Offal batching reduces seabird attendance at fishing vessels

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Offal is the key

- Seabirds are attracted to trawlers by discards, processing waste, and by the catch
- While feeding, they may be struck by trawl warps and killed
- Warp strike observations show that few strikes occur if there is no waste discharge

Mealing, mincing, batching

- Previous studies have shown that when a meal plant is used, and so all processing waste is retained, then there are fewer birds attracted to the stern of vessels
- One approach to reducing interactions include mincing offal so that it disperses further than the stern
- Another approach is to batch the offal and discard it at intervals
- A previous study found that as the batch interval increased from thirty minutes to four and eight hours, there was some decrease in the numbers of birds that were attracted to the discharge events

The 2010 experiment

- In 2010, the batching experiment was repeated on a trawler fishing for hoki and beryx species
- The number of birds behind the vessel were compared between continuous discharge, and discharge at 30 min and 2 hour intervals
- In this report, a preliminary analysis of the results is presented

The Mitigation TAG

- The experiments coordinated by the Mitigation Technical Advisory Group
- Collaboration between DOC, MFish, NGO's, SeaFIC, fishing industry, and research providers
- 2010 batching experiment carried out by a fisheries observer with support from vessel crew
- Vessel operations coordinated by John Cleal (Vessel Management Services Ltd)
- Project and preliminary analysis funded by DOC CSP
- Further analysis funded by ACAP

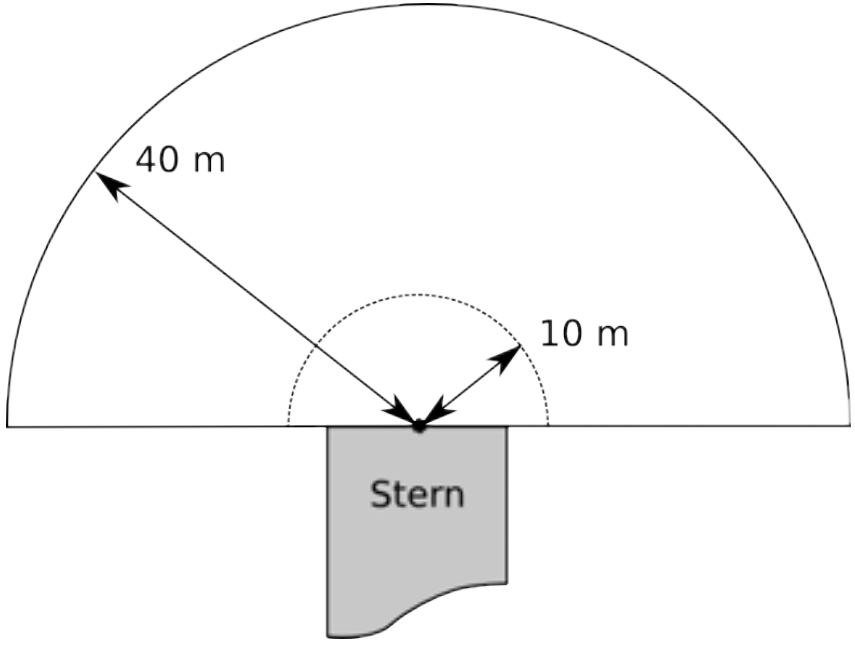
Discharge and seabird abundance

- The number of birds behind the vessel are counted
- Counts made during both fishing and processing
- Normal fishing carried out
- Discharge either continuous, 30-min batches, or 2-hour batches

Protocol

An observation

- Counts made of
  - Large birds (Albatrosses and giant petrels)
  - Cape petrel (*Daption* spp.)
  - Small birds (other birds)
- Counts made with 10 m and 40 m sweeps
- Counts made of birds in air and on water
- Up to 12 counts in a session



Seabird observation form
(Controlled batch vs 'continuous')

Date observations started (ddmmyy)	1 8 0 2 1 0

Sample identification

Trip number	[redacted]	Tow number	3 8

Batching 2010
Number **38**
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Experimental regime

30 min batch	2 hr batch	Continuous discharge
✓		

Background information (record before first observation)

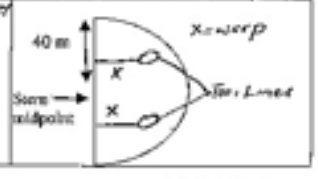
Vessel speed (knots)	4.1	End time of previous discharge (i.e. end of previous batch or stream of 'continuous' discharge)	1103
Swell height (metres)	2m	Previous batch volume (kg)	300

Observation			1	2	3	4	5	6	7	8	9	10	11	12
Time	Hour		11	11	11	11	11	11	11	11	12	12	12	12
	Minute		20	25	30	35	40	45	50	55	00	05	10	15
Wind strength (Beaufort)			5	5	5	5	5	5	5	5	5	5	5	5
Tow stage (S, F, H)			F	F	F	F	F	F	F	F	F	F	F	F
# vessels visible			0	0	0	0	0	0	0	0	0	0	0	0
Discharge	Sump		3	3	3	3	3	3	3	3	3	3	3	3
	Minced		0	0	0	0	0	0	0	0	0	0	0	0
	Offal		0	0	3	0	0	0	0	0	3	0	0	0
	Whole discards		0	0	1	0	0	0	0	0	0	0	0	0
Large birds	40m	Air	50	40	100	80	50	50	40	60	70	80	30	40
		Water	10	20	60	40	20	10	20	30	80	40	20	10
	10m	Air	5	0	10	5	3	2	0	1	20	20	2	5
		Water	0	0	20	2	0	1	0	0	10	0	4	0
Sm birds	40m	Air	60	40	50	30	20	40	30	20	40	20	50	40
		Water	40	40	50	30	20	20	30	30	80	40	20	30
	10m	Air	10	0	10	5	3	4	2	0	5	0	2	0
		Water	2	0	5	0	0	0	0	0	5	0	0	0
Cape pigeon	40m	Air	1	0	0	0	0	0	0	0	0	0	0	0
		Water	0	0	0	0	0	0	0	0	0	0	0	0
	10m	Air	0	0	0	0	0	0	0	0	0	0	0	0
		Water	0	0	0	0	0	0	0	0	0	0	0	0

Comments

Small birds are not monitored by the large birds during discharge.
Vessel hauled immediately after sampling.

Diagram of tori lines and sampling area during sampling



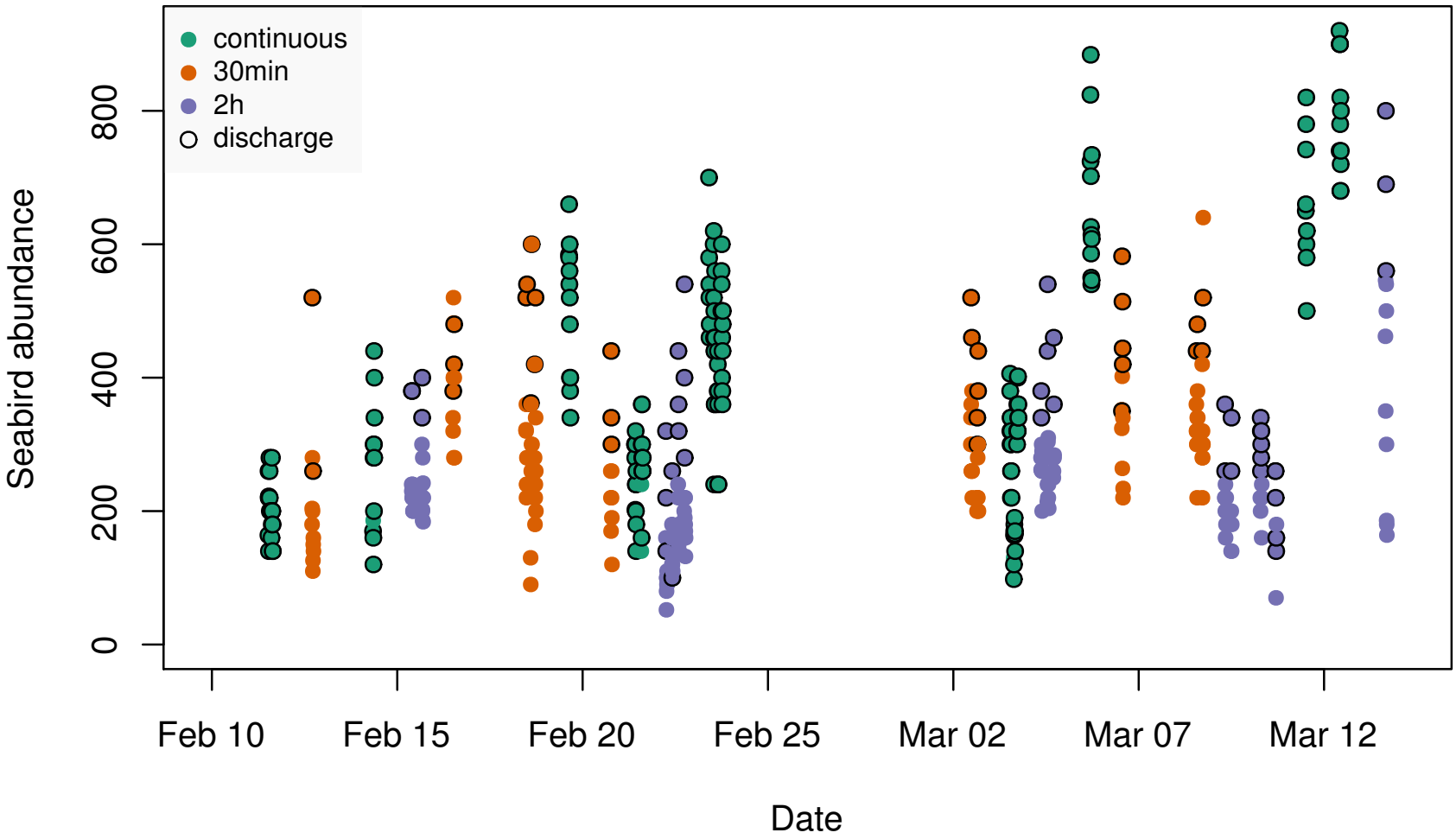
Batch characteristics (batching treatments only)

Batch start time	1130
Batch finish time	1132
Batch volume (kg)	200
Main type (S, F, C)	F

Seabird species

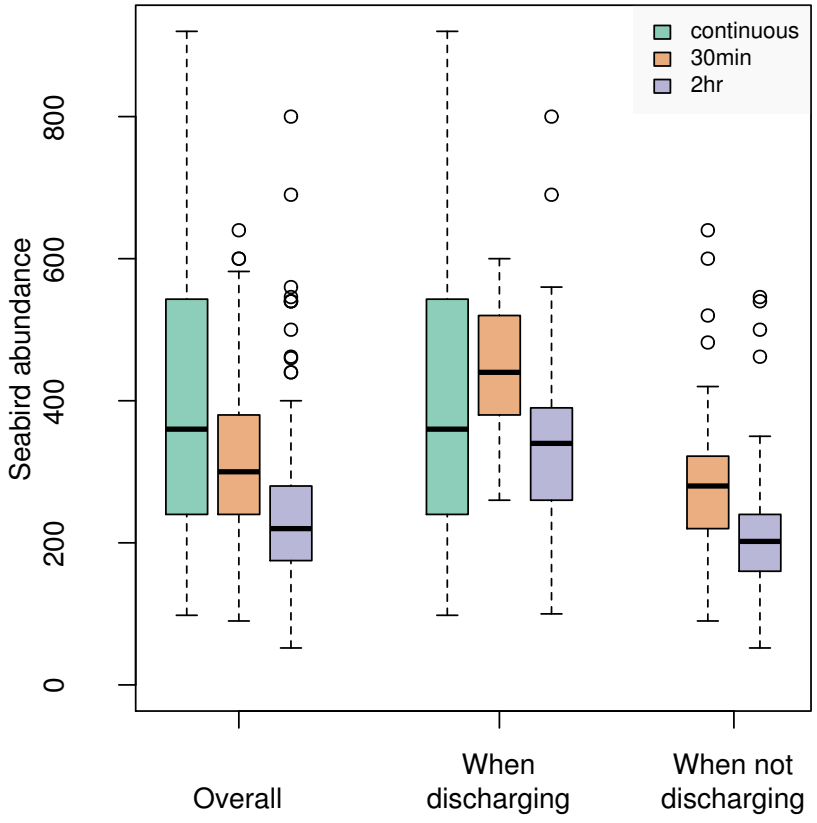
Type	Species	Code	Abundance	
			mean	min–max
Large	Unidentified small albatross	XMA	38.6	10–100
	Salvin's albatross	XSA	38.4	5–80
	Giant petrel	XTP	25.8	10–90
	White-capped albatross	XWM	24.1	0–80
	Buller's albatross	XBM	18.4	0–60
	Unidentified large albatross	XAL	14.2	5–40
Small	Westland petrel	XWP	39.3	10–80
	Unidentified petrel	XPE	27.9	0–80
	Grey petrel	XGP	12.3	0–40
Cape petrel	Cape petrel	XCP	4.1	0–30

Total counts



Effect of discharge

- Difference between treatments due to the greater time spent discharging in the continuous treatment
- Proportion of observations with discharge: 97% continous, 22% (30-min), and 25% (2-hour)
- Typical duration of a session was 40 min (a maximum of 55 min)



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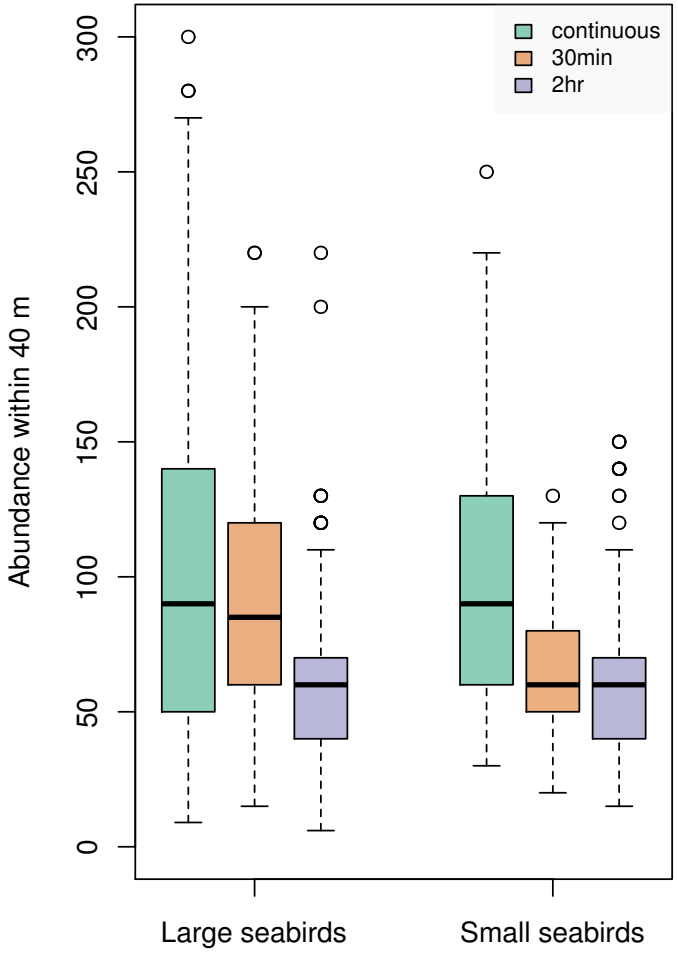
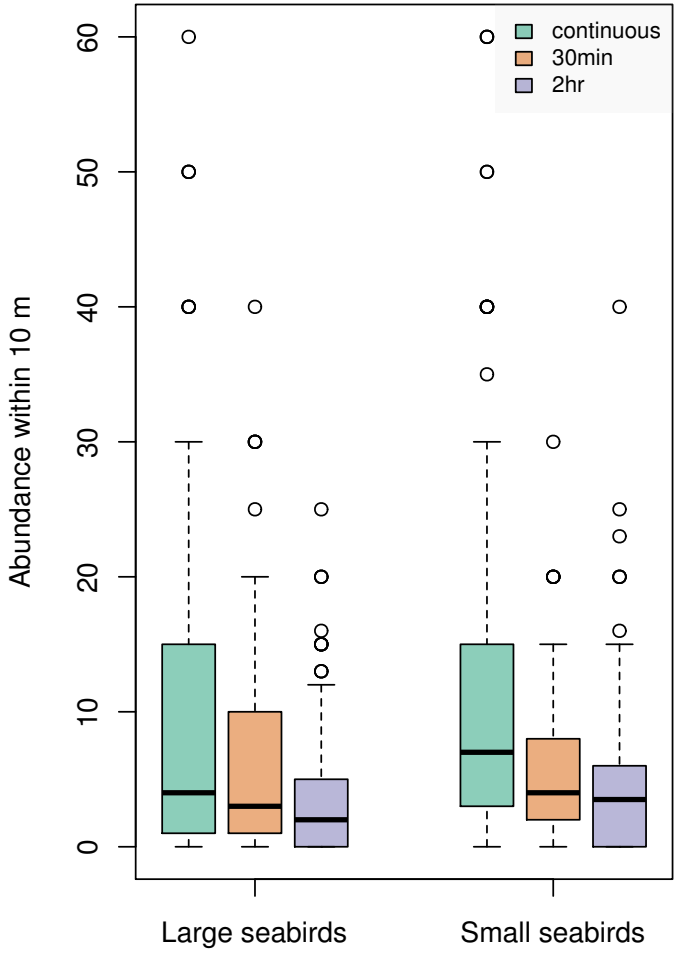
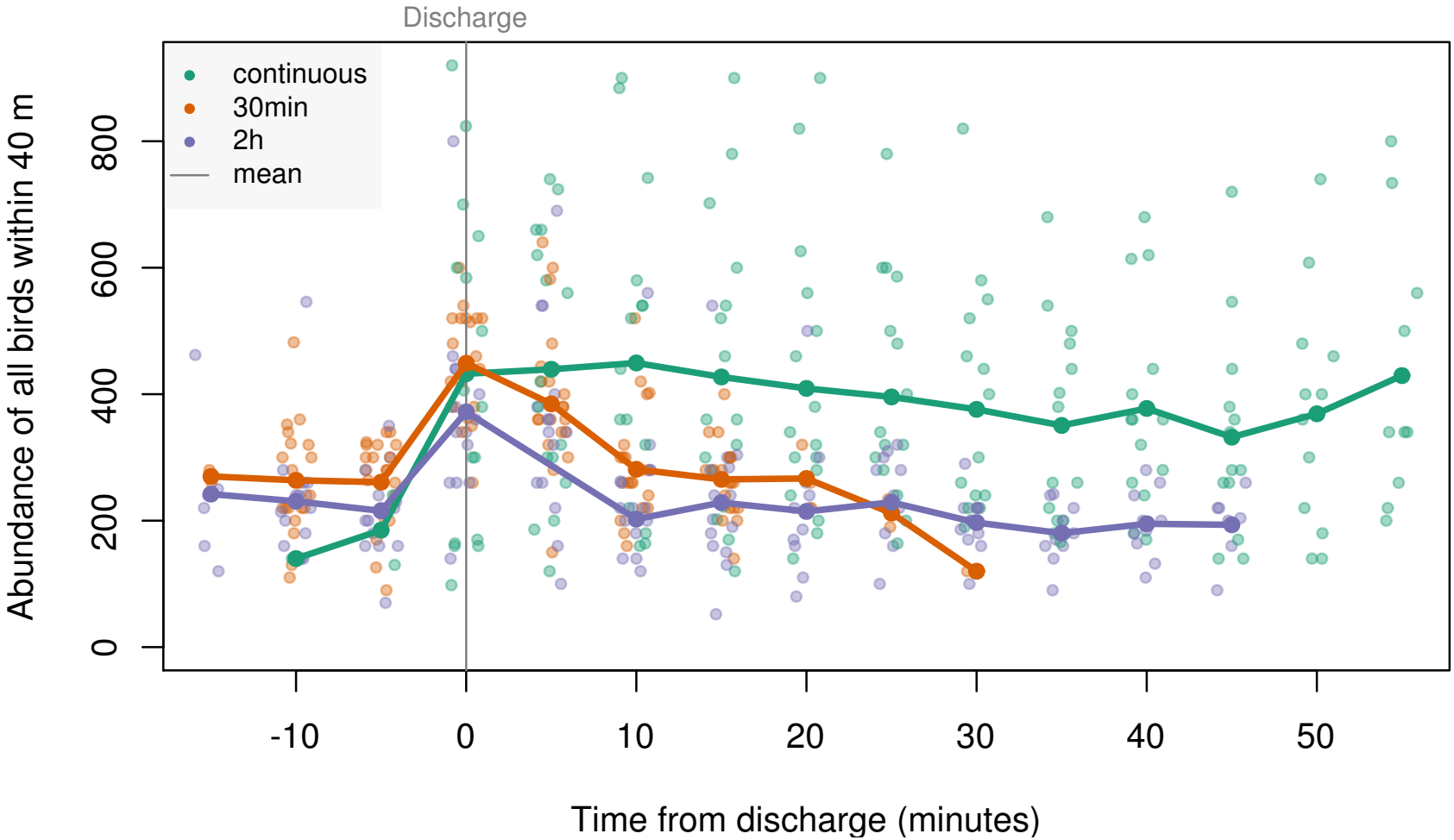
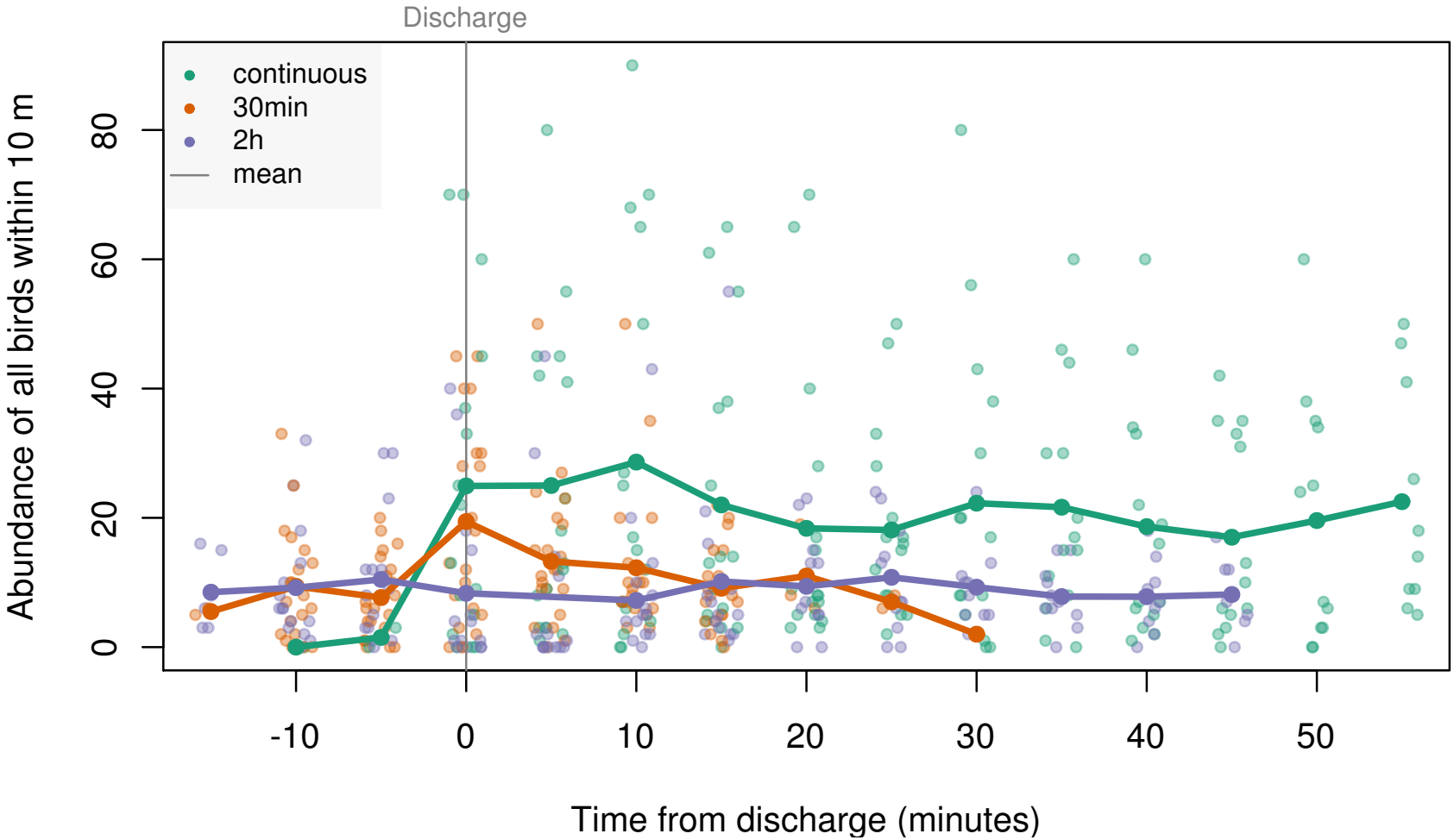




Time response (total birds, 40 m)

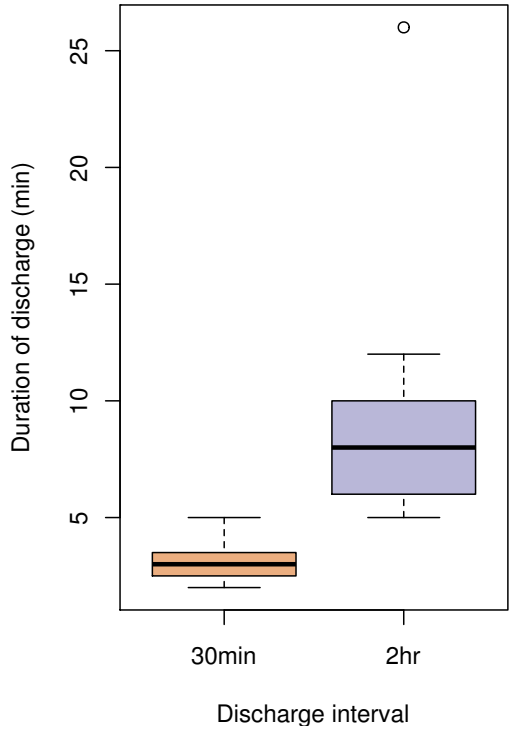


Time response (total birds, 10 m)



Discharge duration

- Average duration of discharge was 3.1 min for the 30-min treatment, and 9.4-min for the 2 hour treatment
- Relative effect of 2-hour and 30-min treatment would depend on the speed of the response of birds to the discharge event
- Unable to determine this from the 5-min count protocol



Summary

- Continuous discharge maintains a high number of birds close to the vessel
- Bird numbers increase and decrease rapidly in response to discharge events
- This results in fewer birds behind the vessel during batched treatment
- Will quantify the difference using statistical analysis of the data