Agenda Item 9.5
For decision

Council

CNL(12)14

Management and Sampling of the St Pierre and Miquelon Salmon Fishery

CNL(12)14

Management and Sampling of the St Pierre and Miquelon Salmon Fishery

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RÉPUBLIQUE FRANÇAISE

PREMIER MINISTRE

Secrétariat
Général de la Mer

Le Secrétaire général adjointe — Paris, le 14 mai 2012

N° 870/SGMER

Affaire suivie par Marie-Sophie DUFAU-RICHET
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Le Secrétaire général adjoint de la mer
To Mrs Mary Colligan
Chairman of the North Atlantic Salmon Conservation Organization

Objet: next meeting of NASCO
Joined documents: 2 documents from France on behalf of St Pierre et Miquelon

In view of the next annual meeting of NASCO (Edinburgh, 5-8 June), I have the honour to send you the report of France on behalf of St Pierre-et-Miquelon:

- Administrative information provided by the Pôle maritime (DTAM[1]) in Saint-Pierre et Miquelon
- Scientific information provided by the IFREMER[2] representative in Saint-Pierre, with genetic analyses by Genindexe

In 2011, salmon catches reached 3756 kilograms, of which 47% were professional and 53% recreational. As expected, the number of licenses remained stable (9 professional: equal to 2010; 58 recreational compared to 57 in 2010) with a moderate fishing effort. 60 boats have been controlled this year.

The sampling programme by IFREMER continued, with an increase in the size of the sample (73). Due to organisational constraints, the workshop between French and Canadian scientists on salmon ageing was postponed to September 2012; it will be held in St Pierre. Funding by the Ministry for Overseas was allocated for the Genindexe analyses and the organisation of a workshop to which the St Pierre Territorial Council also contributed. Finally, freshwater studies in the Belle-Rivière will be continued in 2012.

Mrs Mary Colligan
Chairman of NASCO
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Edinburgh
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Patrick CHEVALLEREAU

[1] *Direction of Territory, Agriculture and Sea*
[2] *Institut français de recherche pour l'exploration de la mer: French Research Institute for the Exploration of the Sea*

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PREFECT OF SAINT PIERRE AND MIQUELON

Department for Territories, Food and the Sea

Maritime Centre

Saint-Pierre, 9 May 2012

Head of the St Pierre and Miquelon Maritime Centre

To

The Director of Maritime Fisheries and Aquaculture
3 Place Fontenoy
75007 Paris

Our Reference: PM/2012

Person responsible: Phillipe Museux
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RE: Report on the 2011 Salmon Fishery

Annual report on the Atlantic Salmon Fishery at Saint Pierre and Miquelon
2011 Season

1. Legislation

Salmon fishing in the St Pierre and Miquelon archipelago is regulated by decree No 87-182 of 19 March 1987, implemented under the Order of 20 March 1987.

This legislation establishes the following:

- The fishery is under license and subject to an Annual Fishery Plan
- The minimum capture size is 48cm
- Nets must be declared and marked
- The minimum mesh size is 125mm
- The fishery season is restricted to 1 May – 31 July
- It is not permissible to place fishing gear within 300m of a river mouth.
- Restricted fishing effort:
  - 3 x 360m nets for professional fishermen
  - 1 x 180m net for recreational fishermen
  - All catch must be declared (through annual declarations and a fishing log)

60 vessels were inspected under this legislation.

2. Permit allocation

Fishing permits are allocated to professional fishermen (who may sell their catch) and recreational fishermen (who are not authorised to sell their catch).

The allocation procedure is based on fishery precedence and on compliance with catch declaration obligations throughout the previous season.

The Department for Maritime Affairs deals with permit applications and allocates each permit holder with a specific site to fish for the entire season. The fishery site plan is published by Order of the Prefect.

In 2011, 9 professional permits were issued (as in 2010) and 58 recreational permits were issued (57 were issued in 2009). The total number of permits is relatively stable when compared to the three previous years (64 in 2008, 58 in 2009 and 66 in 2010).

3. Salmon Catch

The total 2011 catch stands at:

Professional catch: 1764kg (1002kg in 2010)
Recreational catch: 1992kg (1780kg in 2010). 819 salmon were caught, compared to 819 in 2006, 470 in 2007, 933 in 2008, 748 in 2009 and 768 in 2010

The total weight of the catch was 3756kg (compared to 2782kg in 2010 and 3464kg in 2009) and fishing effort remains modest.

The 819 salmon caught by 58 recreational boats averages around 14 salmon per recreational fisherman. It should also be noted that many boats only fish for a very short period and bring their nets in well before the end of the permitted season, as soon as they consider that their catch is sufficient for them and their immediate circle.

	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Professional Fishery										
No. of licenses	12	12	13	14	13	13	9	8	9	9
Catch volume	**1223**	**1620**	**1499**	**2243**	**1730**	**970**	**1604**	**1864**	**1002**	**1764**
Recreational Fishery										
No. of licenses	42	42	42	52	52	53	55	50	57	58
Catch Volume	**729**	**1272**	**1285**	**1044**	**1825**	**1062**	**1846**	**1600**	**1780**	**1992**
Total catch	1952	2892	2784	3287	3855	2032	3450	3464	2782	3756

There is no export of salmon and all salmon caught are consumed by the local market. Most salmon caught are retained for personal consumption, while only a few are sold to restaurants or individuals through a local fishmonger.

It should be noted that there is no fishing for salmon in the archipelago's rivers.

Philippe Museux
Head of the Maritime Centre

Ifremer Office
BP 4240
97500
Saint-Pierre and Miquelon

Goraguer Herlé, Ifremer Saint Pierre and Miquelon
....
May 2012- Délégation SPM-12/01

Report on biological observations made on the Atlantic salmon (*Salmo salar*) catch during the 2011 fishery at St Pierre & Miquelon

Contents

Introduction

1 – Legislation applicable to the St Pierre and Miquelon Salmon Fishery

2 – Permit allocation

3 – The location of fishing sites

4 – Fishing gear

5 – Sampling of the 2011 landings

6 – Salmon catch in 2011

7 – Water temperature

8 – Genetic study

9 – Scale study

10 – Parasite study

Conclusion

Cover photo: Salmon biometry

(copyright: Ifremer Herlé Goraguer)

Introduction:

Sampling of the 2011 Atlantic salmon catch at St Pierre & Miquelon was carried out in response to a request from the Délégation Générale à l'Outre-Mer, and in order to provide NASCO with recent information on the catch at St Pierre & Miquelon. Sampling had been suspended during 2009 due to the absence of an IFREMER agent.

The sampling carried out by IFREMER enables biometric monitoring to be undertaken, the weight and length of the fish to be recorded and tissue samples to be taken in order to determine the origin of the catch. Scale samples are also taken in order to determine the age of the fish.

I – Legislation applicable to the St Pierre and Miquelon Salmon Fishery

The salmon fishery at St Pierre & Miquelon is operated under the management and fish resource conservation measures which are contained in the Order of 20 March 1987, implemented under the decree No 87 – 182 of March 1987.

Article 11. Fishing for Atlantic salmon (*Salmo salar*) in the archipelago's waters is forbidden each year between 1 January and 30 April, and from 1 August to 31 December.

With regard to the location of fishing sites, priority will be given to professional fishermen who will be granted 2 sites per boat. One site per recreational fishing boat will be granted.

Where there is competition between two or more fishermen for one site, the Head of the St Pierre & Miquelon Maritime Affairs Office will make a draw. The draw will be held in the presence of the interested parties. The competing parties will then fish the site in rotation.

Article 12. The total length of authorised salmon fishing nets will not exceed one thousand and eighty metres for professional fishermen and one hundred and eighty metres for recreational fishermen.

Each individual net for use by professional fishermen will not exceed three hundred and sixty metres.

It is forbidden to place any part of a net within 360m of the mouth of any water-course in which salmon may spawn (Belle Rivière and Dolisie), or within 200m of any part of another net.

Where a net becomes displaced, the permit holder has 48 hours to reposition the net correctly. Nets must not be left unattended for more than 5 consecutive days.

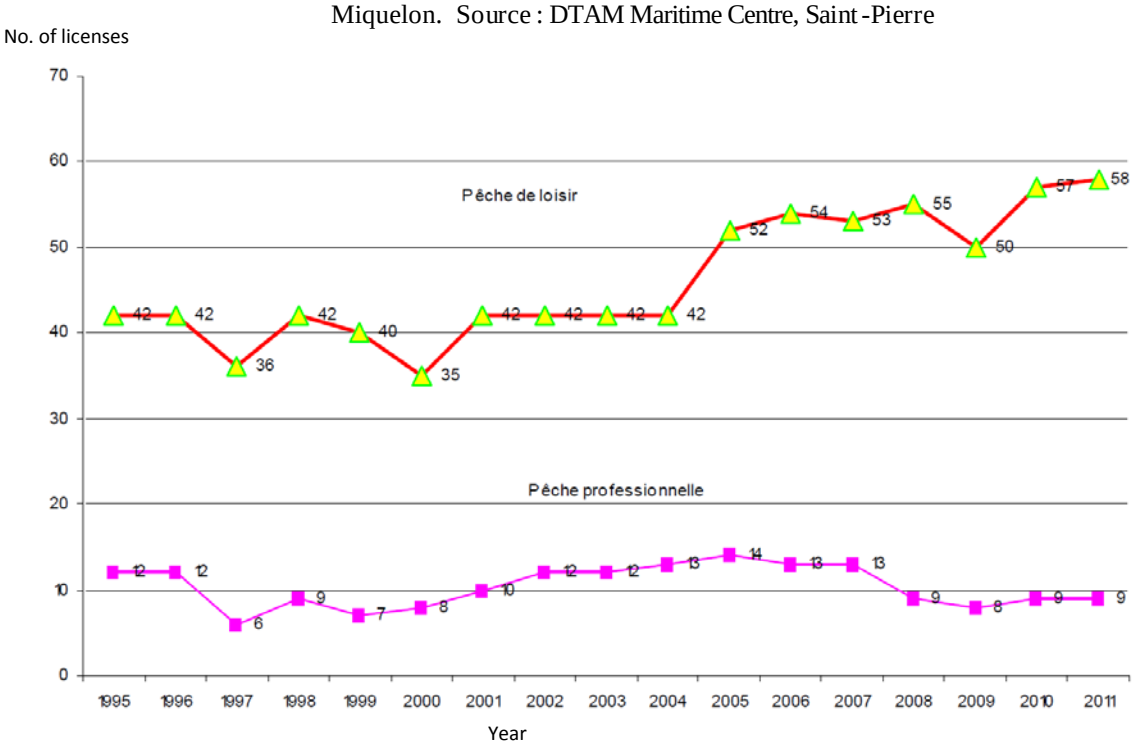
Article 13. Salmon fishermen must register their catch on their fishing log immediately after bringing said catch on board their boat.

This fishing log must be made available on request and should be sent to the Maritime Affairs Office before 1 September each year.

2 – Permit Allocation

In 2011, 9 professional permits were allocated, which is the same as in 2010. 58 recreational permits were issued in 2011, which is one more than in 2010. Figure 1 below shows the changes in permit allocation for both types of fishing since 1995

Fig 1- The number of Atlantic salmon fishing permits issued between 1995 and 2011 at St Pierre & Miquelon. Source : DTAM Maritime Centre, Saint-Pierre



Pêche de loisir – Recreational fishery Pêche professionnelle – Professional fishery

It should be noted that despite the increase in the total number of permits issued since 2007, fishing effort (taken as the maximum authorised length of nets) has fallen by 14.5% between 2007 and 2011 (23,580m in 2007 compared to 20,160m in 2011). This is essentially due to the fact that fewer professional fishermen have exercised their right to place 1080m of net, while recreational fishermen are only permitted to place 180m of net.

3 – The location of fishing sites

The majority of fishing sites are located close to St Pierre, to the South-East of the island and are mainly used by recreational fishermen.

Nets may be placed at the following sites:

Cap Noir, Ile aux Chasseurs, Les Flacous, Cap à Gordon, Les Canailles, Cap Bleu, Ile Pelée, Anse à la Vierge, Anse de l'Ouest, Rochers de l'Est, Caillou aux Chats, Basse Gélin, Basse des Grappins, Ile aux Vainqueurs, Pointe Blanche, Enfant Perdu, Cap Percé, Pointe Anse à Pierre, Cap aux Morts, Ilot Noir, Mirande, Trou aux Renards, Cap à Dinan, Basse Tournioure (see Annex 1 for a map of the main fishing areas around the Archipelago).

4 – Fishing gear

The fishing gear used generally consists of 3 or 4 nets joined together. Made in Canada, they are tied with a 60/100mm diameter polyamide monofilament thread. The thread is bottle-green in colour for nets with a stretched mesh size of 5 inches (125mm). It should be noted that all the nets used cannot be strictly identical.

The maximum authorised net length is 3 x 360m for professionals and 180m for recreational fishermen.

5– Sampling of the 2011 landings

Sampling was carried out on 9 occasions during the fishing season from the end of May to mid-July.

A total of 73 gutted salmon were measured and weighed according to protocol.

Adipose fin samples were taken for genetic analysis, and scale samples were taken in order to determine the age of 73 individual fish.

Sampling is traditionally carried out at local fishmongers, who inform IFREMER as soon as 10 or more salmon are supplied to the establishment.

	2003	2004	2005	2006	2007	2008	2010	2011
Number of Samplings	12	11	8	19	1	2	9	9
Date of the first sampling	4 June	5 June	6 June	6 June	14 June	9 June	10 June	31 May
Date of the last sampling	6 July	29 June	23 June	4 July	14 June	16 June	7 July	7 July
Total weight sampled(kg)	872	837	718	926	49	218	163	314
Number sampled	340	355	310	391	12	68	57	73
Number weighed	340	355	310	391	12	68	57	73

Table 1 – Sampling operations carried out at St Pierre & Miquelon between 2003 and 2011. NB No sampling was carried out in 2009.

6 – Salmon catch in 2011

According to the catch declared to DTAM, the total catch in 2011 was 3,757kg of whole fish, an increase of 975kg compared to 2010. The coefficient conversion used to obtain the gross weight figure is 1.15.

Professional catch accounted for 47% of the total catch, while the recreational catch accounted for 53%.

In 2010, professional catch accounted for 36% and recreational catch 64% of the total catch.

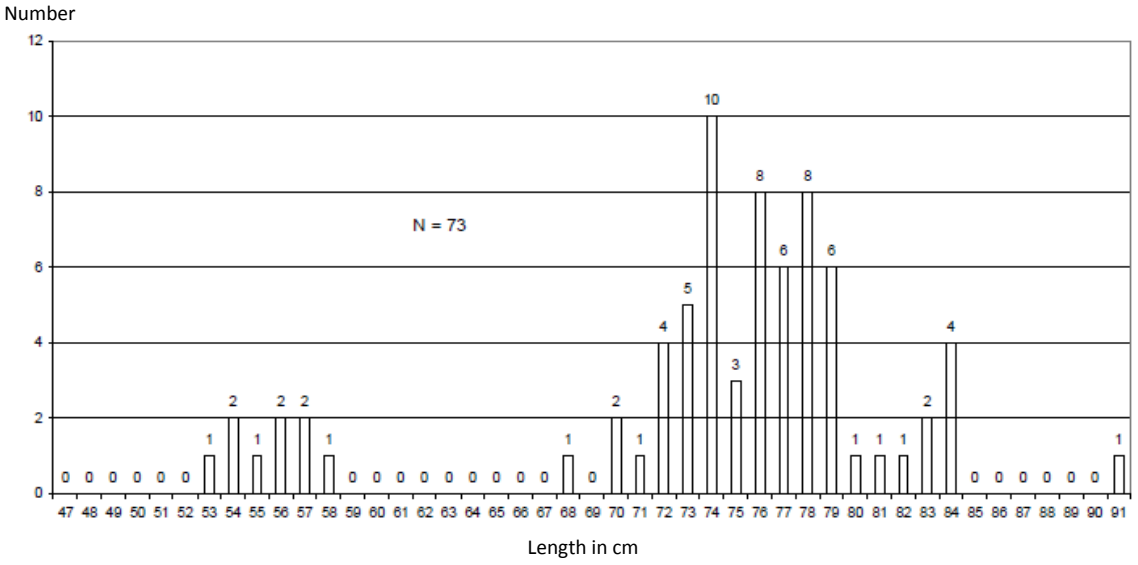
Figure 2 shows the landings by fishing type since 1990.

Fig 2: Atlantic salmon catch at St Pierre and Miquelon between 1990 and 2010.
Source: Maritime Affairs, Saint Pierre

Pêche de loisir – Recreational fishery Pêche professionnelle – Professional fishery

Photo 2: measuring salmon in the workshop (copyright Ifremer)

Fig.3: Size composition of Atlantic salmon sampled at St Pierre & Miquelon in 2011



The majority of salmon measured in 2011 were over 70cm long. The smallest observed was 53cm and the longest was 91cm.

The average gutted weight was 4,300g. The minimum recorded was 1,460g and the maximum was 6,970g. It should be noted that 8 recreational fishermen and 1 professional fisherman declared no catch.

The average weight of salmon in the recreational catch was 2,430g (819 individual fish with a total gross weight of 1993kg). It is not possible to provide this figure for the professional catch as there is insufficient information available.

7 – Water Temperature

As the office did not have the correct equipment during the sampling period, water temperature readings were not taken.

However, an approximation can be made by looking at the data continually recorded at a station in Miquelon harbour. The temperatures recorded there were similar to those recorded in previous years.

8 – Genetic study

73 adipose fin samples were taken from the salmon sampled in 2011 for genetic identification using their DNA imprint. Comparing the profiles using a genetic database allowed the origin of each fish to be determined. This work was carried out by the Genindexe Laboratory in La Rochelle (the full results of the analysis are contained in Annex 2).

2 profiles (or 2.7%) indicated that the fish were of US origin, while the other 71 profiles (97.3%) were considered to be of Canadian origin.

A previous genetic study of 25 fish, carried out in 2004, showed that the salmon sampled at that time were mainly of Canadian origin.

9 – Scale Study

73 scale samples were taken in order to determine the age composition of the salmon. These samples were sent to IFREMER's National Sclerochronology Centre in Boulogne sur Mer which will carry out the analysis. An intercalibration workshop, in collaboration with a DFO laboratory in Canada, will be held in September, in order to better determine the age of the sampled salmon.

10–Parasite study

Ectoparasites were present in 5 of the 73 fish sampled. These are likely to be sea lice, an external copepod parasite, potentially the *Lepeophtheirus salmonis* species (see photo below).

Photo 3: A salmon with ectoparasites (Copyright : Ifremer Herlé Goraguer)

11– Conclusion

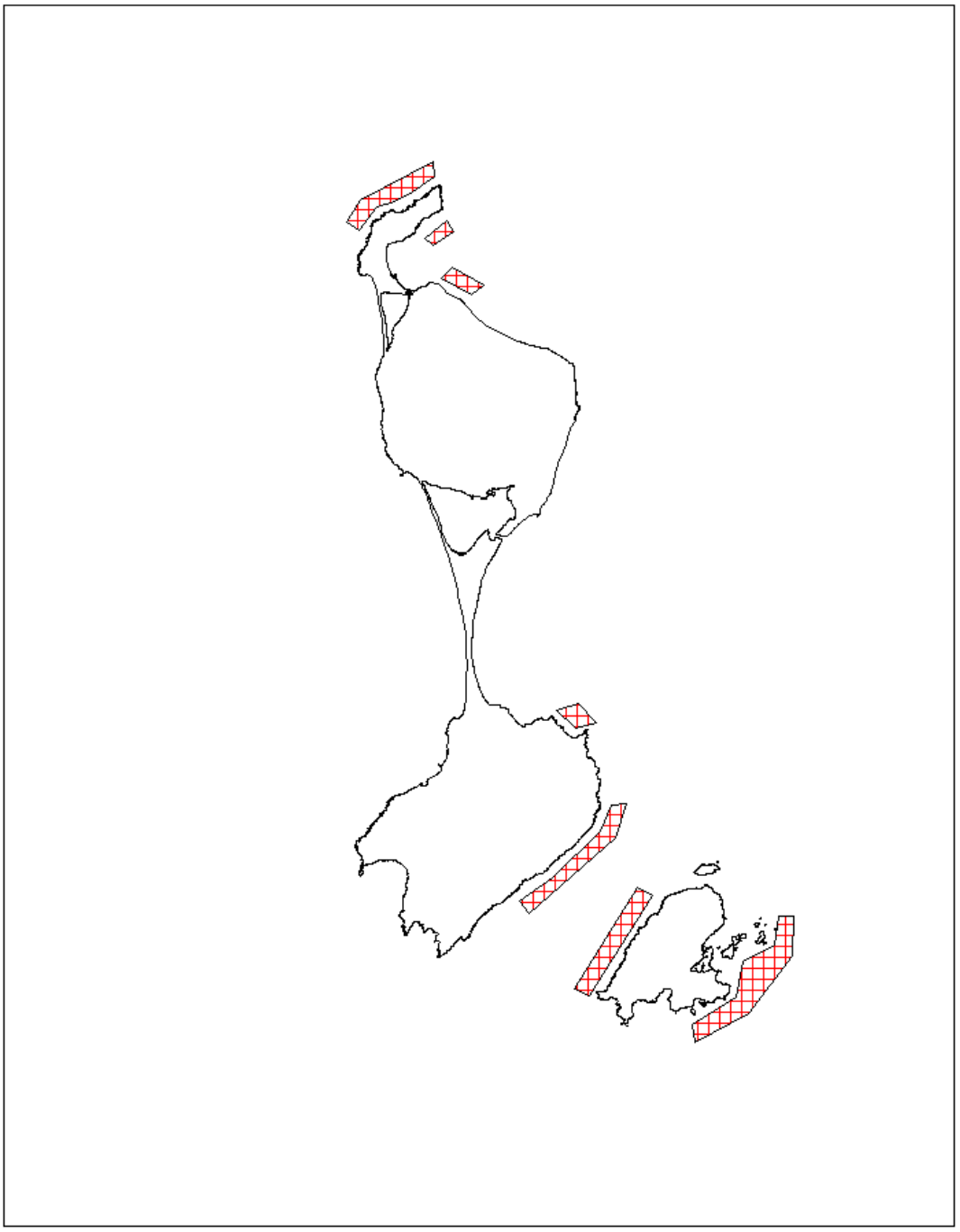
2011 seems to have been a better season than in 2010 in terms of catch.

On average, recreational fishermen caught 14 salmon each, weighing 2.43kg.

The genetic study shows that the majority of salmon caught were of Canadian origin.

It will be of interest to continue this genetic study, especially on those salmon caught around the island of Miquelon. Salmon caught at Miquelon could be of Newfoundland origin.

SALMON FISHING AREAS AT SAINT-PIERRE AND MIQUELON



Annex 1: Location of the main fishing areas at St Pierre and Miquelon during the 2011 season.

Annex 2: Report of the Laboratoire d'Analyses Génétiques Genindexe Analysis

ANALYSIS REPORT

Description of the Request

Date of request: September 2011

Nature of Sample: 73 *Salmo salar* adipose fin samples

Test requested: Genetic identification by DNA imprint and comparison to genetic database for population assignment.

GENINDEXE
6, rue des Sports
17000 La Rochelle

Téléphone : 33(0)5 46 30 69 66
Fax : 33(0)5 46 30 69 68
E-mail : contact@genindexe.com
http://www.genindexe.com

Methodology

The samples were received in the laboratory.
Each sample was identified using a unique internal code between SSA2800 and SSA2872.

The genetic material for each sample was then extracted and purified according to the laboratory's current methods.
The genetic profiles of the individuals were created using the following SALSEA microsatellite markers:

- Ssa14
- Ssa197
- Ssa202
- Ssa289
- SsaD144
- SsaD157
- SsaD486
- SsaF43
- Sssp1605
- Sssp2201
- Sssp2210
- Sssp2213
- Sssp2215
- SsspG7
- SsosL85

In each series of genetic amplification, the following controls were introduced in addition to the DNA extracts from the individuals to be analysed:

- Negative PCR control (blank PCR)
- Extraction control
- Positive PCR control (DNA taken from an individual whose genotype is known and has been standardised)

The profiles obtained will be compared to those in the database in order to assign the population. The profiles will be compared to the following populations:

USA: Maine, Narraguagus
USA: Maine, Penobscot
Canada: New Brunswick, Tobique

Canada: Quebec, Ste Marguerite
Canada: Quebec, Ste Anne
Canada: Quebec, Malbaie
Iceland: Sudurland, Nupsa
Iceland: Vesturland, Langa
Iceland: Nordurland, Laxa i Adaldal
Scotland: Don
Scotland: Almond
Scotland: Coulin
England: Dart
Wales: Dee
France: Allier
France: Sée
Russia: Neva
Russia: Ponoi
Russia: Pulonga
Russia: Varzuga
Finland: Simojoki
Finland: Tornionjoku
Norway: Komag
Norway: Repparfjord
Norway: Figgjo
Norway: Pechora
Norway: Saltdaselva
Sweden: Atran
Denmark: Skejrn
Spain: Stella
Spain: Narcea
Ireland: Boyne
Ireland: Blackwater
Ireland: Dawros

Results of the Analyses

The samples were genotyped according to 16 markers. The positive control showed a complete and true profile. The negative controls gave no signals.

The profiles obtained are shown in Table 1 below.

Genindexe
Laboratoire d'Analyses Génétiques

	Ssa14	Ssa14	Ssa171	Ssa171	Ssa197	Ssa197	Ssa202	Ssa202	Ssa289	Ssa289	SsaD144	SsaD144	SsaD157	SsaD157	SsaD486	SsaD486	SsaF43	SsaF43	SSsp1605	SSsp1605	SSsp2201	SSsp2201	SSsp2210	SSsp2210	SSspG7	SSspG7	SsosL85	SsosL85	SSsp2213	SSsp2213	SSsp2215	SSsp2215
SSA-2800	141	145	242	242	155	183	278	306	118	118	213	257	366	382	171	175	125	125	232	252	308	284	112	112	183	211	195	195	178	218	167	179
SSA-2801	141	145	214	256	187	211	258	286	118	124	209	225	350	366	175	187	127	117	248	248	324	336	112	112	175	179	179	193	194	202	159	179
SSA-2802	141	145	214	244	155	183	258	286	118	124	221	237	334	334	171	175	127	127	232	252	312	328	112	124	183	211	195	195	178	218	117	159
SSA-2803	141	141	238	264	163	187	278	278	118	118	181	213	346	374	171	183	127	127	234	234	288	312	136	136	203	211	187	191	190	202	155	175
SSA-2804	141	145	242	242	175	187	302	306	118	118	237	257	366	390	171	175	111	123	228	228	320	352	112	132	183	183	187	199	182	182	159	171
SSA-2805	141	145	234	264	171	175	278	294	118	118	165	225	342	358	175	187	117	117	238	254	316	348	124	132	183	183	181	187	178	186	179	183
SSA-2806	145	145	246	260	187	211	258	262	118	118	237	225	358	394	171	171	123	123	236	240	312	332	112	120	175	203	179	193	182	186	163	187
SSA-2807	145	145	244	258	187	211	306	310	118	118	173	229	394	358	171	187	123	127	236	238	312	332	112	124	175	203	169	179	182	186	163	187
SSA-2808	141	145	234	242	171	171	286	302	118	118	233	237	362	378	171	187	105	105	232	236	320	374	112	112	187	211	185	187	186	194	159	183
SSA-2809	141	145	232	238	175	179	274	286	118	118	221	257	366	414	171	183	117	123	238	238	300	344	112	136	179	179	179	193	186	190	163	167
SSA-2810	145	145	246	246	175	187	258	306	118	118	241	255	362	406	171	171	117	117	234	238	368	296	112	132	191	195	179	179	190	198	163	163
SSA-2811	141	141	234	238	187	207	270	302	118	124	153	221	334	378	175	191	111	131	246	258	324	378	112	128	163	191	197	197	182	206	159	171
SSA-2812	145	145	260	268	171	179	286	310	118	124	153	217	358	362	175	175	117	117	234	248	332	378	132	136	207	211	183	195	170	194	147	155
SSA-2813	145	145	238	238	179	191	286	314	118	118	241	221	342	354	175	187	117	117	252	260	296	300	112	112	191	195	183	183	174	190	155	159
SSA-2814	145	145	242	260	179	183	298	306	118	118	205	237	338	346	171	187	117	121	246	254	312	328	136	136	207	211	193	193	198	202	159	171
SSA-2815	145	145	246	260	171	199	298	302	118	118	149	189	350	378	175	175	135	135	236	238	296	312	112	112	203	203	191	199	182	190	147	179
SSA-2816	141	145	258	260	183	195	302	322	118	118	189	221	350	366	175	187	117	117	238	252	300	312	112	156	203	219	179	187	186	186	147	163
SSA-2817	141	145	246	258	175	175	294	314	118	118	225	237	322	358	179	191	117	123	238	252	292	288	112	136	183	203	191	193	182	182	163	171
SSA-2818	141	145	234	234	171	195	274	310	118	118	181	245	326	342	171	187	117	117	236	236	328	368	112	124	199	203	179	195	190	202	167	183
SSA-2819	145	145	246	246	167	175	274	294	124	124	213	245	342	378	171	179	117	123	234	264	304	316	112	136	183	191	191	191	198	198	163	167
SSA-2820	145	145	234	258	159	175	298	310	124	128	209	221	378	394	175	187	117	119	234	252	280	328	132	136	167	175	181	181	194	210	163	175
SSA-2821	145	145	230	264	171	179	298	314	118	118	181	221	338	358	171	175	117	117	238	242	312	316	112	136	183	199	179	181	190	190	163	163
SSA-2822	141	141	234	234	179	183	274	310	118	124	193	225	366	410	171	175	117	117	242	246	348	370	112	136	179	199	181	191	186	186	155	171
SSA-2823	141	145	246	250	167	175	258	286	118	118	209	209	362	378	171	191	117	117	238	260	320	328	112	112	175	199	181	191	202	210	163	163
SSA-2824	141	145	230	234	175	183	306	314	118	118	249	253	342	354	187	187	117	117	230	254	292	332	112	136	179	179	181	187	190	194	159	171
SSA-2825	145	145	234	238	159	187	262	298	118	124	193	217	358	414	175	175	127	129	232	232	296	324	112	112	167	203	179	187	190	190	167	167

Genindexe
Laboratoire d'Analyses Génétiques

	Ssa14	Ssa14	Ssa171	Ssa171	Ssa197	Ssa197	Ssa202	Ssa202	Ssa289	Ssa289	SsaD144	SsaD144	SsaD157	SsaD157	SsaD486	SsaD486	SsaF43	SsaF43	SSsp1605	SSsp1605	SSsp2201	SSsp2201	SSsp2210	SSsp2210	SSspG7	SSspG7	SsosL85	SsosL85	SSsp2213	SSsp2213	SSsp2215	SSsp2215
SSA-2826	145	145	238	242	175	175	294	298	118	122	197	237	326	342	175	195	117	117	230	236	320	332	112	136	199	211	193	195	182	190	159	159
SSA-2827	145	145	234	246	167	175	302	302	118	118	217	245	346	362	171	175	117	123	238	246	320	336	124	132	179	187	197	197	190	190	167	195
SSA-2828	141	145	222	238	167	175	298	318	118	118	193	205	370	374	171	187	117	131	234	238	336	336	112	164	175	179	189	191	148	154	167	175
SSA-2829	145	145	234	274	171	183	290	306	118	122	185	245	366	382	179	187	131	131	246	254	324	332	132	136	183	195	199	199	182	186	163	171
SSA-2830	141	145	238	246	171	191	302	302	118	118	189	225	342	346	171	175	117	123	248	252	312	324	112	136	175	211	179	191	186	190	159	163
SSA-2831	145	145	234	246	171	187	282	302	118	124	205	245	318	330	175	187	117	123	230	230	280	296	112	136	167	183	181	195	178	198	147	183
SSA-2832	141	145	234	238	159	171	298	302	118	122	157	217	342	354	187	195	117	119	250	264	344	364	136	156	183	183	179	181	148	198	171	179
SSA-2833	141	145	234	238	187	215	298	302	118	118	193	213	334	370	171	175	111	123	234	246	328	340	132	136	171	207	181	181	148	190	163	175
SSA-2834	141	145	222	242	175	211	282	298	118	124	193	225	354	358	171	171	113	117	230	268	328	378	112	112	183	187	191	195	186	194	167	175
SSA-2835	145	145	234	238	187	199	290	294	118	122	217	225	362	414	175	187	117	123	238	242	332	344	112	136	175	183	179	185	198	202	155	167
SSA-2836	141	145	242	246	183	203	274	294	118	118	245	217	358	366	187	191	117	123	230	254	304	352	112	124	183	183	191	199	186	186	151	167
SSA-2837	141	145	238	242	163	203	302	314	118	118	257	249	354	378	175	179	123	123	252	254	308	332	112	136	167	203	181	185	178	194	167	171
SSA-2838	145	145	234	254	171	191	302	302	118	118	197	225	354	366	171	175	111	111	234	234	312	324	112	114	175	211	181	185	186	194	159	163
SSA-2839	141	145	234	272	171	175	250	290	118	128	209	237	346	354	171	171	117	127	230	252	284	308	124	132	203	203	179	193	190	202	163	171
SSA-2840	145	145	222	250	175	183	306	314	118	118	237	253	354	366	187	187	123	123	234	234	292	332	112	120	171	179	181	193	170	194	163	167
SSA-2841	145	145	234	238	159	187	262	298	118	124	193	217	358	414	175	175	127	129	230	236	296	324	112	120	167	203	179	187	190	190	167	167
SSA-2842	145	145	234	250	175	175	294	298	118	118	197	237	326	342	175	195	117	117	238	246	320	332	112	136	167	195	193	195	182	190	159	159
SSA-2843	145	145	234	246	167	175	302	302	118	118	245	217	346	362	171	175	117	123	234	238	320	336	124	132	179	187	197	197	182	186	167	195
SSA-2844	141	145	222	234	167	175	298	318	118	118	193	205	370	374	171	187	117	131	246	254	336	336	112	164	175	179	189	191	148	154	167	175
SSA-2845	145	145	234	274	171	183	290	306	118	122	185	245	366	382	179	187	131	131	244	260	324	332	132	136	183	195	181	199	182	186	163	171
SSA-2846	141	145	230	250	179	203	278	306	118	118	237	221	346	358	175	187	117	123	230	230	296	272	136	144	167	179	179	181	190	194	163	179
SSA-2847	145	145	234	246	171	187	306	306	118	124	205	209	318	330	175	187	117	123	230	252	280	296	112	136	171	179	181	195	178	198	147	183
SSA-2848	145	145	226	242	175	191	278	290	118	118	213	233	370	394	175	187	117	123	238	238	332	336	112	136	183	207	179	199	182	210	133	155
SSA-2849	141	145	234	238	175	227	282	302	122	124	197	257	374	378	171	175	125	125	236	236	296	312	112	136	187	199	183	197	182	190	155	175
SSA-2850	145	145	240	250	171	179	294	306	118	118	221	221	346	394	175	175	127	127	232	264	312	320	112	136	167	195	179	191	170	198	147	175
SSA-2851	145	145	248	248	171	175	294	302	118	118	213	249	330	330	171	175	117	117	238	254	292	292	112	120	127	183	191	199	194	198	159	175

Genindexe
Laboratoire d'Analyses Génétiques

	Ssa14	Ssa14	Ssa171	Ssa171	Ssa197	Ssa197	Ssa202	Ssa202	Ssa289	Ssa289	SsaD144	SsaD144	SsaD157	SsaD157	SsaD486	SsaD486	SsaF43	SsaF43	SSsp1605	SSsp1605	SSsp2201	SSsp2201	SSsp2210	SSsp2210	SSspG7	SSspG7	SsosL85	SsosL85	SSsp2213	SSsp2213	SSsp2215	SSsp2215
SSA-2852	141	145	238	238	171	183	294	302	118	128	193	213	354	374	171	187	117	117	230	238	300	304	112	124	167	179	181	191	194	198	163	171
SSA-2853	145	145	234	238	171	191	302	310	118	118	221	241	354	378	175	187	117	117	230	250	344	344	124	124	195	195	181	181	182	182	163	167
SSA-2854	141	145	234	246	171	175	302	310	118	118	217	237	370	370	175	175	117	123	230	238	324	348	124	124	179	179	183	195	174	186	159	171
SSA-2855	145	145	230	234	183	219	274	278	118	124	161	221	358	410	171	183	117	117	228	248	312	340	112	112	171	179	181	183	174	186	159	171
SSA-2856	141	145	240	240	171	195	274	282	118	124	125	233	310	354	171	179	127	127	230	246	284	284	112	144	191	207	197	199	190	198	133	163
SSA-2857	145	145	230	214	183	187	278	306	118	122	181	217	322	350	175	187	123	123	242	260	272	296	124	124	167	179	193	193	178	198	133	183
SSA-2858	145	145	246	266	179	203	234	302	118	118	121	161	358	370	171	179	111	117	234	238	280	280	112	112	179	187	185	199	162	162	163	167
SSA-2859	143	145	238	260	171	175	294	302	118	118	201	225	326	342	171	175	119	127	234	252	292	292	112	112	127	183	179	199	190	198	159	163
SSA-2860	145	145	246	268	171	175	302	302	118	118	197	245	334	362	171	175	117	117	228	236	300	304	112	120	167	179	179	181	194	206	159	175
SSA-2861	145	145	244	268	167	195	302	310	118	118	225	217	322	326	171	179	117	123	230	250	328	328	112	112	215	219	193	199	190	198	159	179
SSA-2862	141	145	254	230	175	183	290	294	118	118	197	257	334	342	175	187	131	131	230	254	312	336	112	136	183	199	189	197	194	198	167	171
SSA-2863	145	145	234	254	199	223	282	286	118	118	177	193	382	402	171	175	117	123	250	250	316	320	124	136	167	167	179	179	182	190	171	179
SSA-2864	141	141	254	254	167	215	298	298	118	124	161	161	330	406	171	175	115	115	230	246	312	316	112	112	183	187	179	179	186	186	171	171
SSA-2865	141	145	238	238	171	195	274	282	118	122	177	189	310	354	171	179	111	117	228	228	284	352	112	144	191	207	183	183	170	170	133	163
SSA-2866	145	145	234	234	171	199	294	306	122	122	181	217	322	378	171	175	123	129	242	246	312	320	124	124	179	187	183	195	178	198	133	183
SSA-2867	145	145	244	264	179	203	290	298	118	118	189	237	338	350	175	175	111	117	236	236	308	308	112	112	179	195	189	191	182	198	163	167
SSA-2868	141	141	222	222	179	179	302	302	118	118	185	185	358	394	175	175	115	115	234	260	276	312	124	136	215	219	183	197	186	186	171	171
SSA-2869	141	145	218	234	167	195	302	310	118	118	185	185	342	346	171	179	131	131	228	248	328	328	112	136	203	203	183	195	186	186	159	163
SSA-2870	145	145	242	268	167	195	302	310	118	118	217	225	322	326	171	179	117	123	228	228	328	328	112	112	215	219	193	195	190	198	159	179
SSA-2871	141	145	214	230	163	167	298	298	118	118	161	185	346	374	175	187	123	117	234	250	276	312	112	112	183	199	179	181	178	206	167	171
SSA-2872	141	141	230	230	167	215	294	302	118	124	177	193	342	350	171	175	119	127	228	228	312	316	140	140	183	187	181	181	182	182	167	179
SSA-2873	141	141	252	252	167	215	290	298	118	124	201	241	370	370	171	175	111	111	238	258	312	336	112	112	183	187	179	199	182	182	159	171

Table 1: Genotypes obtained from the 51 adipose fin samples. The figure 0 means that the sample could not be interpreted using the given markers.

Conclusions

Genetic profiles of individual fish were created, analysed and compared to our genetic database.

Table 2: Genetic assignment test results

CODE INTERNE	INDIVIDU	ASSIGNATION
SSA-2800	1	CAN-STE-MARGUERITE
SSA-2801	2	CAN-STE-MARGUERITE
SSA-2802	3	CAN-STE-MARGUERITE
SSA-2803	4	CAN-STE-MARGUERITE
SSA-2804	5	CAN-STE-ANNE
SSA-2805	6	CAN-STJEAN
SSA-2806	7	CAN-STJEAN
SSA-2807	8	CAN-STE-ANNE
SSA-2808	9	CAN-STE-ANNE
SSA-2809	10	CAN-STE-ANNE
SSA-2810	11	CAN-STE-MARGUERITE
SSA-2811	12	CAN-STE-ANNE
SSA-2812	13	CAN-STE-ANNE
SSA-2813	14	CAN-STE-ANNE
SSA-2814	15	CAN-STJEAN
SSA-2815	16	CAN-STE-ANNE
SSA-2816	17	CAN-STE-ANNE
SSA-2817	18	CAN-TRINITE
SSA-2818	19	CAN-STE-ANNE
SSA-2819	20	CAN-STE-MARGUERITE
SSA-2820	21	CAN-TRINITE
SSA-2821	22	CAN-TRINITE
SSA-2822	23	CAN-STE-ANNE
SSA-2823	24	CAN-STE-ANNE
SSA-2824	25	CAN-TRINITE
SSA-2825	26	CAN-TRINITE
SSA-2826	27	CAN-STE-ANNE
SSA-2827	28	CAN-STE-MARGUERITE
SSA-2828	29	CAN-STE-ANNE
SSA-2829	30	CAN-STE-ANNE
SSA-2830	31	CAN-STE-MARGUERITE
SSA-2831	32	CAN-STE-MARGUERITE
SSA-2832	33	CAN-STE-MARGUERITE
SSA-2833	34	CAN-STE-MARGUERITE
SSA-2834	35	CAN-STE-ANNE
SSA-2835	36	CAN-STJEAN
SSA-2836	37	CAN-STJEAN
SSA-2837	38	CAN-STE-ANNE
SSA-2838	39	CAN-STE-ANNE
SSA-2839	40	CAN-STE-ANNE
SSA-2840	41	CAN-STE-MARGUERITE

Table 2 (contd)

CODE INTERNE	INDIVIDU	ASSIGNATION
SSA-2841	42	CAN-STJEAN
SSA-2842	43	CAN-STE-ANNE
SSA-2843	44	CAN-TRINITE
SSA-2844	45	CAN-STE-ANNE
SSA-2845	46	CAN-STJEAN
SSA-2846	47	CAN-STE-ANNE
SSA-2847	48	CAN-TRINITE
SSA-2848	49	CAN-STJEAN
SSA-2849	50	CAN-STE-ANNE
SSA-2850	51	CAN-STE-ANNE
SSA-2851	52	CAN-STE-ANNE
SSA-2852	53	CAN-STE-ANNE
SSA-2853	54	CAN-STE-ANNE
SSA-2854	55	CAN-STE-ANNE
SSA-2855	56	CAN-STE-ANNE
SSA-2856	57	CAN-STE-ANNE
SSA-2857	58	USA-NARRAGUAGUS
SSA-2858	59	CAN-STE-ANNE
SSA-2859	60	CAN-STE-MARGUERITE
SSA-2860	61	CAN-STJEAN
SSA-2861	62	CAN-STE-ANNE
SSA-2862	63	CAN-STJEAN
SSA-2863	64	CAN-STE-ANNE
SSA-2864	65	CAN-STE-MARGUERITE
SSA-2865	66	CAN-STE-ANNE
SSA-2866	67	CAN-STE-ANNE
SSA-2867	68	CAN-STE-ANNE
SSA-2868	69	USA-NARRAGUAGUS
SSA-2869	70	CAN-STE-ANNE
SSA-2870	71	CAN-STE-ANNE
SSA-2871	72	CAN-TRINITE
SSA-2872	73	CAN-STJEAN

Code interne – internal code individu – individual Assignation - assignment

The profile comparisons indicate that the majority of fish analysed are similar to Canadian populations. Table 2 shows the assignation test results of the 73 fish analysed.

La Rochelle, 30 November 2011

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