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Newsletter for Guardians of Pauatahanui Inlet

AUGUST

The Inlet is a newsletter that brings together local and regional news affecting the Pāuatahanui Inlet and its environs.

The Inlet comes out three times a year and current or back issues can be downloaded from our website.

The newsletter includes items of concern that affect the area as well as general interest topics for everyone.

Please contact us if you would like to contribute to **The Inlet.**

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FROM THE CHAIR

The long awaited Transmission Gully Motorway is scheduled to be completed by the end of September this year. While it provides an alternative to the current coastal route for SH1, and it will provide faster and easier road access to and from Wellington, its completion comes with a litany of adverse effects on the Inlet.

Information provided by Greater Wellington Regional Council (GWRC) shows that, between December 2014 and 22 July this year, there have been 255 incidents of varying severity where the TGM contractors failed to maintain or manage the required environmental controls set out in the relevant resource consent



standards. The result was a cascade of consent breaches and unconsented activities. Many of the incidents led to advice letters (32), formal warnings (32) and Infringement Notices (26), and one incident led to an Abatement Notice resulting in a successful prosecution in June this year. GWRC is still investigating some 56 events, all of which occurred in 2021.

In the sentencing notes from the Abatement Notice, prosecution judge, Judge Dwyer from the Environment Court, convicted and fined the CPD-HEB contractors \$70,000 for unconsented earthworks and discharge of sediment into the Belmont Regional Park in early 2019. The sediment then entered the Duck Creek and Cannons Creek catchments.

The CPB-HEB Joint Venture allowed sediment to enter these streams for almost a month and significant slips occurred that could have been avoided.

Judge Dwyer, who was the Chair of the Board of Inquiry that gave the original permissions for the Transmission Gully Motorway said:

'Pāuatahanui and Onepoto Inlets are water bodies of major significance which are widely recognised as being highly vulnerable to the effects of sedimentation, particularly so in the case of Pāuatahanui Inlet. Consistent with the provisions of section 6(a) of the Resource Management Act, their protection is a matter of national importance.

'The potential for the inlets to be adversely affected by sediment generated by earthworks undertaken as part of the Transmission Gully project was well recognised when resource consents for the project were granted. It is incumbent upon those undertaking work on the project to do so in a manner which avoids sediment discharges within the catchment to the greatest extent possible. In that

From the Chair - cont....

regard, the deterrence of breaches of resource consent conditions and permitted activity standards by those carrying out works on the project by the imposition of significant penalties, is a consideration of particular weight.'

Judge Dwyer said the sentence reflected the potential effects on an environment with significant ecological and cultural values, and the need for deterrence and condemnation of offending.

In a previous column, I set out information from Waka Kotahi which showed that, despite the controls on run-off from the motorway, the net effect on the Inlet was unlikely to change, even though the motorway should take traffic off the roads around the Inlet. Further, the traffic volumes on the new motorway will produce an increase in hydrocarbons (from vehicle exhausts) that will adversely impact the Inlet.

The full story on the run-off of sediment, and contaminants from the TGM construction, is yet to be unveiled - there might be further actions and even prosecutions from GWRC. However, any actions now will be well after the events and of no benefit to the Inlet. The continuing saga of control breaches has almost certainly added to the unwanted sediment and mud-loads that threaten the Inlet's health and ecology. Sadly, it seems that those undertaking work on the project did not act sufficiently in a manner that, as Judge Dwyer said, 'avoids sediment discharges within the catchment to the greatest extent possible'.*

Lindsay Gow (Chair)

ANNUAL GENERAL MEETING

This year's AGM was a regular affair except for one resignation and a change to the planned guest speaker.

Lindsay Gow opened the meeting, attended by around 20 people, and introduced the formal agenda which included a review of last year's minutes and a summary of the 2020/21 Annual Report. In this, emphasis was given to the several submissions that GOPI has made during the year, particularly on the development of the site at 39 Paekakariki Hill Road, the major development of the land known as Plimmerton Farm and on the Porirua City proposed District Plan. (The content of all this year's submissions and their outcomes are available on our website at <u>Submissions</u>). Of the regular activities we normally undertake during the year both the annual clean-up and photographic competition were very successful events.

The minutes from 2020 and this year's Annual Report were both accepted by vote.

Stephen O'Neil reported on the end-of-year financial position for 31 March 2021. This of course has not included this year's photographic competition but refers instead to the 2020 competition cancelled due to last year's Covid-19 lockdown.

Both reports can be viewed on our website at http://www.gopi.org.nz/about-us/annual-reports/

A presentation was then given by Andre van Halderen about the Inlet Planting Project. This was a very significant success story for the year where a grant of nearly \$42,000 was approved by DOC for the enhancement of a number of planting sites on the shores of the Inlet. GOPI is undertaking this jointly with Porirua City Council. Weed eradication and pest control form part of the whole of this multi-year project, as well as the planting of hundreds of shoreline plants supporting riparian work already undertaken by Porirua City Council. Updates about the project will be reported upon in the coming months (See our website page: <u>Restoration Planting</u>).

AGM cont....

The meeting continued with the election of officers for the coming year. All but one of the team were reelected for 2021-22 with Helen Reilly, who has been a tremendous secretary for the last six years, stepping down. However, we were fortunate in having Marion Rosner offer her services prior to the AGM and we put her name forward for election to the position of secretary which was accepted unanimously.

The formal part of the evening being over, we as usual introduced our guest speaker. We originally invited Warrick Lyon to talk about his research on the rig shark in the Inlet, but he had to decline due to an alternative commitment. Instead, we were privileged to have Rebecca McCormack, former Education Coordinator for the Te Awarua o Porirua Harbour and Catchment Community Trust (PHACCT), give a talk about her work with schools and teachers and other educators.

Rebecca spoke about her role in providing professional learning opportunities for teachers in the schools of the wider harbour catchment. These opportunities provide teachers with appropriate knowledge and resources to engage children and gain their interest in the catchment and harbour environment and ecosystems. The programme has been very successful with nearly all schools engaged. It has produced lots of results including activities and publications by the students.

Rebecca has also been responsible for a new programme - the *Western Porirua Project*. With starter funding from the Department of Conservation, this project aims to use schools in the western Porirua/ Takapuwahia area to lead and manage conservation projects in their schools and local environment. Ngati Toa Rangatira and Porirua City Council are supporting this initiative.

It is a shame that Rebecca has recently had to resign this position, as she and her family are moving to Wanaka, but we had a great introduction to the contribution she made during her tenure with PHACCT. *

WE WELCOME OUR NEW SECRETARY - MARION ROSNER

arion grew up near the marshlands of coastal Essex, in the southeast of England, and has long had a passion for the environment.

Since moving to New Zealand in 2007, she has lived for over a decade in Whitby and admires and appreciates the Inlet every day on her commute to work.

In 2014 she took a year off work and pursued a Graduate Diploma in Science, majoring in Environmental Studies. Her main work for the Science Communication paper was on threats facing the Pāuatahanui Inlet, which she published on YouTube.

In past years she has assisted in the annual Inlet clean-up but always felt that a more active role was appropriate for her. She was



extremely pleased to be elected onto the committee in 2021.

Marion is also Secretary of Mana Little Theatre, where she acts and directs.

Welcome aboard Marion. *

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PHOTOGRAPHIC COMPETITION

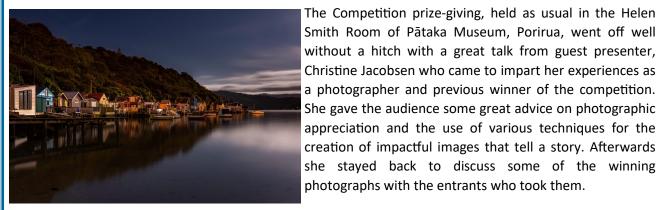
W ith a smaller number of entrants than normal this year, the delayed 20th annual Photographic Competition has still been a great success with many stunning entries to choose from - from some very talented photographers. We are very grateful to Geoff Marshall who again stepped up to the challenge to find the best of the bunch for the 25 awards presented to the Junior, Youth and Open levels in all five categories.

We were disappointed that we didn't have enough registrations to run our Youth Workshop this year but, due to the cancellation of last year's competition, we allowed



1st for Nature—Brendon Doran

the use of images previously taken in 2020 for submission this year. As a result we only had a few youth and junior entrants this time but a couple of them gathered most or all the awards for their age group using photos taken during last year's workshop.



2nd for Scenic—David Lacy

The prizegiving was followed by public showing of the winning photographs on display boards for two weeks at each of the normal venues, Library, Palmers Lifestyle Centre, Lighthouse café and cinema and, finally, at the Whitby New World mall, for the first time in three years. This last venue was a fortunate one. Its second week coincided with a special date—the 50th anniversary of the establishment of the suburb of Whitby. Whitby Residents Association celebrated this milestone on 8 August at the Whitby Collegiate with a list of guests who have had a history with the suburb including Porirua Mayor, Anita Baker. The display of photographs from the competition



3rd for Human Impact—Lance Mosher

was re-located to the school for the occasion, giving additional significance to both the anniversary and the competition that GOPI have run for the last 21 years.

Above are three of this year's stunning images. *

INLET PLANTING PROJECT

e held our first Pāuatahanui Inlet revegetation project community planting event on 7 August at Motukaraka Point. About 45-50 volunteers helped with the planting of sea rush (*Juncus krausii* formerly *maritimus*) at two sites along the shore and in total about 800 rushes were planted. Fortunately the weather-gods smiled on us—the day was the only sunny one to be had, sandwiched between extended spells of rain and cold. There was a big storm on the following day but a check-up on the area a week later showed that this had caused minimal damage, the plants having withstood the waves and wind well, in large part due to the care taken with their placement.

The photos below show one of the areas before and after the planting.

A very big thank-you to all those who were able to help—your hard work is much appreciated. Thanks to DOC for the Community Grant that made this possible. Thanks also to Rachel McLellan and Nigel Clarke (and family) from Porirua City Council for all the help with the logistics and supply of plants. And finally a thank-you goes to Paremata New World for sponsoring the refreshments.

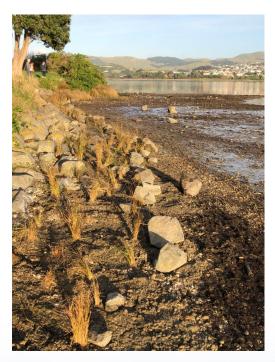
Further community planting events are planned around the Inlet over the next few months—we will keep you informed by email and with notices on our <u>website</u>.*

Andre van Halderen



An area of Motukaraka shoreline chosen for planting of rushes

The same area, later in the day, after the planting had been completed.



Photos courtesy of Andre van Halderen

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FEATURE ARTICLE

Our Harbour, The Pāuatahanui Inlet, is unique in New Zealand because, unlike most other estuaries which empty completely at low tide, this body of water is mainly subtidal, with 65% of its area remaining underwater at low tide. The current topography of the harbour (shape of the land) is a function of its geological history: a combination of erosion, sea-level changes and flooding of valleys with subsequent infill, all complicated by tectonic uplift of active faults such as the Ohariu. The pattern of fluvial (river) and marine terraces around its shores is evidence of all these factors.

In this feature we look at the history of research into these changes, focusing, in particular, on the hydrographic surveys of the Inlet and what they indicate of the past and for the future of the harbour.

Hydrographic surveys of Pāuatahanui Inlet

t the peak of the last glaciation, around 22,000 years ago, both arms of Porirua Harbour were dry river valleys. Pāuatahanui Inlet was a gravel outwash plain, most likely formed from fluvial deposits from glacial erosion. As glaciation declined and vegetation returned, the Inlet gradually became a shallow freshwater swamp up to around 8,360 years ago. Then, as global sea-level rose, from around 7,970 years before the present, marine waters rapidly filled the former Porirua and Pāuatahanui Stream valleys, forming drowned river estuaries. Since then both arms have been infilled with sediment, with Pāuatahanui Inlet accumulating a depth of around 7-10 metres of estuarine deposits by the present day.

Sedimentation, in geological terms, is a natural process by which material such as sand, silt and mud is carried along and then deposited by water, wind or glaciers. It accumulates in all estuaries and harbours over time, either entering the harbour as terrestrial sediment (from the land) or marine sands driven from the open sea into the inner harbour by tidal currents. However, the current rate of sedimentation in the Inlet greatly exceeds the natural rate of 1mm/yr. Research indicates that very little marine sand is now entering the Inlet and that the primary source of the excessive sedimentation is terrestrial. Most of this will be due to human activity.

So, how do we know all this?

The history of research into the topography of Te Awarua o Porirua began in 1850 with hydrographic surveys undertaken at gradually reducing intervals to build a picture of the seabed sediments, water depth and shoreline profiles.

A hydrographic survey is a measure of the characteristic features of a body of water including its depth (bathymetry) using mean sea-level as a reference point. In 1848 *HMS Acheron*, a wooden paddle sloop of the British Royal Navy, began a three-year coastal survey of New Zealand, the first since Captain Cook's visit. It would have used a lead and line to sound¹ out the depth as sonar was not invented until 1913.



The 1850 survey only covered Porirua's outer harbour, stopping at Paremata Point. Even so, maps of the area drawn up at the time indicate that, while navigable through narrow channels to the head of the Inlet, there were already sand-banks in the center preventing craft with a deep draft from negotiating the harbour.

Footnote

1. Note that 'sounding' derives from Old English 'sund' meaning 'water' and refers to the act of fathoming the depth).

Feature Article cont....

The 1855 earthquake, a significant tectonic event caused by rupture of the Wairarapa fault, resulted in uplift of a wide area of the Wellington region. According to eye-witness accounts the earthquake lifted the area of Pāuatahanui by up to a metre (though this is debated) thus further restricting access to the shoreline at the head of the Inlet and preventing supply craft from reaching the well-known Ration Point. Some of the coastal pathways and roads around the Inlet are presumed to have been built on the old wave-cut platforms exposed by this event.

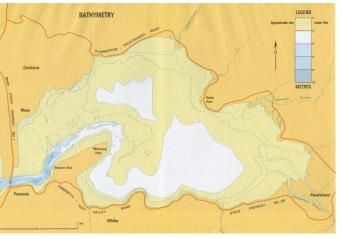
At this time, sedimentation from early human activity was already causing changes to the coastal profile, affecting the various stream outlets. In 1840 Francis Bradey arrived and was to establish a homestead and farm on land purchased around Duck Creek, clearing the forest for the purpose. Timber from this area was used to build Old St Pauls Cathedral. In 1856, heavily forested land around Judgeford was cleared for the Small Farms Settlement which, as a consequence, probably caused significant addition to the silting.



It was another hundred years, in 1950, before the next major survey was carried out, this time by the frigate *HMNZS Lachlan* (put into service around NZ coastal margins from 1949 to 1975) to do major hydrographic survey work. It made a thorough investigation of the Inlet and outer reaches of the harbour, using a motor launch for the purpose. It followed this in 1965 with an examination of the Onepoto Arm and the outer harbour and seabed to beyond Mana Island.

In 1974 a new survey of both Onepoto arm and Pāuatahanui Inlet was undertaken by a private company, TCB & Co., this time using ecosounding. With this new technology the first detailed bathymetric map of the Inlet was made, a copy of which was published by DSIR in the book *Pāuatahanui Inlet – an environmental study* (1980).

In addition to the bathymetric surveys, aerial photographs were taken between the years 1942 and 1977. They indicate that during this period there were only minor changes to overall sedimentation rates. The drainage patterns evident in these photographs also suggest that



Bathymetric map of Pāuatahanui Inlet (W B Healy)

the Pāuatahanui Stream once possessed a braided delta, with numbers of small and comparatively shallow channels. They showed that two other streams—Duck Creek and Ration Creek—had smaller but similar deltas. With increased sedimentation these deltas would have grown and merged, the shallower channels becoming clogged and the main channels deepened, but it does not appear that the Pāuatahanui Stream had, at that time, stabilized with a single main channel. An embayment north of the present mouth suggests that until quite recently a flood could change the outlet but floods have now built levees about a metre above the normal present-day water level, and the present channel seems well established.

It wasn't until the late 1970s that analysis of the long-term sedimentation record was made using core sampling. Driven by the concern about the effects of catchment run-off on the estuary, the sediments were mapped, historical changes in channel and bank morphology were measured, and cores were dated by radiocarbon and pollen methods in an attempt to understand factors influencing sedimentation rates

Feature Article cont....

during the last 12,000 years. Significantly, this was the first time these dating methods were applied to sediments in a New Zealand estuary.

It was also in the seventies that planning and development of the southern hillsides of the Inlet resulted in the rise of a new suburb called Whitby, a development that was to cause a huge increase in the sedimentation of the Inlet, particularly at Browns Bay.

Then in 1991 TCB & Co. undertook another thorough survey covering the same areas as in 1974 but this time possibly using multi-beam eco-sounding, together with satellite systems and coastal radar for more accurate positioning. It was the results of this survey that alerted local residents to the ongoing degradation of the Inlet since 1974 and resulted in the establishment of the Guardians of Pāuatahanui Inlet.

In 2009 a new, very comprehensive, survey of both arms of the harbour was undertaken by Discovery Marine Ltd., commissioned by Porirua City Council. This survey also set up a sea-level measurement site at Mana Marina to accurately determine the range of spring and neap tides, and the mean sea level, in the area. Prior to an analysis of these measurements, the previous bathymetric charts were digitized and, together with the 2009 survey results, a computer analysis of all the data was undertaken to obtain a clear picture of the historic and current sedimentation rates. From this point onward, bathymetric surveys have been conducted by DML every five years, the latest being in 2019.

In summary, the result of all this research has been to established that, following the last glaciation, there had been rapid sedimentation (c11 mm/yr.) at around 8000 years ago when the sea-level was rising rapidly and swamp conditions developed in the Inlet. These sediments overlay the gravels of glacial origin. Slower sedimentation of 1-2 mm/yr. followed over the period 3,610-1,360 years ago when the sea-level stabilised at near its present level.

The pollen analysis recorded the removal of the podocarp forest-cover by fire and its gradual replacement by bracken, associated with Polynesian settlement, followed by the appearance of grasses and exotic pollen, such as pine, associated with European occupation.

As part of the most recent surveys, present-day rates of sedimentation in the estuary have been determined from estimates of catchment run-off and by direct measurements of the changes in the sediment surface level using steel plates buried in the sea floor.

The result of all these surveys gives a picture of the gradual infilling of the Inlet, with the rate increasing significantly in recent times. The 2009 survey analysis calculated the sedimentation rate between 1974 and 2009 as an average 9.1mm/yr. It also estimated the reduction of *tidal prism* (i.e. the volume of water leaving the estuary at ebb tide) as being minus 8.7%, demonstrating in the process that the Inlet has significantly shallowed in that time.

Interestingly, the 2009 analysis also made a prediction as to the future of Pāuatahanui Inlet if the sedimentation rate continues unabated. Even without human activity, sedimentation will occur of course but, if the rate continues to exceed the natural 1mm/yr. rate, the Inlet's future outcome will happen earlier than it otherwise would. What is that future? It would be to become a saline swamp by the year 2180, give or take 25 years. In other words, in about 60 years from now.*

References:

- i. Distribution of surface sediments of Pauatahanui Inlet (NZOI Oceanographic Field Report 7, McDougal, J. C. 1976)
- ii. Pauatahanui Inlet—an environmental study (W.B.Healy 1980)
- iii. Changes to Porirua Harbour in about 1855: historical tradition and geological evidence (George Eiby 1990)
- iv. Coastal Oceanography and Sedimentology in New Zealand 1967-91 (Terry M Hume et al 1992)
- v. Geology of the Wellington Area (Begg and Mazengarb 1996)
- vi. Patterns and Rates of Sedimentation in Porirua Harbour (CML 2009)

Feature Article cont....

- vii. The Porirua Harbour and its Catchment: a literature summary and review (Blaschke and Rutherford Environmental Consultants February 2010)
- viii. Porirua Harbour and Catchment Strategy and Action Plan (PCC 2015)
- *ix.* Te Awarua-o-Porirua Harbour and Catchment Sediment Reduction Plan (Porirua Harbour and Catchment Strategy and Action Plan 2015)
- x. Geni (geni.com/people/Francis-Bradey/)
- xi. Te Ara Encyclopedia of New Zealand—Making and using charts (<u>https://teara.govt.nz/en/charting-the-sea-floor/</u>) **

CANADA GEESE

E ight years ago, in 2013, we became involved in a debate over the increasing presence of Canada geese in the Inlet and the surrounding landscape. The debate became one where a small group of people campaigned enthusiastically against any form of culling while the Pāuatahanui Wildlife Reserve management team were desperately trying to control their numbers due to the increasing pollution they caused and the ongoing invasion of native bird nesting sites. In the end no action was taken, with the assumption given at the time that, when Transmission Gully Motorway construction began at Lanes Flat, the favourite gathering place for these birds, they would be driven out of the area.

But they haven't left the area, just found other locations in which to gather, and their presence is still being felt by local farmers and wildlife volunteers alike.

Unfortunately, while the Canada goose is a well loved bird, displaying a number of wonderful communication skills, it is not native to New Zealand. It finds our climate very accommodating and the population has grown exponentially in recent years. Nationwide they are out of control with the cost of eradication now untenable.

For those who still believe they should be left alone, a recent article published on *The Guardian's* website, explains the current dire situation very well indeed and should be read as a warning. Please go to the following link: <u>https://www.theguardian.com/world/2021/aug/07/the-rabbit-of-the-sky-flocks-of-canada-geese-plague-new-zealand-countryside</u>.

ON THE HORIZON

nlet Clean-up

This annual event has been tentatively set for Sunday 28 November 2021.

If you wish to take part this year please make a note of this date. Further details will be provided closer to the time, posted on our website and on printed posters that will be displayed in the area prior to the event.

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On the Horizon cont....

🖊 embership Form

It has been pointed out that our membership form, which is always on our last page of the newsletter and also part of our pamphlet, is somewhat out of date. Cheques for instance are now a thing of the past. That would also mean the option to post the completed entry form by mail, along with payment, may not be needed. Payment by cash, although still possible if the sender wanted to take that risk, would not be recommended. This part of the form would therefore need to change.

We will review this during the next cycle of the newsletter and publish a revised version in December.



We are looking at options for our website at the moment, including how we host the site and what software is used for creating the pages. It is not something that we expect to complete in the short term but hope that eventually we will have an exciting new format with additional features.

We will keep you posted on this initiative.*

PLEASE SIGN UP A FRIEND OR NEIGHBOUR

Sign up a neighbour, friend, or another family member. Just explain to them that membership numbers really count in giving us a strong voice to argue for what we all value about the Inlet. Membership forms can be downloaded from our website <u>http://www.gopi.org.nz/assets/membersForm/Membership-new.doc</u> or copied from the one at the back of this newsletter. Better still, if you've received this newsletter by email, just forward it to others with a note encouraging them to join.

EMERGENCY NUMBERS FOR THE PAUATAHANUI INLET

Pollution: Discharges of contaminants to air, land, storm-water drains, streams, rivers or sea and for after hours consent enquiries: Greater Wellington Regional Council – 0800 496 734 (24 hours)

Boating infringements: Greater Wellington Regional Council - 384 5708 (24 hours)

Illegal fishing activity: Ministry for Primary Industries – 0800 476 224 (24 hours)

Pauatahanui Wildlife Reserve: Department of Conservation – 0800 362 468

Let us know what you have reported so we can keep an accurate record and follow up if necessary. **235 5052 (Chair, GOPI)** or *pauainlet@gmail.com*.

Guardians of Pāuatahanui Inlet		
Membership Form: new members To join the Guardians of Pāuatahanui Inlet, you can pay your subscription either online or by post. IF YOU ARE PAYING ONLINE, PLEASE REMEMBER TO FILL IN THIS FORM WITH ALL DETAILS, AND EMAIL OR POST IT TO US.		
Online payment	Postal payment	
1. Pay your sub via e-banking into our Westpac account 03-1533-0009387-00. In the 'Particulars' or 'Reference' columns, YOU MUST write your	 Write a cheque made payable to 'Guardians of Pāuatahanui Inlet'. 	
surname AND initials AND the period of your sub (1-yr or 5-yr).	2. Then fill in this form and send it, along with your cheque, to: Membership Secretary, Guardians of Pāuatahanui Inlet, Box 57034, Mana, Porirua	
2. Then fill in this form and either email it to us at pauainlet@gmail.com or post it (see next column for our postal address)	5247.	
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Three-yearly cockle survey	\Box Our educational programmes for schools \Box	
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