Department of Agriculture (NI)

Agriculture & Environmental Science Division

Cruise Report - LF2296

RoxAnn Survey of NI Commercial Scallop Grounds   26-31 May 1996

Personnel

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OBJECTIVES

1. To use the acoustic ground classification system, RoxAnn, to survey sediment types at commercial scallop fishing areas in the Irish Sea.
2. To provide ground truthing information for RoxAnn using underwater cameras mounted on a towed sledge and static frame.
3a. To collect the following scallop data
    i. age composition
    ii. weight, height & length of individual scallops
3b. To retain scallop shell samples for ongoing morphometric studies
3c. Identify and quantify fauna taken as bycatch in the dredges.

METHODS

The RoxAnn system onboard the *Lough Foyle* was used to survey sediment types at commercial scallop fishing areas. Three areas where surveyed off the County Down Coast (Areas I, IV, V) (Figure 1) and one area of the North Coast (Figure 2). A survey box was designated around each scallop fishing area and a RoxAnn survey was carried out by sailing along pre-selected tracks within the box. Ground truthing information was provided using cameras mounted on a towed sledge and backed up by spot drops using the static frame.

Dredges where deployed at three separate locations within the survey box. Dredge gear consisted of a beam to which was attached four 2-foot scallop dredges of the design used in the commercial fishery. Catches were sorted and bycatch identified, and quantified were possible. Scallops were weighed and measured. Shells were aged by examination of growth bands on the flat shell.

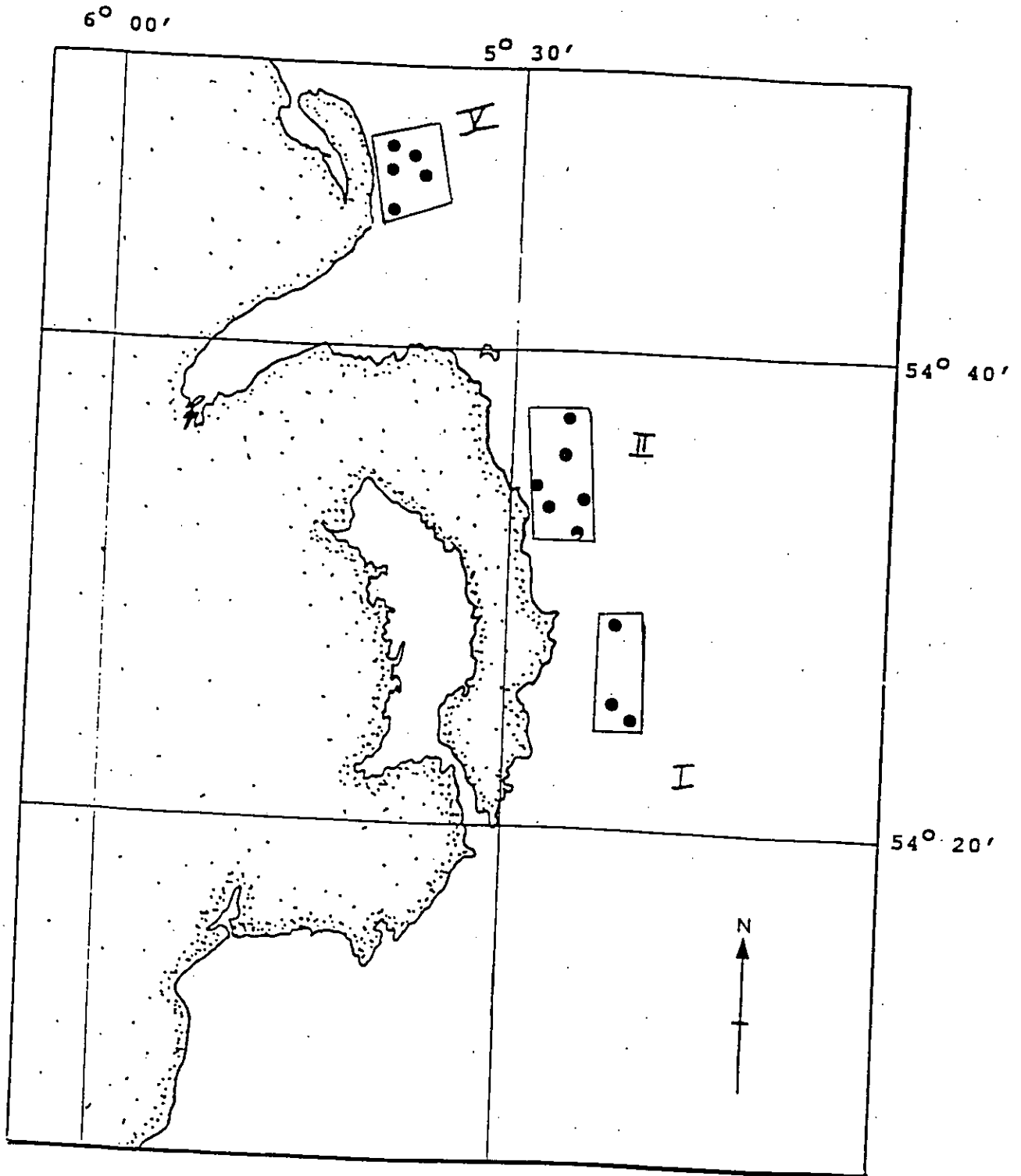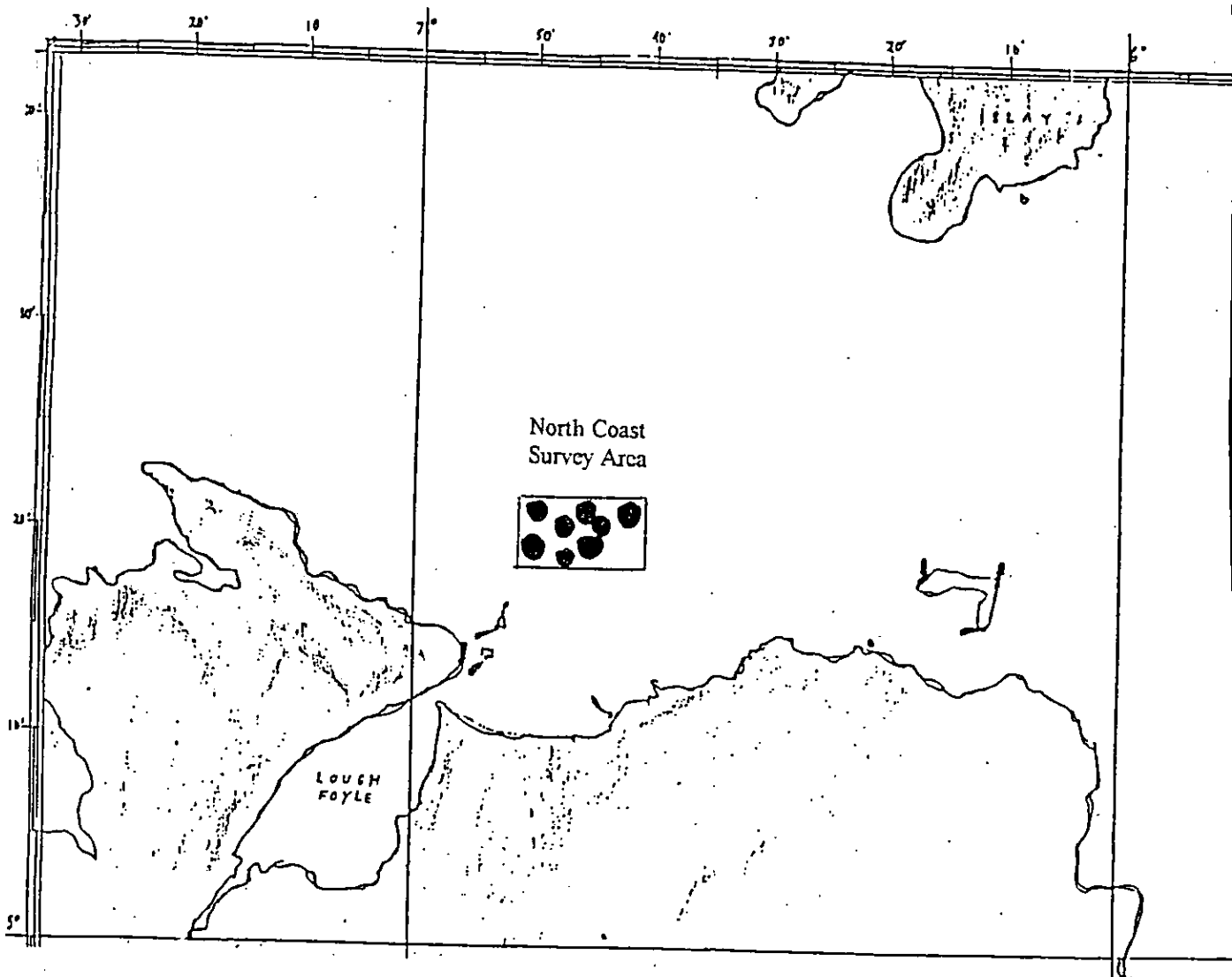Figure 1. The three survey areas off the County Down coast.

Figure 2. The survey area off the North Coast

North Coast
Survey Area

LOUGH
FOYLE

ISLAY

282

NARRATIVE

Sunday 26 May

15.00h - Pre-cruise meeting onboard with personnel from the Coastal Resources Centre (UCC) and Marin Matteknik, Sweden.

Scientific personnel, apart from W. Clarke, boarded the *Lough Foyle* and a thorough safety briefing was given by the Fishing Master. The vessel sailed at 10.00 h and steamed overnight to the scallop fishing area off the North coast.

Monday 27 May

07.00h - the cameras were assembled and tested. 08.00h - a 35 minute camera tow through the North Coast fishing area 'box'. A RoxAnn survey then commenced along tracks, 750m apart. At 13.00h the RoxAnn survey along the tracks was halted and dredges were deployed at three separate locations within the box. Scallops were sampled and bycatch identified. At 21.15h an additional camera tow was completed across the RoxAnn survey tracks. Overnight the remaining tracks within the box were surveyed by RoxAnn.

As part of a separate exercise, RoxAnn tracks were surveyed across the sludge disposal site as requested by M. Service.

The vessel then steamed to the next scallop fishing area off the County Down Coast.

Tuesday 28 May

The camera sledge was deployed at 08.00h within the box defined at Area V. Tracks, 250-300m apart, were surveyed using RoxAnn. At 13.00h the dredges were deployed in three separate locations within the box. Scallops were sampled and bycatch identified.

Additional ground truthing information was achieved by deploying the static frame at selected co-ordinates on the RoxAnn tracks. The vessel steamed back to Belfast and docked at 18.00h. M. Service disembarked and W. Clarke boarded.

Wednesday 29 May

The vessel left dock at 06.00h and steamed to Area II off the Co. Down Coast. At 08.45h tracks, 450m apart within the defined box, were surveyed using RoxAnn. Due to an unfavourable weather forecast it was decided to complete the necessary camera and dredge tows while possible. The camera sledge was deployed at 10.30h and used to obtain representative visual information of the boxed area.

The vessel then steamed to the final scallop fishing area (Area I) and the camera sledge was deployed at 16.00h for a 30min tow.

The vessel steamed back to Area II and the scallop dredges were deployed at 17.15h. Scallops were collected and bycatch identified at three separate locations within the box. The RoxAnn survey of the area commenced at 20.45h, along tracks 500m apart. The RoxAnn survey continued overnight and on completion anchored in Bangor Bay.

Thursday 30 May

At 08.00h the vessel sailed back to Area II to survey additional tracks in the box with RoxAnn, in an attempt to survey the area more intensively. Due to strong winds the vessel docked at Belfast at 17.00h.

Results

It was concluded that RoxAnn was a suitable large-scale survey tool for surveying sediment types at commercial scallop fishing areas. Three survey areas (North Coast, Area V and Area II) were intensively surveyed using RoxAnn. Strong southerly winds prevented the fourth area (Area I) from being completed. It was noted that the computer onboard with the RoxAnn software would need to be updated for future surveys in order to facilitate RoxAnn data as they accumulate. The RoxAnn data will require a certain degree of post-survey analysis in order to produce bottom maps of the survey areas, colour-coded according to sediment type.
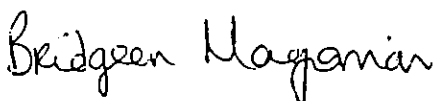
The underwater cameras provided adequate ground truth information, and will also be used in post-survey analysis. W. Clarke suggested minor modifications to the towed sledge for future use. These recommendations included mounting the video camera at a lower position on the sledge and tilting the lights forward slightly.

Scallops were caught in all the dredge tows at each survey area, confirming their status as commercial scallop areas. Figure 3 shows the pooled length composition of scallops from all tows in each survey area. These data have subsequently been passed onto Dr R. Briggs and will be incorporated with data from previous NW Irish scallop stock cruises.

Table 1 lists the bycatch collected in the dredges during each tow. A relatively wide range of benthic fauna were noted and quantified (using as semi-quantitative abundance scale). Echinoderms, particularly starfish species, were the most predominant group. This was confirmed from the video footage. These data, along with data from previous NW Irish scallop cruises, will contribute towards a time series database on fauna associated with scallops, enabling the effects of gear impact to be described.

Acknowledgements

I thank the officers and crew of the *Lough Foyle*, and the scientific staff for their co-operation and assistance throughout this cruise.

Bridgeen Magorrian
(Scientist in charge)

Alan Hughes
(Chief Officer)

Ivan Heaney
(Section Head)

284

Figure 3. The pooled length composition of scallops from all tows in each survey area
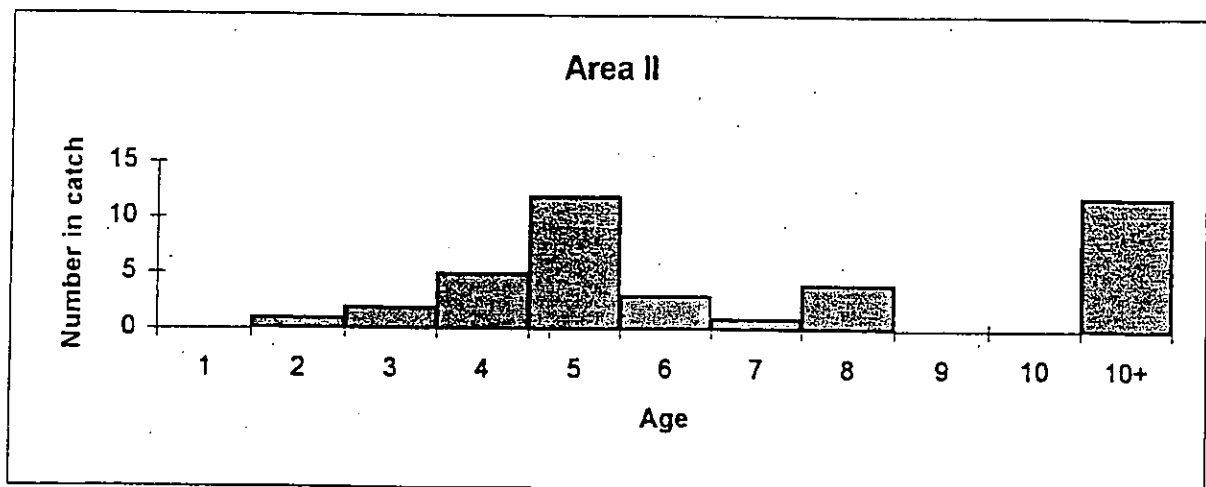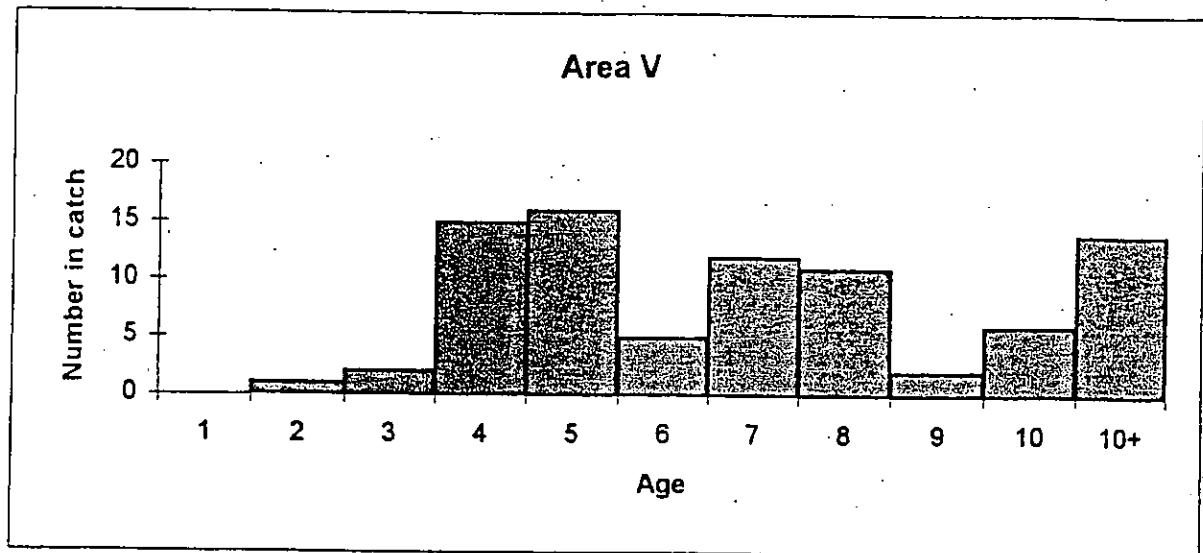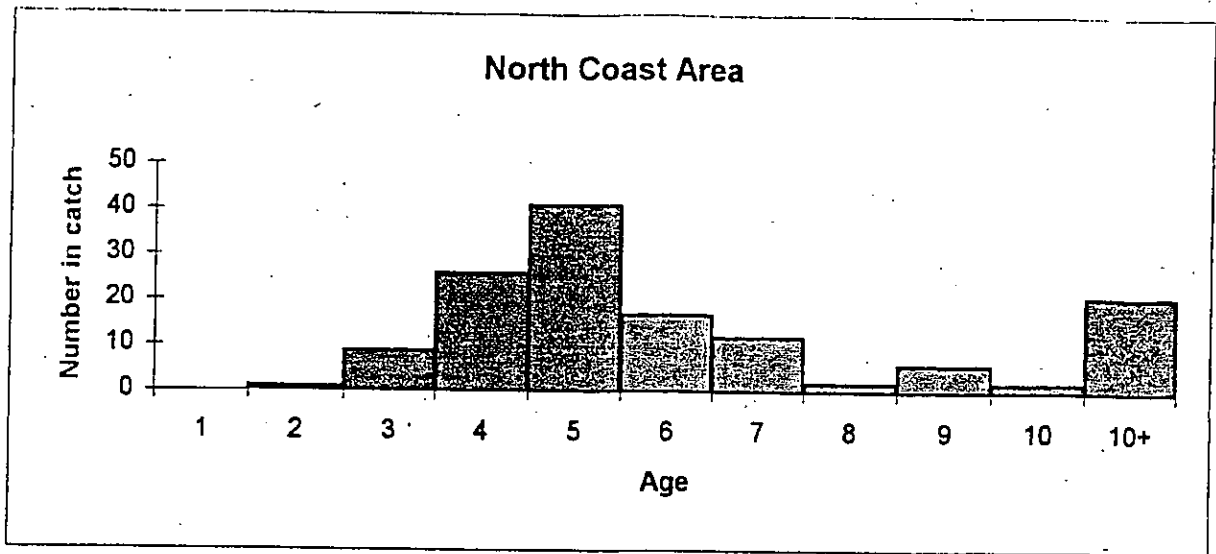

North Coast Area

Area V

Area II

Table 1. Species bycatch list recorded for each tow in the three scallop fishing survey areas.

Species	North Coast Area			Area V			Area II		
	Tow 1	Tow 2	Tow 3	Tow 4	Tow 5	Tow 6	Tow 7	Tow 8	Tow 9
Mollusca									
Aequipecten opercularis							*	*	*
Astarte borealis	*		*	**				*	*
Atelecyclus rotundatus	*			*					*
Buccinum undatum				*		*			*
Diodora gracea	*								
Glycmeris glycmeris	*								
Hiatella artica					*			*	
Sepiola atlantica		*							
Echinodermata									
Anseropoda placenta				*		*	*		
Antendon bifidia				*					
Asterias rubens	*	*	*	***	***	*	*	***	*
Crossaster papposus	*	*	*	*	*	*	*	*	*
Echinus esculentus	*	**	*		*		*	***	*
Henricia oculata	*								*
Luidia ciliaris		*	*				*		
Ophiothrix fragilis	*			*	*				
Ophhiocomina nigra				*		*			
Porania pulvillus	*	**	*						
Psammechinus miliaris	*								*
Crustacea									
Cancer pagurus	*								
Eupagurus bernhardus		*	*					*	*
Macropodia longirostris	*				*				
Pandalus montagui			*						
Pisces									
Aspitrigla cuculus					*				
Lophius piscatorius		*		*		*			
Microstomus kitt			*						
Raja clavata			*						
Cnidaria									
Alcyonium digitatum								*	
Polychaeta									
Aphrodite aculeata	*								

*	0-10	(few)
**	10 20	(occasional)
***	20-50	(frequent)
****	50-100	(common)
AB	100+	(abundant)