2012 Nekton Survey of Restoration Salt Marshes at Ducks Unlimited Canada's Beaubasin/Aulac Marshland

Prepared for
Ducks Unlimited Canada

By

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SUMMARY

As part of a salt marsh restoration project located at Ducks Unlimited Canada's Beaubasin/Aulac marshland, two areas of dyked agricultural land were breached in the fall of 2010. As part of a program to monitor the development of the physical and biological characteristics of the breached areas, nekton surveys were carried out in 2011 and 2012 at one reference site that had been previously surveyed in 2010 prior to breaching of the dykes, and at two sites within the newly breached area. Three surveys were carried out, one in spring, one in mid-summer and one in late summer, using fyke nets and minnow traps. Six species of fish were captured during the 2012 survey period. Nekton species previously collected during 2010 and 2011, but not during 2012 included white perch, smelt and sand shrimp. There was generally little seasonal variation in the species captured, but the abundance of organisms captured was greater during early spring and late summer than during mid-summer.

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1. Background

In the fall of 2010, as part of its salt marsh restoration program, Ducks Unlimited Canada breached an area of existing agricultural dike located at the Beaubasin/Aulac Marshland located within their Beaubasin field station in southwestern New Brunswick. This resulted in nearly 17 hectares of dykeland being restored to its original tidal influence. As part of a program to monitor the development of the physical and biological characteristics of the restoration site, nekton surveys were carried out in 2010 at two reference sites prior to breaching of the dyke, and in 2011 and 2012 at one reference site and at two sites within the restoration site. The results of the 2010 and 2011 surveys have been reported by Brylinsky (2010; 2011). This report presents the results of the 2012 survey.

2. Study Area

The three study areas in which the nekton surveys were carried out are shown in Fig 2.1.

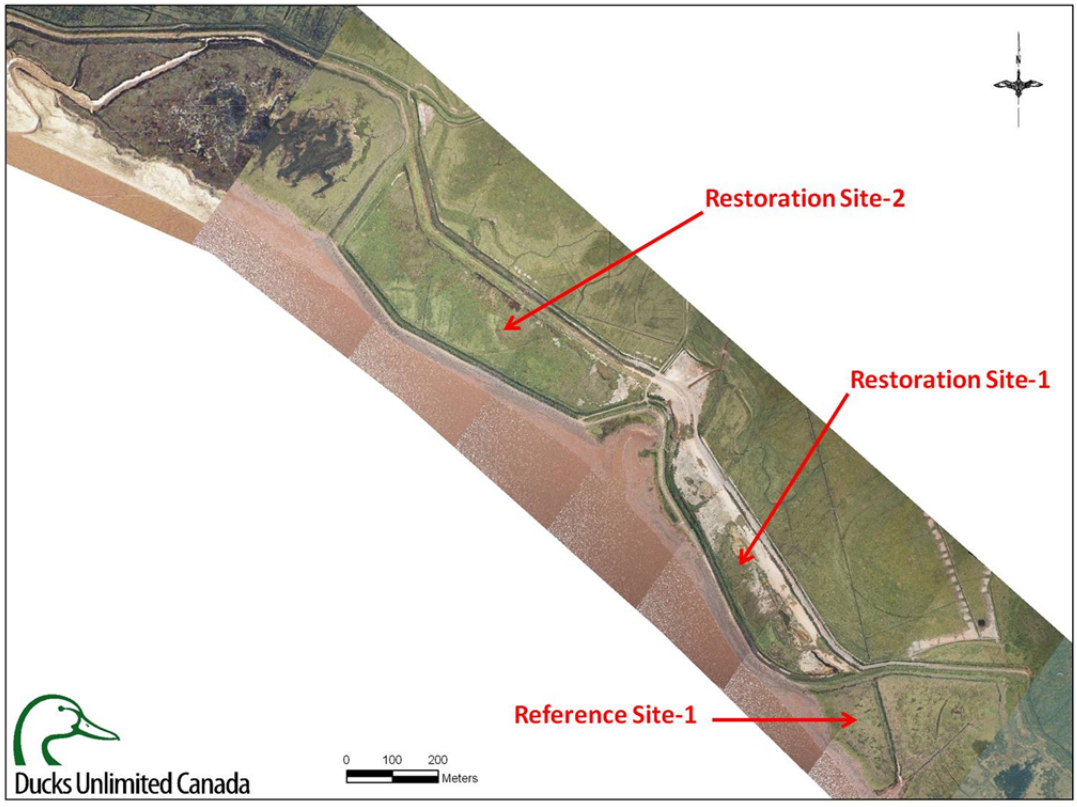

Fig. 2.1. Aerial photo showing the two restoration sites and the natural salt marsh that served as a reference site.

3. Methodology

The nekton surveys were carried out during periods of spring tides at three times: spring (8-9 May); mid-summer (17-18 July); and late summer (5-6 September). The methods employed to capture nekton were the same as those used in the 2010 survey. One fyke net having a main hoop diameter of 0.6 metres and wings of 2.4 metres in length was set across a main channel at each site, and five minnow traps, baited with dry pet food, were deployed at various locations within each site. One minnow trap was set at the same location as the fyke net and the remainder were located landward of the fyke net in smaller channels draining the study areas. Fig. 3.1 shows the location of the fyke net set at each of the monitored sites. GPS coordinateness of all the fyke nets and minnow traps are contained in Appendix I.

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Fig. 3.1 Aerial photo showing the location of each fyke net set at each site monitored.

The fyke nets and minnow traps were deployed at low tide on the evening of the first day of each sampling period, and were removed at low tide on the morning of the last day of each sampling period. This resulted in the three capture periods, each 12 hours in duration, for each survey period. All organisms captured were returned live to the water at the same place at which they were collected.

4. Results and Discussion

The complete database of nekton collected over the three years of monitoring is available as a separate Excel data file.

A total of six species of fish were captured during the entire survey. These included the following: *Microgadus tomcod* (tomcod); *Anguilla rostrata* (American eel); *Fundulus heteroclitus* (mummichog); *Gasterosteus aculeatus* (three spine stickleback); *Menidia menidia* (Atlantic silverside), *Alosa pseudoharengus* (Gaspereau). There were no nekton species collected that had not also been collected during the 2010 and 2011 surveys.

The greatest number of fish was collected during May and the lowest number was collected in July (Fig.4.1). There was little consistency in the relative number of fish captured at each study site during each survey period. During May and September the greatest number were collected at the Reference site. During July the greatest number were collected at Restoration Site 2.

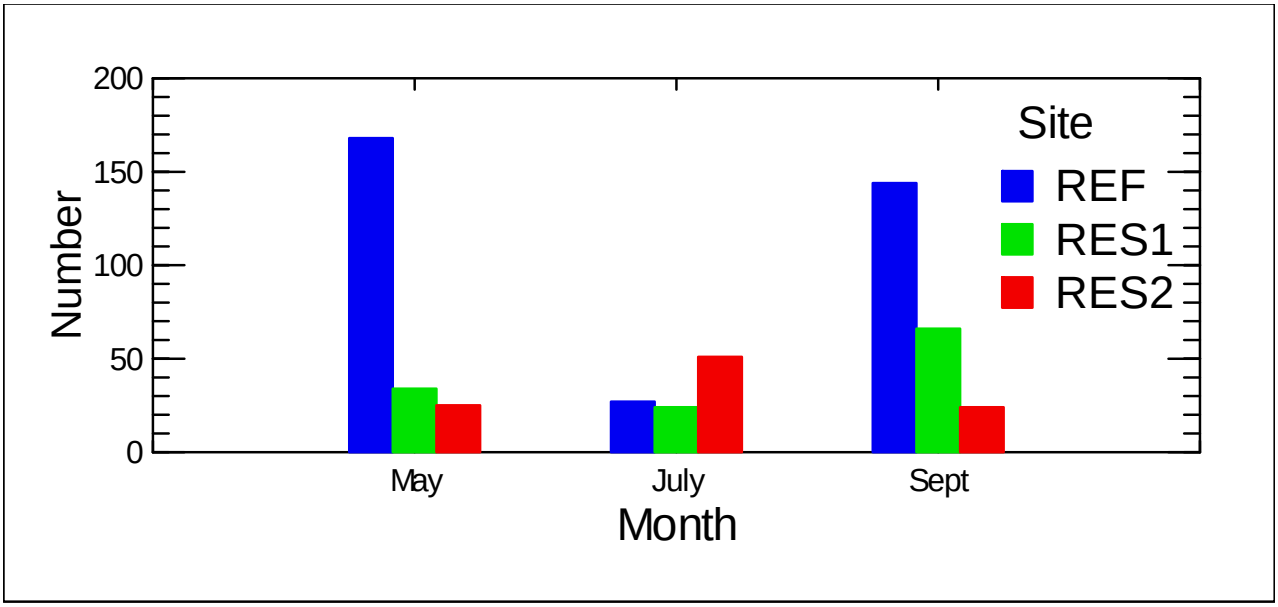


Fig. 4.1. Total number of organisms captured during each survey period at each site.

Mummichogs were captured in the greatest numbers followed by tomcod (Fig.4.2). No 9 spined sticklebacks, white perch, smelt or sand shrimp were captured during 2012.

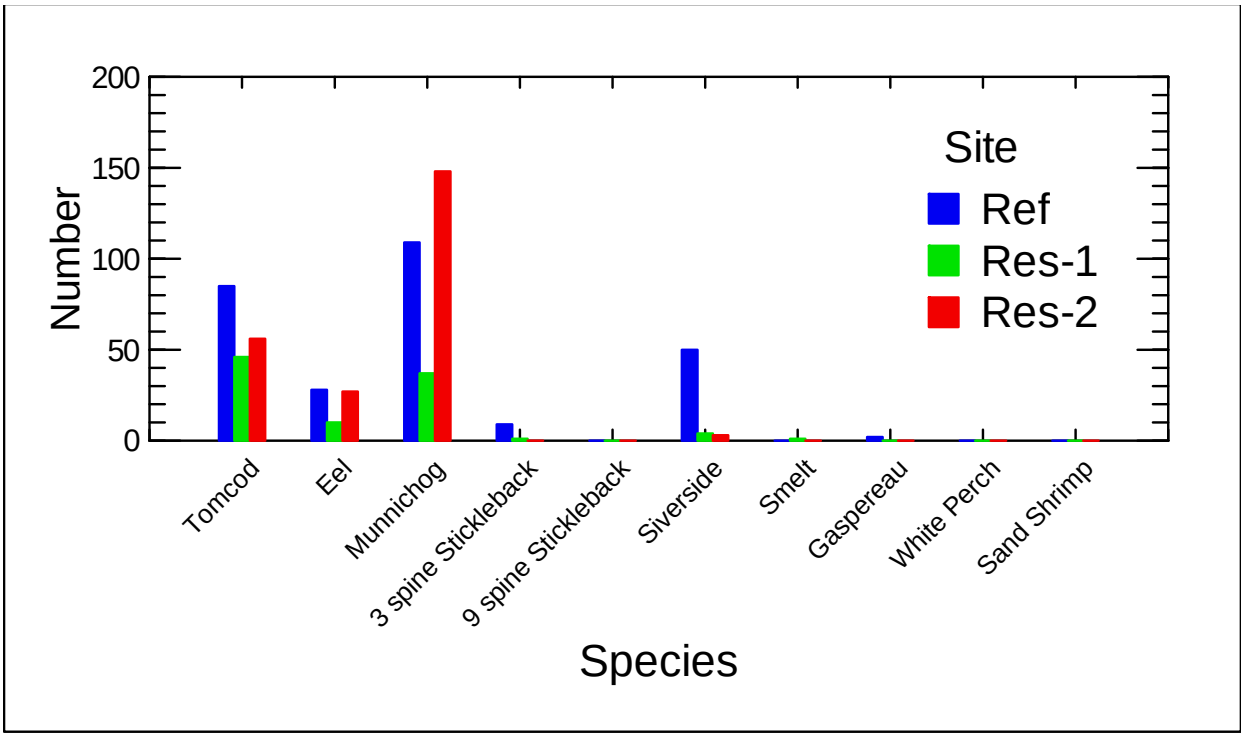


Fig. 4.2. Total number of each species captured at each reference site.

There was considerable seasonal variation in the species captured during the three sampling periods (Fig. 4.3). Tomcod were most common during the May and July sampling period and mummichogs were most abundant during the September survey.

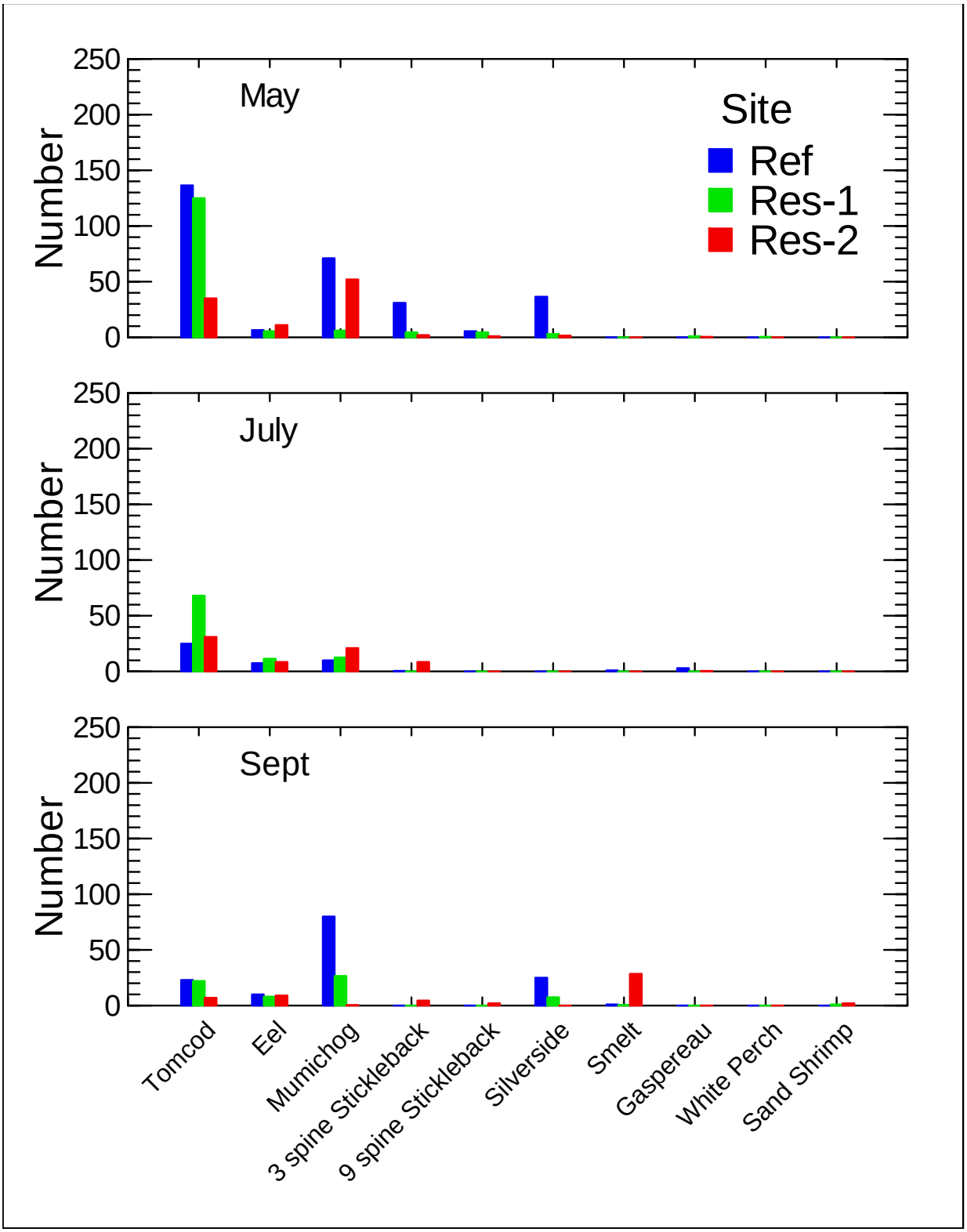


Fig 4.3. Relative abundance of species captured during the three sampling periods.

5. Comparisons of Nekton Numbers Collected Each Year

The total number of nekton collected during 2011 and 2002 was 2001. The largest number was collected at the Reference Site and the lowest number were collected at Restoration Site 2 (Fig. 5.1

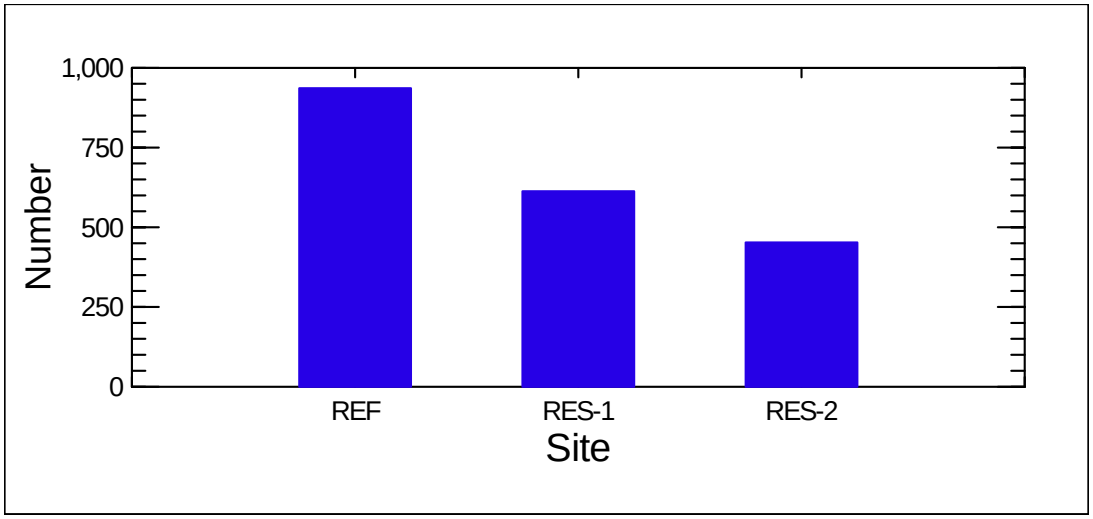
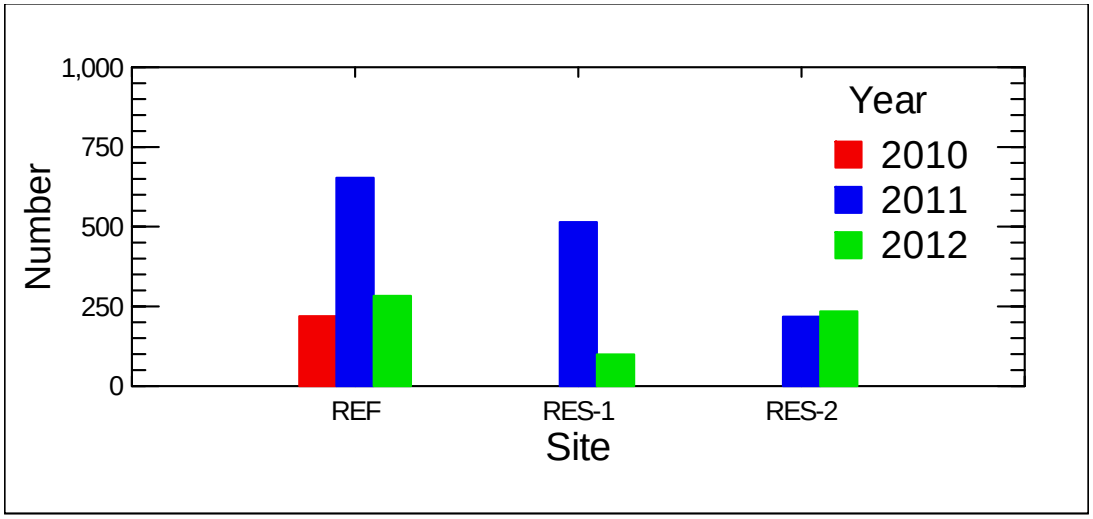


Fig. 5.1 Total number of nekton collected at each site during 2010 and 2012.

The total number of nekton collected at each site during each year varied considerably. There were large decreases in the Reference and Restoration Site 1 in 2012. In contrast there was little difference in the total number of nekton collected at Restoration Site 2 in 2011 and 2012.



6. Acknowledgements

I would like to thank Nic McLellan of Ducks Unlimited Canada for arranging accommodations at the Beaubasin field station. Thanks are due Jeremy Broome, Mat Baker and Freya Keyser of Acadia University for their able assistance in the field work.

7. References

Brylinsky, M. 2010. Nekton Survey of Two Natural Salt Marshes at Ducks Unlimited Canada's Beausejour/Aulac Marshland. Report prepared for Ducks Unlimited Canada. 8p.

Brylinsky, M. 2011. Nekton Survey of Two Natural Salt Marshes at Ducks Unlimited Canada's Beausejour/Aulac Marshland. Report prepared for Ducks Unlimited Canada. 6p.

Appendix I. GPS Coordinates of Sample Stations.			
Site	**Station**	**GPS Coordinates**	
Reference Site 2	REFF	20 T 398323	5079491
“	REFM-1	20 T 398323	5079491
	REFM-2	20 T 398398	5079526
“	REFM-3	20 T 398403	5079500
“	REFM-4	20 T 398432	5079535
“	REFM-5	20 T 398456	5079367
Restoration Site 1	RES1F	20 T 399141	5078696
“	RES1M-1	20 T 399141	5078696
“	RES1M-2	20 T 399194	5078723
“	RES1M-3	20 T 399066	5078731
“	RES1M-4	20 T 399263	5078675
	RES1M-5	20 T 399275	5078783
Restoration Site 2	RES2F	20 T 399598	5078117
“	RES2M-1	20 T 399598	5078117
“	RES2M-2	20 T 399575	5078182
“	RES2M-3	20 T 399575	5078182
“	RES2M-4	20 T 399427	5078629
“	RES2M-5	20 T 399427	5078629