

# Marsh Bird and Amphibian Communities in the St. Lawrence River (Canada and USA) AOC, 1995 – 2002.



## Purpose of the MMP

The Marsh Monitoring Program (MMP) was established to provide baseline surveys of marsh bird and amphibian populations and their habitats in marshes within Areas of Concern (AOCs) in the Great Lakes basin, sites where rehabilitation and restoration efforts have taken place or are planned in AOCs, and in many other Great Lakes basin wetlands. Marsh bird surveys were first implemented in the Canadian and bi-national AOCs in 1994. In 1995, the program expanded throughout the basin to include surveys of calling amphibians. To date, over 650 MMP volunteers have surveyed marsh bird and/or amphibian populations and their habitats. Information about abundance and diversity of these species provides useful, and easily obtainable indicators of habitat quality, structure and areal extent.

## Purpose of the Report

This report summarizes results of MMP surveys done in the St. Lawrence River AOC from 1995 to 2002. It also explains how the set of indicators used by the MMP assesses marsh quality and describes the significance of MMP results for this AOC. Results herein provide an opportunity to determine whether or not amphibian and/or marsh bird community status at St. Lawrence River AOC wetlands are impaired. This report should be read in conjunction with the context and analyses description in the Marsh Monitoring Program: Areas of Concern Summary Reports 1995 – 2002.

## Highlights of the MMP's St. Lawrence River Results

### Indicator Species

The presence of the following suite of marsh bird and amphibian species indicates high quality marsh habitat.

A **T** indicates those species found in the St. Lawrence River AOC marshes.

#### *Birds*

- T American Bittern (AMBI)
- T American Coot (AMCO)
- T Black Tern (BLTE)
- T Blue-winged Teal (BWTE)
- T Common Moorhen (COMO)
- T Common Snipe (COSN)
- T Least Bittern (LEBI)
- T Marsh Wren (MAWR)
- T C. Moorhen/ A.Coot (MOOT)
- T Pied-billed Grebe (PBGR)
- T Sora
- T Virginia Rail (VIRA)

#### *Amphibians*

- T Bullfrog (BULL)
- T Chorus Frog (CHFR)
- T Mink Frog (MIFR)
- T Northern Leopard Frog (NLFR)
- T Spring Peeper (SPPE)

- Since the program's initiation, five amphibian, five marsh bird and two routes surveyed for both amphibians and marsh birds have been monitored in the St. Lawrence River AOC. During the period from 1995 through 2002, the number of routes surveyed and number of volunteers were relatively stable, however, volunteer participation decreased from 2000 to 2002.
- Overall, ten amphibian species were recorded, including all five amphibian indicator species (Bullfrog, Chorus Frog, Mink Frog, Northern Leopard Frog, Spring Peeper). The most common species occurring at St. Lawrence River marshes were Bullfrog, Green Frog, Northern Leopard Frog and Spring Peeper, occurring at seven of eight routes surveyed. In general, species were recorded at various levels (Call Level Codes 1, 2 and 3).
- Number of marsh nesters at St. Lawrence River AOC routes ranged from five to 21. Overall, 29 species of marsh nesters were recorded in the St. Lawrence River AOC – a very high level of diversity. Further, all 12 marsh bird indicator species were recorded in the St. Lawrence River AOC. Red-winged Blackbird was the most abundant nesting species, followed by Swamp Sparrow, Yellow Warbler and Marsh Wren. Common Tern was the most abundant water forager species and Tree Swallow was the most abundant aerial forager.

- Of the five amphibian indicator species present in the St Clair River AOC, Bullfrog and Mink Frog relative occurrence scored above the average, Northern Leopard Frog and Spring Peeper scored within the average and Chorus Frog scored below the average of Great Lakes basin non-AOC routes. Abundance five marsh bird indicator species (Common Snipe, Least Bittern, Marsh Wren, Common Moorhen/American Coot, Virginia Rail) that occurred in the St. Lawrence River AOC scored within the average, and abundance of seven marsh bird indicator species (American Bittern, American Coot, Black Tern, Blue-winged Teal, Common Moorhen, Pied-billed Grebe, Sora) scored below the average of those for these species at Great Lakes basin non-AOC routes.
- St. Lawrence River marsh bird indicator species diversity scored within the average and marsh nesting bird species diversity scored below the average of those at Great Lakes basin non-AOC routes. Total amphibian species diversity and amphibian indicator species diversity scored below the average of those at Great Lakes basin non-AOC routes. Overall, this AOC is apparently impaired in its ability to support marsh dependent species.

## MMP Methods

**Table 1. Marsh Monitoring Program Survey Methods**

Survey	Time commitment	Skills Required	Survey Duration	Weather conditions
<b>Birds</b>	2 evenings, 10 days apart, between May 20 and July 5	ability to identify about 50 common birds	10 minutes at each station	warm, dry weather with little or no wind
<b>Amphibians</b>	3 nights, 15 days apart, between April 1 and July 15	ability to learn about 10 amphibian calls	3 minutes at each station	warm, dry weather with little or no wind

A route, consisting of up to eight semi-circular stations (100 m radius for marsh birds and unlimited distance for amphibians), is established in each marsh being surveyed. Stations are usually accessed by foot, but can be surveyed by canoe or boat. Marshes must be a minimum of two hectares and if very large, may support more than one route. Stations must be 500 metres apart for amphibian surveys and 250 metres apart for marsh bird surveys. Numbers of marsh birds heard calling or seen in the station are recorded. At amphibian stations, one of three Call Level Codes is used to record calling intensity of each species; abundance estimates are also made. Participants are also asked to identify if they hear each amphibian inside and/or outside of the 100 m semi-circle. Each MMP volunteer is provided with a training kit that fully explains survey methods. The kit also includes a copy of the MMP Training Tape that aids volunteers in learning songs and calls of common marsh birds and amphibians. For further information about these methods, please refer to the 2003 edition of the *MMP Training Kit and Instructions for Surveying Marsh Birds, Amphibians and their Habitats*, which is available from Bird Studies Canada.

## MMP in the St. Lawrence River AOC

Since the program's initiation, five amphibian, five marsh bird and two routes surveyed for both amphibians and marsh birds have been monitored in the St. Lawrence River AOC. During the period from 1995 through 2002, number of routes surveyed and number of volunteers were relatively stable, however, volunteer participation decreased from 2000 to 2002.

A number of habitat rehabilitation projects have been proposed in the St. Lawrence River AOC that address loss of marsh habitat, in addition to shoreline and riverine habitats. Such sites should be monitored by the MMP.

There are additional marshes in the St. Lawrence River AOC where routes could be established and existing routes where complementary marsh bird or amphibian surveys would permit a more definitive evaluation of the AOC's wetland-dependent wildlife. Volunteer recruitment to fill these needs is ongoing.

To become involved, please contact the MMP Volunteer Coordinator, Bird Studies Canada at (888) 448-2473 (phone), (519) 586-3532 (fax), or by email at [aqsurvey@bsc-eoc.org](mailto:aqsurvey@bsc-eoc.org).

## Results

Marshes in the St. Lawrence River AOC ranged from tiny to huge in size, which is in itself a positive aspect. Habitat data were collected for 11 St. Lawrence River routes. Three of these were classified as coastal marshes, thus affected by fluctuations in St. Lawrence River water levels, and eight were classified as inland marshes.

The number of amphibians in the St. Lawrence River AOC ranged from three to eight per route (Table 3). Overall, ten amphibian species were recorded, including all five amphibian indicator species (Bullfrog, Chorus Frog, Mink Frog, Northern Leopard Frog, Spring Peeper). According to the Ontario Herpetofaunal Summary, the St. Lawrence River AOC formerly supported Bullfrog, Chorus Frog, Northern Leopard Frog and Spring Peeper. The most common species occurring at St. Lawrence River marshes were Bullfrog, Green Frog, Northern Leopard Frog and Spring Peeper, all which occurred at seven of eight routes surveyed. In general, species were recorded at various levels (Call Level Codes 1, 2 and 3).

The number of marsh nesters at St. Lawrence River AOC routes ranged from five to 21 (Table 4). Overall, 29 species of marsh nesters were recorded in the St. Lawrence River AOC – a very high level of diversity. Further, all 12 marsh bird indicator species were recorded in the St. Lawrence River AOC. According to the Ontario Breeding Bird Atlas database, this AOC formerly supported nine of the 12 marsh bird indicator species. Densities for 11 of 29 marsh nesting species were higher at St. Lawrence River routes than at Great Lakes basin non-AOC routes. Red-winged Blackbird was the most abundant nesting species, followed by Swamp Sparrow, Yellow Warbler and Marsh Wren.

Six water foragers and five aerial foragers were recorded in the St. Lawrence River AOC – a high level of diversity (Table 4). Two species of conservation interest in Ontario (Black-crowned Night Heron and Great Egret) were also present. Common Tern was the most abundant water forager species and Tree Swallow was the most abundant aerial forager. Densities were higher at St. Lawrence River routes than at Great Lakes basin non-AOC routes for three (Black-crowned Night Heron, Common Tern, Green Heron) of six water foraging species and for two (Barn Swallow and Tree Swallow) of five aerial foraging species.

## Conclusions

Of the five amphibian indicator species present in the St. Clair River AOC, Bullfrog and Mink Frog relative occurrence scored above the average, Northern Leopard Frog and Spring Peeper scored within the average and Chorus Frog scored below the average of Great Lakes basin non-AOC routes (Table 5). Abundance five marsh bird indicator species (Common Snipe, Least Bittern, Marsh Wren, Common Moorhen/American Coot, Virginia Rail) that occurred in the St. Lawrence River AOC scored within the average, and abundance of seven marsh bird indicator species (American Bittern, American Coot, Black Tern, Blue-winged Teal, Common Moorhen, Pied-billed Grebe, Sora) scored below the average of those for these species at Great Lakes basin non-AOC routes.

St. Lawrence River marsh bird indicator species diversity scored within the average and marsh nesting bird species diversity scored below the average of those at Great Lakes basin non-AOC routes (Table 6). Total amphibian species diversity and amphibian indicator species diversity scored below the average of those at Great Lakes basin non-AOC routes. The St. Lawrence River AOC is apparently impaired in its ability to support a high diversity of either amphibian and marsh bird species (Table 6). Overall, this AOC is apparently impaired in its ability to support marsh dependent species.

## Recommendations

Efforts should be made to continue to rehabilitate marsh habitat and to monitor marsh bird and amphibian populations to properly address the effects of habitat loss. MMP routes should be established at all marsh rehabilitation projects. Efforts should be made to encourage all MMP volunteers surveying routes within AOCs to rigorously collect habitat information at their survey stations. Complementary amphibian and marsh bird surveys

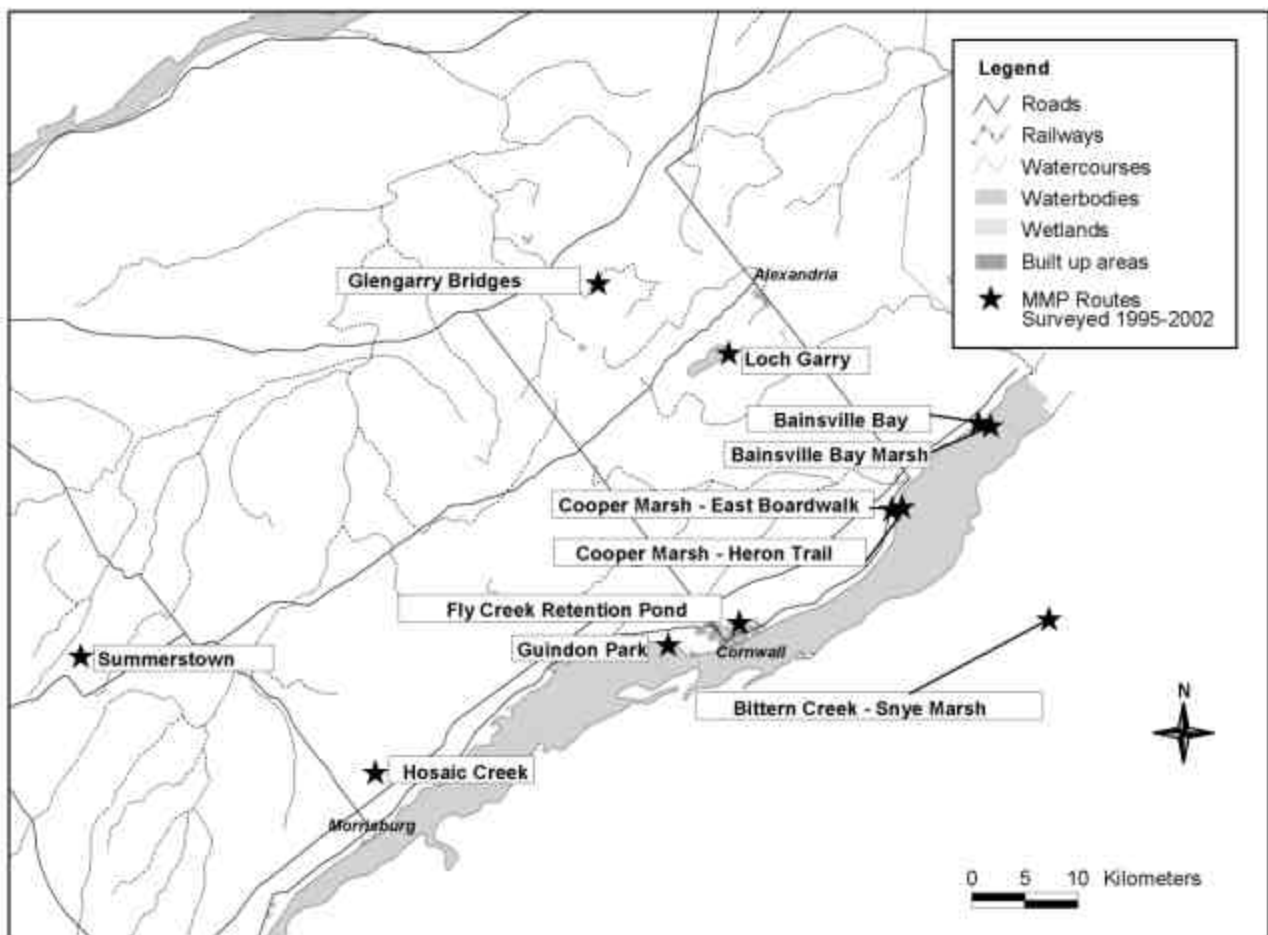
should be conducted at all new and existing routes to permit a more definitive quantitative analysis of this AOC's wetland-dependent wildlife.

## Volunteer Efforts

Thirteen participants contributed over 368 person hours between 1995 and 2002 to the program at this AOC. In addition, many volunteer hours at non-AOC routes were contributed to produce results that were used for comparison purposes. Our thanks extend to the dedicated participants who conducted the St. Lawrence River surveys: John Anderson, Steve Anderson, Rinchen Boardman, Peggi Calder, Amy Chabot, Rose-Marie Chretien, Anke Craig, Christena Ferre, Brian Hickey, Naomi Langlois, Moira MacLeod, Carmen Penty and John Stuart.

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**MMP routes in the St. Lawrence River AOC.** Coles Creek State Park route not shown.

**Table 2. Marsh Monitoring Program Routes in the St. Lawrence River (Canada and USA) AOC.**

<b>Year</b>	<b>Route Type</b>	<b># Routes</b>	<b># Volunteers</b>
1995	Amphibian	3	3
	Bird	3	3
	Both	2	1
1996	Amphibian	3	3
	Bird	3	3
	Both	2	2
1997	Amphibian	2	2
	Bird	4	3
	Both	2	1
1998	Amphibian	2	2
	Bird	2	2
	Both	2	1
1999	Amphibian	2	3
	Bird	3	2
	Both	3	1
2000	Amphibian	2	2
	Bird	2	2
	Both	0	0
2001	Amphibian	2	2
	Bird	1	1
	Both	0	0
2002	Amphibian	1	1
	Bird	0	0
	Both	0	0
Total	Amphibian	5	6
	Bird	5	6
	Both	3	3

**Table 3. Amphibian species composition and abundance (maximum Call Level Code<sup>1</sup>) at St. Lawrence River (Canada and USA) AOC MMP routes from 1995 through 2002. Shading denotes indicator species.**

Amphibian Species	Bainsville Bay	Bainsville Bay Marsh	Coles Creek State Park	Cooper Marsh - East Boarwalk	Fly Creek Retention Pond	Glangarry Bridges	Loch Garry	Summers town	St. Lawrence River (maximum)
American Toad	3	-	-	1	1	3	3	1	3
Bullfrog	2	1	3	2	2	3	3	-	3
Chorus Frog	-	-	-	-	-	2	-	-	2
Gray Treefrog	-	-	3	3	-	3	3	2	3
Green Frog	2	2	3	2	-	2	1	1	3
Mink Frog	-	-	-	-	-	-	2	-	2
Northern Leopard Frog	3	1	-	2	1	2	3	1	3
Pickerel Frog	-	-	-	1	-	-	-	-	1
Spring Peeper	3	1	1	3	-	3	3	3	3
Wood Frog	3	-	-	-	-	3	-	3	3

<sup>1</sup> Call Level Code 1: Individuals can be counted; calls not simultaneous. Call Level Code 2: Calls distinguishable, some simultaneous calling. Call Level Code 3: Full chorus; calls continuous and overlapping.

**Table 4. Marsh bird species composition and abundance (mean number per 10 stations) in the St. Lawrence River (Canada and USA) AOC from 1995 through 2002. Means for St. Lawrence River routes and Great Lakes basin non-AOC routes are given for comparison. Shading denotes indicator species and 'p' indicates that a species was present only outside of the survey stations.**

<i>Marsh Nesters</i>													
Alder Flycatcher	p									0.4		0.05	0.34
American Bittern	p	0.7	1.0			p	2.2		p	p		0.47	0.64
American Coot	0.7	4.0				1.4	0.6		1.7			0.92	0.99
American Wigeon						p						p	0.02
Black Tern	1.0	60.7	32.0								p	8.09	3.87
Blue-winged Teal						5.7	2.2					1.24	0.77
Canada Goose	p					5.7	1.7					1.16	4.56
Common Grackle	5.0		p	30.0	2.9	11.7				1.2		4.33	7.70
Common Moorhen	0.3	6.0					4.4					1.09	1.56
Common Snipe	2.1	p	3.0			11.4	10.6		6.7	2.4		5.18	0.38
Common Yellowthroat	1.7		14.0	20.0	5.7	2.8		3.3	10.0			5.74	6.41
Eastern Kingbird	2.7	1.3					0.6	2.2	p	4.0		1.16	1.51
Gadwall						p						p	0.12
Least Bittern								0.6				0.04	0.43
Little Gull		p										p	0.12
Mallard	p	6.7	3.0	p	1.4	16.7	1.1	0.8				3.56	5.36
Marsh Wren	11.8	27.3	20.0	5.0	7.1	15.0		4.2	0.4			10.00	8.30
Moorhen/Coot	1.1	17.3	1.0					0.8	0.4			1.64	0.73
Northern Harrier			1.0						p			0.12	0.09
Northern Shoveler									p			p	0.08
Pied-billed Grebe	1.0	11.3				4.3	0.6					1.71	1.69
Red-winged Blackbird	47.6	26.0	30.0	160.0	30.0	37.8	34.4	29.2	25.2			38.94	44.89
Sedge Wren	2.3	4.0							0.8	0.4		0.77	0.58
Song Sparrow	p					1.4		1.7		0.4		0.40	5.16
Sora	0.3						0.6		2.5			0.47	1.06
Swamp Sparrow	18.8	2.7	26.0	35.0	11.4	17.2		32.5	24.0			19.05	10.13
Virginia Rail	8.3	11.3	2.0				15.6		8.3	5.2		6.12	3.12
Willow Flycatcher			2.0			7.1				1.6		1.58	0.54
Yellow Warbler	12.5	1.3	2.0	25.0	5.7	5.6		21.7	18.8			10.15	6.31
<i>Water Foragers</i>													
Black-crowned Night Heron	0.7	0.7	p			2.9	1.1					0.76	0.42
Belted Kingfisher							0.6	p		0.4		0.12	0.53
Common Tern		2.0		5.0	p			p	7.5			1.42	0.84
Great Egret							0.6					0.08	0.47
Green Heron	4.3	0.7	p		1.4	0.6						0.96	0.52
Great Blue Heron	0.3	2.7	1.0	5.0	p	0.6	p	p	p			0.66	1.66
<i>Air Foragers</i>													
Bank Swallow			1.0				10.6					1.59	2.95
Barn Swallow	1.3		12.0			28.6	22.2	20.6	2.5			11.12	8.86
Cliff Swallow							1.7					0.23	0.25
Purple Martin						2.9	1.1					0.62	1.77
Tree Swallow	23.6	18.7	24.0	35.0	77.1	114.4	10.0	15.8	10.0			41.61	32.59

<sup>1</sup> Route Name	Route Number
Bainsville Bay	1
Bainsville Bay Marsh	2
Bittern Creek - Snye Marsh	3
Coles Creek	4
Cooper Marsh - Heron Trail	5
Cooper Marsh - East Boardwalk	6
Guindon Park	7
Hosaic Creek	8
Loch Garry	9

**Table 5. Status assessment of marsh bird and amphibian indicator species abundance in the St. Lawrence River (Canada and USA) AOC from 1995 through 2002. ' - ' denotes values below the Great Lakes basin non-AOC average. ' 0 ' denotes values within the Great Lakes basin non-AOC average. ' + ' denotes values above the Great Lakes basin non-AOC average. Blank indicates that the species was not present and ' p ' indicates that a species was present only outside of the sample stations.**

Route Name	Marsh Bird Indicator Species												Amphibian Indicator Species					
	AMBI	AMCO	BLTE	BWTE	COMO	COSN	LEBI	MAWR	MOOT	PBGR	SORA	VIRA	BULL	CHFR	MIFR	NLFR	SPPE	
Bainsville Bay	p	0	0		0	+		0	0	0	0	+	+			+	-	
Bainsville Bay Marsh	0	+		+	+	p		+	+	+		+	0			0	-	
Bittern Creek - Snye Marsh	0		+			+		+	0			0						
Coles Creek								0					0				0	
Cooper Marsh - Heron Trail	p	0		+		+		0	0	0								
Cooper Marsh - East Boardwalk	0	0	+		0	+		+	0	0	0	+	+			+	0	
Fly Creek Retention Pond													0			0		
Glengarry Bridges														-				
Guidon Park							0						+			+	+	
Hosaic Creek	p	0				+		0	0		0	+						
Loch Garry	p		p			+		-	-			0	+		+	+	+	
Summerstown																0	0	
<b>St. Lawrence River Overall Assessment</b>	-	-	-	-	-	0	0	0	0	0	-	-	0	+	-	+	0	0

**Table 6. Status of St. Lawrence River (Canada and USA) marshes from 1995 to 2002<sup>1</sup>. ' - ' denotes values below the Great Lakes basin non-AOC average. ' 0 ' denotes values within the Great Lakes basin non-AOC average. ' + ' denotes values above the Great Lakes basin non-AOC average.**

Route Name <sup>2</sup>	Survey Type	Year	Number of Stations	Assessment of Marsh Bird and Amphibian Species Diversity				Overall Assessment <sup>3</sup>
				Marsh Nesting Bird Diversity	Marsh Bird Indicator Species Diversity	Amphibian Species Diversity	Amphibian Indicator Species Diversity	
Bainsville Bay C, Huge	Amph Bird	1996 - 1997	6 6	-	-	-	-	0
Bainsville Bay Marsh C, Huge	Amph Bird	1996 - 1997	3 3	0	+	-	-	3
Bittern Creek - Snye Marsh I, Large	Bird	1999	5	+	+			4
Coles Creek I, Tiny	Amph Bird	1996	1 2	+	-	+	0	5
Cooper Marsh - Heron Trail C, Huge	Birds	1995	7	0	0			2
Cooper Marsh - East Boardwalk I, Huge	Amph Bird	1995 - 2001	4 6	+	+	-	0	5
Glengarry Bridges I, Tiny	Amph	1996 - 1997, 2002	5			+	0	3
Guidon Park I, Small	Bird	1996 - 2001	3	-	-			0
Hosaic Creek I, Huge	Bird	1997, 1999	6	0	0			2
Loch Garry I, Huge	Amph Bird	1995 - 1997, 1999 - 2000	6 5	0	-	0	-	2
Summerstown I, Large	Amph	1996 - 1997	4			0	0	2
<b>St. Lawrence River Overall Assessment</b>				-	0	-	-	1

<sup>1</sup> See the Marsh Monitoring Program's 1997 Final Technical Report for a detailed description of the scoring system.

<sup>2</sup> C = coastal, I = inland. Tiny (2 - 2.5 ha), Small (2.5 - 5 ha), Medium (5 - 25 ha), Huge (> 50 ha).

<sup>3</sup> A score of 0, 1 or 2 indicates impairment, a score of 3, 4 or 5 indicates no apparent impairment and a score of 6, 7 or 8 indicates an above average marsh.