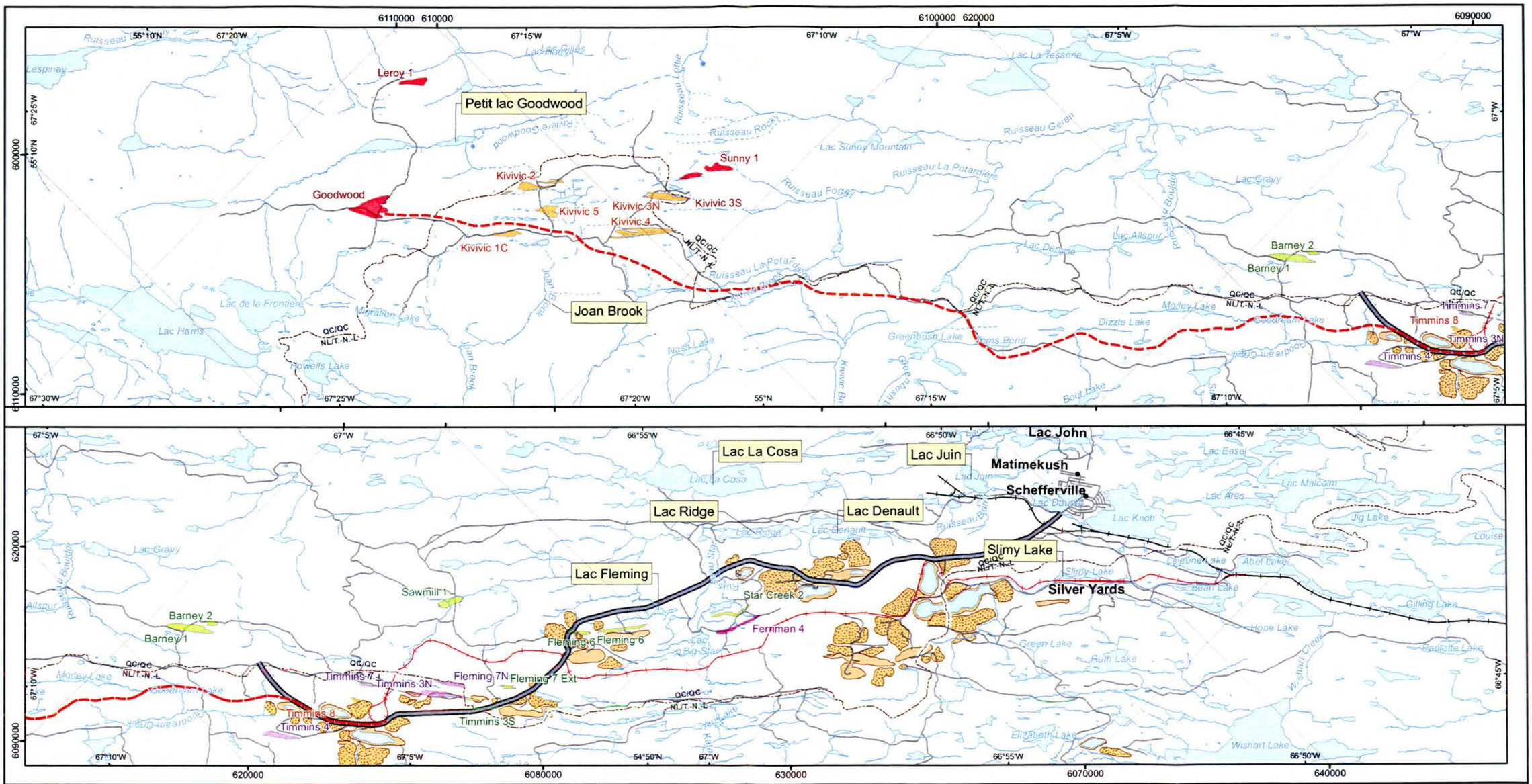
Table 1. Lakes studied in the various watersheds and their respective areas

Watershed	Watershed area (ha)	Lakes	Lake area (ha)
Goodwood	1 781	Little Goodwood Lake	15
		Ridge Lake	46
Denault	372	Denault Lake	61
		La Cosa Lake	20.1
Juin	557	Juin Lake	48
Fleming 6	656	Fleming Lake	4.2
Bean	1 087	Slimy Lake	13.7
Joan	1 767	Joan Brook (JB)	n.a.

Potential spawning grounds (in lakes or streams) free of obstacles to migration were located and were characterized with a view to creating or restoring fish habitat. Emphasis was put on sport fishing species in the region of Schefferville, that is Brook trout (*Salvelinus fontinalis*) and Lake trout (*Salvelinus namaycush*). Another aspect of the study consisted of reviewing the possibility of optimizing migratory routes to increase accessibility to habitat for the species in the various watershed (e.g., repairing culverts, enhancing migratory sills, etc.).

The lakes and water courses were surveyed solely to determine areas potentially available for fish habitat enhancement in case such habitats near the future mining sites are degraded. They were not assessed from the perspective of habitat requirements or carrying capacity.

Following the assessment of the potential enhancement areas, specific recommendations were prepared, and compensatory measures were proposed. A descriptive summary of the proposed enhancement work is presented in Appendix I. Consequently, the information provided in this document will make it possible to progress to the stages of assessing costs and preparing a work plan.



LEGEND/LÉGENDE

Infrastructures and mining components
infrastructures et composantes minières

Deposit/gisement
Assessment group/unité d'évaluation
- 1a
- 1b
- 2a
- 2b
- 2c

Proposed access road/ voie d'accès proposée
Projected railway/ voie ferrée projetée

*Hydronyms are oriented along the direction of water flow
*Les hydronymes sont orientés selon le sens d'écoulement de l'eau

Surveys/inventaires
XX Aquatic environment visited/ milieu aquatique visité

Map base/Fond de carte
- Border/frontière
- Main access road/ route d'accès principale
- Road/route
- Existing railway/ voie ferree existante
- Waterbody/ plan d'eau
- Disappearing pond/ étang disparaissant
- Wetland/milieu humide
- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Disappearing watercourse/ cours d'eau disparaissant
- Artesian spring/ source jaillissante
- Existing mined-out pit/ fosse existante épuisée
- Existing waste dump/ halde de stériles existante
- Contour interval/ courbe de niveau

Aquatic Environment Surveys

Inventaires du milieu aquatique

Compensation

0 1 2 3 4 5 6 7 8
kiometers/kilomètres

SCALE/ÉCHELLE:
1:100 000

UTM 19N NAD 83

FILE, VERSION, DATE, AUTHOR/ FICHIER, VERSION, DATE, AUTEUR: GH-0155-01, 2010-02-23, J.T.

HEMISPHERES le groupe

SOURCES:
Government of Canada, NTDB, 1:50,000, 1979
Government of NL and government of Quebec, Boundary used for claims
New Millennium Capital Corp., Mining sites and roads
Groupe Hémisphères, Hydrology update, 2009

Gouvernement du Canada, BNDT, 1/50 000, 1979
Gouvernement de T-N-L et gouvernement du Québec, frontière utilisée pour les titres miniers
New Millennium Capital Corp., gisements et routes
Groupe Hémisphères, mise à jour de l'hydrologie, 2009

Figure 1

2 METHODOLOGY

2.1 Assessment of spawning grounds

A fish habitat survey was carried out along each water course feeding from or discharging into each pre-selected lake. Water courses containing habitat customarily used by Brook trout were examined on foot until an obstacle to fish migration was met, or until the habitat was no longer favourable to Brook trout. The presence of fry of any species was recorded.

The shores of all the lakes were examined from a boat using polarized glasses in order to locate potential spawning grounds and areas that could be enhanced for Lake trout or Brook trout spawning.

2.1.1 Physical and chemical data

In situ measurements were taken in all the water bodies visited. Dissolved oxygen and temperature readings were taken over the entire water column using a YSI probe (Model 51B). Conductivity and pH were measured using a portable Hanna probe. Water transparency was evaluated using a Secchi disk.

2.2 Lakes

2.2.1 Characterization of potential enhancement areas

As a general rule, potential enhancement areas were characterized according to several parameters. The degree of erosion was assessed as low (80% of the bank was stable), moderate (50-80% of the bank was stable) or high (less than 50% of the bank was stable). The NHWM was determined according to the simplified botanical method (MDDEP, 2007). The slope of the bank was assessed as gentle (less than 10%), moderate (10-30%) or steep (more than 30%). The extent of overhanging riparian plant cover (herbaceous, shrubs) and of the canopy (deciduous, conifers) above the water was assessed as a percentage. The composition of the substrate was recorded as the percentage cover of each class (Table 2). The coordinates at the beginning and the end of each spawning area were recorded using a GPS.

Table 2. Classes, types and dimensions of substrate surveyed

Class	Type	Dimension (mm)
Fine	Clay	< 0.075 texture
	Loam	< 0.075
	Fine sand	0.075 - 2
	Coarse sand	2 - 5
Medium	Gravel	5 - 40
	Pebble	40 - 80
	Cobble	80 - 250
Coarse	Rock	> 250
	Bedrock	Continuous rock

Adapted from Bradbury *et al.* (2001), Sooley *et al.* (1998) and MRNF (2008)

2.3 Water courses

As soon as a potential compensatory area (suitable for spawning or for enhancement) was identified, its location was recorded and it was characterized.

2.3.1 General characteristics assessed in potential enhancement areas

The characterization proceeded upstream from the point where the stream flowed into a lake. Obstacles to migration (temporary or permanent), the horizontal course of the streambed, the slope of the segment (measured using a clinometer), the bed profile (V-shaped, U-shaped, flat or irregular) and the type of channel (Table 3) were recorded.

Table 3. Types of channels

Channel pattern	Description
Run	Section of a water course with vigorous flow and some surface agitation, but without major obstruction to the current; coarse substrate.
Pool/riffle	Sub-system integrated in the flow channel type that includes riffles (shallow zones with vigorous agitated current, turbulent water and partially exposed substrate, usually gravel or pebble) and pools (deeper areas over part of or the whole width of the water course; velocity is reduced due to the depth or width of the area; streambed generally rounded in the trenches).
Pocketwater	Zone where turbulence increases behind obstacles protruding above the surface, such as boulders creating a vortex or erosion holes.
Flat pool/steady	Section of a water course where the surface water is calm and the substrate generally composed of organic matter, sand, silt or fine gravel. The bed is usually flat. This habitat differs from pools by its length and gentle slope. The term also designates backflow caused by a dam, sill or weir (e.g. a pool upstream from a beaver dam).
Glide	Wide and shallow pool, with a flow from slow to moderate and a calm, turbulence-free surface. Substrate usually made up of sand, gravel and pebbles.
Rapid*	Zone with a pronounced gradient, irregular and fast current and often with turbulent white water. Mainly associated with wider segments of water courses and rivers.
Cascade/Waterfall*	Cascade: Similar to rapids but steeper, with a significant drop, strong turbulence and large boulders. Unlike rapids, cascades may hinder fish migration. Waterfall: Water flow falling from a cliff or a sudden drop in elevation. Creates an absolutely insurmountable obstacle.

* No transect was carried out in such zones for safety reasons.

The water level (high, average, minimum), the ambient temperature and the vegetation and plant cover on both banks (Table 4) were also noted.

Table 4. Types and characteristics of plant cover

Type	Characteristics
Overhanging	Cover produced by herbaceous plants and shrubs of maximum size equivalent to1 m lying or suspended above the water along the banks.
Integrated (obstacles)	Cover usually composed of fallen trees, rocks, boulders or other accumulated debris. Also includes overhanging banks.
Integrated (vegetation)	Cover composed of living plants, including herbaceous plants, macrophytes, mosses and algae.
Canopy	Cover produced by mature trees along the banks, but including only the parts overhanging the water course.

The flow velocity, depth of the water, composition of the substrate, slope, aquatic vegetation (presence/absence) and the wet width of the water course were recorded to characterize the overall habitat. The height of the NHWM was measured, as was the channel width. Depth measurements were taken (using a measuring stick) at intervals of 1/3, 1/2 and 2/3 of the wet width. Flow velocity was also measured at each of the three measuring points using a Model FP101 Global Flow Probe velocimeter. It was measured at 60% of the depth when the latter was less than 85 cm. The average of the flow velocities measured at 20% and at 80% of the depth was used when the depth exceeded 85 cm. The composition of the substrate along the transect was recorded as the percentage of the areal coverage by each class of substrate (Table 2).

In the tables entitled "Summary of field observations and preliminary compensatory measures", it is possible that the numbers in the second column do not correspond with those in the last column. That is because the former (potential enhancement area (m^2)) represent the total area to be enhanced whereas the latter (work required) correspond, among other things, to gravel areas to be modified. These numbers are approximate and are subject to change depending on unforeseen field situations and on natural changes that may have occurred in the water courses since the last survey.

Methods to enhance fish habitat were selected taking into account the natural conditions in the areas surveyed and the selection criteria described on the reference cards in Appendix I.

3 RESULTS

North sector (DSO4 or assessment groups 2a and 2b)

3.1 Joan Brook (JB)

3.1.1 No potential enhancement areas

The JB water course flows out of Joan Lake, on the northeast side of the road, and ends in the Howells River. The segment from the Lake to the road and the studied segment (from the road to 1.1 km downstream) were classified as intermittent since water does not flow over the stream bed without interruption. On December 1, 2009, Peter-Paul Mameanskum noted that part of the stream was dry. He decided, therefore, to disregard that water course segment for the compensatory habitat plan (Figure 2).

The surveyed segment started at the road and descended westward 1.1 km (number 1 circled in Figure 2). That segment was considered as intermittent and was not retained as fish habitat. The area with enhancement potential (number 2 circled on Figure 2) commenced at km 1.1 and extended to km 1.8. Finally, another segment of 1.8 km, commencing at km 1.8 and extending to km 3.6, was considered to be without enhancement potential (number 3 circled on Figure 2). Although that segment had permanent flow, it was rejected as a potential enhancement area because the swiftness of the flow would disturb the substrate required for a spawning area. Table 5 summarizes the characterization carried out in the JB water course, which contained no potential enhancement areas.

Newfoundland-and-Labrador/Terre-Neuve-et-Labrador

Quebec/Québec

Joan Lake

Joan Brook

Note : Carte à titre indicatif seulement, veuillez utiliser les points GPS originaux pour géoréférence terrain/
Note : Map for illustrative purposes only, please use the original GPS points for georeference on the field

Figure 2 : Potential Habitat Management for Fish / potentiel d'aménagement d'habitat pour le poisson Joan brook/ ruisseau Joan

Compensatory measure/ mesure compensatoire

- No potential/sans potentiel
- Good potential/bon potentiel
- Cleaning/nettoyage

Basemap/fond de carte

- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Waterboby/plan d'eau
- Wetland/milieu humide
- Secondary road/ route secondaire
- Characterization area/ étendue de la caractérisation
- Border/frontière
- Contour interval (ft)/ courbe de niveau (pi)

0 250 500 1 000 m

No. de lot :	Centroïde du lot : X : 607 187 Y : 6 102 726 Projection : UTM zone 19N, NAD 83
No. Projet Groupe Synergis 0910-088-ENVC	BNDT/NTDB 1 :50,000 (RNC/NRC) BDTQ, 1 :20,000, (MRNF) Hydrology/hydrologie, GHI (2009).

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Checked by/vérifié par : Luc Guillemette (biologiste)

Date : 2010-04-22

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Table 5. Joan Brook (JB) Segment – Without potential enhancement areas

Water course	Latitude °N Longitude °W	Description	Studied area (m^2)	Photos
JB	S[1]: 55.05718 S: 67.32236 E[2]: 55.05821 E: 67.30813	Sampling date: 28/08/2009 Tributary located southwest of Joan Lake. Length 1423 m; Width 17 m. Substrate: 40% pebbles, 30% cobbles, 20% gravel and 10% boulders. Clean. Average depth 0.22 m; Approximate flow velocity 0.65 m/s; Approximate temperature 4.4°C; pH 8.1.	**146 569**	

[1] S = start of the studied segment [2] E = end of the studied segment

3.1.2 Potential enhancement areas

Table 6 describes the potential enhancement areas for Brook trout compensatory habitat in a segment of Joan Brook. The studied area having enhancement potential was considered as a permanent stream located 1.3 km downstream from the road (Figure 2). As shown on the photos taken in September (Table 5), the substrate appeared coarse. That is a sign of a relatively strong flow (especially during the spring runoff) carrying away gravel and other fine substrates. Nevertheless, within that segment of Joan Brook (Figure 2), a 200 m^2 area could be enhanced with 134 spawning areas of 1.5 m^2 each. That segment is not too steep and the flow velocity there is not too high (0.32 m/s). It would be important to check the flow velocity during the spawning season to ensure that it remains within the comfort zone of Brook trout.

Table 6. Joan Brook (JB) Segment – With potential enhancement areas

Water course	Latitude °N Longitude °W	Description	Area[1] (m^2)	Photos
JB *In green segment (Figure 2)*	55.059315 67.313223	Sampling date: 03/09/2009 Tributary located south-west of access road. Approximate length 1157 m; Average width 3.2 m. Substrate: 10% gravel, 40% cobbles, 50% boulders. Clean. Average depth 0.20 m; Approximate flow velocity 0.32 m/s.	200	 
JB *In green segment (Figure 2)*	55.055106 67.327332			

[1] Area = potential enhancement area

3.1.3 *Proposed compensatory measures*

The total area that can be enhanced as compensatory habitat is 200 m^2 divided into 134 spawning grounds.

Table 7 presents a summary of the suggested compensatory measures and work required. A schematic of the enhancement work for the JB water course is presented in Figure 3.

Table 7. Summary of field observations and preliminary compensatory measures

Water course	Potential enhancement area (m^2)	Suggested compensatory measure	Work required
DSO4 (Assessment groups 2a and 2b)			
JB	**200**	Enhancement of Brook trout spawning grounds	• Place large boulder (≈1 m by 1 m) upstream from chosen area. • Dig, clean and level the bed at chosen area (1.5 m^2). • Add a 0.3 m layer of gravel (9 to 40 mm).

The goal of this type of enhancement is to shelter spawning grounds by placing boulders upstream so that the substrate downstream is not disturbed during runoff periods. If present in the river, large boulders should be used prior to the addition of new boulders. To help keep the substrate in place, the spawning area should be framed with rocks (Figure 3).

The main technical difficulty in carrying out that enhancement measure is transporting approximately 60 m^3 of substrate material to the site.

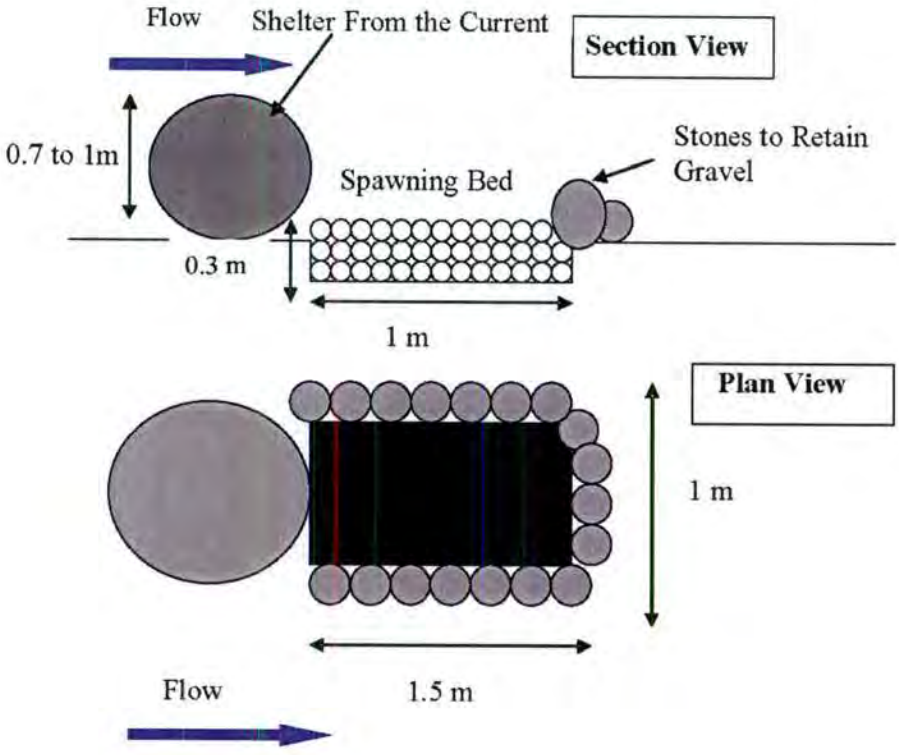


Figure 3. Schematic of JB water course spawning grounds installation

3.2 Little Goodwood Lake

The survey in this sector was limited to characterizing Little Goodwood Lake, its emissary E-1 and its tributary T-2. The survey revealed a potential enhancement area for Lake trout spawning in Little Goodwood Lake (Figure 4). In addition, the upstream tributary of Little Goodwood Lake (GU) presented interesting characteristics for enhancing Brook trout spawning grounds. GU is located between a pond and Little Goodwood Lake. Within that segment, three potential enhancement areas were located (GU-1, GU-2 and GU-3).

3.2.1 No potential enhancement areas

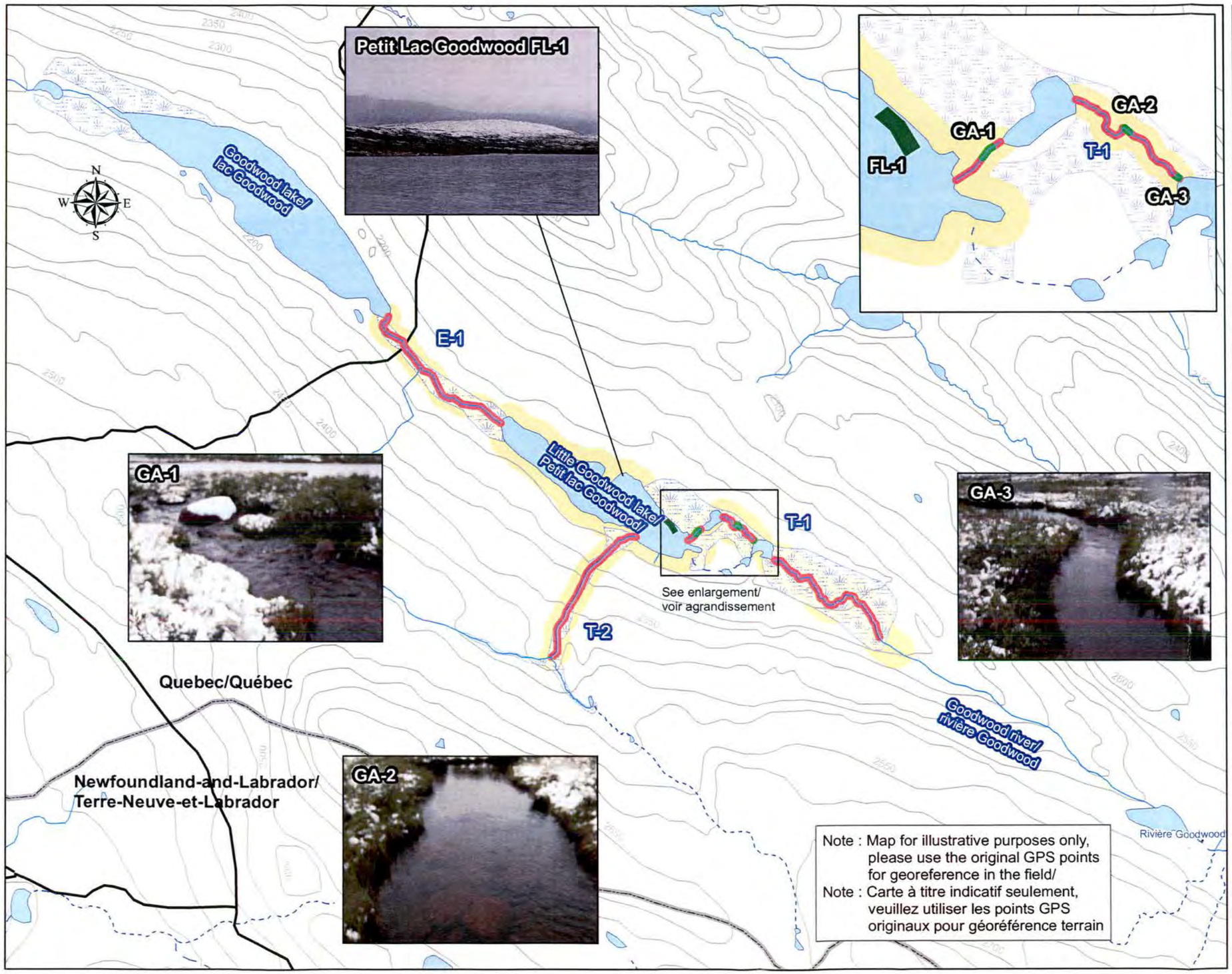
With respect to Little Goodwood Lake, both the emissary (E-1) and the tributary (T-2) were characterized but presented no potential enhancement areas for Brook trout (Figure 4). Table 8 describes the areas without enhancement potential.

Table 8. Emissary E-1 and tributary T-2 of Little Goodwood Lake – Without potential enhancement areas

Water course	Latitude °N Longitude °W	Description	Photos
Emissary E-1	55.09844 67.31043	Sampling date: 27/08/2009 Emissary located northwest of Little Goodwood Lake. Presence of ericaceae; flow slow to non-existent. No potential for Brook trout.	
Tributary T-2	55.09374 67.30133	Sampling date: 27/08/2009 Tributary located southwest of little Goodwood Lake. Presence of ericaceae; flow slow to non-existent. No potential for Brook trout.	

3.2.2 Potential enhancement areas

Table 9 describes the potential enhancement areas for Brook trout and Lake trout compensatory habitat in Little Goodwood Lake and its tributary (T-1). The survey of the shoreline revealed some areas with potential for Lake trout spawning. Given the limited extent of such areas (40 m^2), it would be desirable to create more. The lack of potential spawning areas is probably caused by the limited effect of the wind on such a small body of water (area: 15.6 ha). Figure 4 shows the potential enhancement areas.



Note : Map for illustrative purposes only, please use the original GPS points for georeference in the field/
Note : Carte à titre indicatif seulement, veuillez utiliser les points GPS originaux pour géoréférence terrain

Figure 4 :
Potential Habitat Management for Fish / potentiel d'aménagement d'habitat pour le poisson
Lake Little Goodwood/ lac Petit Goodwood

Compensatory measure/ mesure compensatoire
- No potential/sans potentiel
- Good potential/bon potentiel
- Cleaning/nettoyage
- Good potential for spawning area/ bon potentiel pour frayère

Base map/fond de carte
- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Secondary road/ route secondaire
- Contour interval (ft)/ courbe de niveau (pi)
- Waterbody/plan d'eau
- Wetland/milieu humide
- Characterization area/ étendue de la caractérisation
- Border/frontière

0 250 500 1 000 m

No. de lot :	Centroïde du lot : X : 608 482 Y : 6 106 815 Projection : UTM zone 19N, NAD 83
No. Projet Groupe Synergis 0910-088-ENVC	BNDT/NTDB 1 :50,000 (RNC/NRC) BDTQ, 1 :20,000, (MRNF) Hydrology/hydrologie, GHI (2009).

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Checked by/vérifié par : Luc Guillemette (biologiste)

Date : 2010-04-22

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Table 9. Little Goodwood Lake and Upstream Tributary – With potential enhancement areas

Lake / water course	Latitude °N Longitude °W	Description	Area[1] (m^2)	Photos
Little Goodwood Lake	55.09420 67.29884	Sampling date: 26/08/2009 Portion of lake 20 m long by 2 m wide. Substrate: 5% boulders, 10% gravel, 50% pebbles, 30% cobbles, 5% silt. Temperature 4.4°C; DO 12 mg/L; pH 8.1.	40	
GU-1	55.09387 67.29726	Sampling date: 27/08/2009 Tributary area. Substrate: 80% cobbles, 10% boulders and 10% pebbles. Moderately clogged. Average depth 0.25 m; Approximate flow velocity 0.35 m/s. Temperature 2.3°C; pH 8.6.	60	
GU-2	55.09397 67.29455	Sampling date: 27/08/2009 Tributary area; Substrate: 50% pebbles, 30% cobbles, 15% gravel, 5% boulders. Moderately clogged. Approximate depth 0.35 m; Approximate flow velocity 0.50 m/s. Temperature 2.3°C; pH 8.2.	32	
GU-3	55.09352 67.29336	Sampling date: 27/08/2009 Tributary area; Substrate: 15% boulders, 30% cobbles, 50%pebbles, 5% silt/mud. Moderately clogged. Average depth 0.25 m; Average flow velocity 0.45 m/s; Temperature 2.8°C; pH 8.2.	23	

[1] Area = potential enhancement area

3.2.3 *Proposed compensatory measures*

The total area that can be enhanced as compensatory habitat is 155 m^2: 40 m^2 in Little Goodwood Lake and 115 m^2 divided into three areas in the upstream tributary (GU).

Table 10 presents a summary of the suggested compensatory measures and work required. Schematics of the enhancement work for each area are presented in Figures 5, 6, 7 and 8.

Table 10. Summary of field observations and preliminary compensatory measures

Water course	Potential enhancement area (m^2)	Proposed compensatory measures	Work required
DSO4 (Assessment groups 2a and 2b)			
Little Goodwood Lake	**40**	Enhancement of Lake trout spawning grounds	• Dig, clean and level bed at chosen area; • Add at least a 50 cm layer of substrate (50 to 300 mm).
GU-1	**60**	Enhancement of Brook trout spawning grounds	• Block right arm of stream with boulders and cobbles to increase flow; • Remove small boulders; • Remove existing substrate (≈30 cm); • Replace with an equal quantity of gravel (9 to 40 mm); • Keep large boulders in place to create shelters.
GU-2 GU-3	**32** **23**	Enhancement of Brook trout spawning grounds	• Remove ≈30 cm of substrate, replace with equivalent quantity of gravel (9 to 40 mm); • Stabilize left and right banks with small boulders; • Add large boulders on either side of GU-2 to reinforce banks.

The main technical difficulty in carrying out that enhancement measure is transporting approximately 55 m^3 of substrate material to the site.

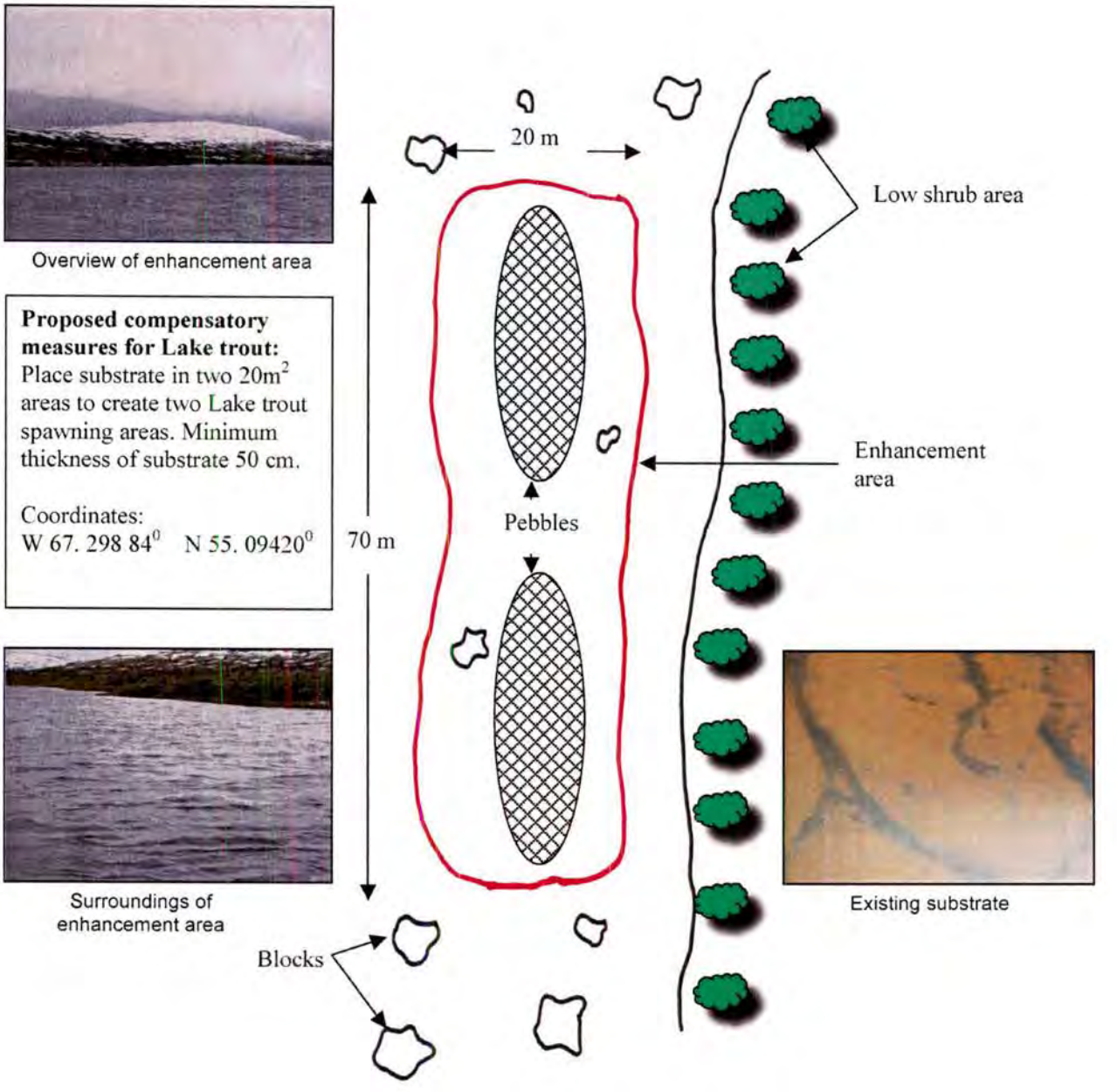
Lake Spawning Ground (LSG-1) in Little Goodwood Lake

Overview of enhancement area

Proposed compensatory measures for Lake trout:
Place substrate in two $20m^2$ areas to create two Lake trout spawning areas. Minimum thickness of substrate 50 cm.

Coordinates:
W 67. 298 84^0 N 55. 09420^0

Surroundings of enhancement area



Existing substrate

Figure 5. Schematic of lake spawning ground (LSG-1) in Little Goodwood Lake

Spawning Ground (GU-1) in Tributary (T-1) of Little Goodwood Lake

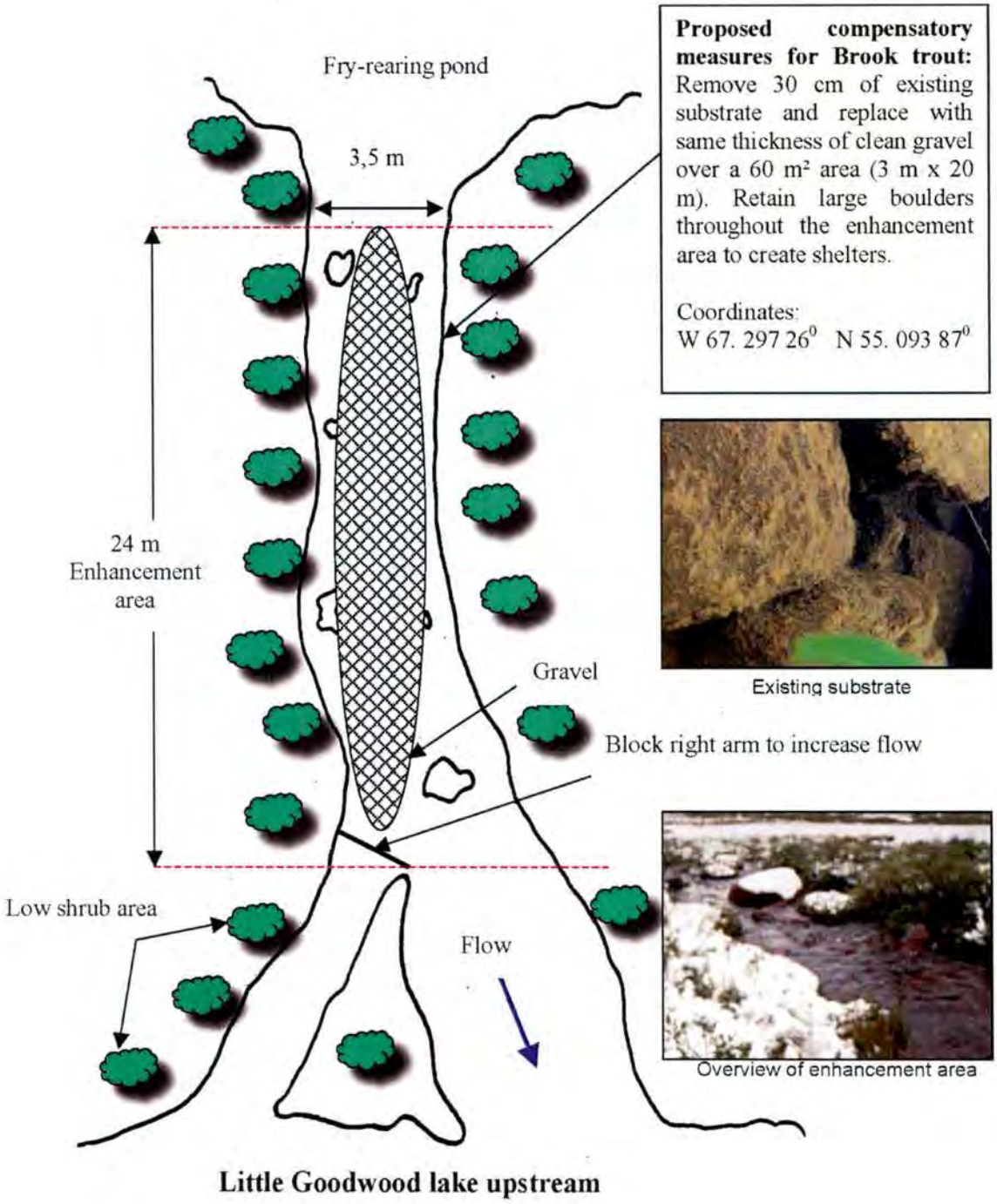


Figure 6. Schematic of spawning ground (GU-1) in tributary (T-1) of Little Goodwood Lake

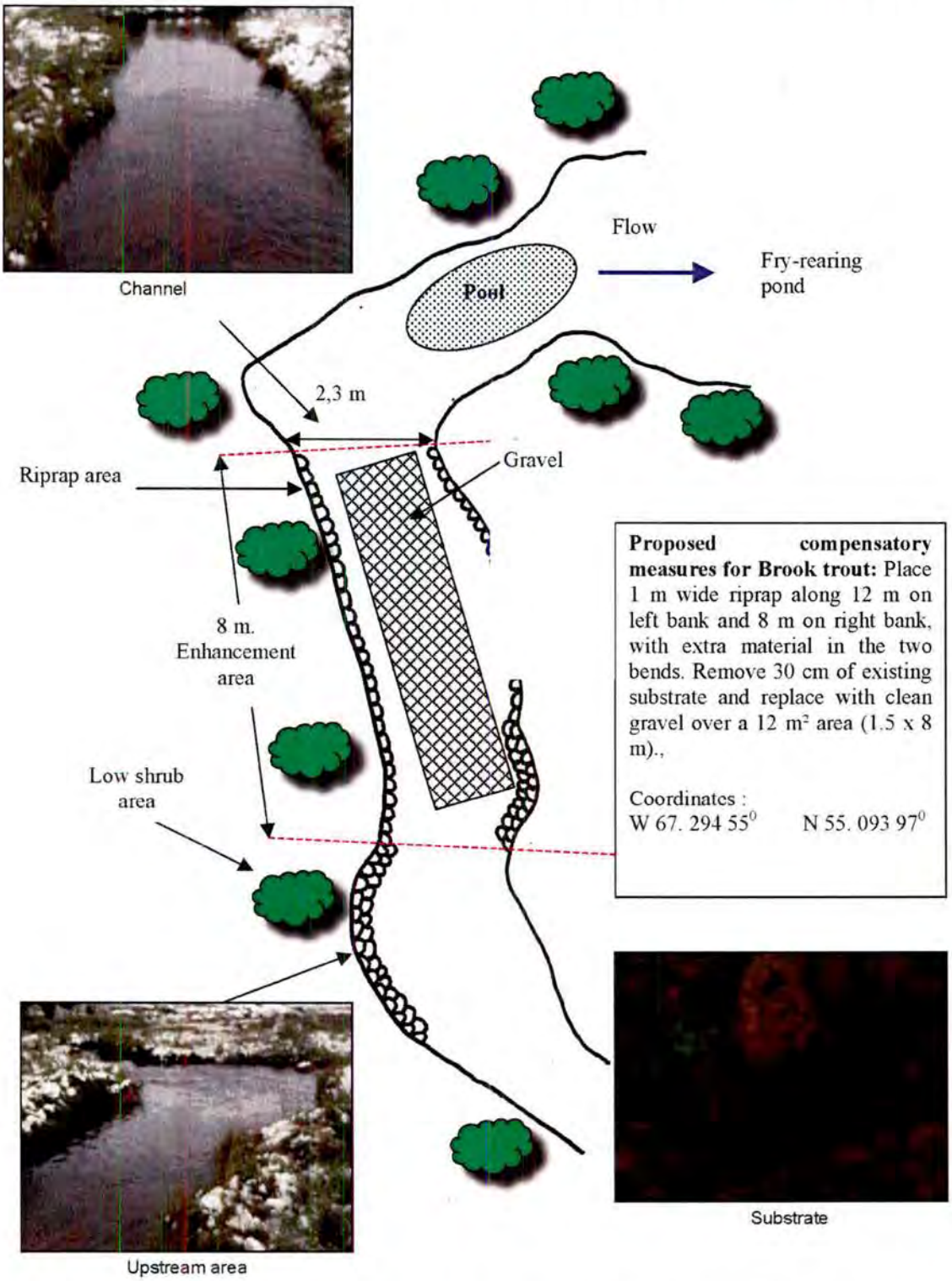


Figure 7. Schematic of spawning ground (GU-2) in tributary (T1) of Little Goodwood Lake

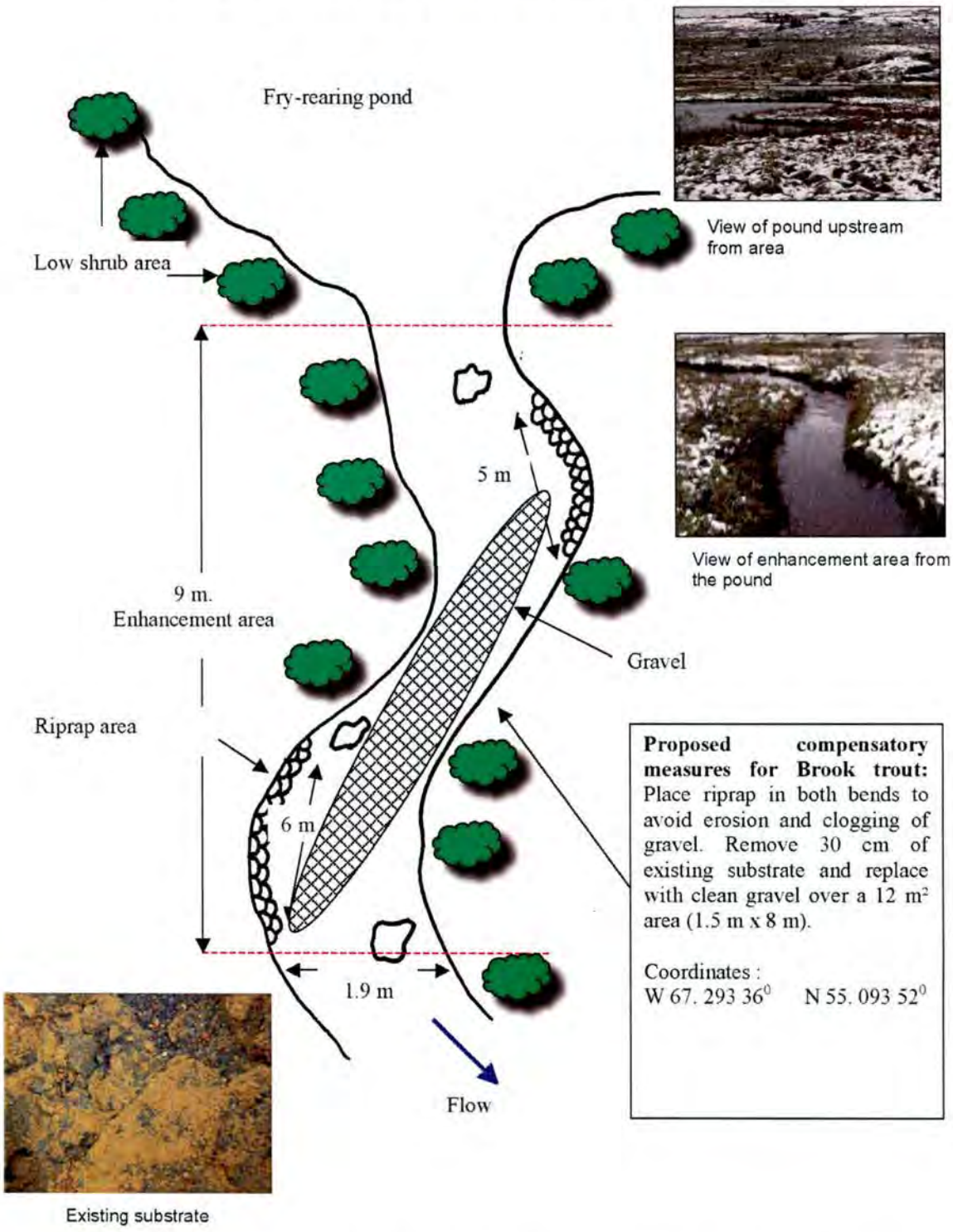


Figure 8. Schematic of spawning ground (GU-3) in tributary (T1) of Little Goodwood Lake

3.3 Ridge Lake

3.3.1 No potential enhancement areas

Table 11 summarizes the survey carried out in the tributaries (T1 and T2) of Ridge Lake. Neither of those can be used for fish compensatory habitat enhancement, since they are small streams with practically no flow (Figure 9).

Table 11. Ridge Lake tributaries T1 et T2 - Without potential enhancement areas

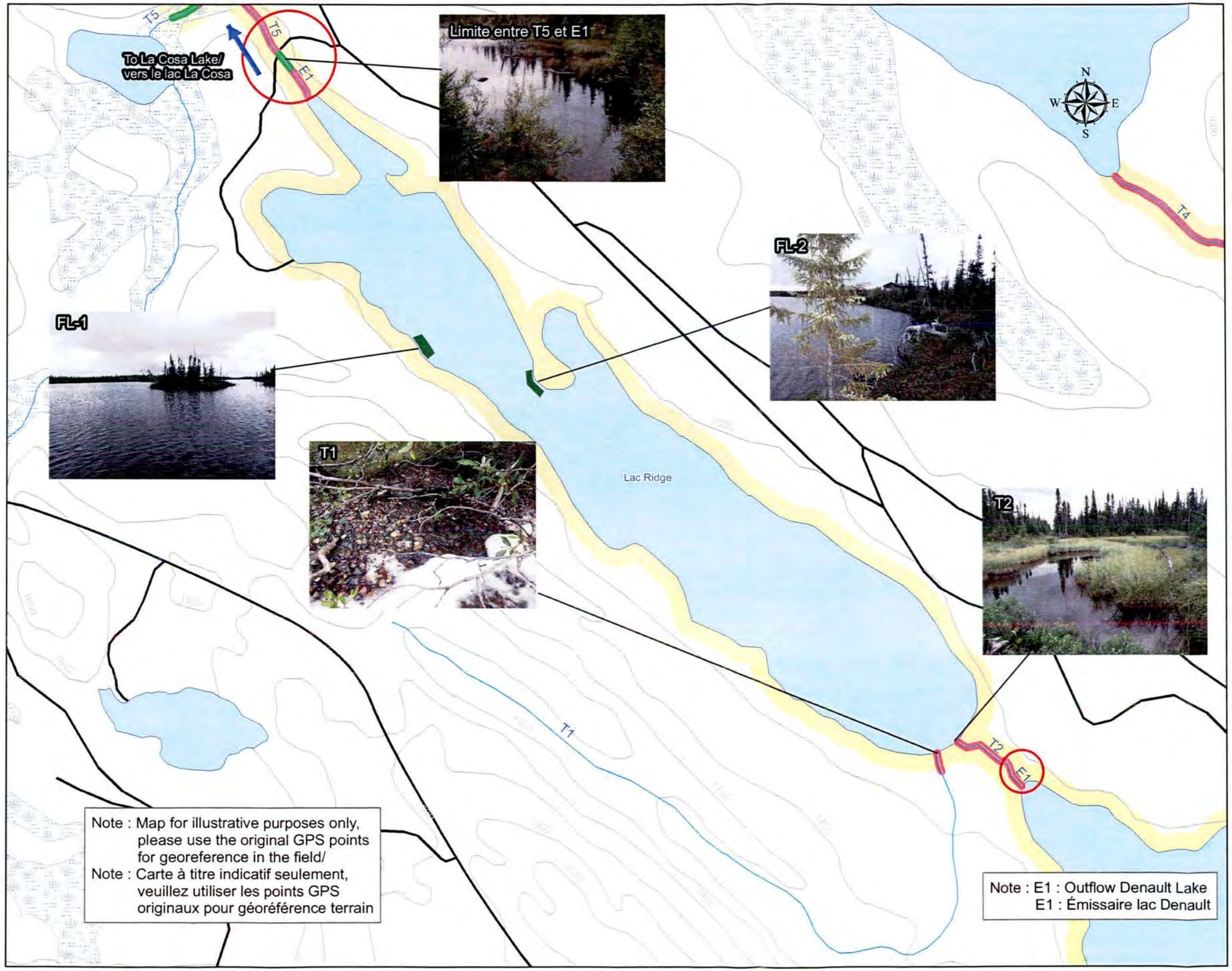
Water course	Latitude °N Longitude °W	Description	Photos
T1	54.84820 66.90583	Sampling date: 29/08/2009 Tributary located upstream of Ridge Lake; only the downstream end was characterized (≈300 m). Presence of ericaceae and low, almost non-existent, flow. No potential for Brook trout. *The photo shows that water from the lake does not reach the mouth of the tributary.*	
T2	54.84783 66.90644	Sampling date: 29/08/2009 Tributary located upstream from Ridge Lake, slightly to the east of T1. Presence of ericaceae and low, almost non-existent, flow. No potential for Brook trout. *The photo shows that water from the lake does not reach the mouth of the tributary.*	

3.3.2 Potential enhancement areas

Table 12 describes the potential enhancement areas for Brook trout and Lake trout compensatory habitat in Ridge Lake. Those areas are shown on Figure 9.

A potential enhancement area for Brook trout was identified by another survey conducted at the emissary of Ridge Lake (Figure 9).

Figure : 9
Potential Habitat Management for Fish / potentiel d'aménagement d'habitat pour le poisson Lake/lac Ridge



Compensatory measure/ mesure compensatoire

- No potential/sans potentiel
- Good potential/bon potentiel
- Cleaning/nettoyage
- Good potential for spawning area/ bon potentiel pour frayère

Base map/fond de carte

- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Waterbody/plan d'eau
- Wetland/milieu humide
- Secondary road/ route secondaire
- Characterization area/ étendue de la caractérisation
- Contour interval (ft)/ courbe de niveau (pi)

0 125 250 500 m

No. de lot :	Centroïde du lot : X : 633 750 Y : 6 080 432 Projection : UTM zone 19N, NAD 83
No. Projet Groupe Synergis 0910-088-ENVC	BNDT/NTDB 1 :50,000 (RNC/NRC) BDTQ, 1 :20,000, (MRNF) Hydrology/hydrologie, GHI (2009).

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Checked by/vérifié par : Luc Guillemette (biologiste)

Date : 2010-04-22

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Table 12. Ridge Lake and streams – With potential enhancement areas

Lake / Water course	Latitude °N Longitude °W	Description	Area[1] (m^2)	Photos
Ridge Lake LSG-1	54.85177 66.91738	Sampling date: 29/08/2009 Lake area 5 m long by 2 m wide. Substrate: 10% cobbles, 50% pebbles, 30% gravel, 5% fine sand, 5% silt. Slightly clogged with a sandy point (seen on photo) well exposed to dominant wind. Temperature 12.1°C; DO 6.9mg/L; pH 8.2.	8	 
Ridge Lake LSG-2	54.85565 66.92379	Sampling date: 29/08/2009 Lake area 18 m long by 3 m wide. Substrate: 10% cobbles, 40% pebbles, 40% gravel, 10% silt. Moderately clogged. Temperature:12.1°C; DO 6.9mg/L; pH 8.2.	16	 

Lake / Water course	Latitude °N Longitude °W	Description	Area[1] (m^2)	Photos
Emissary E-1	54,86129 66,92796	Sampling date: 29/08/2009 Substrate: 10% cobbles, 35% pebbles, 50% gravel, 5% fine sand. Clean. Average depth 0.22 m; Approximate flow velocity 0.17 m/s; Temperature 12.0°C; DO 6.9mg/L; pH 8.5.	**7.5**	 

[1] Area = potential enhancement area.

3.3.3 *Proposed compensatory measures*

The total area that can be enhanced as compensatory habitat is 31.5 m^2: 24 m^2 in Ridge Lake and 7.5 m^2 in its emissary. Table 13 presents a summary of the suggested compensatory measures and work required. Schematics of the enhancement work for each area are presented in Figures 11, 12, 13.

Table 13. Summary of field observations and preliminary compensatory measures

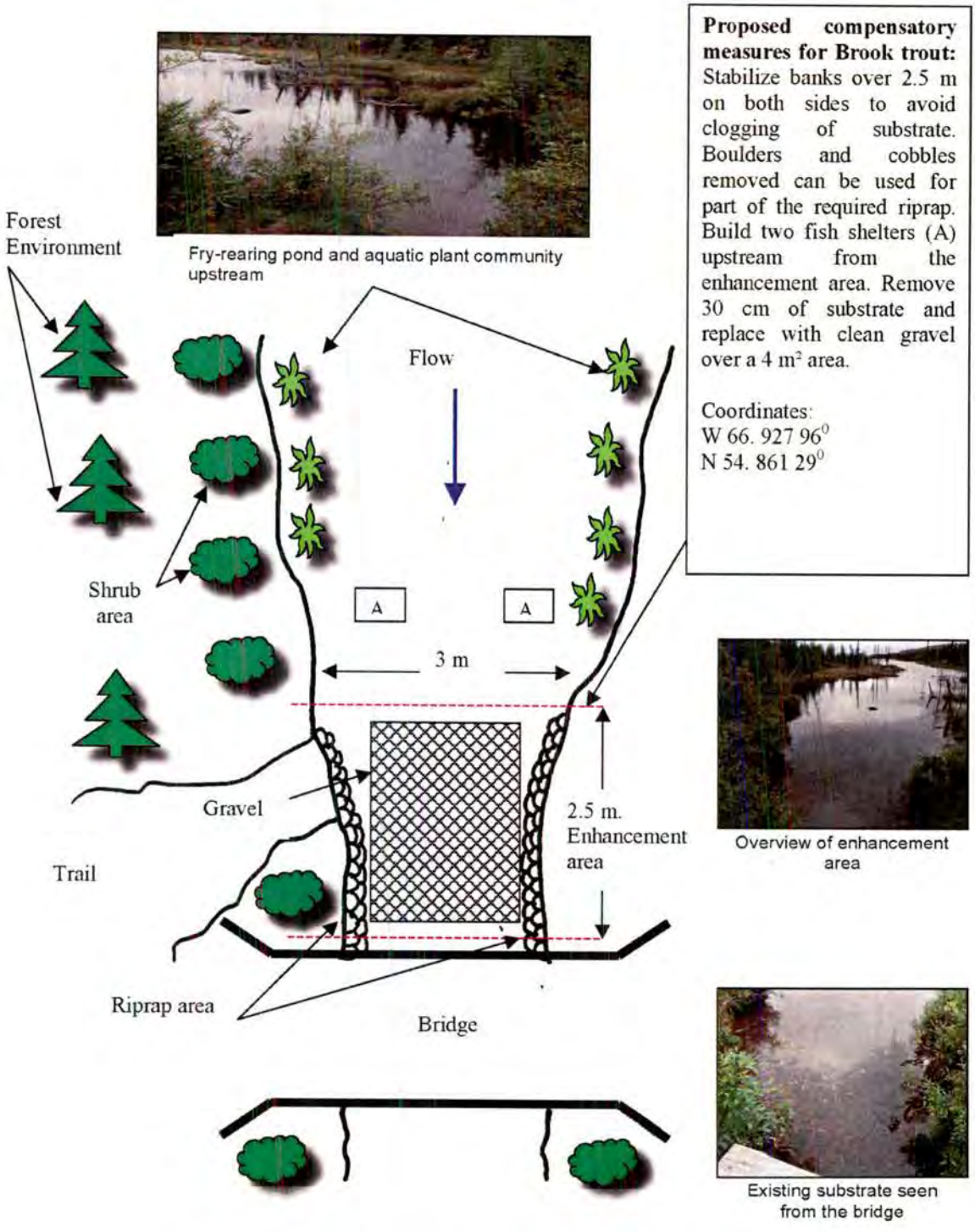
Water course	Potential enhancement area (m^2)	Proposed compensatory measures	Required work
DSO4 (Assessment groups 2a and 2b)			
Ridge Lake LSG-1	8	Enhancement of Lake trout spawning grounds	• Add a 50 to 300 mm layer of substrate over a 8 m^2 area within the suitable area.
Ridge Lake LSG-2	16	Enhancement of Lake trout spawning grounds	• Place a layer of pebbles of at least 50 cm in two spawning areas of 4 m^2 each. • Construct four fish shelters with boulders.
Emissary E-1	7,5	Enhancement of Brook trout spawning grounds	• Remove ≈30 cm of substrate and replace with an equivalent layer of gravel (9 to 40 mm) over a 4 m^2 area. • Stabilize right and left banks with small boulders over 2.5 m to avoid clogging of substrate. Boulders and cobbles removed from the stream bed can be used as riprap. Plant vegetation in between boulders to promote the quick re-vegetation of the banks. • Construct two fish shelters (A) upstream form the enhancement area.

The main technical difficulty in carrying out that enhancement measure is transporting approximately 10 m^3 of substrate material to the site.

A gravel deposit was discovered between the emissary E-1 and the spawning area LSG1 on the northeast side of Ridge Lake at the following coordinates: N 54.85774 W 66.91853 (Figure 10). The gravel will have to be screened and washed.

Figure 10. Photos 1 and 2: Gravel deposit north of Ridge Lake

Spawning Ground in Emissary (E-1) of Ridge Lake



Proposed compensatory measures for Brook trout: Stabilize banks over 2.5 m on both sides to avoid clogging of substrate. Boulders and cobbles removed can be used for part of the required riprap. Build two fish shelters (A) upstream from the enhancement area. Remove 30 cm of substrate and replace with clean gravel over a 4 m^2 area.

Coordinates:
W 66. 927 96^0
N 54. 861 29^0

Figure 11. Schematic of spawning ground in emissary (E-1) of Ridge Lake

Lake Spawning Ground (LSG-1) in Ridge Lake

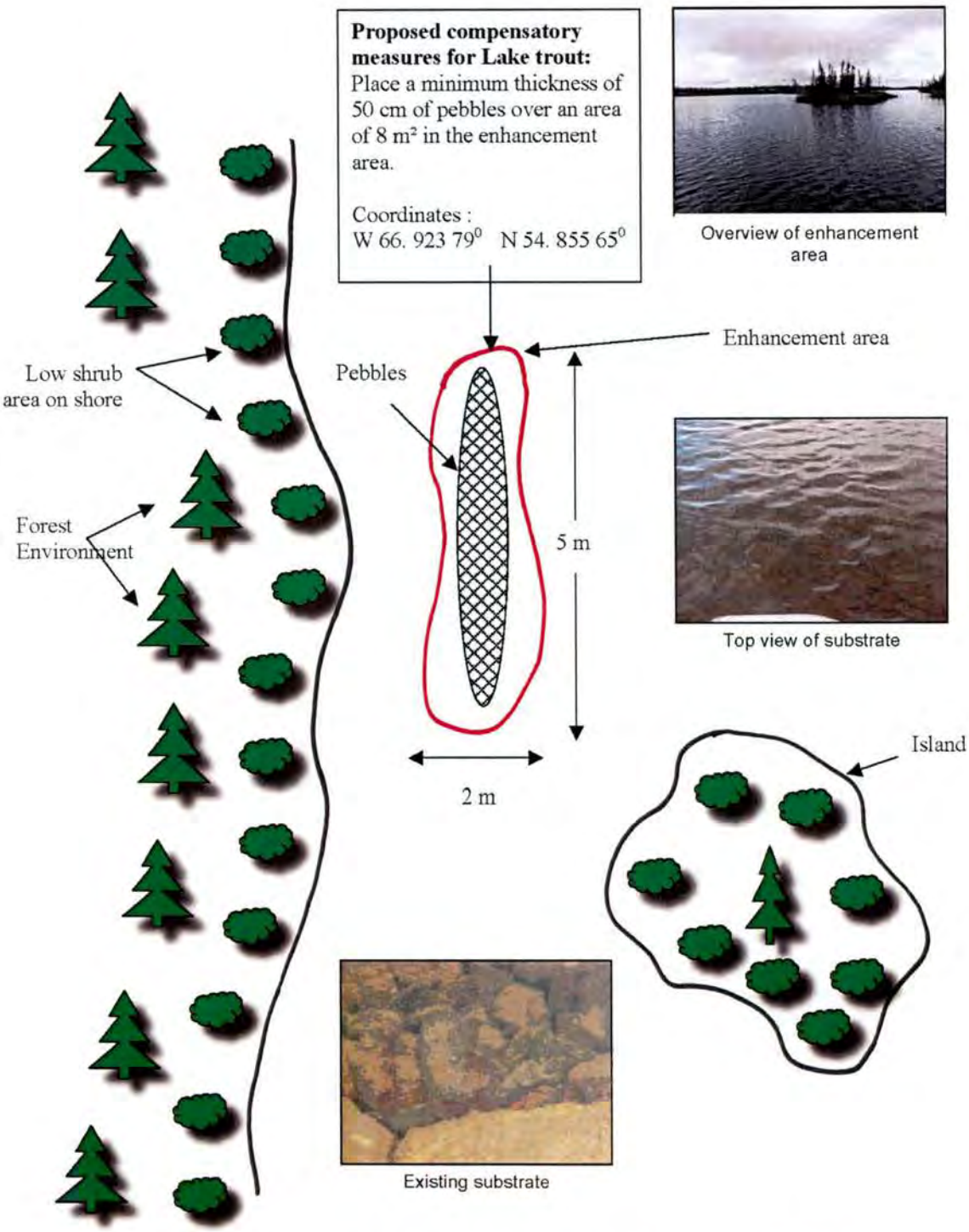


Figure 12. Schematic of lake spawning ground (LSG -1) in Ridge Lake

Lake Spawning Ground (LSG-2) in Ridge Lake

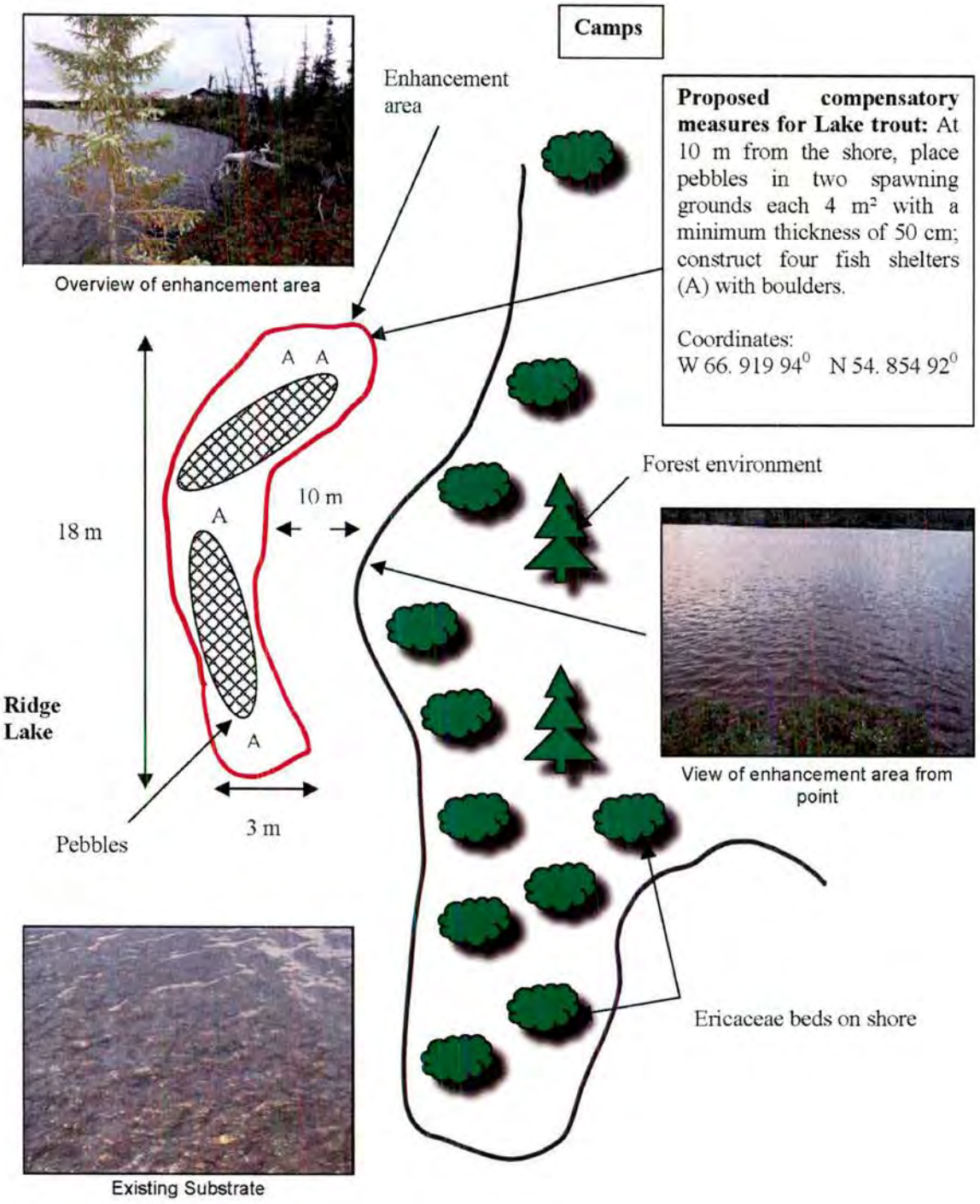


Figure 13. Schematic of lake spawning ground (LSG-2) in Ridge Lake

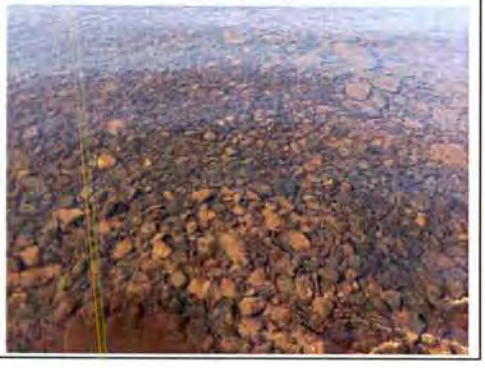
3.4 La Cosa Lake

3.4.1 No potential enhancement areas

Table 14 summarizes the survey carried out in the T1 tributary, the emissary and the west segment of the T6 tributary. The water course west of T6 has not yet been characterized due to its distance from access roads. The T1 water course and the emissary cannot be used as compensatory habitat since they already are excellent areas for Brook trout (see photos in Table 14 and Figures 14 and 15).

Table 14. La Cosa Lake Tributary T1 and western segment of tributary T6 - Without potential enhancement areas. La Cosa Lake emissary is already suitable for Brook trout spawning.

Water course	Latitude °N Longitude °W	Description	Photos
T1	54.88701 66.94022	Sampling date: 01/09/2009 Tributary located west of La Cosa Lake. Presence of ericaceae. Excellent spawning ground for Brook trout.	 
Segment west of T6	54.87373 66.93413	Sampling date: 02/09/2009 Segment located west of La Cosa Lake, approximately 360 m past the mouth of tributary T6. Segment located ≈300 m past the culvert. Area needing much clean-up. Little potential for Brook trout.	

Water course	Latitude °N Longitude °W	Description	Photos
			
Emissary (E-1)	54.88159 66.92234	Sampling date: 01/09/2009 Emissary located north of La Cosa Lake. Presence of ericaceae and clean substrate suitable for Brook trout spawning.	 

3.4.2 *Potential enhancement areas*

Table 15 describes the potential enhancement areas for Brook trout and Lake trout compensatory habitat in water courses associated with La Cosa Lake. The survey was carried out in the emissary and in all the tributaries of La Cosa Lake. The results revealed potential enhancement areas for Brook trout spawning in tributaries T-2, T-3, T-4, T-5, and T-6 (Figures 14 and 15).

No potential enhancement areas for fish habitat were identified along the shores of La Cosa Lake.

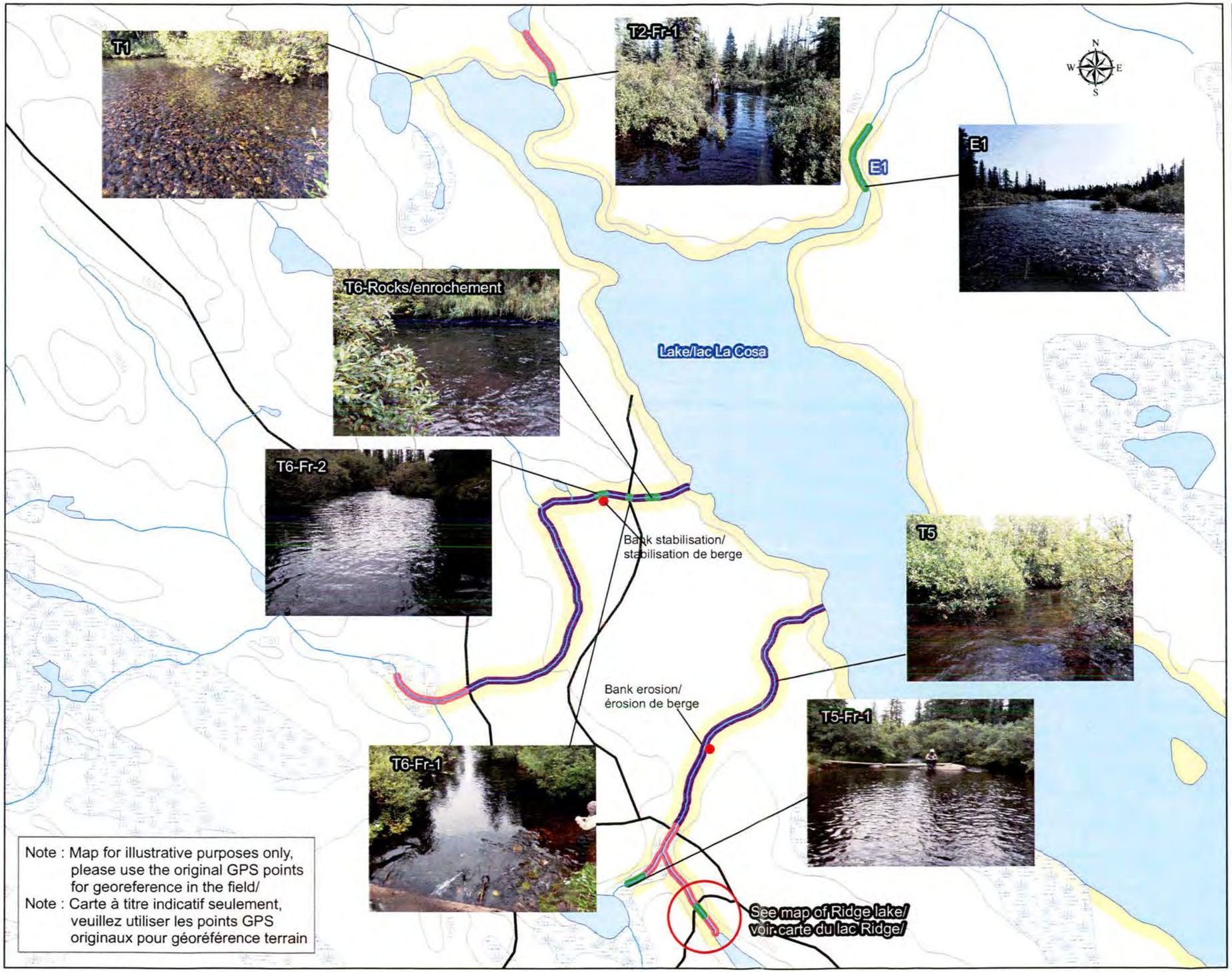


Figure : 14
Potential Habitat Management for Fish / potentiel d'aménagement d'habitat pour le poisson
Lake/lac La Cosa (North/nord)

Compensatory measure/ mesure compensatoire
- No potential/sans potentiel
- Good potential/bon potentiel
- Cleaning/nettoyage

Base map/fond de carte
- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Waterbody/plan d'eau
- Characterization area/ étendue de la caractérisation
- Secondary road/ route secondaire
- Wetland/milieu humide
- Contour interval (ft)/ courbe de niveau (pi)

0 175 350 700 m

No. de lot :	Centroïde du lot : X : 632 812 Y : 6 082 757 Projection : UTM zone 19N, NAD 83
No. Projet Groupe Synergis 0910-088-ENVC	BNDT/NTDB 1 :50,000 (RNC/NRC) BDTQ, 1 :20,000, (MRNF) Hydrology/hydrologie, GHI (2009).

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Date : 2010-04-22

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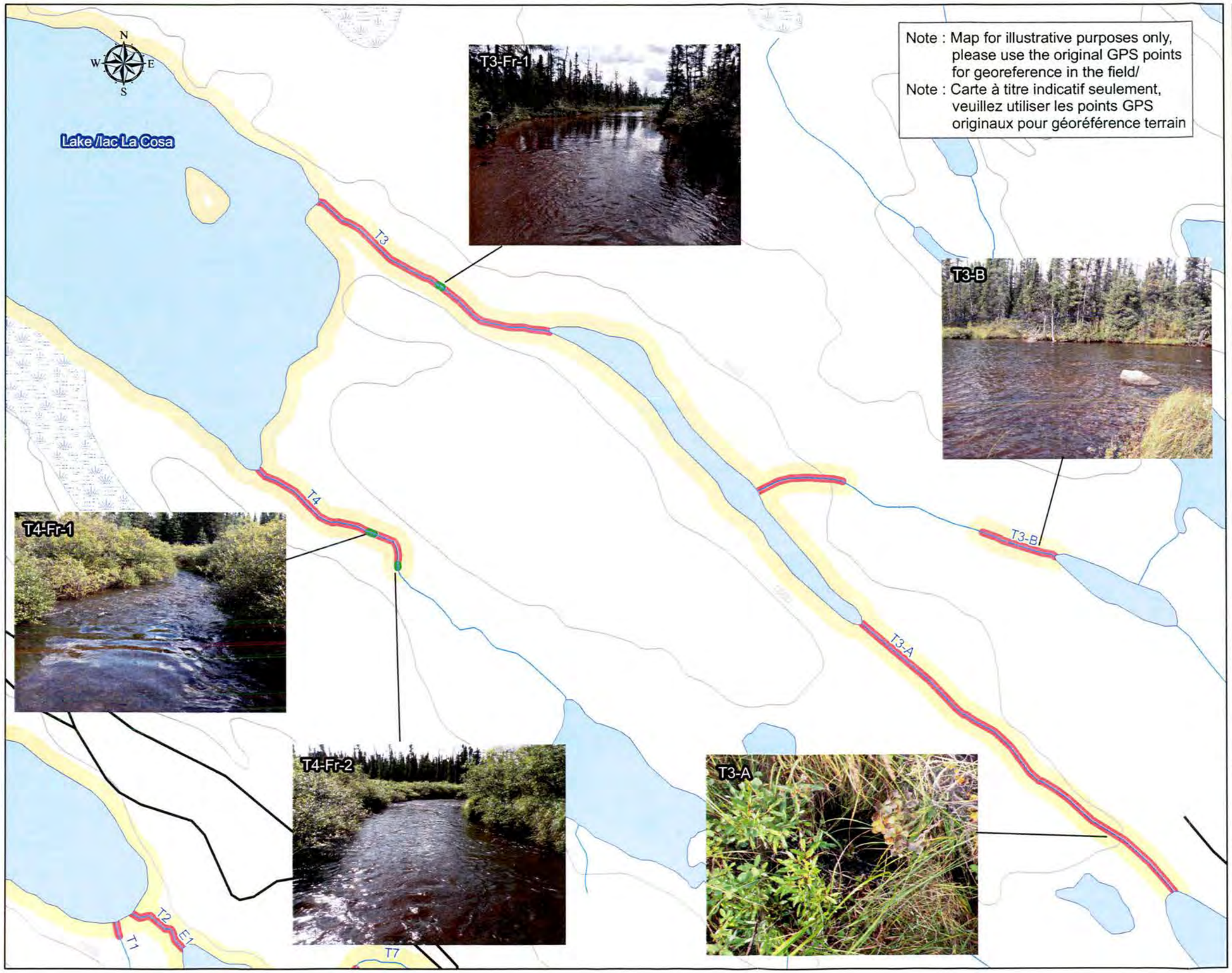

Figure : 15
Potential Habitat Management for Fish / potentiel d'aménagement d'habitat pour le poisson
Lake/lac La Cosa (South/sud)

Compensatory measure/ mesure compensatoire
- No potential/sans potentiel
- Good potential/bon potentiel
- Cleaning/nettoyage

Base map/fond de carte
- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Waterbody/plan d'eau
- Wetland/milieu humide
- Secondary road/ route secondaire
- Characterization area/ étendue de la caractérisation
- Contour interval (ft)/ courbe de niveau (pi)

0 150 300 600 m

No. de lot :	Centroïde du lot : X : 635 820 Y : 6 080 985 Projection : UTM zone 19N, NAD 83
No. Projet Groupe Synergis 0910-088-ENVC	BNDT/NTDB 1 :50,000 (RNC/NRC), BDTQ, 1 :20,000, (MRNF) Hydrology/hydrologie, GHI (2009).

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Date : 2010-04-22

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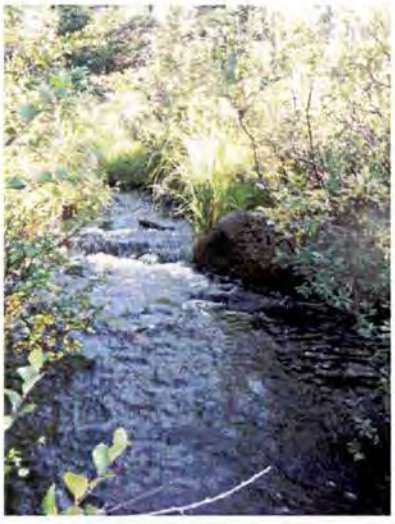
Table 15. La Cosa Lake Tributaries – With potential enhancement areas

Water body/ Water course	Latitude °N Longitude °W	Description	Area[1] (m^2)	Photos
Tributary T-2-SG-1	54.87412 66.93240	Sampling date: 01/09/2009 Substrate:10% silt/mud, 5% fine sand, 5% gravel, 55% pebbles, 25% cobbles. Moderately clogged. Average depth: 0.36 m; Approximate flow velocity 0.10 m/s; Temperature 8.2°C; pH 7.3.	15	
Tributary T-3-SG-1	54.86298 66.89233	Sampling date: 01/09/2009 Substrate: 20% gravel, 50% pebbles, 20% cobbles, 10% boulders. Moderately clogged. Average depth:0.39 m; Approximate flow velocity 0.39 m/s; Temperature 11.4°C; pH 8.1.	30	 
Tributary T-4-SG-1 T-4-Sg-2	54.85613 66.89468 54.85705 66.89562	Sampling date: 01/09/2009 Substrate: 5% silt/mud, 40% gravel, 45% pebbles, 10% cobbles. Moderately clogged. Average depth 0.38 m; Approximate flow velocity 0.49 m/s; Temperature 11.0°C; pH 7.9.	22 115	

				
Tributary T-5-SG-1 Problem of bank erosion	54.86216 66.93166 54.86559 66.92800	Sampling date: 02/09/2009 Substrate: 5% silt/mud, 5% fine sand, 20% gravel, 25% pebbles, 45% cobbles. Clean. Approximate depth 0.41 m; Approximate flow velocity 0.18 m/s; Temperature 10.0°C; pH 8.2.	**32** **25**	 
Tributary T-6 T-6-SG-1 T-6-SG-2 Stabilization of banks	54.87412 66.93085 54.87398 66.93269 54.87398 66.93269	Sampling date: 02/09/2009 Substrate: 5% silt/mud, 5% coarse sand, 25% gravel, 30% pebbles, 20% cobbles, 15% boulders. Clean. Average depth 0.44 m; Approximate flow velocity 0.30 m/s; Temperature 7.2°C; pH 8.0.	**78** **120** **10**	 

[1] Area = potential enhancement area

3.4.3 Proposed compensatory measures

In the La Cosa Lake tributaries, the total area that can be enhanced as compensatory habitat is 12 388 m^2. Bank stabilization work is required in T5 and T6 to maintain the spawning areas. Boulders and rocks should be placed in a 35 m^2 area to counteract the movement of sediment in the stream and to stabilize the banks. Shrubs should also be planted in all stabilized areas. In addition, re-vegetating eroded areas would contribute to eliminating the problem of erosion (Figures 20 and 24).

To renew fish access to all potential enhancement streams associated with La Cosa Lake, it will be important to completely clear the T-5 and T-6 tributaries (Figure 14). In T-5, clearing should be carried out over an area of 4400 m^2 (1100 m by 4 m). In T-6, clearing should be carried out over an area of 7600 m^2 (1900 m by 4m).

Table 16 presents a summary of the suggested compensatory measures and work required. Schematics of the enhancement work for each area are presented in Figures 16 to 23.

Table 16. Summary of field observations and preliminary compensatory measures, La Cosa Lake

Water course	Potential enhancement area (m^2)	Proposed compensatory measures	Required work
DSO4 (Assessment groups 2a and 2b)			
T2	**15**	Enhancement of Brook trout spawning grounds	Construct three fish shelters upstream from the spawning area. Place boulders on either side of the spawning area. Remove a ≈30 cm layer of substrate, and replace with equivalent layer of gravel (9 to 40 mm) over a 9 m^2 area.
T3	**30**	Enhancement of Brook trout spawning grounds	Construct three fish shelters upstream from the spawning area. Place boulders on either side of the spawning area. Remove a ≈30 cm layer of substrate, and replace with equivalent layer of gravel (9 to 40 mm) over a 16 m^2 area.
T4 SG-1	**22**	Enhancement of Brook trout spawning grounds	Place boulders on the left side of the pool upstream from the spawning area. Remove a ≈30 cm layer of substrate, and replace with equivalent layer of gravel (9 to 40 mm) over a 12 m^2 area.
T4 SG-2	**115**	Enhancement of Brook trout spawning grounds	Place boulders on the left side slightly upstream from the spawning area over a 10 m^2 area. Place boulders on the right side slightly upstream from the spawning area over a 25 m^2 area. Remove a ≈30 cm layer of substrate, and replace with equivalent layer of gravel (9 to 40 mm) over a 80 m^2 area.
T5	**4 400**	Clearing	Clear stream in a 4 m-wide band over 1.1 km.
T5 SG-1	**32**	Enhancement of Brook trout spawning grounds	Construct three fish shelters upstream from the spawning area. Place boulders on either side of the spawning area. Remove a ≈30 cm layer of substrate, and replace with equivalent layer of gravel (9 to 40 mm) over a 20 m^2 area.
T5 Banks	**25**	Stabilization of banks	Place boulders on the left side of the stream in two places; one over 10 m and the other over 15 m. Fill in runoff crevasses to control erosion. Re-vegetate the riprap area to accelerate the bank stabilization process.
T6	**7 600**	Clearing	Clear stream in a 4 m-wide band over 1.9 km.
T6 SG-1	**64**	Enhancement of Brook trout spawning grounds	Place boulders on either side of the spawning area to minimize clogging of gravel in the 24 m^2 spawning area. Remove a ≈30 cm layer of substrate, and replace with equivalent layer of gravel (9 to 40 mm) over a 40 m^2 area.
T6 SG-2	**75**	Enhancement of Brook trout spawning grounds	Place boulders on either side of the spawning area to minimize clogging of gravel in the spawning area. Construct three fish shelters in the spawning area. Remove all pebbles, boulders and cobbles in the 75 m^2 enhancement area.
T-6 Banks	**10**	Stabilization of banks	Place boulders on the right side of the pool upstream from the sill area.

The main technical difficulty in carrying out that enhancement measure is transporting approximately 80 m^3 of substrate material to the site. The closest gravel deposit is located nearby, close to the emissary of Ridge Lake (Figure 9).

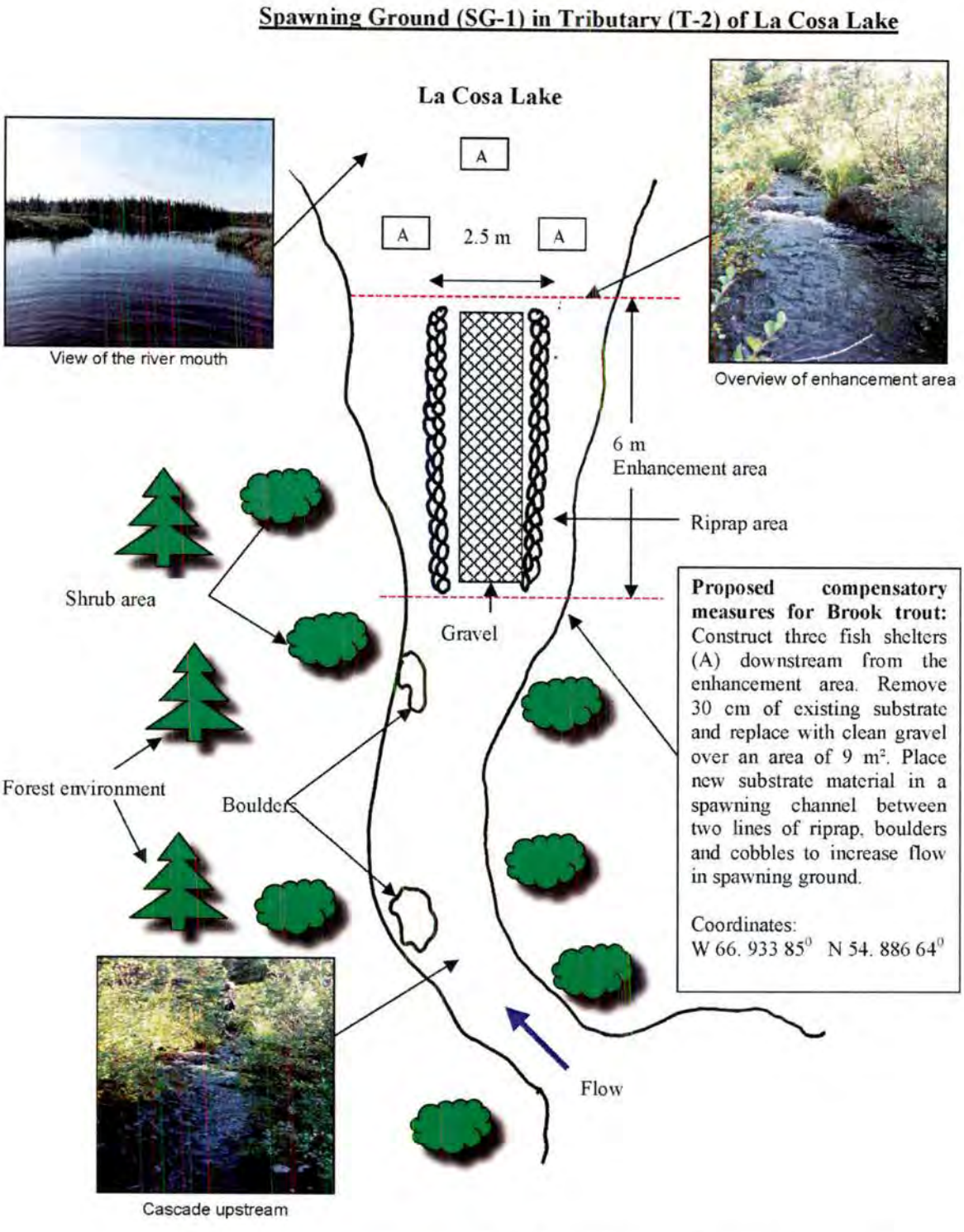


Figure 16. Schematic of spawning ground (SG-1) in tributary (T-2) of La Cosa Lake

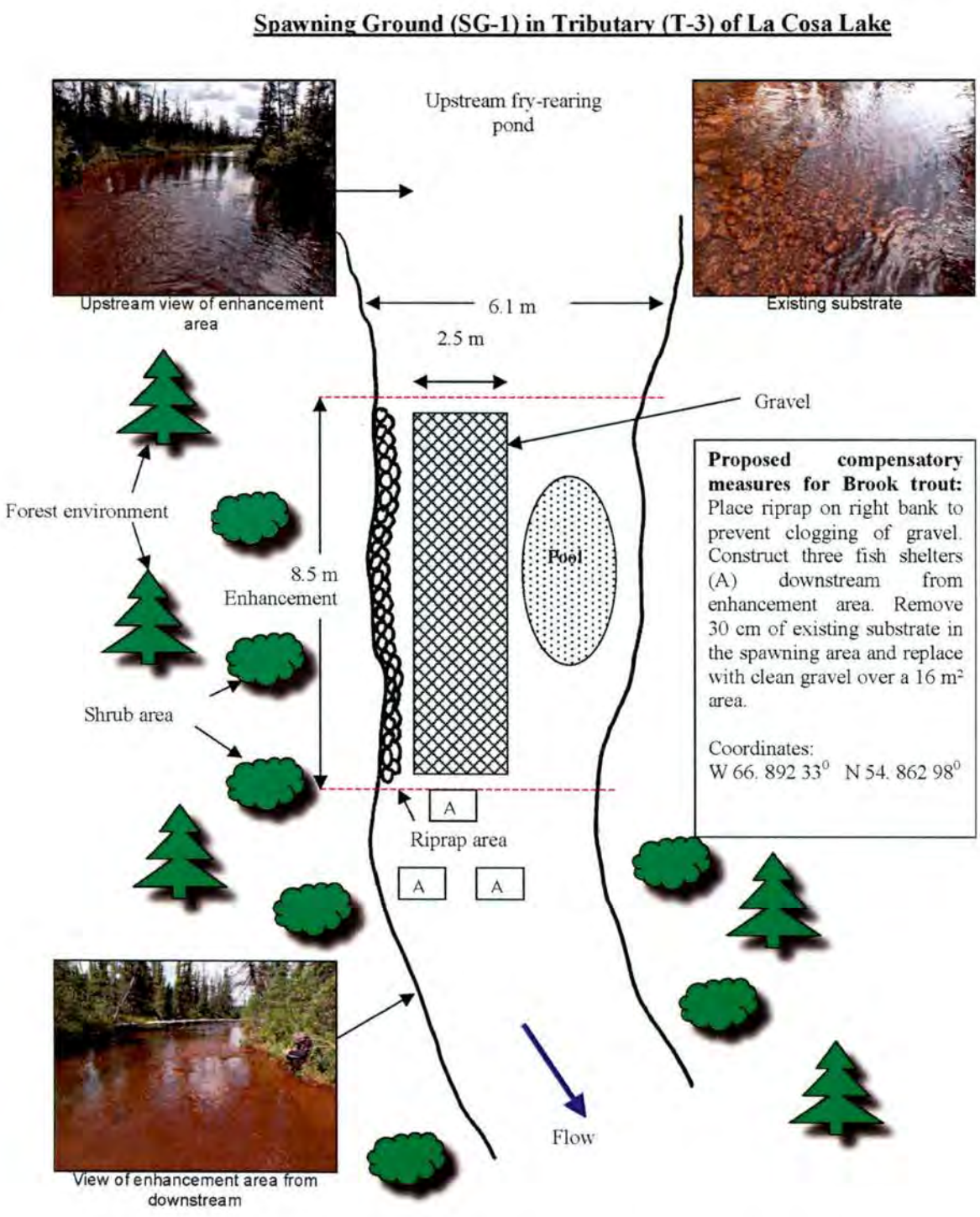


Figure 17. Schematic of spawning ground (SG-1) in tributary (T-3) of La Cosa Lake

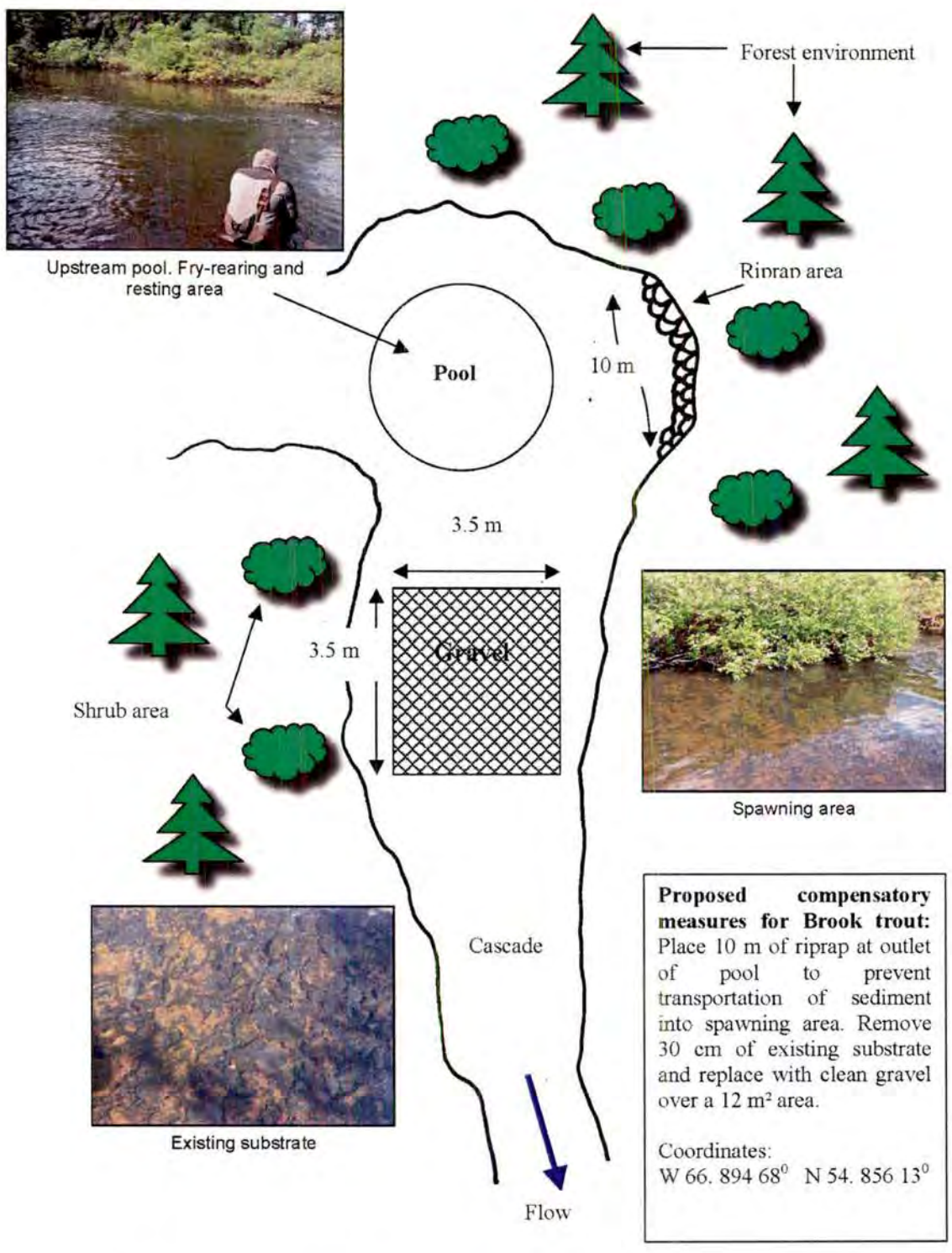


Figure 18. Schematic of spawning ground (SG-1) in tributary (T-4) of La Cosa Lake

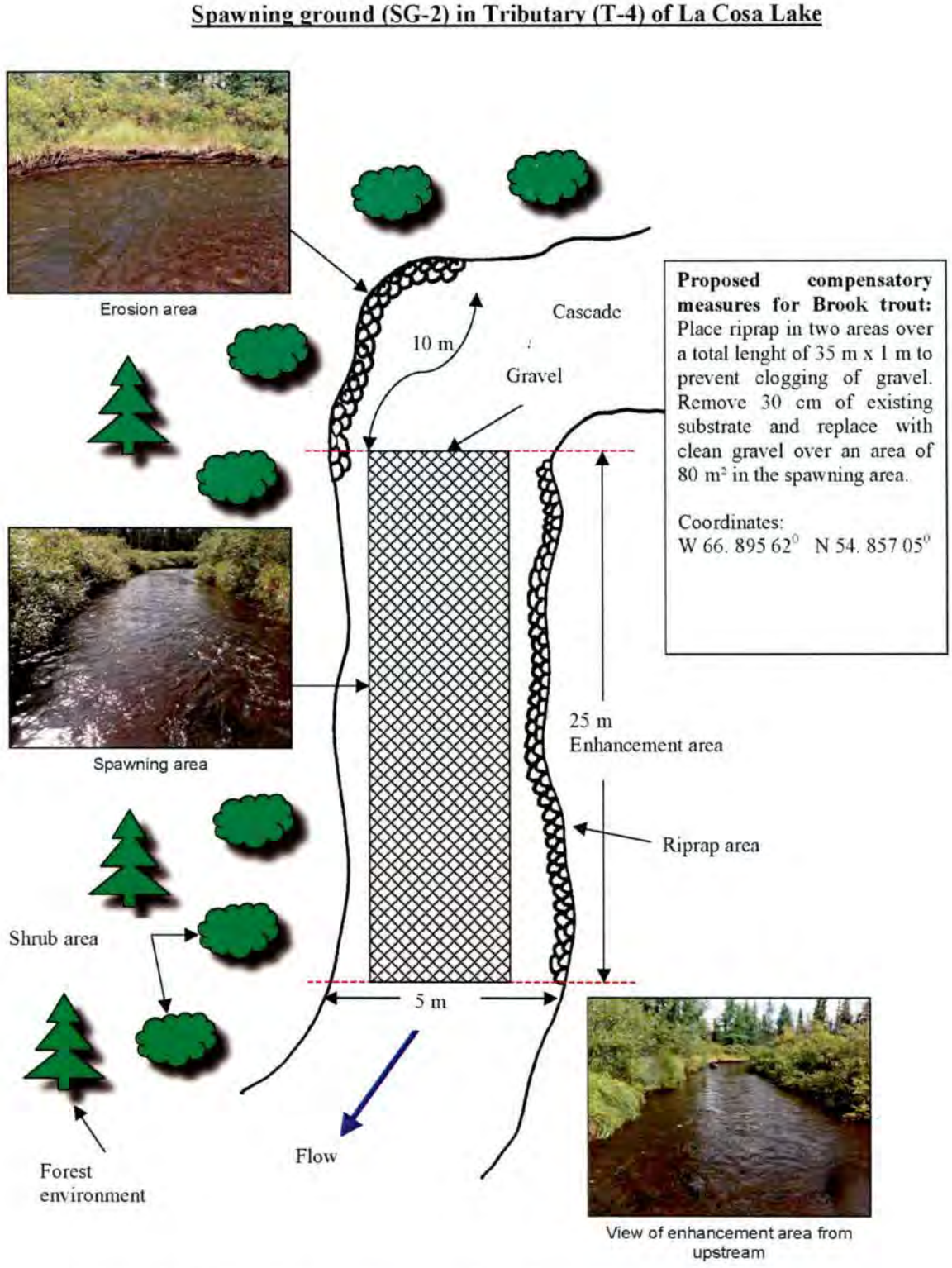


Figure 19. Schematic of spawning ground (SG-2) in tributary (T-4) of La Cosa Lake

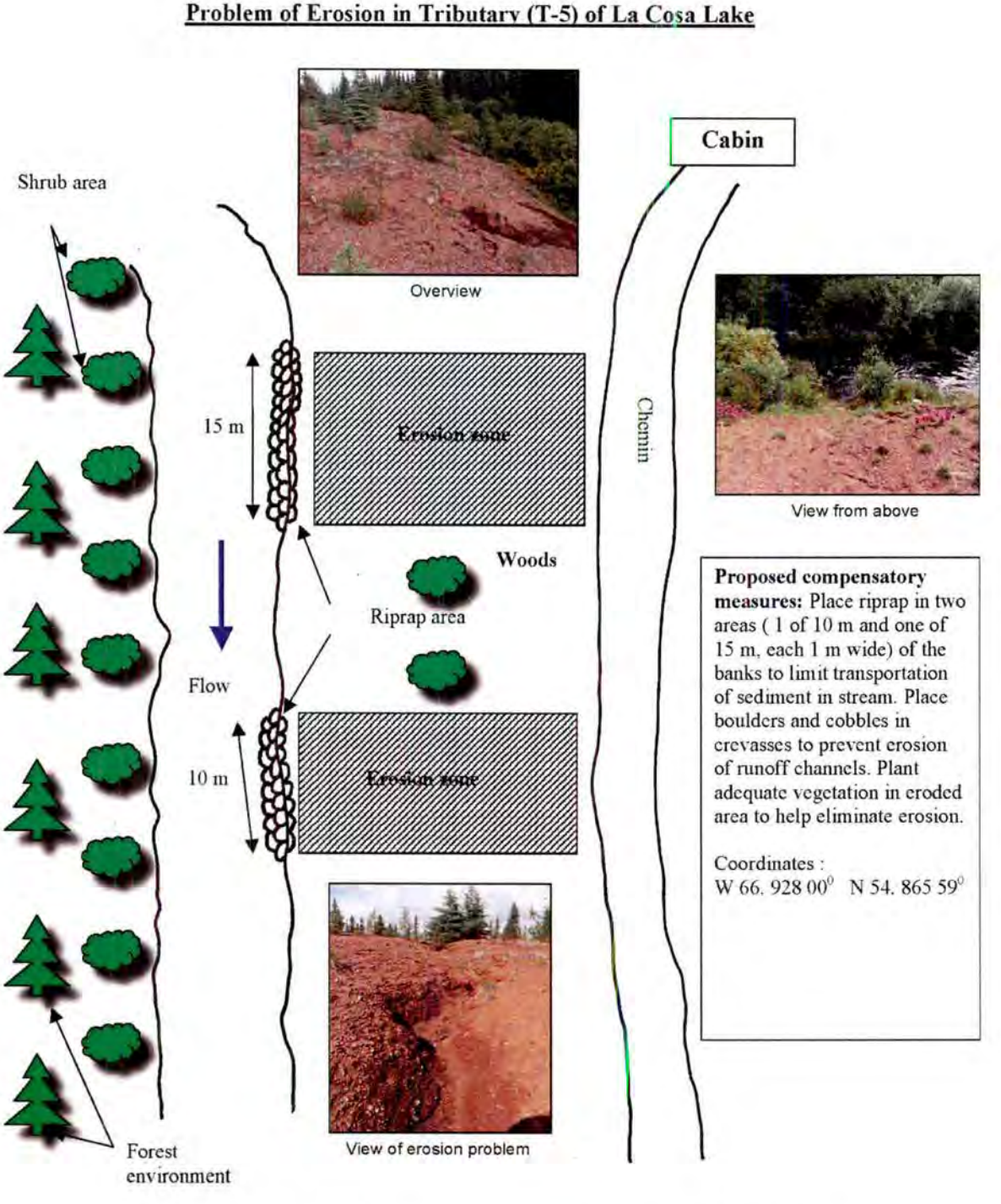


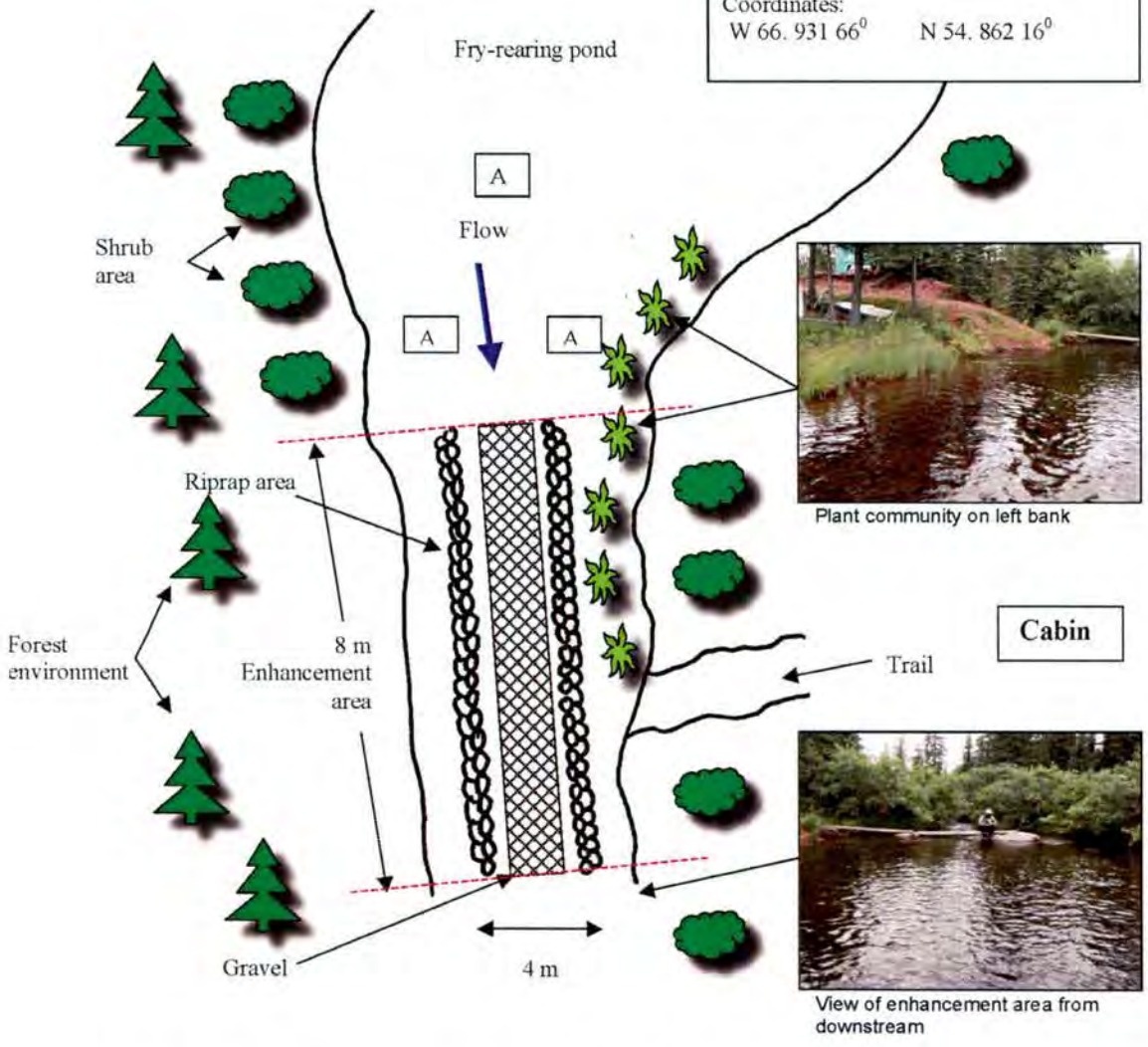
Figure 20. Schematic of eroded area enhancement in tributary (T-5) of La Cosa Lake

Spawning Ground (SG-1) in Tributary (T-5) of La Cosa Lake

View from upstream and pond

Proposed compensatory measures for Brook trout: Remove 30 cm of boulders, cobbles and fine substrate and replace with clean gravel over an area of 20 m^2. Use excavated boulders and cobbles to construct a spawning channel in the enhancement area and to maintain substrate free of sediment. Construct three fish shelters (A) upstream from enhancement area.

Coordinates:
W 66. 931 66^0 N 54. 862 16^0



Plant community on left bank

View of enhancement area from downstream

Figure 21. Schematic of spawning ground (SG-1) in tributary (T-5) of La Cosa Lake

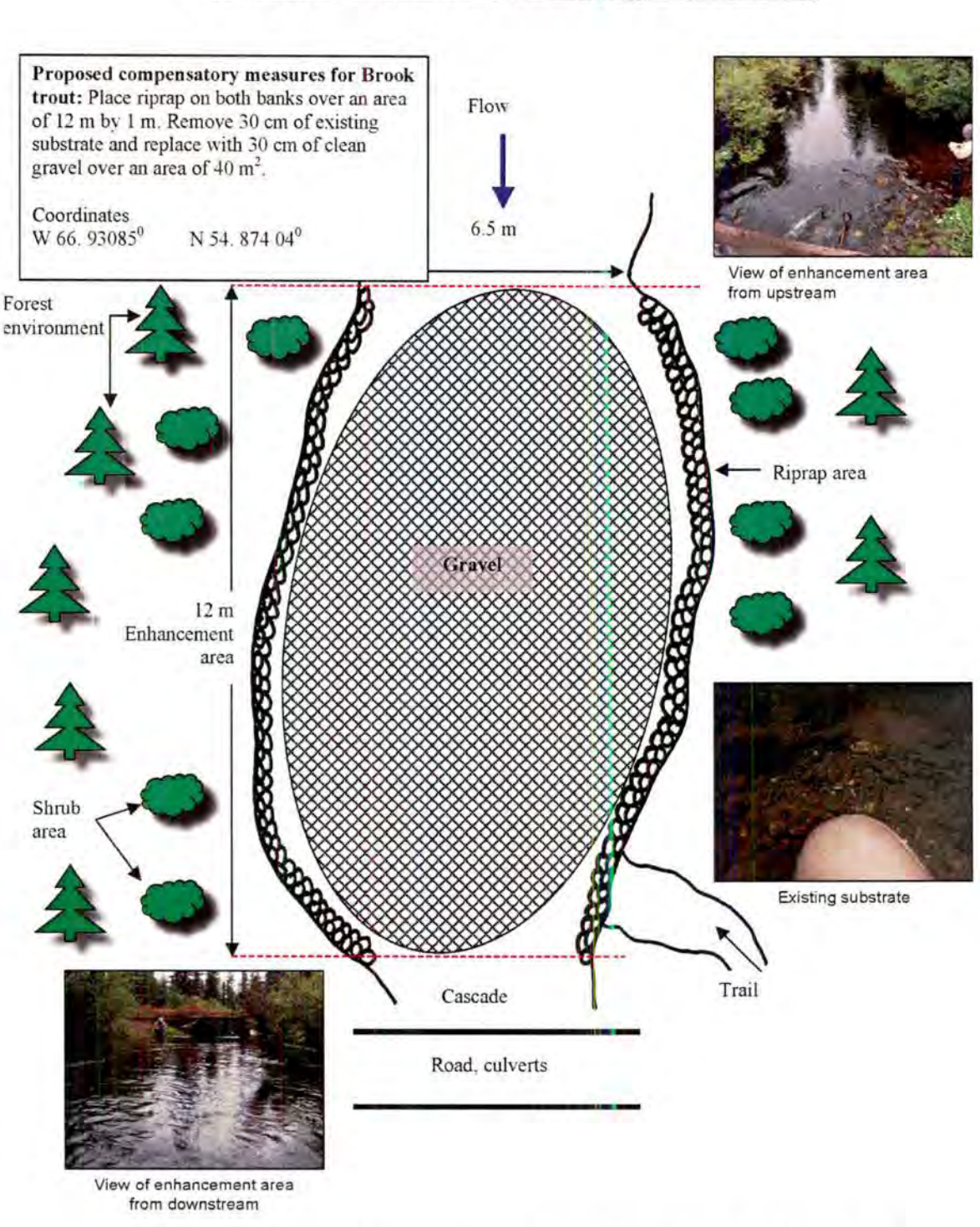


Figure 22. Schematic of spawning ground (SG-1) in tributary (T-6) of La Cosa Lake

Spawning Ground (SG-2) in Tributary (T-6) of La Cosa Lake

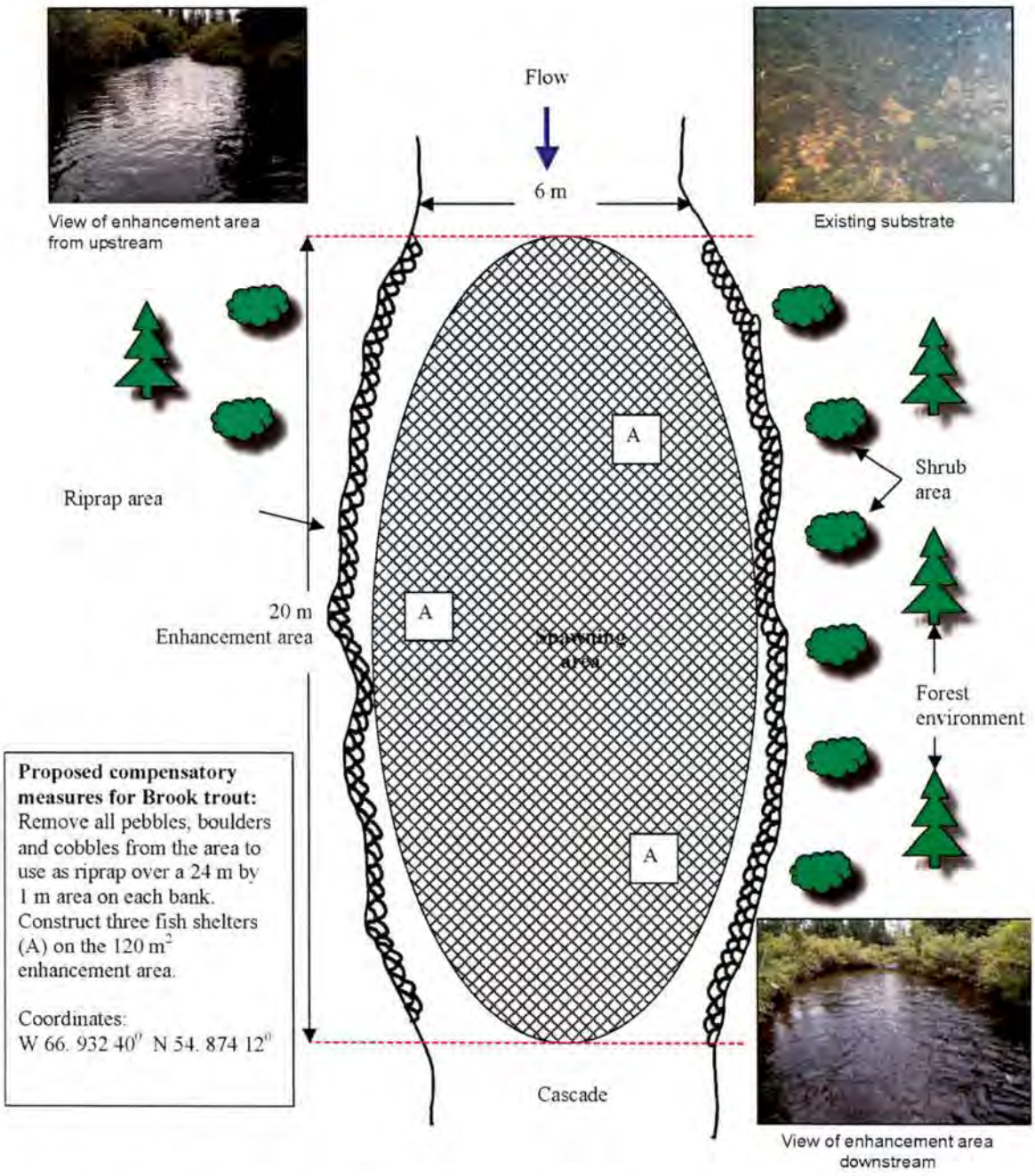


Figure 23. Schematic of spawning ground (SG-2) in tributary (T-6) of La Cosa Lake

Bank Stabilisation in Tributary (T-6) of La Cosa Lake

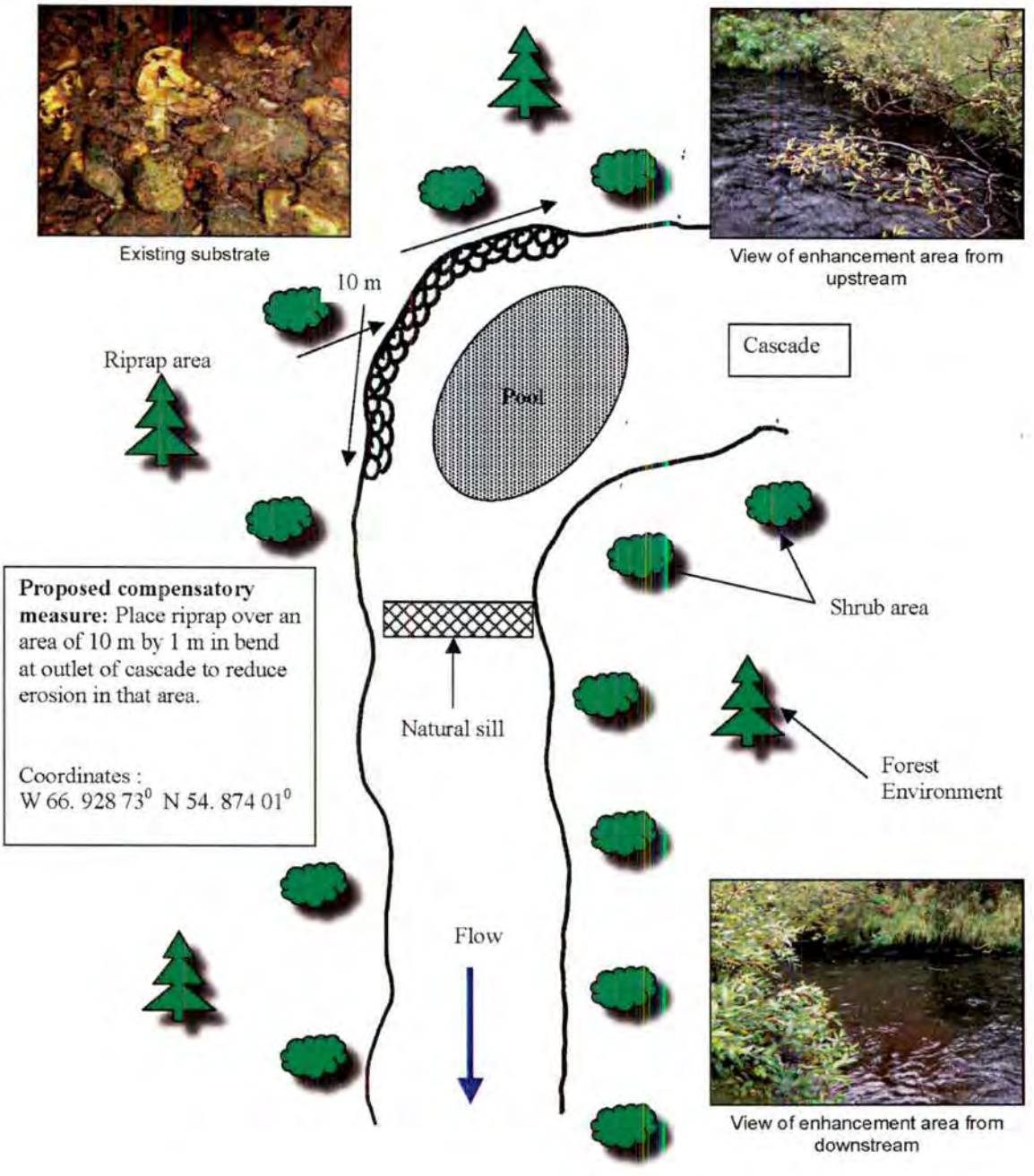


Figure 24. Schematic of bank stabilisation in tributary (T-6) of La Cosa Lake

3.5 Denault Lake

3.5.1 No potential enhancement areas

Table 17 summarizes the survey of tributaries T1, T2, T3, T4, T5, T6, T7, T8 and of the emissary of Denault Lake (Figure 25). Given the sluggishness of their flows, those streams cannot be used as compensatory habitat for fish.

Table 17. Denault Lake Tributaries T1, T2, T3, T4, T5, T6, T7, T8 and emissary – Without Potential enhancement areas

Water course	Latitude °N Longitude °W	Description	Photos
T1 T2	54.83065 66.87955	Sampling date: 02/09/2009 Tributaries located southeast of Denault Lake. Large shrub area. Stream hard to find because of limited quantity of water. No potential for Brook trout. *Photo taken from the lake towards the bank; no sign of river mouth was noticed.*	
T3	54.82981 66.88047	Sampling date: 02/09/2009 Tributary located southeast of Denault Lake. Large shrub area. Stream not found. No potential for Brook trout. *Photo taken from the lake towards the bank; no sign of river mouth was noticed.*	
T4	54.83306 66.88665	Sampling date: 02/09/2009 Tributary located southwest of Denault Lake. Large shrub area. Stream not found. No potential for Brook trout. *Photo taken from the lake towards the bank; no sign of river mouth was noticed.*	

Water course	Latitude °N Longitude °W	Description	Photos
T5	54.83973 66.89791	Sampling date: 02/09/2009 Tributary located west of Denault Lake. Large shrub area. Very sluggish flow. No potential for Brook trout.	
T6	54.84260 66.90195	Sampling date: 02/09/2009 Tributary located west of Denault Lake. Conductivity 56 µmhos/cm; Temperature 6.1°C; pH 7.8. No potential for Brook trout due to sluggish flow.	
T7	54.84538 66.89771	Sampling date: 02/09/2009 Tributary located north of Denault Lake. Small bed close to the board . No potential for Brook trout.	
T8	54.84312 66.89095	Sampling date: 02/09/2009 Tributary located north of Denault Lake. No streambed found (small stagnating puddle); no flow. No potential for Brook trout.	

Water course	Latitude °N Longitude °W	Description	Photos
Émissaire	54.84701 66.90399	Sampling date: 02/09/2009 Tributary located northwest of Denault Lake. Conductivity 30 µmhos/cm; Temperature 11.6°C; pH 7.9. No potential for Brook trout.	

3.5.2 *Potential enhancement areas*

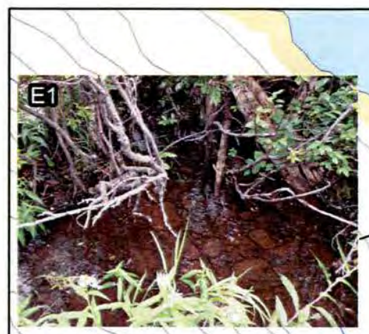
Table 18 describes the only potential enhancement area for Lake trout compensatory habitat in Denault Lake (Figure 25).

Table 18. Denault Lake and water courses – With potential enhancement areas

Water body / Water course	Latitude °N Longitude °W	Description	Area[1] (m^2)	Photos
Denault Lake LSG-1	54.84402 66.89335	Sampling date: 02/09/2009 Portion of lake of 30 m long by 3 m wide. Substrate: 10% boulders, 20% pebbles, 70% gravel. DO 7,1 mg/L; Temperature 9.9°C; pH 7.8.	40	 

[1] Area = potential enhancement area

Figure : 25
Potential Habitat Management for Fish / potentiel d'aménagement d'habitat pour le poisson
Lake/lac Denault



Note : T2 : Tributary lake Ridge
T2 : Tributaire lac Ridge

Note : Map for illustrative purposes only, please use the original GPS points for georeference in the field/
Note : Carte à titre indicatif seulement, veuillez utiliser les points GPS originaux pour géoréférence terrain

Compensatory measure/ mesure compensatoire

- No potential/sans potentiel
- Good potential/bon potentiel
- Cleaning/nettoyage
- Good potential for spawning area/ bon potentiel pour frayère

Base map/fond de carte

- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Waterbody/plan d'eau
- Wetland/milieu humide
- Secondary road/ route secondaire
- Characterization area/ étendue de la caractérisation
- Contour interval (ft)/ courbe de niveau (pi)

0 162.5 325 650 m

No. de lot :	Centroïde du lot : X : 635 253 Y : 6 078 720 Projection : UTM zone 19N, NAD 83
No. Projet Groupe Synergis 0910-088-ENVC	BNDT/NTDB 1 :50,000 (RNC/NRC) BDTQ, 1 :20,000, (MRNF) Hydrology/hydrologie, GHI (2009).

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Date : 2010-04-22

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3.5.3 Proposed compensatory measures

The total area that can be enhanced as compensatory habitat is 40 m^2. Table 19 presents a summary of the suggested compensatory measures and work required. A schematic of the enhancement work for the area is presented in Figure 26.

Table 19. Summary of field observations and preliminary compensatory measures

Water course	Potential enhancement area (m2)	Proposed compensatory measure	Required work
DSO4 (Assessment groups 2a and 2b)			
Denault Lake LSG-1	**40**	Enhancement of Lake trout spawning grounds	• Add a 50 cm layer of clean pebbles (50 to 300 mm) over a 40 m^2 area. • The depth of the spawning area should be between 0.5 and 1.2 m.

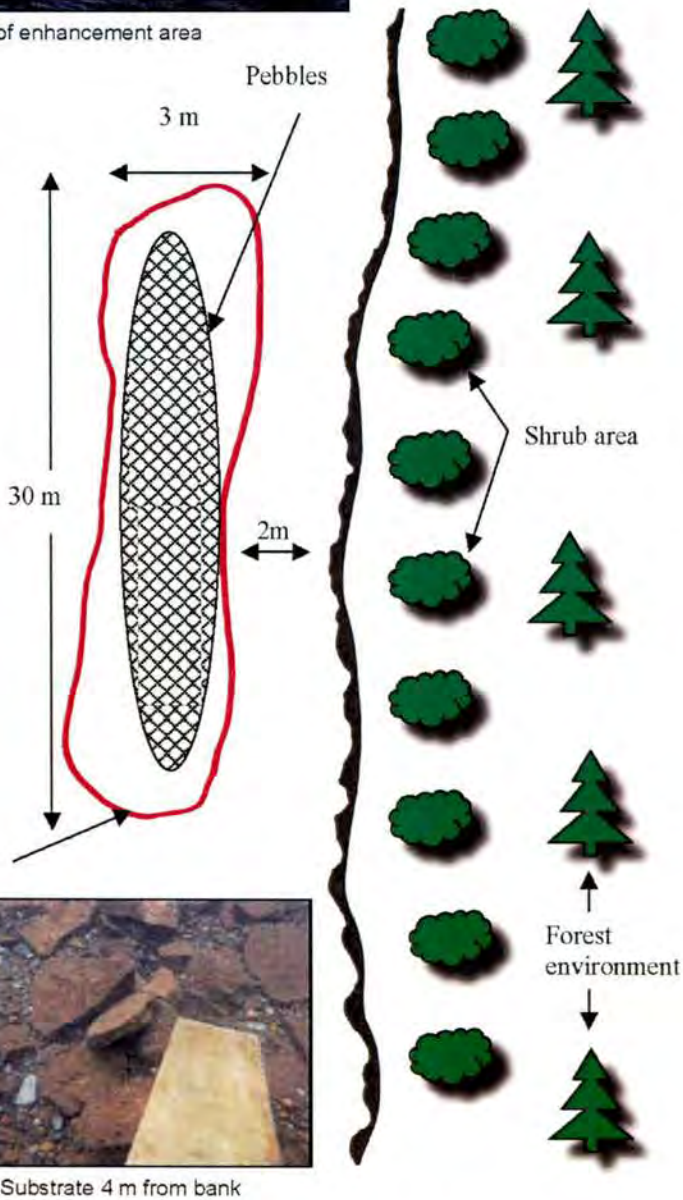
Lake Spawning Ground (LSG-1) in Denault Lake

Overview of enhancement area

Proposed compensatory measures for Lake trout: Place a minimum thickness of 50 cm of substrate over an area of 40 m^2 in the enhancement area. The depth of the spawning area should be from 0.50 m to 1.2 m below surface of lake. The spawning area should form a band of 2 m by 20 m within the enhancement area, approximately 2 m from the shore.

Coordinates:
W 66. 893 35^0 N 54. 844 02^0

View of enhancement area



Substrate on bank

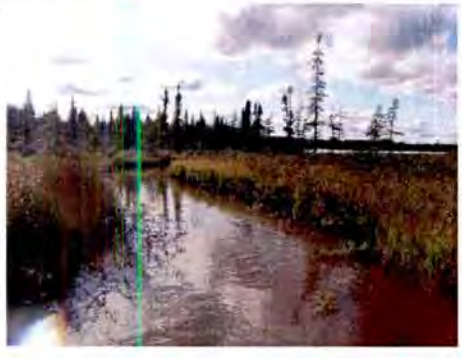
Substrate 4 m from bank

Figure 26. Schematic of lake spawning ground (LSG-1) in Denault Lake

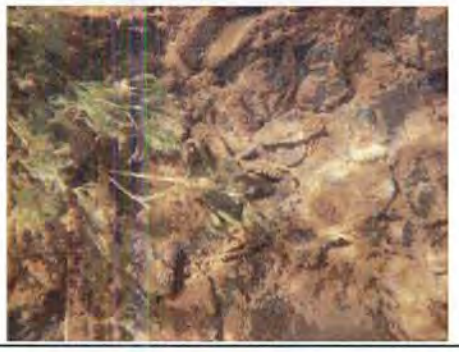
3.5.4 No potential enhancement areas

Table 20 summarizes the survey carried out in Juin Lake, its tributaries T1, T2, T3 and T4 and its emissary E-1. These streams cannot be used for compensatory habitat since their substrate is clogged by sediment (see photos in Table 20). Furthermore, Juin Lake is the receptor of waste water from the town of Schefferville. Figure 27 shows the location of Juin Lake, its tributaries and its emissary.

Table 20. Juin Lake tributaries T1, T2, T3, T4 and emissary E-1 – Without enhancement potential areas

Water course	Latitude °N Longitude °W	Description	Photos
T1	54.81765 66.82133	Sampling date: 04/09/2009 Tributary located south-east of Juin Lake Conductivity 350 µmhos/cm; Temperature 10.6°C; pH 6.0. Culvert of 6.0 m in length in good condition upstream. Sluggish flow ending in a bog with larch on the banks. No potential enhancement area.	 
T2	54.82369 66.84435	Sampling date: 04/09/2009 Tributary located south-east of Juin Lake. Conductivity 107 µmhos/cm; Temperature 10.0°C; pH 8.0. Substrate entirely clogged. Series of stagnating ponds with organic matter. No potential enhancement area.	 

Water course	Latitude °N Longitude °W	Description	Photos
T3	54.82143 66.84291	Sampling date: 04/09/2009 Tributary located south-east of Juin Lake. Conductivity 117 µmhos/cm; Temperature 10.6°C; pH 8.1. Presence of ericaceae; low water level and sluggish flow. No potential enhancement area.	 
T4	54.81898 66.83674	Sampling date: 04/09/2009 Tributary located south-east of Juin Lake Conductivity 80 µmhos/cm; Temperature 11.4°C; pH 8.0. Presence of many tires at the mouth. Substrate clogged. Northern pike observed. Flow from sluggish at the mouth to moderate where the stream narrows. No potential enhancement areas.	 

Water course	Latitude °N Longitude °W	Description	Photos
Emissary	54.82143 66.83942	Sampling date: 04/09/2009 Tributary located south-east of Juin Lake. Conductivity 86 µmhos/cm; Temperature 10.8°C; pH 8.1. Substrate largely clogged. Two Lake trout observed. No potential enhancement areas.	 

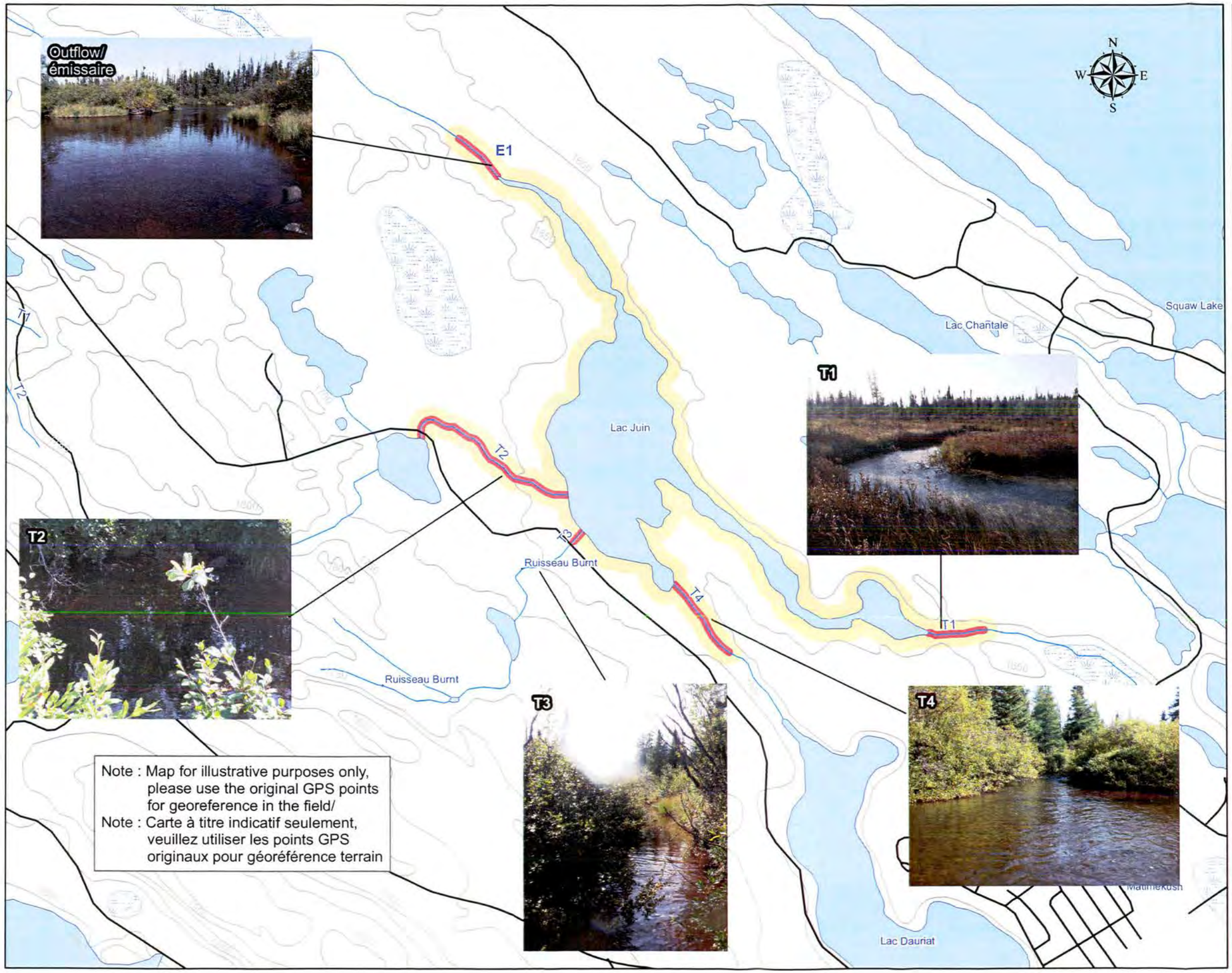


Figure 27 : Potential Habitat Management for Fish / potentiel d'aménagement d'habitat pour le poisson Lake/lac Juin

Compensatory measure/ mesure compensatoire

- No potential/sans potentiel
- Good potential/bon potentiel
- Cleaning/nettoyage

Base map/fond de carte

- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Waterbody/plan d'eau
- Wetland/milieu humide
- Secondary road/ route secondaire
- Characterization area/ étendue de la caractérisation
- Contour interval (ft)/ courbe de niveau (pi)

0 250 500 1 000 m

No. de lot :	Centroïde du lot : X : 638 786 Y : 6 077 175 Projection : UTM zone 19N, NAD 83
No. Projet Groupe Synergis 0910-088-ENVC	BNDT/NTDB 1 :50,000 (RNC/NRC) BDTQ, 1 :20,000, (MRNF) Hydrology/hydrologie, GHI (2009).

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Date : 2010-04-22

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3.5.5 Potential enhancement areas

No potential enhancement areas for Brook trout or Lake trout compensatory habitat were recorded.

3.5.6 Proposed compensatory measures

In the absence of any potential enhancement area, no compensatory measures were proposed.

3.6 Fleming and Slimy lakes

For Fleming and Slimy lakes, the survey was carried out with a different methodology, which enabled the research team to visit more sites than if they had been following the original method. Spot checks were done while walking around certain areas to explore possibilities for compensatory habitat. During that exploration, the effort focused on identifying eroded areas that could be stabilized and on the potential restoration of culverts to allow fish to circulate freely and to occupy habitats that are currently inaccessible.

3.6.1 No potential enhancement areas

Table 21 summarizes the survey in Fleming and Slimy lakes. Before conclusions can be formulated with respect to the potential for compensatory habitat, further study is required to obtain more data on the environmental parameters (water level, flow, substrate, cleanliness of substrate, etc.). That study will allow the team to develop potential enhancement work for fish habitat in a specific environment. Figure 28 shows the areas surveyed in the vicinity of Fleming Lake, and Figure 29 shows those surveyed in the vicinity of Slimy Lake.

N
W E
S

Lac La Cosa

Ruisseau Star

Lac Star

Lac Big Star

Quebec/Québec

Newfoundland-and-Labrador/
Terre-Neuve-et-Labrador

Note : Map for illustrative purposes only, please use the original GPS points for georeference in the field/
Note : Carte à titre indicatif seulement, veuillez utiliser les points GPS originaux pour géoréférence terrain

Figure : 28
Localisation of characterized sites/
localisation des sites caractérisés
Area/secteur
Lakes/lacs Fleming and/et Slimy
North/nord

Characterized element/
élément caractérisé

Base map/fond de carte

- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Waterbody/plan d'eau
- Wetland/milieu humide
- Secondary road/ route secondaire
- Border/frontière
- Contour interval (ft)/ courbe de niveau (pi)

0 0.325 0.65 1.3 Km

No. de lot :	Centroïde du lot : X : 631 290 Y : 6 080 912 Projection : UTM zone 19N, NAD 83
No. Projet Groupe Synergis 0910-088-ENVC	BNDT/NTDB 1 :50,000 (RNC/NRC) BDTQ, 1 :20,000, (MRNF) Hydrology/hydrologie, GHI (2009).

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Lac Chantale
Squaw Lake
Lac Juin
Ruisseau Burnt
Ruisseau Burnt
Lac Maryjo
Burnt Creek
Lac John
Matimekush
Lac Dauriat
Schefferville
Quebec/Québec
Newfoundland-and-Labrador/
Terre-Neuve-et-Labrador
Slimy Lake
Silver Yards
Green Lake
Lake

N
W
E
S

Note : Map for illustrative purposes only, please use the original GPS points for georeference in the field/
Note : Carte à titre indicatif seulement, veuillez utiliser les points GPS originaux pour géoréférence terrain

Figure : 29
Localisation of characterized sites/
localisation des sites caractérisés
Area/secteur
Lakes/lacs Fleming and/et Slimy
South/sud

Characterized element/
élément caractérisé

Base map/fond de carte

- Watercourse/cours d'eau
- Intermittent watercourse/ cours d'eau intermittent
- Torrential channel/ chenal torrentiel
- Waterbody/plan d'eau
- Wetland/milieu humide
- Secondary road/ route secondaire
- Border/frontière
- Contour interval (ft)/ courbe de niveau (pi)

0 0.375 0.75 1.5 Km

No. de lot :	Centroïde du lot : X : 638 825 Y : 6 075 358 Projection : UTM zone 19N, NAD 83
No. Projet Groupe Synergis 0910-088-ENVC	BNDT/NTDB 1 :50,000 (RNC/NRC) BDTQ, 1 :20,000, (MRNF) Hydrology/hydrologie, GHI (2009).

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Date : 2010-04-22

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Table 21.Streams in the vicinity of Fleming and Slimy lakes – Without potential enhancement areas

Water course	Latitude °N Longitude °W	Photos
Fleming Lake	54.84910 66.98679	Sampling date: 06/09/2009  
Slimy Lake	54.78103 66.82703	Sampling date: 06/09/2009 

3.6.2 Potential enhancement areas

Potential enhancement areas for Brook trout and Lake trout compensatory habitat have not yet been quantified. Should the need for enhancement areas exceed those identified in the present study, a complete survey could be undertaken.

3.6.3 Proposed compensatory measures

Before passing judgement on the possibility of enhancing fish habitat, the water courses of that area should be better characterized. The repair of road crossings could have two major impacts. It could facilitate fish migration upstream and downstream on the one hand, and it could also greatly facilitate access to the territory for local fishermen.

4 SYNTHESIS

Only a tiny part of the territory surrounding the Project was surveyed. The effort focused on areas that are part of the fishing territory used by the community of the Schefferville region. The data compiled in this report indicate that potential enhancement areas totalling 12 860 m^2 were identified. Of this total, 12 000 m^2 form part of tributaries that need to be cleaned. The potential enhancement areas are found in Joan Brook (JB), Little Goodwood Lake, Ridge Lake, La Cosa Lake and Denault Lake and in their tributaries. No potential enhancement areas were identified in Juin Lake, Fleming Lake and Slimy Lake. The upstream segment of Slimy Lake, however, suffers from a large input of sediment coming from old waste rock piles. Culverts could be built to lessen the number of obstacles on the territory.

All schematics presented above are sufficiently detailed for the work to be carried out.

Here are the findings from the data compiled in this study:

- Joan Brook had a 200 m^2 potential enhancement area that could be divided into 134 spawning areas each of 1.5 m^2;
- Little Goodwood Lake had a 40 m^2 potential enhancement area. Its tributary had a 115 m^2 potential enhancement area divided into three spawning areas, for a total potential enhancement area of 155 m^2;
- Ridge Lake had a 24 m^2 potential enhancement area. Its tributary had a 7.5 m^2 potential enhancement area, for a total potential enhancement area of 31.5 m^2;
- La Cosa Lake, including its nine tributaries and emissaries, had a 12 388 m^2 potential enhancement area. La Cosa Lake as such does not, however, contain potential enhancement areas;
- Denault Lake had a 40 m^2 potential enhancement area. No potential enhancement areas were identified in its tributaries and emissary.

The majority of compensatory measures involve the placement of riprap, the construction of fish shelters, the replacement of substrate and re-vegetation. The lakes require only that substrate material in spawning areas be modified to make them suitable for Lake trout.

A second survey campaign may be needed if the actual impacted habitat area proves to exceed the limits of the present study area. Members of the First Nations of the Schefferville area have helped to identify other water bodies that could be enhanced for compensatory habitat.

5 ADDITIONAL PROPOSED COMPENSATORY MEASURES

In order to increase social acceptance of the Project by the residents of the Schefferville region, Peter-Paul Mameanskum interviewed fishermen to obtain additional input. The suggestions that he obtained are summarized below:

- help train First Nations wildlife officers;
- promote the creation of outfitting camps managed by members of the First Nations;
- install a permanent hydrometric station on the Howells River;
- propose a solution for the management of waste water currently disposed of by various owners directly into Dauriat Lake. If adequately managed, that lake could be used by the community for subsistence and education purposes;
- organize fishing tournaments having an environmental training/education aspect for children;

- seed plants in lakes to promote minnow habitat so as to increase the quantity of prey for piscivorous fish in the water bodies around Schefferville;
- assess the management of the outfitting camps associated with the Squaw Lake float plane base and propose ways of operating in accordance with the laws and regulations governing outfitting;
- evaluate the possibility of introducing Arctic char into the region, since it is a species prized for its taste and for sport fishing;
- if Arctic char could be introduced, study the need for aquaculture facilities for rearing fry that would be used to stock chosen areas.

6 REFERENCES

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APPENDICES

APPENDIX I

MANAGEMENT TECHNIQUES REFERENCE CARDS

STREAM CLEARING

JUSTIFICATION

What: This type of work consists of removing from a water course elements (dead trees, branches, log-jams, domestic waste, mud, etc.) likely to have an adverse effect on the establishment or development of a valued fish species (FFQ, 1996).

Why: Clearing allows fish to have access to inaccessible areas that are essential to their life cycle (spawning area, fry-rearing area, etc.). It also helps to restore areas that are suitable for fish and that may have been degraded by human activities (FFQ, 1996).

Where: Clearing is carried out on the stream bed and on banks, over a band wide enough to clear from the water body the elements that may have had an adverse effect on the establishment or development of the targeted species. Generally, the tributaries most suitable for spawning are cleared, as are certain accessible segments of isolated water courses.

DESCRIPTION OF WORK

Clearing is usually done with light hand tools: chainsaw, rake, axe.

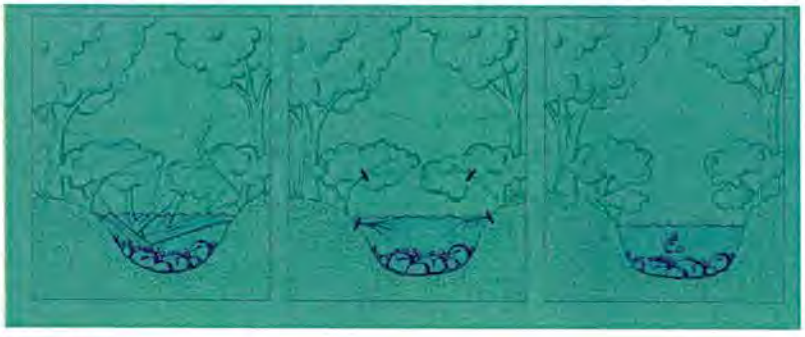
Clearing is done from upstream to downstream and consists of:

- removing trunks, branches and logs that are not embedded in the substrate;
- removing from the banks rotting trunks and branches that threaten to fall into the water course;
- trimming trees and shrubs located along the shore and pruning tangled growth in the water to promote flow and the development of shoots above the water line;
- if forming a sill and not impeding the flow of water and movement of fish, elements that could be used as shelters should be preserved as they also protect the banks from erosion. They include:
  - large boulders;
  - logs and branches embedded in the substrate;
  - overhanging tree trunks.

Caution:

- clearing should not be excessive;
- it should not provoke erosion or excessively increase the flow velocity;
- debris should be disposed of above the natural high water mark.

Note: For more information, see FFQ (1996).



Source: FFQ, 1996

ENHANCEMENT OF BROOK TROUT SPAWNING AREA

JUSTIFICATION

What: This type of work consists of enhancing or restoring habitats that are suitable for fish reproduction while optimizing existing elements that are essential to spawning (substrate, dissolved oxygen, etc.) (FFQ, 1996).

Why: The objective of enhancing spawning areas is to ensure the natural reproduction of existing species so as to increase fish production in a water body by: (FFQ, 1996):

- allowing the fish to reproduce in ideal conditions;
- promoting survival of the eggs;
- ensuring the development and protection of fry prior to their emergence from the substrate.

Where: Spawning areas are generally enhanced in environments where:

- runoff and ice do not cause the erosion of the stream banks and bed;
- there is no problem with sedimentation;
- there is a sufficient quantity of water at all seasons;
- the flow and velocity are low (0.6 à 1 m/s);
- the slope is gentle (1.5 to 5%).

DESCRIPTION OF WORK

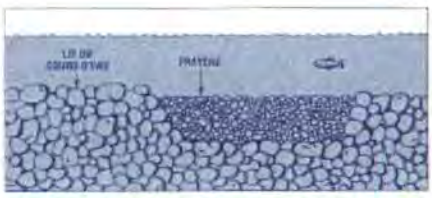
Several types of spawning areas may be enhanced for Brook trout (mound, channel, crib). A specialist should decide on the basis of experience and environmental conditions which type is most suitable for the stream or lake in question.

In general, enhancement of spawning areas should be carried out in streams already cleared of vegetation and other debris that could provoke erosion or render the area inaccessible:

- gravel must be smooth and free of sediment, varying in dimension from 9 to 40 mm.
- there must always be at least 5 cm of water above the gravel.
- ideally, the average thickness of the gravel layer in the spawning area should be 30 cm.

Note: For more information, see FFQ (1996).

EXAMPLES



Source: FFQ, 1996

Source: Luc Guillemette, 2003

STABILIZATION OF BANKS

JUSTIFICATION

What: The stabilization of banks includes all types of work the goal of which is to consolidate or restore the banks of a lake or water course (FFQ, 1996).

Why: The effects of stabilizing banks are:

- the protection of the banks from erosion;
- the reduction of sediment input into the water course;
- the reduction of water turbidity;
- the protection of spawning areas and sources of food from sediment accumulation;
- the improvement of fish habitat and the bank landscape.

Where: This work is carried out where banks have been eroded as a result of natural or human actions.

The riprap technique is used on steep slopes and in water courses up to the natural high water mark. Plant stabilization is used above the natural high water mark up to the talus, especially on longer slopes.

DESCRIPTION OF WORK

There are several techniques of stabilization using rocks (simple riprap, gabions, etc.) or vegetation. A specialist should advise the proponent on the best technique to use. Here are some instructions generally followed in stabilization work:

- use a geotextile membrane on the slope extending to the natural high water mark;
- use rock 300 to 450 mm in size.
- riprap should not be placed on clay soils;
- avoid filling in the shore and encroaching on the water course;
- for vegetal stabilization, take into account the types of soil, indigenous species and planting period, which may vary according to regional climate.

Note: For more information, see FFQ (1996).

EXAMPLES

22

Source : FFQ, 1996

FISH SHELTERS

What: This type of enhancement consists of imitating natural structures (rocks, tree trunks, etc) found in lakes and water courses to create shelters and rest areas for fish (FFQ, 1996).

Why: Shelters are used to:

- create and increase protective cover;
- protect spawners in the spawning season and fry during their growth and when they emerge from the gravel;
- indirectly provide physical support to aquatic organisms (insects, etc.) on which fish feed.

Where: The selected area will determine the type of shelter to be installed:

- flat stones in shallow water;
- overhanging banks along the shore;
- pyramidal structures in deeper areas (2 to 8 m).

DESCRIPTION OF WORK

This reference card deals only with flat stone shelters.

Shelters should not be constructed in pronounced bends of a water course to avoid bank erosion. In addition, they should preferably be built close to feeding or spawning grounds.

The flat stone shelter:

- must be permanently submerged;
- must not be built in streams where the substrate is mostly sand;
- must use flat stones and supporting rocks of a size proportionate to the stream so as not to impede the flow;
- must consist of flat stones laid on supporting rocks placed in the stream so as not to impede the flow;
- must have a 10 to 30 cm clearance beneath the main stone.

In some cases, big boulders placed in a stream can create shelters from the current or feeding areas for fish.

Note: For more information, see FFQ (1996).

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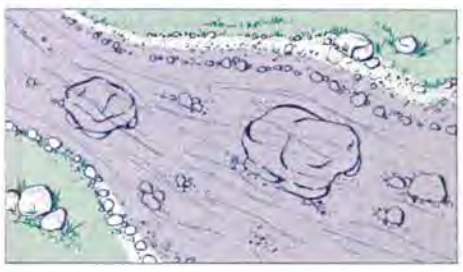
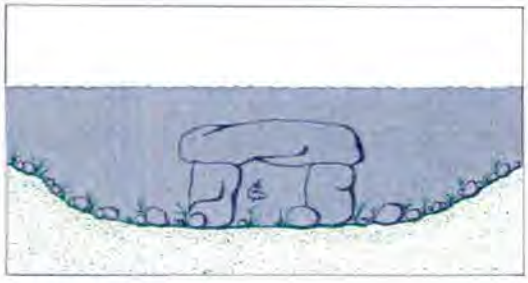




Source: FFQ, 1996

ENHANCEMENT OF SPAWNING AREAS FOR LAKE TROUT

JUSTIFICATION

What: This type of work consists of enhancing or restoring habitats that are suitable for fish reproduction while optimizing existing elements that are essential to spawning (substrate, dissolved oxygen, etc.) (FFQ, 1996).

Why: The objective of enhancing spawning areas is to ensure the natural reproduction of existing species so as to increase fish production in a water body by: (FFQ, 1996):

- allowing the fish to reproduce in ideal conditions;
- promoting survival of the eggs;
- ensuring the development and protection of fry prior to their emergence from the substrate.

Where: Spawning areas are generally enhanced in lakes where:

- there is no erosion of the banks;
- there is no problem with sedimentation;
- there is a sufficient quantity of water at all seasons;
- ideally, there is a pool close by;
- the slope is gradual and exceeds 20%;
- there is no emissary close by.

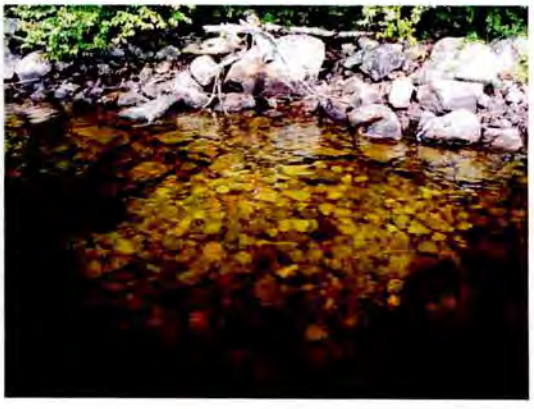
DESCRIPTION OF WORK

In general, spawning areas should be enhanced close to the shore of a lake or on a rocky shoal exposed to the dominant winds and free from sediments:

- the substrate can be smooth or angular, but must be free of sediment. Its size can vary from 50 to 300 mm.
- the substrate must be at least 50 cm thick.
- there should always be at least 50 cm of water above the gravel.

Note: For more information, see FFQ (1996).

EXAMPLES



Source :Luc Guillemette, 2008