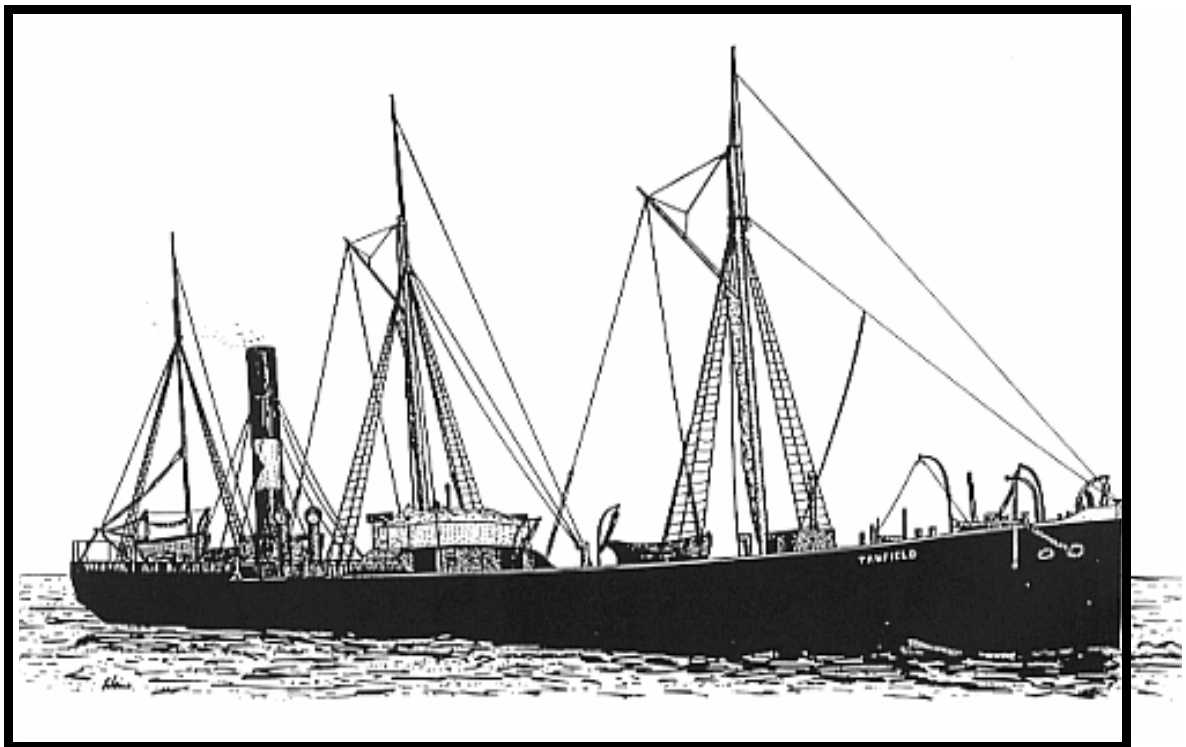




NSW
Heritage
Office

SS *LADY DARLING* **(1864 - 1880)**

CONSERVATION PLAN



Prepared by Tim Smith and David Nutley
September 1998

Cover: The ss Lady Darling is thought to be similar in appearance to the collier Tanfield, built in 1865. After Waine, Charles, Steam Coasters and Short Sea Traders. 2nd Ed. Waine Research Publications

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Figure 1: Water Police divers preparing to enter the water over the Lady Darling wreck site.
Photo: Tim Smith.

ss *LADY DARLING*

CONSERVATION PLAN

INTRODUCTION

This report details a series of inspections at the ss *Lady Darling* shipwreck site, located near Narooma, NSW. The inspections were coordinated by the Heritage Office following the discovery of the remains in August, 1996.

This interim report summarises all inspections undertaken to-date by the Office's Maritime Archaeology Program staff. The work is ongoing, in line with continued historic research and archaeological inspections of related sites throughout Australia. As such, the findings presented here are preliminary in nature. Future work might revise details contained herein.

The Office's field inspections were linked to annual fieldwork timetabling and where possible, to periods of suitable weather. The work has been assisted by many individuals and organisations who have provided their expertise at various stages in the recording, research and management of this important shipwreck site. Their contributions are listed in "*Acknowledgments*".

The survey work had a number of general objectives:

- identification of the newly located remains
- initial inspection and documentation of the wreck site
- photographic recording of the site
- continuation of historic research
- implementation of a management plan for the site

The field projects were organised by the Heritage Office as part of its role in administering the State's component of the National Historic Shipwreck Program (NHSP). Heritage Office Maritime Archaeologists David Nutley (Project Leader) and Tim Smith coordinated the field work which was undertaken over a number of separate visits:

- Initial site visit and confirmation of identification, 26 August, 1996
- subsequent orientation visit, 11 September, 1996
- Extended Survey Trip, November 3-7, 1996 (canceled on-site due to poor weather)
- Presentation of awards to finders, 26 March, 1997
- Extended Survey Trip, 14-17 April, 1997
- Extended Survey Trip, 15-19 June, 1998

Fieldwork support was obtained on all visits from Mr Colin Browne, Manly Hydraulics Laboratory (PWD) and Mr Bert Elswyk, *Island Charters, Narooma*.

Significant fieldwork assistance was also provided by the NSW Water Police and the Department of Land and Water Conservation.

The Heritage Office has completed extended field surveys at Wreck Bay (1993), Tweed Heads (1995), Twofold/Disaster Bay (1996), North Coast (1997) and Myall Lakes (1998).



Figure 2: Location map -The ss Lady Darling wreck site and environs. Courtesy, Manly Hydraulics Laboratory, Department of Public Works and Services.

OBJECTIVES

General

To investigate a newly reported shipwreck near Narooma (notified on 19 August, 1996) and establish its identity. To undertake a comprehensive archaeological assessment of the wreck site and an assessment of threats to the integrity of the site. To utilise this documentation in the management and advancement of the archaeological site.

Specific

1. to identify the newly reported shipwreck remains;
2. to implement site protection measures under the *Historic Shipwrecks Act*, 1976;
3. To record an accurate position;
4. to complete general orientation dives at the site;
5. to initiate a site plan or other graphic representation of the remains
6. to undertake comprehensive photographic and video documentation of the wreck site;
7. to implement a sidescan survey of the remains
8. to develop a photogrammetric survey of the remains
9. to construct wreck site condition models and specific engine and boiler models
10. to liaise with local dive shop operators, Eurobodalla Shire Council, Narooma Police, Narooma Coastal Patrol and media.
11. to utilise the results of these site surveys in the development of management options for the archaeological site.
12. to implement agreed management options and assess human impact at the site.

METHODOLOGY

Background histories of potential shipwrecks in the Narooma area were compiled by the Heritage Office prior to the initial site inspection. This documentation provided information on the general history of each vessel lost in the area, including aspects of

their construction and details of each wreck event. The initial dive to the wreck confirm it to be the *Lady Darling* of 1880.

Upon identification, research into the history of this vessel has continued through British and Australian archives. This work is ongoing. The absence of detailed drawings, plans or photographs of the *Lady Darling* has hampered the interpretation of the archaeological remains. To date, the appearance of the vessel is suggestive only, based largely on the examination of the archaeological remains.

An accurate position was obtained for the wreck site using differential GPS aboard the Public Works and Services research vessel, *Seascan*. The major features of the site have been identified by on-site mapping and remote sensing imagery. Due to the depth of the site, diving operations were strictly coordinated by the diving supervisor, Colin Browne, and followed occupational diving standards as required by the NSW Workcover Authority. Appropriate first aid equipment was on hand at all times together with procedures for prompt recovery.

The depth of the site affected the amount of data that could be obtained during the site visits. With a bottom diving time of approximately twenty minutes, many additional dives would be required to fully document the observed remains. Changes to scouring patterns across the site means that new areas of the wreck can become exposed at different times.

The distance of the wreck site from the Heritage Office's base in Sydney meant that access to the site was scheduled according to work commitments, rather than taking advantage of periods of good weather. As a result, several days were lost due to changes in weather and sea conditions, the extended field trip of November, 1996, being abandoned altogether. This meant that the usable diving days within each inspection period varied.

HISTORICAL CONTEXT

Introduction

The ss *Lady Darling* is remembered today as a collier which operated in the coal trade between Melbourne and Newcastle. During this period of the third quarter of the nineteenth century, colliers were a commonplace sight as they passed on their regular trips, with the result that their activities were seldom recorded in the contemporary records. Research today proves difficult.

The situation is highlighted with the sinking of the *Lady Darling* in 1880. At this time, far greater newsworthy stories were at hand. On the day of the loss, the notorious bushranger Ned Kelly was hanged at Old Melbourne Gaol providing endless comment ¹.

The wreck of the collier by contrast, was summarily mentioned in the local press. Indeed, the earlier operational life of the steamer is understood only through fragmentary notes of its voyages and trades, in many cases, it is difficult to detect through surviving records.

Partly because of this lack of contemporary documentation, the steamer as an archaeological site today, is of special interest. It provides an example of a general coastal cargo/collier in operation at a time of great expansion in Australia's coastal shipping companies. Its simple inverted marine engines are only represented by one other located example in New South Wales. Thorough recording of the shipwreck remains can therefore help to fill in details of its design and working life that are lacking in written sources.

A steamer is built

The *Lady Darling* was constructed at Liverpool in the county of Lancashire, United Kingdom under Special Survey by Lloyds of London. The year was 1864, and as the vessel's form took shape at the building yard of W.H.



Figure 3: *Ned Kelly from The Illustrated Sydney News, 10 July, 1880.*

¹ *Sydney Mail*, 13 November, 1880.

Potter & Co., it was surveyed by Lloyds of London and given the Official Number, 50499.

Both the Lloyds Building Survey report of 1864 and the initial Customs Register entry at the Port Of Liverpool survive, providing valuable information on the vessel's specifications and initial ownership ².



Figure 4: *Lloyds Building Survey Report, 1880. National Maritime Museum, Greenwich. London.*

Some plans of the new steamer also survive but these are limited to midships cross sectional drawings, with no deck plan or elevation to provide the general form and layout of the vessel ³. A search

for additional ship's drawings at archives in the United Kingdom proved fruitless ⁴. Similarly, no photographs have been found ⁵.

The new steamer was owned by merchants, Messrs. Tyndall and Heywood Bright of Liverpool and the initial master was Thomas Johnston ⁶. In July of 1864, the *Lady Darling* was launched with an A1 classification by Lloyds ⁷.

The Early Years in the United Kingdom

Details of the steamer's early years remain sketchy and will require further research through newspapers and other sources in the United Kingdom. The annual *Lloyds Register of British Shipping* however, provides a skeletal framework of its service life and structural changes.

The *Lady Darling* began life as a single screw iron steamer with a

before they could be copied. No material related to this builder was found at the Ships Plans Section. Letter from Mr Michael Melia, dated 20 February, 1997.

⁴ Letter from Chief Archivist, Tyne & Wear Archives, Newcastle Upon Tyne, dated 7 April, 1997; Letter from Anita Flynn, Assistant Curator, National Maritime Museum & Galleries of Merseyside, Liverpool, dated 12 March, 1997.

⁵ A photograph reproduced in Williams, P & Serle, R., 1968, *Ships in Australian Waters*. Sydney. p.74, is in fact the steamer *Barwon*. Research undertaken by John Riley who located the original photograph.

⁶ Customs Register, #426 of 1864, Liverpool. National Maritime Museum & Galleries of Merseyside, Liverpool. Note that the Lloyds Register suggests that the owners were Gibbs and Company: *Lloyds Register of British Shipping*, 1865, London. Australian National Maritime Museum, Sydney.

⁷ Lloyds Building Survey Report, #18944, July - September 1864. National Maritime Museum, Greenwich. London (IRN 3767).

² Lloyds Building Survey Report, #18944, July - September 1864. National Maritime Museum, Greenwich. London (IRN 3767); Customs Register, Port of Liverpool, #426 of 1864 (dated 12 October). National Maritime Museum & Galleries of Merseyside, Liverpool.

³ Plans associated with the Lloyds Building Survey Report, National Maritime Museum, Greenwich, London. The plans were stored folded and required conservation by the Museum's Paper Conservation Section

length of 189.7 feet, gross tonnage of 649 tons and an engine generating 100 nominal horse power. This was built by Morrison & Company at Newcastle ⁸. It had three masts, a brigantine rig, elliptical stern and four bulkheads ⁹. In 1864, shortly after it was launched, the lower hull was strengthened with cement as per the common practice. The steamer initially operated around Liverpool ¹⁰.

The *Lloyds Register* suggests that the steamer remained firmly within the British sphere until 1875 ¹¹. This is not the case however, with Australian records revealing that the vessel arrived in Melbourne as early as January, 1865 ¹². This was just six months after completion. The registry was officially transferred to Melbourne by 1866 ¹³ from its initial Liverpool register entry (426 of 1864). The new owner was Charles Edward Bright of Melbourne, after a sale concluded on 14 November, 1865 ¹⁴.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Official Number	Ship's Name, &c.	Master.	Registered Tonnage	Engine Power	Build	Where	When	Owner	Port	Port of Registry	Port of Call	Character	Remarks
61	Lady Gandon Sr		100	72-81-2	St. Malo	1861	E. Press	Yarm'th					
62	Clare	Sewster	760	235-0-31-1	Stockton	1874	G. Pym & Co	W. H. H. H. H.					
63	Iron	48. H. H. H.	1188	235-0-31-1	Stockton	1874	G. Pym & Co	W. H. H. H. H.					
64	Clarendon	8	1258	216-0-38-1	N. Brunswick	1856	John Law	Greenock					
65	Clive	Sewster	621	254-5-38-9	Sunderland	1859	Cory Bros & Co	Cardiff					
66	Constance	Ex. J. Abbott	195	90-0-24-1	Sunderland	1858	W. H. H. H. Co	Shimpton					
67	Darling	Sewster	722	259-0-26-1	Liverpool	1864	J. Peterson	Melbourne					
68	Douglas	Ex. A. Stephens	194	166-2-27-3	Greenock	1856	Taylor Bethell	London					

Figure 5: Typical entry in Lloyds Register of Shipping, London, for Lady Darling. Australian National Maritime Museum. Sydney.

Departure for Australia

Leaving Liverpool on 18 October, 1864, the *Lady Darling* arrived at Lisbon on the 26th and the Cape of Good Hope on the 10 October, where it re-coaled. The master was Captain Thomas Johnston, who safely brought the vessel to Hobson's Bay, Melbourne on 17 January, 1865 ¹⁵. While no passengers joined the inaugural trip to Australia, cargo included 30 boxes of type, 1350 boxes of fruit, 50 barrels of apples and 25 casks of wine ¹⁶.

⁸ Lloyds Register of British Shipping, 1875, London. Australian National Maritime Museum, Sydney.

⁹ Lloyds Register of British Shipping, 1865, London. Australian National Maritime Museum, Sydney.

¹⁰ Lloyds Register of British Shipping, 1868, London. Australian National Maritime Museum, Sydney.

¹¹ Lloyds Register of British Shipping, 1875, London. Australian National Maritime Museum, Sydney.

¹² *Melbourne Argus*, 18 January, 1865.

¹³ *British Register of Ships: Port of Melbourne*, 9 of 1866. Australian National Maritime Museum. Sydney.

¹⁴ *British Register of Ships: Port of Melbourne*, 9 of 1866. Australian National Maritime Museum. Sydney.

¹⁵ *Melbourne Argus*, 18 January, 1865.

¹⁶ *Melbourne Age*, 18 January, 1865; *Melbourne Argus*, 18 January, 1865.

A Steamer's Life

The new owners, Bright Brothers & Co. of Melbourne, intended to run the steamer in the developing colonial steamer trade with their ss *Hero*. Bright & Co, were a branch of the Liverpool firm which sent the vessel out to Australia. It was intended that the *Lady Darling* would act in association with the companies sailing vessels arriving in Melbourne. Here it would continue the transport of cargo and passengers ¹⁷.

The *Lady Darling's* first Australian voyage occurred on 13 April, 1865 from Hobson's Bay to Dunedin in New Zealand. It is interesting that this voyage occurred just four days after the notorious bushranger "Mad Dog" Dan Morgan was shot dead by Police, initiating the *Lady Darling's* association with the major period of bushranging in Australia ¹⁸. This was the steamers first trip to New Zealand. Cargo included:

32 chests, 168 half chests, 10 boxes of tea; 16 packages of cigars; 53 packages of tobacco; 50 cases of geneva; 10 hogsheads of ale; 39 packages of boots and shoes; 20 cases of india rubber goods; 12 cases of billiard tables; 3 cases of maps and charts, 50 casks of biscuits; 25 packages of bacon; 11 packages of glassware,; 200 bags of flour; 1 case of bonnets; 1 parcel of jewelry; 2 cases of statuary; 1 case of ploughs; 1 case of barrows; 2 cases of drapery; 7 cases of sewing machines; 50 cases of bitters; 250 cases of kerosene; 25 cases of fruit; 38 pigs and 3 horses ¹⁹.

The *Hero* left with the *Lady Darling* but was bound for Otago, with general merchandise. It was expected that after arrival at Dunedin, the *Lady Darling* would try its luck procuring work at the new gold fields at Okitiki in New Zealand ²⁰.

Several months later, on the 9 of October, 1865, the steamer is noted at Port Chalmers in Otago, New Zealand, under command of Captain Allardyce. From here it proceeded to Nelson. It left here on the 13 October with a cargo of 7600 ounces of gold for the Bank of New South Wales, seven passengers and another seven in steerage ²¹. Entries for vessels arriving at the Port of Sydney indicate that the *Lady Darling* successfully crossed the Tasman Sea and entered Sydney for the first time on 21 October, 1865 ²².

The *Lady Darling's* early ventures in Australian control, appeared to follow the growing pattern of steamer trade along the eastern coast, cashing in on developing cross Tasman trades. This development was partially linked to the New Zealand gold rushes of the period and to the growing emergence and acceptance of steam travel in this period.

Research to-date picks up the steamer again in mid 1866. An incident occurred on 26 May that year when the steamer ran aground on the dangerous reef at Green Cape in NSW. The *Lady Darling* was on a voyage from Melbourne to Gladstone under command of Captain McEachern when it struck, filling the fore compartment with water. On returning to Melbourne and slipping at the Government Patent Slip, it was found that the forefoot, a

¹⁷ Pers.Com. Ronald Parsons. Letter dated 26 July, 1998.

¹⁸ Dan Morgan was shot on 9 April, 1865 and followed quickly by Ben Hall on 5 May and John Gilbert, 13 May, 1865. Sharpe, A, 1980. *Bushranger Country*. Melbourne.

¹⁹ *Melbourne Argus*, 14 April, 1865

²⁰ *Melbourne Argus*, 14 April, 1865; *Melbourne Age*, 15 April, 1865.

²¹ *Sydney Morning Herald*, 23 October, 1865.

²² *Index to Ships Arrived: Port of Sydney*. Archives Office of NSW. COD 72/3.

portion of the keel and about a dozen hull plates had been shorn away²³. The First Mate was held responsible at the later Steam Navigation Board (Melbourne) meeting of 13 June²⁴.

Sydney newspapers mention that on 22 August, 1866, the *Lady Darling* stopped in on a voyage from Gladstone, Queensland, to Melbourne with a cargo of 280 head of cattle. It arrived in Melbourne on 26 August, under command of Captain Jas Clark²⁵.

The steamer was listed to sail for Hokitika in New Zealand on the 15 September, 1866, although it is unknown whether this occurred²⁶. It is known to have returned to Melbourne from Gladstone (18th) via Sydney on 29 September, 1866. Onboard were 270 head of cattle and 12 sheep but no passengers. This voyage was greeted with some acclaim as no cattle were lost, despite the steamer passing through “rain, hail and snow”²⁷.

A trip to Invercargill is suggested for the 21 November, 1866, although it is uncertain whether this refers to the steamer, or its schooner namesake, which worked the coast at the same time²⁸. The *Lady Darling* was laid up from November to December due to an overhaul at the Government Patent Slip. Here, the hull was painted and the bottom coated with Borthwick’s Patent Anti-fouling Composition, while the compass was adjusted in the bay²⁹.

On the 28 November, the *Lady Darling* resumed its trading, departing Melbourne for Newcastle in ballast. The master is now recorded as Captain John Pain³⁰. On 2 December, 1866, it again arrived at Newcastle from Melbourne, departing on 4 December with 760 tons of coal but no passengers³¹. Leaving Melbourne in ballast on the 13th, the *Lady Darling* limped into Sydney on the 17th after an air pump gave way off Wollongong³². It arrived back in Melbourne from Newcastle on the 28th with 786 tons of coal and 127 pigs³³.

These early years under the ownership of Bright & Company appeared difficult, the impression being that the steamer aimed to pick up any trade it could get. It is important to note that during this early phase, the steamer was operating in many guises as passenger steamer, general cargo carrier and collier. During this period, alterations were made to the *Lady Darling* to enable it to capture some of the emerging interest in passenger trade. This involved fitting out for passenger accommodation with a direction to place the steamer on the Sydney- Melbourne route³⁴. Competition with the major shipping companies was always going to be hard.

Few details have been located for the steamer’s operations in the first half of 1867. The vessel is not recorded in Sydney that year, although a representative trip involved a voyage in ballast from Melbourne to Newcastle on 22 March, 1867. Here it is noted that Captain

²³ *Melbourne Argus*, 29, 30 May, 1866; 1 June, 1866.

²⁴ Pers.Com. Ronald Parsons. Letter dated 26 July, 1866. With thanks to Mr Parsons for highlighting this incident.

²⁵ *Sydney Morning Herald*, 22 August, 1866; *Melbourne Argus*, 27 August, 1866.

²⁶ *Melbourne Argus*, 28 August, 1866; *Melbourne Argus*, 12 September, 1866.

²⁷ *Melbourne Argus*, 1 October, 1866.

²⁸ *Melbourne Argus*, 21 November, 1866.

²⁹ *Melbourne Argus*, 27 November, 1866.

³⁰ *Melbourne Argus*, 29 November, 1866.

³¹ *Melbourne Argus*, 4/6/10 December, 1866.

³² *Index to Ships Arrived: Port of Sydney*. Archives Office of NSW. COD 72/3; *Sydney Morning Herald*, 18 December, 1866. See also: *Melbourne Argus*, 14 December, 1866

³³ *Melbourne Argus*, 29 December, 1866

³⁴ Newspaper reference (not obtained) 4 Dec, 1866, Ronald Parsons pers.com. Letter dated 16 December, 1996.

William Clayton was in command ³⁵. Clayton is noted as the master in the *Lloyds Register* from 1868 ³⁶.

In August, it is announced that “the steamer *Lady Darling*, lately employed in the Melbourne to Newcastle trade, is about to be sent back to England where a more profitable employment has been found for her” ³⁷. The vessel departed Melbourne for Liverpool on 27 August, 1867 ³⁸. With its sale recorded in the *British Register of Ships*, ownership transferred back to the former Liverpool based, Tyndall and Heywood Bright ³⁹. No other details have been obtained, although the vessel was sold again at Liverpool on 9 June, 1869, to Henry A. Bright ⁴⁰ and is said to have been operating out of that port ⁴¹.

A factor in the rather unsuccessful career of the steamer in Australia might be found in the owners' inability to place it in a regular service. The voyages undertaken by the *Lady Darling* indicate there varied nature and it appears that the vessel found difficulty in securing two-way cargoes. This problem may have been offset if the owners had sought some negotiation with the rival shipping companies ⁴².

Back in Liverpool, major structural changes were made in 1870 when the vessel was lengthened by 50 feet to 239.6 feet and a new bottom added. The ship's machinery was also re-certified that year and the tonnage raised to 895 tons gross, reflecting the extensions. Specified voyages now included the Mediterranean and St Johns in (Canada ?) ⁴³. The Lloyds entry for 1871 records that the vessel had damage repairs that year, presumably to the hull. The *Lloyds Captains Register* indicates that the damage was caused by collision ⁴⁴. Lloyds also indicates that the inverted direct acting engine was now rated at 140 horse power ⁴⁵. No other structural or ownership changes are recorded by Lloyd's.

³⁵ *Melbourne Argus*, 23 March, 1867.

³⁶ *Lloyds Register of British Shipping*. London 1868. Australian National Maritime Museum. Sydney.

³⁷ *Melbourne Argus*, 10 August, 1867.

³⁸ *Melbourne Argus*, 27 August, 1867.

³⁹ *British Register of Ships: Port of Melbourne, 9 of 1866*. Australian National Maritime Museum. Sydney.

⁴⁰ *British Register of Ships: Port of Melbourne, 9 of 1866*. Australian National Maritime Museum. Sydney.

⁴¹ *Melbourne Argus*, 12 November, 1880.

⁴² Pers.Com. Ronald Parsons. Letter dated 26 July, 1998.

⁴³ *Lloyds Register of British Shipping*, 1870, London. Australian National Maritime Museum, Sydney.

⁴⁴ *Lloyds Captains Register*. London. Entry under Captain William Clayton, 1871. Australian National Maritime Museum. Sydney.

⁴⁵ *Lloyds Register of British Shipping*, 1871, London. Australian National Maritime Museum, Sydney.

The Steamer return's to Australia

A new chapter in the vessel's association with Australia had to await nearly seven years until 1874.

In this year, the *Lady Darling* was again sold to Melbourne interests, this time to James (Jas) Paterson of Paterson & Co. The sale is dated 22 January, 1875⁴⁶ although the steamer arrived at Melbourne on 3 May, 1874⁴⁷. It is noted that this sale was recorded in the British *Lloyds Register of Shipping* with a change of masters from William Clayton to W. Sewel⁴⁸.

This was the *Lady Darling's* second transfer to Australia, departing Liverpool on 1 February, 1874. Captain Clayton brought the vessel out and arrived in Melbourne under sail. There were no passengers onboard but the cargo included 11, 601 d_ais?, 200 casks of cement, 42 tons of pig iron and 80 kilograms of nails⁴⁹.

Paterson, as the new owner, took control of the steamer which must have appeared much changed to Australian observers, following its extensive lengthening of 1870. This was a period of rapid growth for steamer services between Australian and overseas ports. Paterson however, in comparison to the vessel's earlier Melbourne owners, was well established in the eastern coast coal trade. His fleet comprised sailing vessels which until now, did the bulk of the general coal trade. They variously included the *Sarah Ann*, *Springbok*, *Lady Griffiths*, *Sea Nymph* and *Ensign*⁵⁰. His introduction of the steamer, *Lady Darling*, was an attempt to modernise his collier fleet in the face of growing shipping competition. This was to be the vessel's primary new role. Paterson's main focus however was the distribution of coal to major utilities in Melbourne and the interior⁵¹. 1874 also saw the purchase of the iron paddle tug *Rescue*, as the operations of the company were expanded⁵².

The *Lady Darling's* first trip in its new home was from Melbourne to Newcastle on 22 June, 1874. The trip involved the transfer of part of the original Liverpool cargo⁵³. The steamer arrived back home on 1 July with 1200 tons of coal in what was regarded as a quick passage⁵⁴. The coal was unloaded alongside the Sandridge Railway Pier⁵⁵.

The steamer cleared out of Melbourne again for Newcastle on 23 July in ballast⁵⁶. This was to be a familiar pattern, returning home with a full load of coal. It returned to Melbourne on 1 August after another quick trip with over 1000 tons of coal⁵⁷. Departing Melbourne again on 6 August for Newcastle in ballast, it left there on the 12th, and arrived back home on the 15th with 1100 tons of coal⁵⁸. Examination of succeeding newspaper entries for the remainder of 1874 record an identical pattern⁵⁹.

⁴⁶ *British Register of Ships: Port of Melbourne, 1 of 1875*. Australian National Maritime Museum. Sydney. Note: the previous register for the vessel is noted as 183 of 1870, Liverpool (not obtained). The *Melbourne Argus* states that Captain William Saul was given command of the vessel until he was transferred to the *Easby*. This was probably the Captain Sewel noted in the *Lloyds Register* from 1875. He was then replaced by Captain L.A. Roberts. *Melbourne Argus*, 12 November, 1880.

⁴⁷ *Melbourne Age*, 4 May, 1874.

⁴⁸ *Lloyds Register of British Shipping*, 1875, London. Australian National Maritime Museum, Sydney.

⁴⁹ *Melbourne Age*, 4 May, 1874.

⁵⁰ Doherty, Frank, 1958, *The Paterson Story*. Melbourne. p. 7.

⁵¹ Pers.Com. Ronald Parsons. Letter dated 26 July, 1998.

⁵² Doherty, Frank, 1958, *The Paterson Story*. Melbourne. p. 7.

⁵³ *Melbourne Age*, 23 June, 1874.

⁵⁴ *Melbourne Age*, 2 July, 1874.

⁵⁵ *Melbourne Age*, 3 July, 1874.

⁵⁶ *Melbourne Age*, 24 July, 1874.

⁵⁷ *Melbourne Age*, 29 July, 3 August, 1874.

Details of voyages between 1875 and 1879 have not been researched in detail. It is expected however that the steamer continued on its now established Melbourne - Newcastle route.

On 11 April, 1876, the *Lady Darling* again visited Sydney although contemporary newspapers make no apparent mention of the arrival ⁶⁰. Firmly entrenched in the coal trade, the now aging workhorse was probably a common sight as it worked up and down the coast. This familiarity meant that its movements were only summarily recorded in the local press.

By 1879, Paterson & Co. bought the iron collier *Easby* ⁶¹ to join the *Lady Darling*. The vessel was newly built at Sunderland and had a tonnage of 1,489 tons, and was later to be involved in a terrible sinking of the *Gambier* with loss of life, at Port Phillip Bay ⁶². The *Lady Darling* was only going to survive into the next year.

The Emergence of Steamers as a force

How does the *Lady Darling* fit into the history of steam trade along Australia's east coast? The development of an engine powered vessel is credited as early as 1783. However, the first practical steam vessel was constructed in Britain in 1802 ⁶³. In Australia, the first steamer to operate on the coast was the ps *Sophia Jane*, while the first to be built there was the paddle steamer *Surprise*. These events both occurred in 1831. Other paddle steamers soon followed, and included, the *William The Forth* (1831), *Tamar* (1833), *Maitland* (1837), *Rose*, *Shamrock* and *Thistle* (1841), *Seahorse* and *Juno* (1842), *Phoenix* (1846) and *Illalong* (1854) ⁶⁴.

The paddle steamer *Juno* made the first voyage across the Tasman Sea to New Zealand as early as 1847 ⁶⁵. It was not until 1851 however, that the first screw steamer began work in Australian waters. This was the steamer, ss *Keera*. By the time the *Lady Darling* arrived in 1864, screw steamers were becoming commonplace. Many, however, were powered by adapted paddle wheel engine types.

Each of the Australian colonies had established its own identity by this time. This led gradually to the development of rival shipping companies which opened up new regular routes. However, during the 1860's "the story of inter-colonial shipping in Australia is largely that of the Australian Steam Navigation Company (ASN) ⁶⁶. The company initiated runs to Queensland and then New Zealand, taking diggers to the new gold fields at Otago and opening up a monthly service from Sydney to Nelson, Wellington and Dunedin. There was some competition, including that from the Intercolonial Royal Mail Company ⁶⁷ and other concerns.

At this early stage, the *Lady Darling* was noted participating in limited voyages to New Zealand under Bright & Company, bringing the proceeds of the gold boom back to Australia.

⁵⁸ *Melbourne Age*, 7, 13, 17 August, 1874.

⁵⁹ See: *Melbourne Age*, 29 September, 1874; 6 November, 1874; 2 December, 1874; 8 December, 1874; 17 December, 1874 and 26 December, 1874.

⁶⁰ *Index to Ships Arrived: Port of Sydney*. Archives Office of NSW. COD 72/3.

⁶¹ The *Easby* arrived in Australia in June, 1874. *Melbourne Age*, 23 June, 1874.

⁶² Doherty, Frank, 1958, *The Paterson Story*. Melbourne. p. 11.

⁶³ Richards, Mike, 1996, *Pig and Whistle Run*. Grafton. p.9.

⁶⁴ Richards, Mike, 1996, *Pig and Whistle Run*. Grafton. p.5-16.

⁶⁵ Parsons, Ronald, 1979, *Steamers in the South*. Melbourne. p.8.

⁶⁶ Bach, John, 1976, *A Maritime History of Australia*. Sydney. p.193.

⁶⁷ Bach, John, 1976, *A Maritime History of Australia*. Sydney. p.193.

Most of its activities focused on east coast trade routes where it operated as a general cargo carrier, passenger vessel and part time collier.

The 1850's had seen massive increases in the production and shipment of coal ⁶⁸. As demand increased with the gold rushes, ensuing urban development and the needs of supplying increased shipping, led to an escalation of the coal trade from Newcastle to other centers.

The Newcastle trade played an important part in the development of several shipping firms, particularly during the 1870's, where six major shipowners entered the inter-colonial trade. The *Lady Darling's* arrival back in Australia in 1874 coincided with this period of growth.

Emerging companies joined established ones such as ASN and Huddart Parker (formerly established in 1876) who traded in coal from Newcastle to Melbourne. They included the Melbourne Steamship Company which had been an amalgamation of separate ventures (officially established in 1895) ⁶⁹ and the Adelaide, Melbourne & Otago Steam Ship Company, which began sending vessels to both Wellington and Port Chalmers by 1870 ⁷⁰. Another smaller concern at this time was the Tasmanian Steamship Company which traded across Bass Strait, and the Union Steamship Company of New Zealand formed in 1875 ⁷¹.

James Paterson, the *Lady Darling's* second Australian owner, established another of these smaller rival companies. Its roots went back to the 1850's where he quickly realised the potential of the Newcastle - Melbourne coal trade in the wake of the gold rush expansion. He procured a fleet following his arrival in Melbourne in 1852 and his early career at the diggings. The fleet comprised timber sailing vessels until he acquired the *Lady Darling* in 1874, his first iron steamer ⁷².

⁶⁸ Bach, John, 1976, *A Maritime History of Australia*. Sydney. p.191.

⁶⁹ Bach, John, 1976, *A Maritime History of Australia*. Sydney. p.193; Pemberton, B, 1979, *Australian Coastal Shipping*. Melbourne. p.7.

⁷⁰ Pemberton, B, 1979, *Australian Coastal Shipping*. Melbourne. p.202.

⁷¹ Bach, John, 1976, *A Maritime History of Australia*. Sydney. p.191.

⁷² Pemberton, B, 1979, *Australian Coastal Shipping*. Melbourne. p.202. See also: Doherty, Frank, 1958, *The Paterson Story*. Melbourne (no pages marked).

SHIPPING.

ARRIVALS.—APRIL 7.

Kiama (s.), 200 tons, J. McArthur, from Moruya, Clyde, and Ulladulla. Passengers—Mrs. Malone and family (5), Miss Gray, Mrs. Pool, Messrs. Anderson, Sevecomb, Farford, Bishop, Miller, Test, Connions, Macfarlane, Manning, Broddridge, Miss and Master Manning, and 3 in the steerage. I.S.N. Co., agents.

Gunga (s.), 797 tons, Captain C. E. Saunders, from Levuka 30th ultimo. Passengers—Mrs. C. D. St. Pinnock child and servant, Miss Hadley, Rev. S. Nobbs, Messrs. H. Levick, E. N. Marks and native servant, A. Sharp, E. F. McPherson, J. McKenzie, P. James, T. W. Webber, A. M. Severn, and 10 in the steerage. A.S.N. Co., agents.

Lady Darling (s.), 722 tons, Captain J. H. Roberts, from Warrnambool. Evans and Co., agents.

Jer-falcen, schooner, 280 tons, Captain Bentley, from Samarang 21st January. Passengers—Mrs. Bentley and 2 children. Colonial Sugar Co., agents.

Mavis, schooner, 89 tons, returned to port.

Ly-ee-Moon (s.), 1200 tons, Captain G. Tait, from Melbourne. Passengers—Saloon: Mrs. Solomans and child, Mrs. F. Solomans, Mrs. J. Sands, Mrs. Loughnan, Mrs. A. Loughnan child and servant, Miss Sands, Misses Solomans (2), Miss Stanley, Miss Teale, Messrs. S. Solomans, H. Solomans, A. Loughnan, A. Trimble, J. Kilgour, Wybert Reeve, R. L. Malcolm, G. Trimble, J. Living, G. Darrell, and 20 in the steerage. A.S.N. Co., agents.

City of Melbourne (s.), 1000 tons, Captain R. M. Phillips, from Noumea 27th ultimo. Passengers—Madame Taillotte, Madame Prudome and child, Messrs. Prudome, Durrand, Philippe, W. G. St. George Maurice, and 11 in the steerage. A. S. N. Co., Agents.

Hero (s.), 851 tons, Captain Thomas Logan, from Auckland 31st ultimo, via Wellington. Passengers—Mrs. Halstead, Mrs. Stevenson, Master Stevenson, Miss McDonald, Miss C. Stuart, Miss M. Stuart, Mrs. Hunter, Mrs. Woolnough and 2 children, Messrs. Symonds, O. M. Grundle, Jeyes, Masters E. and W. Stuart, and 19 in the steerage. Bright, Brothers, and Co., agents.

Mary Cochrane (s.), 135 tons, Captain Nicholson, from Macleay River 5th instant. Passengers—Messrs. E. Toohell and Muir, Master Muir, and 1 in the steerage. P. Hogan, agent.

DEPARTURES.—APRIL 7.

Lady St. Aubyn, for Port Wakefield, S. A.

Crownthorpe, for Wellington, N. Z.

Derwent (s.), for Brisbane, Maryborough, and Bundaberg.

Glenelg (s.), for Adelaide and Hobart Town.

Hero (s.), for Melbourne.

PROJECTED DEPARTURES.—APRIL 8.

Elizabeth, and Tongatabu, for Samoa; Mavis, for South Sea Islands; Anna Bella, for London; George Noble, for Timaru, via Newcastle; Roscond, for Normanton; Ocean Queen (s.), for Levuka; Rotorua (s.), for Auckland and all New Zealand ports.

CLEARANCES.—APRIL 7.

George Noble, barque, 253 tons, Captain Greenwood, for Timaru, via Newcastle.

Glenelg (s.), 894 tons, Captain S. Nicholson, for Adelaide, via Hobart Town. Passengers—Miss Nottage, Mr. Mrs. and Miss Sharp, Mr. and Mrs. Allen, Miss L. Allen, Miss A. Allen, Masters Allen, J., Mr. Mrs. and Miss Davis, Miss Brooks, Messrs. J. Kerr, Nottage, C. Ruland, J. Woodard, J. Spence, W. Richardson, Sundmann, and 10 in the steerage.

Cheviot (s.), 764 tons, Captain Charles Ashford for Melbourne.

Figure 6: A typical entry for the Lady Darling's shipping movements. Sydney Morning Herald, 8 April, 1880.

Paterson embraced this period of modernisation and knew that he must keep up with his rival players, and developments in vessel design. He later added a number of other iron steamers to the trade, including the *Taramung*, *Easby* (1879) and *Glaucus*⁷³. It is worth noting that

⁷³ Gregory, D, 1928, *Australian Steamships Past and Present*. London. p.119; O'May, D.G, 1976, *Song of Steam*. Hobart. p.171.

when purchased in 1874, the *Lady Darling* was ten years old and no longer at the forefront of iron steamer design. While it was probably a familiar vessel to Paterson following its earlier association with Melbourne, his interest in the vessel might be explained more by the amount of current capital he had to upgrade his fleet to iron and steam ⁷⁴.

Pemberton notes that at this period it is difficult to distinguish coal carriers from cargo ships, for most of the latter engaged in the coal trade from time to time ⁷⁵. This is also true for the *Lady Darling* which, although principally serving as a collier from 1874, carried general produce on several trips. The 1870's is also viewed as a period of the rapid growth in passenger shipping following an overall escalation of vessel tonnage's, powering and frequencies. Steamers such as the ss *Ly-ee-Moon* (which operated on the east coast from 1877-1886) are examples of the gradual refinement of passenger/cargo transportation towards the end of the period.

The Final Year

The activities of the *Lady Darling* have been more fully researched for 1880, the year in which it was wrecked. While still firmly in the Melbourne - Newcastle trade, the steamer visited Sydney on 22 February, 7 March, 23 March, 7 April, 20 April and 4 May that year ⁷⁶.

Sydney newspapers record that in February, the steamer was captained by J. A Roberts and was on a voyage from Warnambool in Victoria to Newcastle via Sydney with 280 tons of potatoes ⁷⁷. The addition of an alternative cargo is an interesting revelation and might indicate the need for additional income to sustain the vessel's operations. The arrival in Sydney on 7 March was again from Warnambool and on this trip, the vessel was carrying 2000 bags of potatoes on behalf of Evans & Co, 1400 bags for C.B. Bond and 600 bags for F. Horsey ⁷⁸. The trip to Sydney took 3 days. It is unclear where the vessel departed to, but it was presumably again Newcastle, arriving back in Sydney on 21 March.

It was an established run, the steamer again arriving in Sydney from Warnambool on 7 March (cargo not recorded), 20 April (cargo not recorded) and 4 May departing for Newcastle (cargo not recorded) ⁷⁹. On this latter trip, the newspapers noted that the vessel "*experienced fresh southerly winds to the Promontory (Wilson Promontory), from thence to Gabo Island, light southerly winds to strong south west winds to arrival*" ⁸⁰. The return cargo from Newcastle was invariably coal.

The *Lady Darling* was not to visit Sydney again but was sighted passing the Heads at 5am on 15 October, 1880 on a trip from Melbourne to Newcastle ⁸¹. It was recorded in Newcastle again on the 26 from Melbourne ⁸², arriving back there on 30 October ⁸³ and departing again for Newcastle in company with the *Easby* on 4 November ⁸⁴. During this trip, the steamer

⁷⁴ Noted also by Parsons. Pers.com, letter to Heritage Office.

⁷⁵ Pemberton, B, 1979, *Australian Coastal Shipping*. Melbourne. p.202.

⁷⁶ *Index to Ships Arrived: Port of Sydney*. Archives Office of NSW. COD 72/3.

⁷⁷ *Sydney Morning Herald*, 23 February, 1880.

⁷⁸ *Sydney Morning Herald*, 8 March, 1880.

⁷⁹ *Sydney Morning Herald*, 23 February, 8 March, 8 April, 21 April, 5 May 1880.

⁸⁰ *Sydney Morning Herald*, 5 May, 1880.

⁸¹ *Sydney Daily Telegraph*, 16 October, 1880.

⁸² *Sydney Daily Telegraph*, 28 October, 1880.

⁸³ *Sydney Daily Telegraph*, 2 November, 1880.

⁸⁴ *Sydney Daily Telegraph*, 6 November, 1880.

was noted passing Twofold Bay ⁸⁵ arriving at Newcastle on the 7th ⁸⁶. This was to be the last voyage and it took onboard a standard load of 1, 220 tons of coal which was not insured ⁸⁷.

Disaster Strikes

The *Lady Darling* departed Newcastle for its regular trip back to Melbourne on the 8 November, 1880 ⁸⁸. Disaster struck just to the south of Montague Island in New South Wales, a little before midnight on the night of 10 November, 1881. The vessel had proceeded under steam at seven knots, with all sails set except the topgallant yards ⁸⁹. Captain Roberts claimed the collier struck something in the dark four miles south of the island, and immediately began filling with water. Within an hour, the *Lady Darling* had sunk. Newspapers described a rising gale which “attained the force of a hurricane” ⁹⁰.

Grave fears were held in Sydney for the crew who were presumed lost. The Illawarra Steam Navigation Company’s steamer, *Kameruka* saw an unidentified sunken vessel at 5am on the morning of the 11th, located south west of Montague Island, as it passed on a voyage to Tathra. Captain Walker stopped his vessel and inspected the wreck. At this stage, only twenty feet of the mainmast and the tip of the mizzen mast stood above water. Attached to the mizzen was the remains of the vessel’s ensign, reversed as an indication of distress. After removing the flag and recording the depth as 15 fathoms (28 metres) of water, the *Kameruka* continued to Tathra and telegraphed Sydney ⁹¹.

In Sydney, the Marine Board dispatched the pilot vessel, *Captain Cook* to the scene to search for survivors. During this time, another steamer, the *Kiama*, passed the wreck also on the 11 November, while going north. It lay directly within the route steamers took inside of Montague Island. They observed signals for help from the island and found the crew who had escaped the wreck in one of the *Lady Darling*’s boats ⁹². The crew had rowed for the safety of the island as a large work crew were stationed there building the new lighthouse ⁹³. The shipwrecked crew were brought back to Sydney by the *Captain Cook* and transhipped outside the Heads to the steamer, *Barrabool*, which was proceeding to Melbourne, the *Lady Darling*’s home port ⁹⁴.

The remains were also seen by the steamer *Atjeh* from Port Adelaide on the 15 November ⁹⁵, while the steamer *Ridge Park* found one of the *Lady Darling*’s boats upturned about five miles south of Montague. They noted that it was painted black with, “*Lady Darling of Melbourne*” painted in a circle on the bow ⁹⁶.

By the 19 November, the Office of the Marine Board placed a notice to mariners, warning vessels of running over the wreck and providing details of its location ⁹⁷. A search of

⁸⁵ *Sydney Daily Telegraph*, 8 November, 1880.

⁸⁶ *Sydney Daily Telegraph*, 9 November, 1880.

⁸⁷ *The Melbourne Age*, 12 November, 1880 and *Melbourne Argus*, 12 November, 1880.

⁸⁸ *The Melbourne Age*, 12 November, 1880.

⁸⁹ *The Melbourne Age*, 22 November, 1880.

⁹⁰ *Sydney Morning Herald*, 12 November, 1880. Note that transcripts of the later Navigation Board Inquiry make no mention of poor weather: see *Melbourne Argus*, 24 November, 1880.

⁹¹ *Ibid.*; also: *The Sydney Daily Telegraph*, 12 November, 1880; *The Sydney Mail*, 13 November, 1880.

⁹² *Ibid.*

⁹³ *The Sydney Daily Telegraph*, 12 November, 1880.

⁹⁴ *The Sydney Mail*, 20 November, 1880.

⁹⁵ *Sydney Daily Telegraph*, 17 November, 1880.

⁹⁶ *Sydney Daily Telegraph*, 16 November, 1880.

⁹⁷ *NSW Government Gazette*, 19 November, 1880. Mitchell Library, State Library of NSW.

contemporary newspapers however make no mention of other sightings of the wreck past the 15 November. It appears that by this time the *Lady Darling*'s masts had come down, the wreck had shifted position, or heeled over.

The vessel is fatally holed

Details regarding the first impact and its effects on the steamer, are recorded. From this information, it is possible to reconstruct the final moments of the *Lady Darling* as it settled then sank mid-ocean. Investigation of the wreck site adds another dimension to this analysis, enabling a picture to be formed of the gradual breakdown of the vessel structure to the point witnessed today. This study finds that the formation of the wreck site follows well established iron ship disintegration patterns.

Captain Roberts described his reasoning for the vessel's loss to the Steam Navigation Board at a later hearing ⁹⁸. He stated that as the steamer proceeded on its southerly course, some four miles south of Montague Island, something struck the vessel on the port side with a glancing blow. Crew members provided some graphic accounts of the effects of the striking. The Chief Mate, Robert Hughes recalled how it seemed the steamer was struck by something coming at right angles to its path, causing it to heel over in the water. The blow "*resembled that of a sledge hammer*" , almost throwing Arthur Sweet over the ship's wheel ⁹⁹. This impact was concentrated at a spot abreast of the engine room, about nine feet (2.75 metres) below the water line and forty feet (12.20 metres) forward of the stern ¹⁰⁰. The impact tore into the coal bunker near the engine room (aft) bulkhead. The damage was catastrophic and water immediately began pouring into the hull flooding the fires in the boiler within five minutes. Urgent attempts were made to keep the engines running for as long as possible while the vessel was steered towards the shore. The pumps became useless as the steam was lost so early ¹⁰¹.

Roberts quickly realised that the steamer did not have enough power for a beaching and ordered all hands to abandon ship. In order to prevent the boiler exploding from the inrush of cold water, the safety valves were opened to blow off steam. The hull was already settling down by the time the men got into the boats. They rowed about a quarter of a mile from the wreck and within half an hour, the steamer's bows rose high into the air "*in an almost perpendicular position*" ¹⁰², and the *Lady Darling* sank. It was half past twelve in the middle of the night.

⁹⁸ The Melbourne Steam Navigation Board Report into the loss has not been located, but extracts of the hearing are reprinted in the *Melbourne Age*, 22 November, 1880; *Melbourne Argus* of 24 November, 1880; and the *Sydney Morning Herald*, 29 November, 1880.

⁹⁹ *Melbourne Age*, 22 November, 1880 and *Melbourne Argus*, 24 November, 1880.

¹⁰⁰ The *Lady Darling*'s fireman stated that he inspected the damage and it was a large enough hole for soemone to crawl through, and that it was located 8 feet below the waterline and about 30 feet from the sternpost. *Melbourne Argus*, 24 November, 1880.

¹⁰¹ *Melbourne Argus* of 24 November, 1880

¹⁰² *Melbourne Argus* of 24 November, 1880

It took the crew about three and a half hours to row to Montague Island, which they reached about four O'clock in the morning. The captain and crew were at a loss to explain what the steamer had struck, stating that nothing was seen before or after the impact. Roberts suggested they may have struck the wreck of the *Result* which had been lost earlier ¹⁰³. Historic records discount the possibility of a vessel called the *Result* being wrecked in the area. It was probable that the vessel was just missing from port at the time of the *Lady Darling*'s loss.

Was it an uncharted rock or floating object which led to the disaster. The Navigation Board appeared skeptical. Armed with the latest coastal charts, they could find no reason why the vessel should have been holed, but as all the crew agreed with their captain's statement, they could not charge him with negligence ¹⁰⁴. Today, it appears likely that the *Lady Darling* had been steaming too close to Montague Island and had struck Aughinish Reef (Montague Reef) to the south of it. Captain Roberts maintained that the steamer was never closer than one mile to the island ¹⁰⁵ and that he had passed over the same spot on many occasions ¹⁰⁶.

The evidence indicates that the steamer sank heavily stern first in fifteen fathoms (27.5 metres) of water. In fact, the wreck was found in 29 metres of water. It is unknown whether it hit the seabed at this sharp angle before finally settling out horizontally. Certainly the vessel's rudder is missing, indicating that it might have been detached when the stern hit the sand. It is probably buried nearby. There is no structural evidence that the impact crushed the hull aft, providing the possibility that the *Lady Darling* flattened out during its decent. While the bow is broken off and cantered to starboard, this is a normal pattern of iron shipwreck deterioration, and not evidence that the vessel plowed into the sand bow first (see below).

Discovery

The location of the *Lady Darling* appears to have remained a mystery for 116 years. Despite concerted efforts by divers to locate the illusive wreck site over the past fifteen years, its discovery was accidental. It occurred when a Bermagui fisherman, Mr Dom Puglise, fouled his trawling nets on a sandy bottom off Mystery Bay. Local Narooma dive charter operator Bert Elswyk and his friend, dentist Paul Mood, went out to assist the fisherman to recover the net hauling gear. Their interest was sparked when it was reported that fragments of riveted iron plating were pulled up with the damaged net.

On Friday 16 August, 1996, the team anchored near to the GPS position given by the trawler. However, when diving to the bottom in thirty metres of water, they found clean sand. Apparent on the seafloor however, was a distinct furrow probably caused by the trawling net. They followed the scour and soon recognised the unmistakable silhouette of a ship's bow. Examining further, they detected the impressive stern section of the wreck, including the engine and boiler. The divers returned to the surface with jubilation. Completing two dives the following day, they recovered the remainder of the tangled net

¹⁰³ *Melbourne Age*, 22 November, 1880. Only two *Result*'s are noted lost in NSW according to the Heritage Office Shipwreck Database. One was wrecked at Port Stephens in 1875, the other at Shoalhaven Bight in 1893. Two other *Result*'s were lost in Victoria, one a lighter, the other a small schooner. None of these are known to have been lost in the general vicinity. The reference to this mystery *Result* as a possible factor in the wrecking is unclear.

¹⁰⁴ *Sydney Morning Herald*, 29 November, 1880.

¹⁰⁵ *Sydney Morning Herald*, 29 November, 1880.

¹⁰⁶ *Melbourne Age*, 22 November, 1880

which was located at the stern and observed limited damage caused to one of the engine cylinders.

On the 19 August, they promptly notified the Heritage Office of their discovery as required under Section 17 (1) of the Commonwealth *Historic Shipwrecks Act*, 1976. Tim Smith, one of the Office's Maritime Archaeologists, visited the site on the 26 August in company with Colin Browne of the Manly Hydraulics Laboratory (PWD). This inspection aimed to familiarise the Office with the wreck site and to establish its identity and location. Previous research provided enough information to conclusively identify the remains with the *Lady Darling*. This was based primarily on the wreck's location, the materials used in construction, and the rare simple marine engine documented in the original building survey reports.

The discovery attracted immediate media interest both locally and statewide ¹⁰⁷. David Nutley, Coordinator of the Heritage Office Maritime Archaeology program again visited the site on 11 September, 1996 to further document the site and to meet with local dive charter operators, the Narooma Police and the Narooma Pilot Station staff.

Wreck site integrity

Diving inspections at the site suggested that there has been no prior visitation by divers. This is based on the absence of any earlier claims of discovery, the general lack of information within the diving community as to the location of the wreck, and the many easily recoverable relics at the wreck which would be expected to have been removed by earlier diving activities.

There is no direct evidence that the site has been previously disturbed by fish trawling operations. This includes the absence of nets of any kind on the wreck, or remains of trawling gear. The few exposed items outside of the hull amidships, including the donkey boiler, a winch and some rigging gear, could have been dragged from the site by a net passing through this collapsed section, but they can equally be explained by the general pattern of the wrecks disintegration and prevailing current patterns. The professional fisherman who hooked up on the wreck leading to its discovery, was unsure why his nets fouled in an area thought to be barren ¹⁰⁸. A few isolated fishing weights have been identified however, indicating that some limited line fishing has occurred over the site.

¹⁰⁷ *Sydney Morning Herald*, 6 September, 1996; *Daily Telegraph Mirror*, 6 September, 1996; *Canberra Times*, 6 September, 1996; *Narooma News*, 4, 11 & 25 September, 1996; *Sun Herald*, 15 September, 1996; *TCN 9 News*, 19 September, 1996; *Network 10 News*, 19 September, 1996; *Radio 2KY Sydney*, 26 September, 1996; *DiveLog Magazine*, October 1996; *Scuba Diver Magazine*, November/December, 1996; *Australian Geographic Magazine*, Issue 47, 1996.

¹⁰⁸ Bert Elswyk, pers.com. 1998.

Wreck site description

In his pioneering work, John Riley has conclusively shown that iron vessels which settled upright on their keels on sand, often bury to their approximate waterline. His research is described as the waterline theory of iron ship disintegration¹⁰⁹. In this scenario, an iron vessel quickly settles in the sandy substrate approximately to the level it would float in water.

Repeated examination of shipwrecks found upright on sandy bottoms has shown that the stern and midships usually remain intact as does the heavy engine and boiler (s). The decks, deck beams and hull sides tend to collapse where they are not supported by bulkheads. With the loss of support, the bow, a relatively strong unit, often breaks away from the hull. Sand enters the opening hull to the approximate level of the surrounding sand profiles. At this stage, the internal hull acts as a receptacle for the smaller fittings which dislodge from the collapsing structure.

In the case of the *Lady Darling*, the bow has pivoted along the keel line and collapsed to starboard, due to the breakdown of the hull sides aft. A similar picture is seen at several NSW's wreck sites including the *Bonnie Dundee* (1879) and *Catterthun* (1895). The action of swells can hasten this process of collapse.

Figure 7: *Divers examining the structurally imposing stern section of the Lady Darling wreck site. Prominent is the stern standing to a height of five metres, the marine engine and boiler. Photo: Andrew Green.*

¹⁰⁹ Riley, J, (nd) "The waterline theory of iron ship disintegration", in *Iron Ships and Steam Shipwrecks*. Perth.



Figure 8: *Maritime Archaeologist, Tim Smith, swimming over the raised stern portion of the hull. Photo: by Andrew Green..*



Figure 9: *Archaeologists David Nutley and Tim Smith inspecting the stern bulkhead behind the engine room. Photo: Andrew Green.*

Typically in line with this scenario, the structurally strong stern of the *Lady Darling* stands intact to near the upper deck level. The hull sides remain to a reasonable height up to the engine room bulkhead. Forward of this bulkhead however, the hull sides have disintegrated to approximately the level of the surrounding sand, the engine room area demarcated only by the still upright engine and boiler. Forward of the boiler, the hull sides are difficult to identify with current sand levels all the way to the bow. Two vertical stanchions are visible forward of the boiler and mark the centreline of the hull. They probably served to support the upper deck. This was the main cargo area of the steamer, and with few structural supports in this region, the hull sides have been severely reduced.

The bow survives in a recognisable form but, unsupported by the hull sides, has fallen over. All of the fittings associated with the bow have tumbled outside of the hull and lie to starboard, following the direction of collapse. These include an Admiralty and Porters Patent anchor which were probably stowed at deck level, the Patent Capstan, a davit, anchor chain and a collection of tumbled deck beams. It is apparent that the bow survives up to about the level of the lower deck, no hawse pipes being visible on the surviving sides¹¹⁰. In the midships region, the donkey boiler, a winch and timber rigging deadeyes, have fallen just outside the hull to starboard. The latter are probably associated with the mainmast which would have been located forward of the boiler.

The remainder of the visible relics have fallen within the area limited by the hull. In the stern area, these include a ships lantern and crockery deck beams and other structural elements. Towards the bow is a mound of anchor and chain, and the remains of the iron collars which probably supported the forward mast.

Figure 10: *Examples of the smaller items which are visible in the debris field. Here, timber deadeyes from the vessel's rigging can be clearly seen. Photo: Andrew Green.*

¹¹⁰ John Riley, pers.com. July, 1998.

The fact that the iron collars from the top and lower deck levels lie on top of each other with associated deck frames, supports the view that the decks largely collapsed downwards into the hull. A section of the port side of the hull has also fallen into the wreck in this area.

Other identifiable features are expected to survive beneath present sand levels, particularly forward of the boiler, the presumed area of the bridge. Sand levels are likely to vary over the site due to storm and swell activity, with buried structure becoming exposed at certain times. Currently, this body of sand is actively helping to preserve these remains together with the buried hull structure.

***Lady Darling* - Construction Details** ¹¹¹

At time of loss in 1880

Name:	<i>Lady Darling</i>
Type:	Single screw steamer
Materials:	Iron, timber decks
Builder:	W.H. Potter & Co.
Built:	1864
Where built:	Liverpool, County of Lancashire, United Kingdom
Owner:	James Paterson and E. Newbiggin, Melbourne
Port of Registry:	Melbourne, Australia
Length:	239.6 feet
Breadth:	28.1 feet
Depth:	16.4 feet
Gross tonnage:	894.90 tons
Number of decks:	Two and a break
Bulkheads:	Four ¹¹²
Masts:	Three
Rig:	Schooner
Figurehead:	None
Stern:	Elliptical
Engine:	Two vertical direct acting engines (“simple”), by Morrison & Co., Newcastle Upon Tyne. Diameter of cylinders: 40 inches Length of stroke: 30 inches Placement: Aft Horsepower: 90 (Lloyds Register states 140 hp)
Insurance:	Vessel insured for 9000 pounds ¹¹³

The following details of construction and fitting out were recorded in the original Lloyds Building Survey Report of 1864 ¹¹⁴. Although the steamer was substantially lengthened in

¹¹¹ *British Register of Ships, 1 of 1875*, Port of Melbourne. Australian National Maritime Museum. Sydney.

¹¹² *Lloyds Register of British Ships*, 1880. London.

¹¹³ *Melbourne Argus*, 12 November, 1880.

1870, with the inclusion of a new bottom and repairs to its machinery, the following details are not considered to have altered dramatically by the time the vessel was lost in 1880.

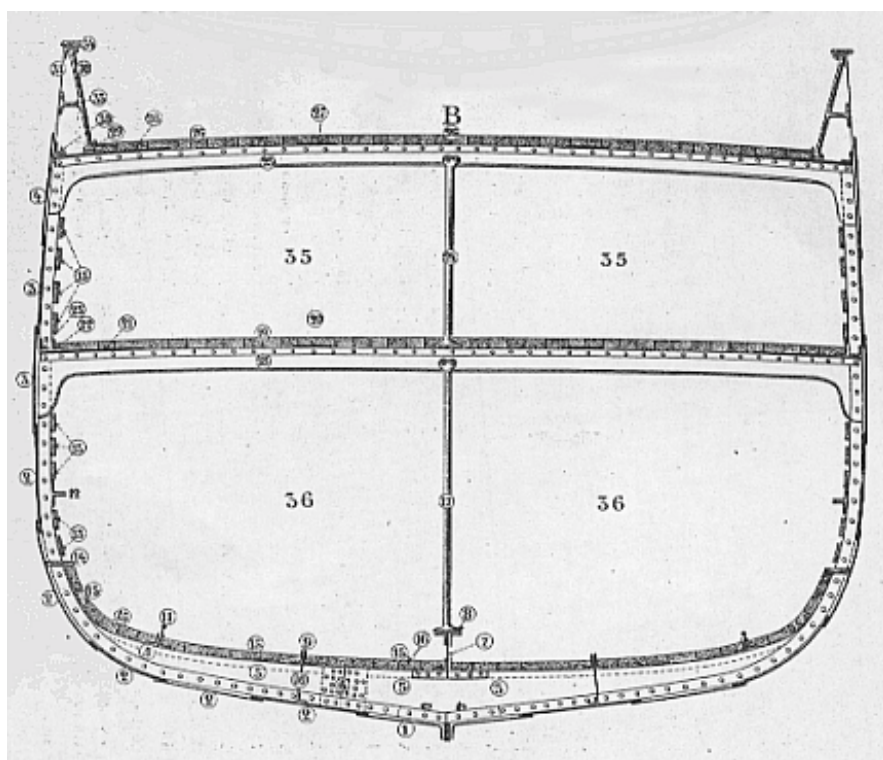


Figure 11: *Typical cross section of a two-deck iron steamer with timber decks. After, Paasch, Lucian, 1901, From Truck to Keel. London. Figure 34.*

The *Lady Darling* was clench built with a double bottom hull from forward to the engine room bulkhead, 130 feet from the stern. The four bulkheads extended from the floors to the upper deck. The inner plating of the floors was 6/16th inch in thickness, the plates extending on to the outer plating at the bilges and riveted through the same. The edges of the plating from the keel to the sheerstrake were double riveted. The engine was placed well aft, while the masts were of timber, the decks of yellow pine. The vessel had one longboat and two others, a patent capstan, two pumps in the main hold, one donkey (boiler) and four others (pumps). Six Porter's Patent anchors are listed, together with 264 fathoms of chain.

¹¹⁴ *Lloyds Building Survey Report*, National Maritime Museum, Greenwich. London.

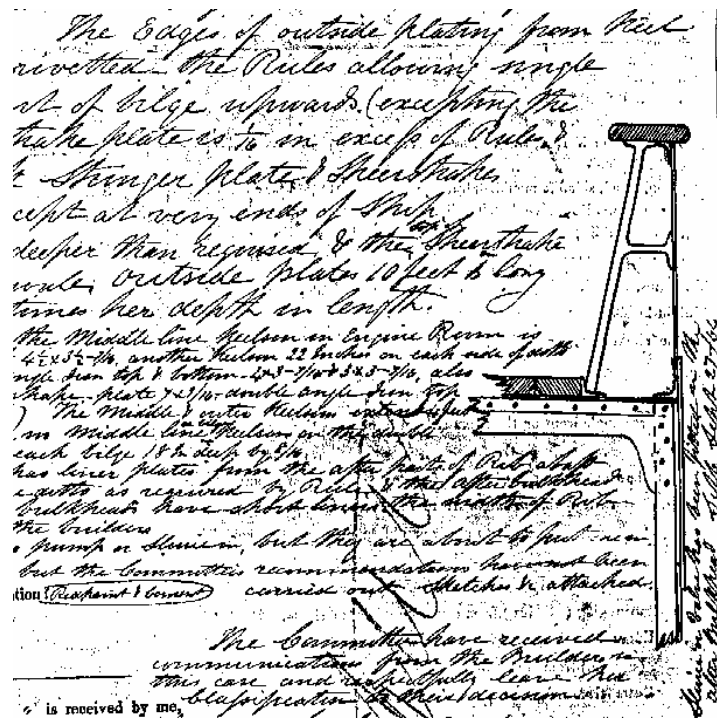


Figure 12: Construction details for the Lady Darling's top-sides, from the Lloyds Building Survey Report. National Maritime Museum, Greenwich, London.

Figure 13: The only original plan located for the Lady Darling. Midship's cross section as built in 1864. Courtesy: National Maritime Museum, Greenwich, London.

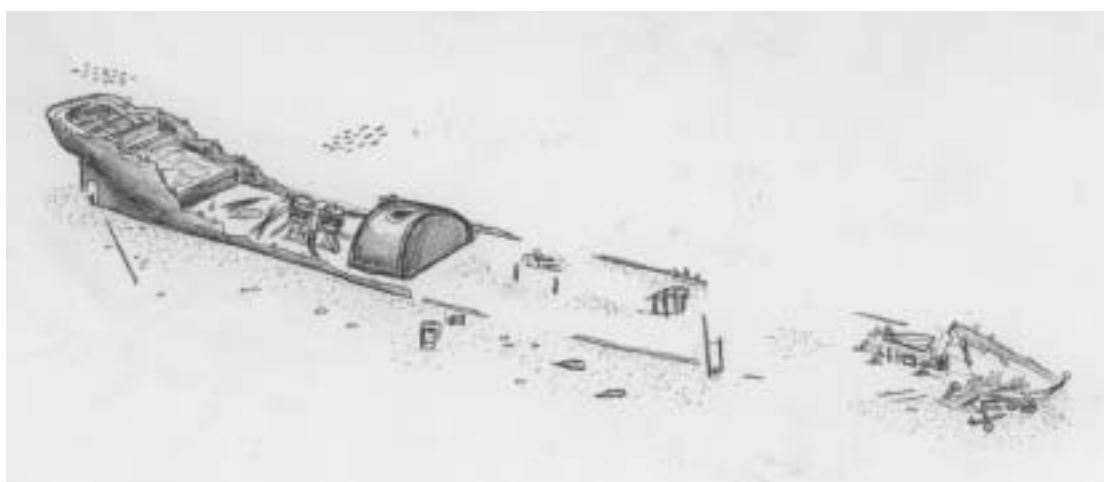


Figure 14: *Initial wreck site sketch prepared by Tim Smith. This is an approximation of the visible features noted at the site.*

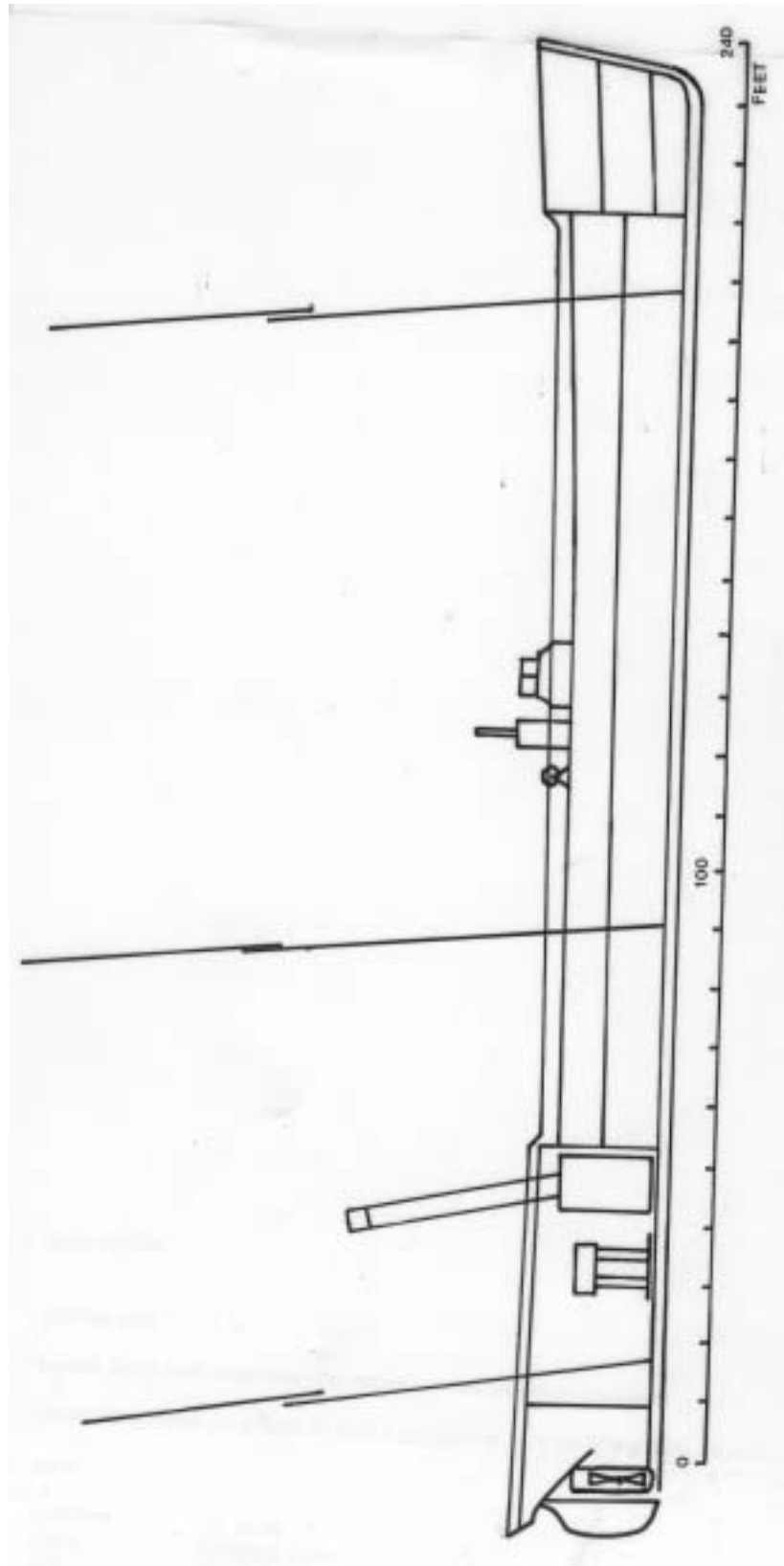


Figure 15: *This reconstruction of the Lady Darling's profile was completed by John Riley, based on site measurements obtained during the field surveys. It is a hypothetical arrangement, based on the recorded placement of key features at the wreck, together with a knowledge of contemporary vessels.*

The on-site survey work

The physical mapping of the wreck structure was a priority of all inspections to the site. As previously noted, a number of factors affected the survey approaches taken. The first was the depth of the wreck. Because of its location in twenty-nine to thirty metres of water, and with the requirements of Occupational dive tables (DCIEM), bottom time was limited. Each diver had a single planned daily dive with approximately twenty minutes on the bottom. Taken in conjunction with cancellation of dives due to poor weather or strong currents, each dive had to obtain maximum results. The size of the site necessitated several initial dives to familiarise the team with overall layout and special features worthy of detailed inspection. The extent of the wreck also meant that initial surveys would concentrate on gaining overall measurements only. When possible, more detailed coverage of key areas such as the engine, was achieved. In order to fully document the *Lady Darling*, many more visits would be required.

The initial dives at the wreck by Tim Smith (26 August, 1996) and David Nutley (11 September, 1996), aimed to familiarise the Heritage Office staff with the site. These trips also aimed to confirm the wreck's identity, based on earlier historic research. At this stage, a basic site sketch was completed, together with some general photography and video documentation.

Research into the history and construction of the *Lady Darling* was then undertaken in earnest, in order to determine the significance of the site, and to aid in its interpretation. This involved a systematic survey of records held at various Australian archives and those of the United Kingdom. While a substantial amount of material has now been collated, additional research is required to fill out the growing picture of the vessel's day to day activities.

Figure 16: *Tim Smith and Colin Browne obtaining overall site measurements at the stern area. Photo: David Nutley.*

An extended mapping project was then proposed for 3-7 November, 1996. This was to include a conservation assessment of the wreck site and its structural condition by a materials conservator. Unfortunately, after the team arrived to begin work, poor weather canceled all diving at the site.

The inspection was rescheduled for 14-17 April, 1997, following an earlier visit to Narooma to award commemorative plaques to the wreck finders, and to launch an interpretative plaque outlining the history of the vessel. The survey team comprised the Heritage Office's two Maritime Archaeologists, Mr Colin Browne, dive supervisor from Manly Hydraulics Laboratory and two divers from the Sydney Water Police, Sgt Ian Moss and Senior Constable Craig McCarthy. Mr Andrew Green also continued his photographic documentation of the wreck.



Figure 17: *Mr Steve Holtznagel deploying the Department of Land & Water Conservation's side scan sonar, during the remote mapping phase of the project. Photo: David Nutley.*

The principle aim of the fieldwork was the commencement of detailed site measurement. This included direct measurement of the visible hull and major features, from the stern to the bow. Because of the length of the site and its depth, the work required several dives over a number of days. Most dives concentrated at the complicated stern of the wreck and around the engine. Additional video footage was obtained, together with still photography. Mr Attila Bicskos of AMB Productions, assisted in the video recording of the wreck structure. Unfortunately, strong currents made diving hazardous and the survey work was cut short. An inspection was made instead of the two boilers from the wreck of the *Monaro* at nearby Binge Binge Point.

The next visit to the site could not be scheduled until 15-19 June, 1998. The team again comprised David Nutley, Tim Smith and Colin Brown, but also included Mr Steve Holtznagel and Peter Evans from the Department of Land and Water Conservation, and Mr John Riley. Holtznagel and Evans initiated a side scan sonar survey of the wreck site using their workboat, *Seascan*. The survey successfully mapped the site providing a clear indication of its general orientation and composition (see results at [Appendix 2](#)). Direct

measurements were also obtained from the side scan imagery. The diving component of the trip aimed to continue on-site measurement. Mr John Riley completed the overall measurement of the wreck forward of the boiler, and obtained heights of the wreck structure, particularly at the engine and boiler. These measurements have subsequently been incorporated into an initial site plan. The work also provided sufficient detail to produce an interpretative model of the engine and boiler.

David Nutley and Tim Smith concentrated on mapping the engine structure photographically. The resulting photographs are currently being processed in a three-dimensional mapping program by the Centre For Excellence In Maritime Archaeology in Western Australia. Called *Photomodeler*, the system involves digitising photographs to produce a computer generated three dimensional model. To maintain accuracy, each photograph included known reference points and scale rules placed in three planes. Prior to the mapping of the engine, a sketch was prepared and key features marked. The distance between these features, eg, cylinder heads, pipes, etc were taken and recorded on the drawing. These served as control points for the later digitisation of the photographs.

The points were marked with “*Utac*”, a yellow plasticine type compound (a version of *Blotch*). *Utac* proved extremely useful and had the advantage of being non intrusive to the wreck structure (completely removable), reusable, and clearly visible. Results from the trial survey have not yet been received for inclusion in the current report. The resulting three dimensional image should provide a convenient way to interpret the engine structure. If successful, the process could be extended to cover the entire wreck site. This would allow the wreck to be viewed from any angle, and additional details to be incorporated based on future site work.

The main advantage of the process lies in the amount of data that can be obtained with a limited number of dives. Once some basic control points are established, all that is required is a diver to progressively photograph the wreck structure. A substantial amount of data can be recorded in the photographs and digitally manipulated later, saving many hundreds of dive hours required by the standard manual measurement of shipwreck sites.

The site survey work has been successful in producing a wreck site plan. This provides a convenient way to illustrate the site and to interpret it to divers and non-divers alike. The recording of the archaeological remains is a critical stage in the complete assessment of any site. By viewing the elements of a site in detail, a clearer picture of the whole is obtained. The work is extremely important with the absence of detailed original plans and photographs of the *Lady Darling*. The examination of the engine, in particular, will aid future studies of early marine engine design and development.

The Engine

The *Lady Darling* was built during an intriguing time in the development of screw steamer design. The vessel's engine is arguably its most significant feature. It survives as a rare example in New South Wales of an early marine steam type - the "simple engine". These were the first modern efficient steam engines which could run at high revolutions without significant gearing or vibration problems¹¹⁵. The engine comprises two cylinders (engines) of identical size, mounted vertically. The engine room, with a length of 28 feet, was located aft allowing for greater cargo storage forward. Described in the *Lloyds Register of British Ships* as a vertical, direct acting engine, it connected via a piston rod and a connecting rod (not visible above sand), directly to the propeller shaft (crank). Much of the lower portion of the engine and engine floor remain buried in sand, making complete observation impossible at present.

As McCarthy has summarised¹¹⁶, the paddle steamer dominated the field of steam propulsion in the first half of the nineteenth century. The first paddle steamer to be built in Australia was the *Surprise* of 1831¹¹⁷. At this time, the first foreign paddle steamer to arrive and operate in Australia (at Sydney) was the *Sophia Jane*, that same year, followed by the *Tamar*¹¹⁸.

While screw propulsion had been trialed as early as 1796, the technology was not refined for greater application until the 1840's¹¹⁹. The first screw engines were naturally an adaptation of the paddle steamer types (which included side lever engines, oscillating engines, trunk engines, diagonal engines, grasshopper engines) requiring gearing to achieve the far greater rotation required by a single screw. The first iron screw steamer to arrive in Australia was the *Keera*, in 1852¹²⁰. The first iron steam collier to be registered in London occurred that same year¹²¹.

The simple inverted marine engines of the *Lady Darling* type were an improvement on these adapted types and are, according to John Riley, regarded as a development of the 1860's. They were however quickly superseded by a new development, the compound engine, which, while of a similar size initially, provided more power and greater economy.

The compound engines are the most common type found on shipwrecks in New South Wales and are found in a variety of sizes. They took up little space, were the first engines to use high pressure steam economically through the use of a high and low pressure cylinder, and required a steam pressure of between 80 and 120 pounds per square inch. Compound engines were themselves overtaken by the development of the triple expansion engine, the final development of the inverted compounding engine. They were more expensive to build, required high steam pressures which could only be provided by Scotch boilers, and took up more room. They are represented on shipwrecks in New South Wales from the 1880's.

¹¹⁵ John Riley, pers.com, August, 1998.

¹¹⁶ McCarthy, Mike, "A brief history of marine steam propulsion with special reference to the trunk engine type", in *Iron Ships and Steam Shipwrecks: Papers from the first Australian seminar on the management of iron vessels and steam shipwrecks*. Fremantle (nd). p.200-202.

¹¹⁷ Richards, Mike, *Pig and Whistle Run*. Grafton. ed 2, 1997. p.5-16.

¹¹⁸ Richards, Mike, *Pig and Whistle Run*. Grafton. ed 2, 1997. p.10ff.

¹¹⁹ McCarthy, Mike, "A brief history of marine steam propulsion with special reference to the trunk engine type", in *Iron Ships and Steam Shipwrecks: Papers from the first Australian seminar on the management of iron vessels and steam shipwrecks*. Fremantle (nd). p.200-202.

¹²⁰ Richards, Mike, *Pig and Whistle Run*. Grafton. ed 2, 1997. p.19.

¹²¹ Waite, C, *Pioneer Steam Colliers*. London. p. 13.

Much of the *Lady Darling*'s engine is buried by sand. This restricts the amount of recording possible but assists in the long term preservation of the item and the context of associated fittings. Shipwreck specialist John Riley has developed a formula for estimating the buried depth of marine engines based on a knowledge of the engine's stroke. From this, he has calculated that the *Lady Darling*'s engines probably stand to a height of about 15 feet, 6 inches (approximately 4 metres). This is based on the engine's specified stroke of 31 inches¹²². This means that just over half the engine is buried under existing sand levels.



Figure 18: *The Engine model constructed by John Riley, based on measurements recorded on site*
Photo: David Nutley.

¹²² Riley, John, "Estimating depth of cover on screw steamship wrecks powered by inverted, compound, triple expansion and quadruple expansion engines". in: *Bulletin of the Australian Institute for Maritime Archaeology*, 20.2. pp.55-6.

The Heritage Office has undertaken a photographic mapping project of the engine. This has involved taking photographs of all faces of the engine in association with ranging poles and direct measurements to key features. The photographs are then digitised and imported into a three dimensional mapping package, called Photomodeler. While the results have not been completed at the present time, it is hoped that an accurate three dimensional plan of the engine will be developed.

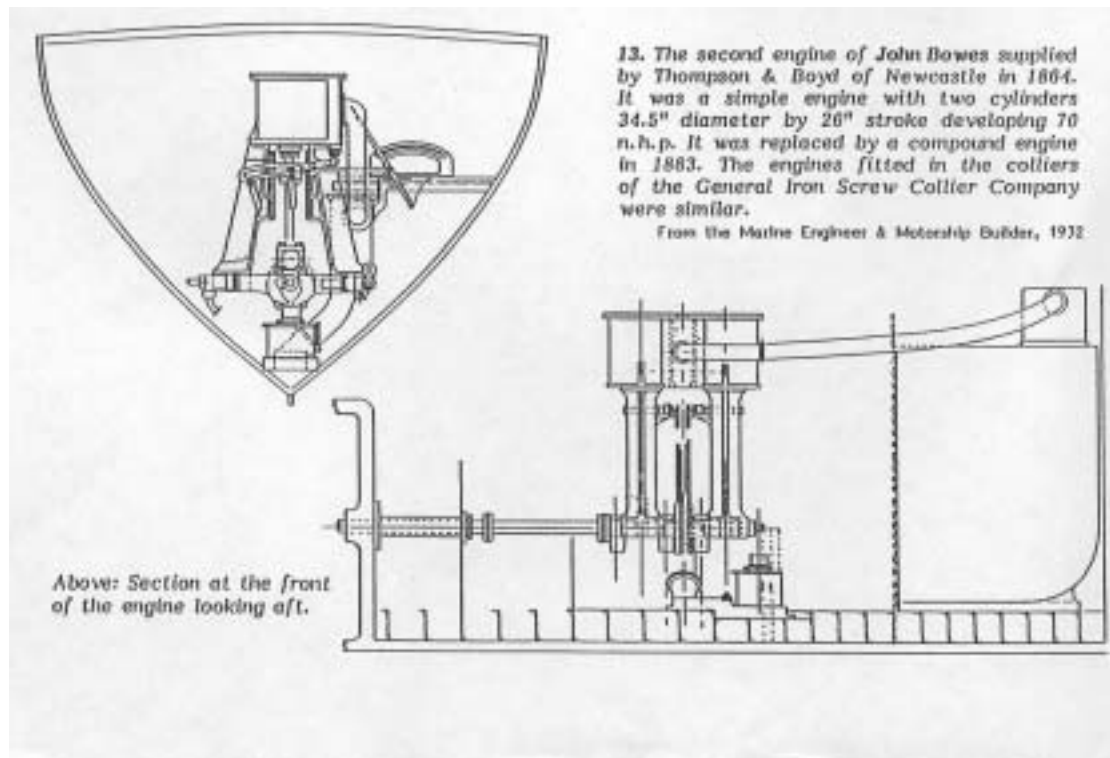


Figure 19: *Drawing of a simple marine engine arrangement. This differs from the Lady Darling, who's engine is not placed as far aft. After: Waine, C, The Steam Collier Fleets. Waine Research Publications.*

Measured drawings have also been taken of the engine and associated boiler, enabling interim drawings to be prepared. Mr John Riley has, based on measurements taken on site, constructed a scale model of the *Lady Darling* engine and boiler for use as an illustrative guide. This model provides a convenient way to show the principle characteristics of the engine, its placement and overall design elements.

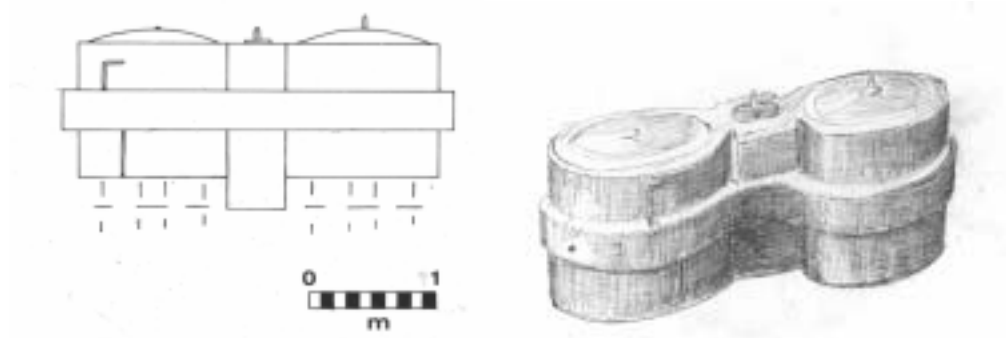


Figure 20 : *Sketch of the visible portion of the engine. Drawn by Tim Smith.*

The Boiler

When built in 1864, the *Lady Darling* would have been fitted with a new boiler. Marine boilers of this period were generally of the “Cylindrical” type. Cylindrical boilers were an improvement on the earlier Box boiler which generated a low steam pressure of about 15 pounds per square inch. Having flat surfaces, the Box boilers ¹²³ required heavy internal staying in all three planes to maintain structural strength.

The cylindrical boiler was a development between the Box boiler and the later common Scotch boiler types. They still had a low pressure of about 25 pounds per square inch but they had the advantage of only required stays between the two flat ends. Like the Box boiler, they still used sea water to create steam which required regular service to remove corrosion and build up of impurities. The *Lady Darling's* boiler measures an impressive sixteen feet in diameter, a very large example of its type. Like Box boilers, they only had a relatively short operational life and it is therefore likely that the boiler observed on the seafloor is not the original. It was probably made new to the old design when the engines were reclassified in 1870, or after that date. Although the lower half of the boiler is buried by sand, it is probable that a boiler of this size had three furnaces, the uptake to the funnel exits the top of the boiler from near its centre.

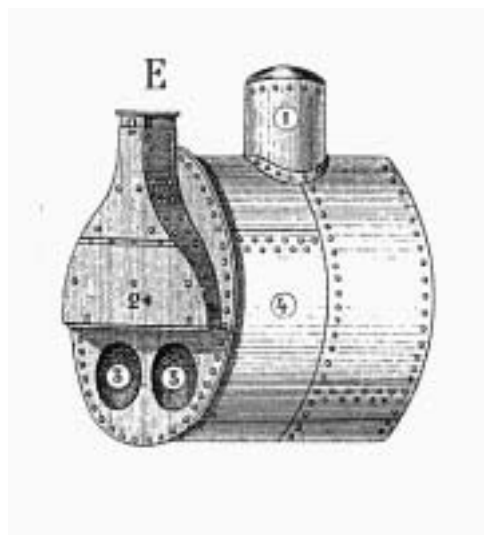


Figure 21: A typical “Cylindrical” boiler of the type visible at the *Lady Darling* wreck site. After Paasch, L: *From Keel to Truck: Marine Dictionary*. London. 1894.

Scotch boilers are noted especially from the 1870's. Of stronger design and thicker plating, they could achieve working pressures of up to 200 pounds per square inch required by improved compounding engines. They used fresh water in a closed system and generally range in size from 10 -16 feet in diameter.

A smaller vertical Donkey boiler is located on the wreck site to starboard of amidships. Donkey boilers were a development from the 1870's and therefore it is a later addition to the *Lady Darling's* machinery. They provided a separate steam source to power winches, pumps and windlasses, and could provide a higher steam pressure than the main boilers of

¹²³ Riley, John, *Marine Engines and Boilers*, research notes prepared for the production of the Marine Engines and Boilers topic sheet for inclusion in the Shipwreck Atlas of NSW Heritage Office. 1998.

their day. The machinery required an operating pressure from 75 pounds per square inch. The Donkey boiler was probably mounted on deck or near to the engine room.

COMPARATIVE SITES

In 1997, John Riley was commissioned by the Heritage Office to research the range of marine engines and boilers found on NSW's wreck sites ¹²⁴. This work has revealed that only one other example has been found to date in New South Wales. This "simple" marine engine belongs to the ss *Woniora*, a smaller collier wrecked off Botany Bay, NSW on 28 October, 1882. Like the *Lady Darling*, the iron steamer was built in the United Kingdom but a little earlier in 1863. While a considerably smaller one decked vessel with a length of 141 feet and tonnage of 160 tons, the *Woniora* also had an elliptical stern, three masts, a schooner rig and engines placed aft. Of special interest is the "simple" marine steam engine rated at 123 horsepower, built by J. Thompson also at Newcastle-on-Tyne ¹²⁵.

Sixteen other simple engine types are known to have been fitted to vessels wrecked, but not yet found, in New South Wales. These include the *Britanniar*, *Shamrock* and *St Albans*.

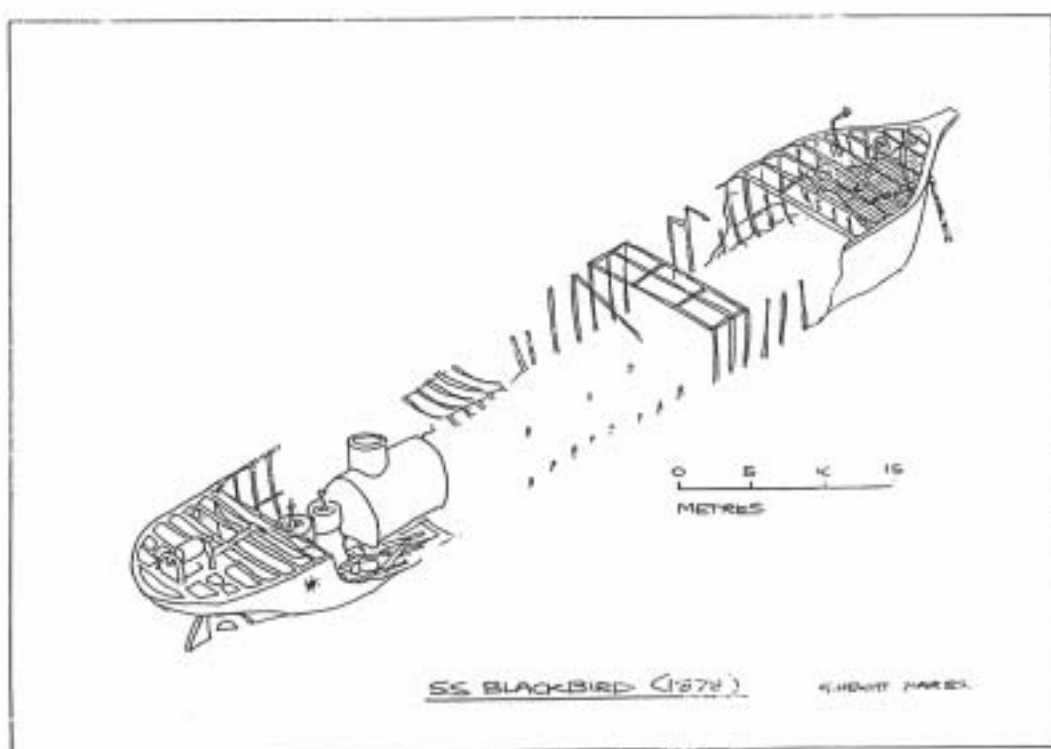


Figure 22: Drawing of the Blackbird wreck site (1863-1878) in Victoria. This vessel is considered to have looked very similar to the *Lady Darling*. Courtesy, Heritage Victoria.

The steam collier *Blackbird*, wrecked in Victoria, is again of very similar date range ¹²⁶. It was built at Newcastle-upon-Tyne in 1863 and wrecked near Port Albert, Victoria in 1878.

¹²⁴ Riley, John, Marine Engines and Boilers, research notes prepared for the production of the Marine Engines and Boilers topic sheet for inclusion in the Shipwreck Atlas of NSW Heritage Office. 1998.

¹²⁵ British Register of Ships, 51 of 1863, Port of Sydney.

¹²⁶ The following information is extracted from, "SS Blackbird (1863-1878: Case for Declaration as an Historic Shipwreck. Victoria Archaeological Survey. Melbourne. 1989.

The vessel closely matches the *Lady Darling*'s dimensions before it was lengthened - length of 196.4 feet (compare *Lady Darling* at 189.7 feet at time of build) and a tonnage of 665 tons (compare *Lady Darling* at 649 tons at date of build). It too, had a direct acting two cylinder engine placed aft, comparable to the *Lady Darling*'s, with a diameter of 36 inches, stroke of 30 inches, and estimated horsepower stated at 80HP.

Other examples in Australia include the *City of Launceston* (1863-1865) and the *Auckland* (1863-1871) wrecked in Victoria, although the latter were compounded in 1871.

Two other steamers built in the United Kingdom at the same period as the *Lady Darling*, provide an indication of its likely appearance. They are the *Mary Nixon* (below) and the *Tanfield* (front cover), built in 1865.

Both constructed of iron, they are rear engine, have three masts, schooner rig and a bridge placed forward of the engine room. They have the same straight stem post which is indicated by the *Lady Darling* wreck site, and are typical of the modern steamers built in this decade of modernisation. They serve as a probable model for reconstructing the profile of the *Lady Darling*, until further evidence can be found.

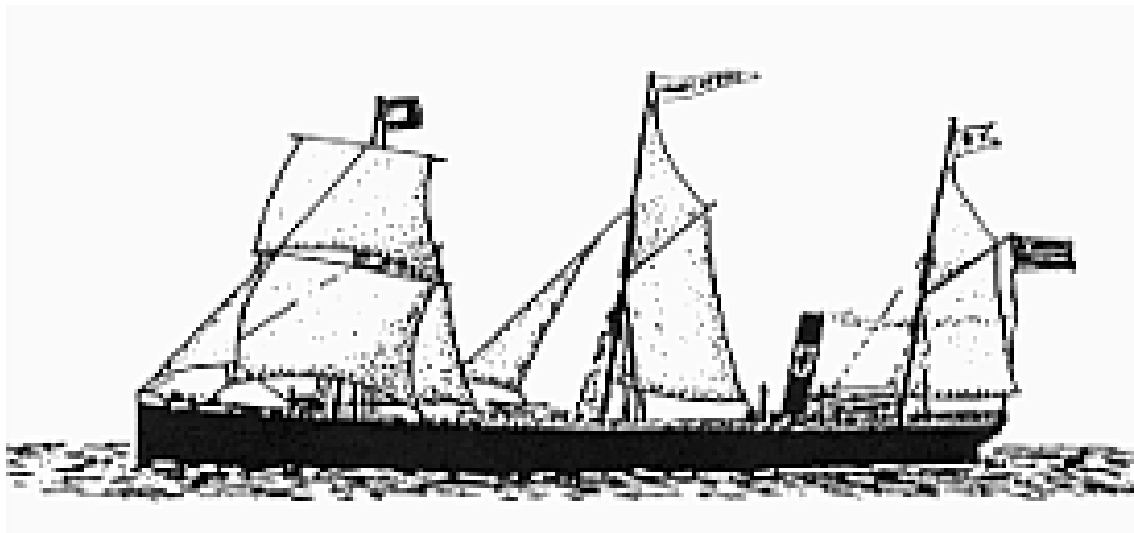


Figure 23: This is a presumed likeness of the *Lady Darling* based on available information. The collier is the *Mary Nixon* of 1865. C.V. Waine, *The Steam Collier Fleets*.

LEGISLATIVE PROTECTION

NSW's shipwrecks and submerged cultural heritage are protected by legislation which aims to limit interference, damage or destruction to individual sites, while encouraging responsible public access to maritime heritage sites.

Shipwrecks located inland (within rivers, harbours, lakes and enclosed bays) which are more than 50 years of age from the date of build, are protected as relics under the Relics Provisions of the *Heritage Act*, 1977 (State).

Those wrecks situated in open waters, below the low water mark, adjacent to the coast and lost 75 years ago or more, like the *Lady Darling*, are protected from interference or damage by the *Historic Shipwrecks Act*, 1976 (Commonwealth). The *Lady Darling*, together with the *Duckenfield* near Sydney, have the additional control of a Protected Zone exclusion zone placed around the wreck, under section 7 of the Act. A permit is required from the Heritage Office to visit these exclusion zones.

ASSESSMENT OF SIGNIFICANCE

Significance has been assessed in accordance with the nature and degree of significance of the sites' primary attributes. These include attributes related to historical, social, archaeological, scientific and interpretative significance.

LADY DARLING

NATURE OF SIGNIFICANCE

Historical (Concerned with range of context)

The arrival of the *Lady Darling* in Australian waters in 1864 occurred during a general shift in Maritime commerce from sailing and paddle screw technology to more modern screw vessel types.

An event significant in its associations with improvements in coastal sea navigation.

The wrecking near Montague Island during the completion of the lighthouse, demonstrated the need for efficient lighting of navigational hazards on the south coast of New South Wales.

Social (Concerned with community regard or esteem)

A site important for its association with the development of south coast interstate steamer commerce in the latter half of the nineteenth century.

The site forms an important element in the cultural heritage of the Eurobodalla area, representing one of the largest vessel losses in the region. As a recreational dive site, the *Lady Darling* provides the only major local wreck diving attraction, rich in varied marine life systems.

Technical (Concerned with technical or creative achievement)

The site retains high technological significance.

Substantially preserved, the marine engine represents a rare example of a specific type developed for powering early screw steamships. It is a rare example nationally.

Archaeological (Concerned with research potential through investigation of material remains)

A site important for the archaeological documentation of advances in marine steam technology.

The *Lady Darling* has the potential to assist in the documentation of iron screw propulsion developments in Britain during the third quarter of the nineteenth century.

The early “Cylindrical” boiler type is poorly represented on shipwreck sites in NSW, providing scope for analysis and research.

Its simple marine steam engine is represented by only one other located site in NSW. Documentation of the engine remains could significantly contribute to the study of developments in design during a formative period in marine engineering.

The site’s in-situ collection of artefacts are retained in an archaeological context and hold potential for investigation into the social and operational life of this coastal cargo carrier.

Interpretative (Concerned with public education values)

Although the wreck site is isolated, there remains potential for further shore based interpretation projects.

These could include the production of pamphlets, books, local history projects targeted at school groups, etc. There is potential for the site to provide a focal point in the construction of a shore based maritime heritage trail, linking sites of local maritime interest.

STATEMENT OF SIGNIFICANCE

The *Lady Darling* is an important local reminder of the dangers of coastal maritime trade in the nineteenth century. Its engine and associated machinery survive as a rare Australian example of a specific development period in marine engineering last century. The shipwreck and its associated in-situ artefacts retains high recreational importance as the most intact shipwreck for diver visitation in the Eurobodalla Shire region.

SITE MANAGEMENT

Background

Heritage Office investigations and evaluation of the *Lady Darling* have established that it is a very significant addition to known wreck sites in New South Wales. This significance is evident on a number of levels, notably the integrity of the visible structure, the pristine

condition and context of the archaeological remains, the uniqueness of the early marine engine and the prolific marine system established at the site.

Experiences with the discovery of the ss *Myola* wreck near Sydney in 1995 was a critical factor in the desire by the Heritage Office to seek a workable management solution to maintain the integrity of the site. The *Myola*, another iron collier, was automatically protected under the *Historic Shipwrecks Act*, 1976. The site was found and reported to the Heritage Office by divers, John Riley and Peter Fields. However, shortly after its location was widely circulated amongst the diving community, the *Myola* was quickly stripped of archaeological relics by a handful of divers. In that instance, the Heritage Office had recommended that the Commonwealth provide additional site protection for the site by invoking a special permit-entry Protected Zone around the site under section 7 of the Act. Unfortunately, the damage occurred before this legislative protection was put in place.

A previous experience with the ss *Duckenfield* off Narrabeen also indicated that the establishment of a Protected Zone would not in itself provide sufficient protection. In that instance, permits were issued to all applicants who agreed to abide by the permit conditions. The permit system was effective in the early days in limiting the number of boats that visited the site at any one time. However, there was no effective control over activities at the site. The site suffered considerable damage from unintentional anchor damage and from intentional removal of artefacts from the site. Interest in the wreck as a dive site dropped dramatically once these items had been removed.

Expectations were that the *Lady Darling* would be a well sought after recreational dive site, especially amongst the wreck diving component of the sportsdiving fraternity. This was despite its relative isolation away from a major urban centre like Sydney. The popularity of Narooma for dive charter holidays and the interest that a new, relatively intact wreck would generate, raised concern. It's relative isolation also meant that effective policing of visitation to the site was going to be difficult.

Development of a site management strategy

With the support of the reporters of the wreck site, an application to the Federal Minister for Communications and the Arts, responsible for the national management of the *Commonwealth Historic Shipwrecks Program*, for a Protected Zone of 150 metres radius around the wreck was quickly filed under Section 7 of the *Historic Shipwrecks Act*, 1976. This was sought to facilitate a level of visitation control at the site (23 August, 1996). The major aim of this move was to enable the site to be visited on a small scale through a controlled permit system, allowing the Heritage Office to examine the site in more detail and to enable the archaeological assessment and recording to be conducted.

The Protected Zone was gazetted in the New South Wales Government Gazette on 6 September, 1996. The invocation of the Protected Zone was brought to the attention of the Minister for Urban Affairs and Planning and the New South Wales Heritage Council at its next meeting of 3 October, 1996.

Following the formal establishment of the zone and its advertisement in the Gazette and local press, an initial permit to dive the site was provided to Mr Bert Elswyk of Island Charters, Narooma, as finder. This permit was current from 9 September.

Discussions were also commenced in September 1996 with dive charter operators from Narooma and Bermagui. These included specific discussions with the Narooma Charter Boat Operators Association. Discussions were focused on protection of the *Lady Darling* wreck, access arrangements and the potential to work jointly to manage the site.

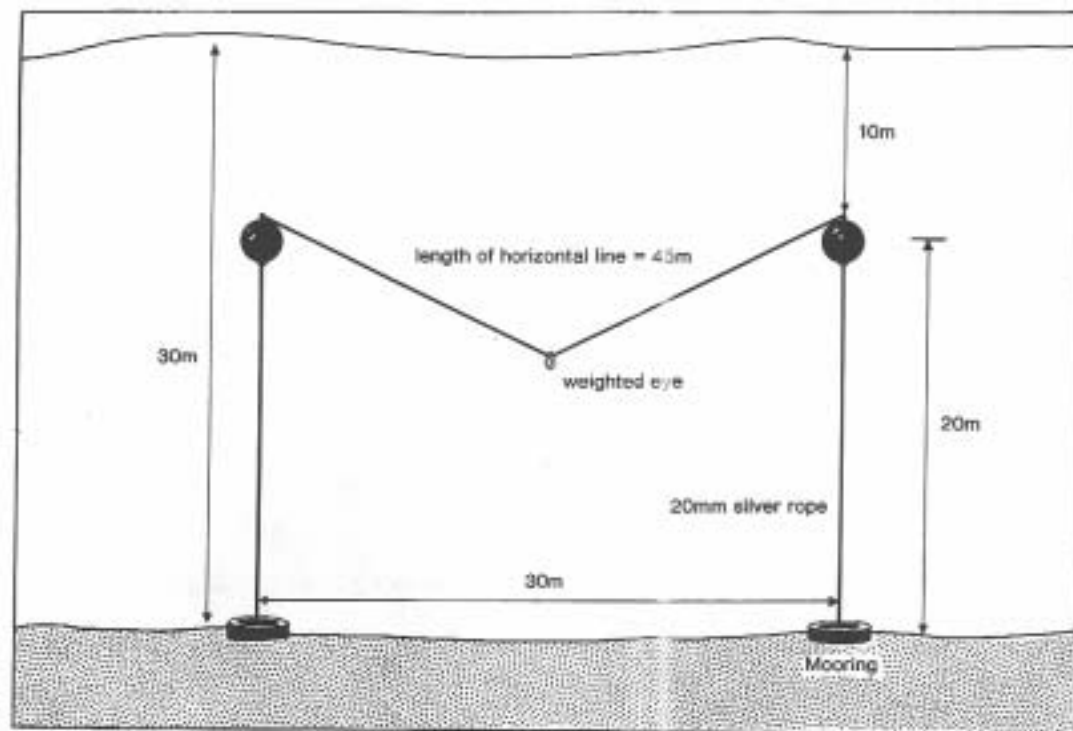
Negotiations were commenced to devise a permanent sub-surface mooring system that would enable visitation to the site without the threat of inadvertent anchor damage occurring. These discussions were held with the permit holder, Mr Bert Elswyk, Mr Colin Browne of Manly Hydraulics Laboratory (PWD) and the Environmental Protection Authority (EPA). The Heritage Office provided the outcomes of these discussions to the local dive charter operators for discussion.



Figure 24: *Mr Bert Elswyk (in yellow), co-reporter of the wreck site, overseeing the placement of a railway wheel to be used as a mooring at the wreck.. Photo: David Nutley.*

The mooring design consists of two vertical lines weighted to the seafloor. In the case of the *Lady Darling* railway wheels have been utilised but chained segments of railway line could also be used instead of or added to the railway wheels. The vertical stands are connected some ten metres below the surface by a horizontal positively buoyant line. Mooring vessels

approach the mooring with a grapnel, hook up on the horizontal line and secure it to the boat. The mooring stands either side of the shipwreck to enable efficient entry and exit points for divers.



Mooring System Devised for Historic Shipwreck Sites

(After a drawing from Manly Hydraulics Laboratory – PWD)

Heritage Office NSW

Figure 25: *The mooring system devised by Manly Hydraulics Laboratory with input from the Heritage Office.*

A primary consideration in all of the Heritage Office's shipwreck management considerations is in assuring a broad base of public access to Historic Shipwrecks and involvement in historic shipwrecks management. In this regard, it was considered highly desirable that a number of dive charter operators were able to begin to access the site and to develop familiarity with it. This was to enable them to comply with the procedures established in the initial permit and to forge stronger communication links with the Heritage Office. Applications to apply for additional access permits were therefore forwarded to the major local dive charter operators in October, 1996.

A revised set of permit condition were designed to ensure that the impact of visitation to the site was kept to an absolute minimum and that the integrity of the site would not be compromised at any level. The conditions include informing the local Narooma Police or the Narooma or Bermagui Coastal Patrols at the time of visitation, access by only one vessel to the Protected Zone at any one time, and a maximum of three visits to the site on any one day. A maximum number of divers at any one time was restricted to twelve.

A total of seven permits were therefore granted in October, 1996, including one to the co-reporter of the *Lady Darling*, Paul Mood.

With the mooring established, alterations were made to the approved permits, requiring permit holders to use the new mooring system and to ban any anchoring within the Protected Zone. Due to the benefits of the mooring system, the number of divers allowed at any one

visit was increased, following joint discussions. The permits are reviewed on an annual basis at the end of June.

In line with the Heritage Office's commitment to acknowledge and publicise significant contributions to the Historic Shipwrecks Program in NSW, the award of Finder's Recognition Plaques was arranged for 26 March, 1997. This date enabled the presentation of the Awards to the two finders, Mr Bert Elswyk and Mr Paul Mood, by Mrs Hazel Hawke, Chair of the Heritage Council of NSW. The presentation of the awards was held at the Narooma Pilot Station and was assisted by the General Manager of Eurobodalla Shire Council, Mayor Chris Vardon, and the Narooma Coastal Patrol.



Figure 26: *Mrs Hazel Hawke, Chair of the NSW Heritage Council awarded commemorative wreck finder plaques to Paul Mood (left) and Bert Elswyk, (right) co-finders of the wreck site. The presentation occurred at the Narooma Pilot Station in company with the General Manager of Eurobodalla Shire Council, Mr Chris Vardon, Rosalind Strong, Director of the NSW Heritage Office, and guests. Photo: Isabelle Bennett.*

The Heritage Office assisted the Eurobodalla Shire Council in the design of a bronze outdoor interpretative plinth, which was funded by the Council.



Figure 27: *The bronze interpretative plaque funded by Eurobodalla Shire Council based on research provided by the Heritage Office. The plaque was launched by Hazel Hawke, Chair of the NSW Heritage Council. Photo: David Nutley.*

Council also funded the production of five separate plaques detailing the protection and access conditions applicable to the site, to be mounted at all local boat ramps and slips.



Figure 28: *One of the five metal-photo signs produced by the Heritage Office and installed at key boat ramps and wharves by Eurobodalla Shire Council. The signs provide information on the protective status of the Lady Darling wreck site. Photo: David Nutley.*

The location of the *Lady Darling* Historic Shipwreck was also added to the newly completed Edition 3 of the Office's *Shipwreck Atlas of NSW*, which was officially launched at the ceremony.

The expiry of current permits concluded in June, 1997. During this initial period following discovery (August 1996 - June 1997), a total of **448 divers** visited the *Lady Darling* wreck site in 61 visits. The seven permit holders applied for and received permits for the 1997-8 year. During this period, **597 divers** visited the site in 76 separate visits - a total of 1045 divers in the 22 months since discovery.

The seven permit holders had their permits renewed for the current 1998-9 year. An additional application was received in August 1998. No objections were received by the existing permit holders and the application was approved. There are now 3 dive charter permit holders in Narooma and three in Bermagui. The seventh permit is held by the co-reporter of the *Lady Darling*, Paul Mood who is not a dive charter operator.

RESULTS

The success of the management approach is confirmed by the number of divers willing to inspect the site within the terms of the Protected Zone entry conditions. The success of the Protected Zone in assisting the long term preservation of the site, is proven by the retention of relics in context with the associated with the wrecked hull and the minimal interference to the visible wreck structure on the whole. In fact, at the date of this report, no relics have been reported moved off the site since the terms of the Protected Zone came in force.

This is a remarkable achievement and is based, in large part, by the prompt notification, control and guidance of the wreck reporters, Mr Bert Elswyk and Mr Paul Mood, and all other permit holders, in the monitoring of diving operations at the site.

It is an encouraging success story. There is no other iron shipwreck in Australia that has been as accessible and as frequently visited as the *Lady Darling* that has been kept as intact and as attractive as a dive site.

The success of the protective mechanisms in place at the *Lady Darling* site, justifies the invocation of the Protected Zone around the site under the *Historic Shipwrecks Act*, 1976. It is evident that the site has been retained in its near pristine condition, while general diver access has not been restricted. Some limited damage was caused to the site prior to the Protected Zone being put in place (scraping on stern). Subsequent to the establishment of the Protected Zone and the mooring system, there has been a single incident of damage from the unauthorised use of an anchor on the site.

Taken as a whole, the management approach implemented at the site, in discussion with the local dive industry and key interest groups, has assisted in the preservation of the site. The system could not work so effectively without local interest in maintaining the historical and archaeological importance of the remains. This interest is evident in the operations of the site's finders and other permit holders, particularly through diver education programs and input into the formulation of the permit conditions.

ISSUES

Artefact removal

The *Lady Darling* is an important component of the shipwreck heritage of New South Wales. It has become a significant facet of dive tourism in the Narooma and Bermagui district.

The retention of the site's tourism potential is closely associated with its retention of its archaeological potential. The appeal of the site is enhanced by the knowledge that it has not been 'picked over' either by souvenir hunters or archaeologists. Divers can experience this enhancement either by actually seeing a porthole, dead-eye or ceramic plates on site, or by being aware that these items are somewhere hidden under the sand.

Where these items become visible, good quality photographic records can be compiled to enable non-divers to experience the visual context of these elements of a diving experience. Removal would deplete the significance of the site and would be accompanied by a very high level of cost. This cost, depending on the quantity and nature of the items removed, the level of conservation required and the preparation or construction of suitable storage and display facilities could be considerable.

The removal of artefacts from the site would not only reduce its appeal as a dive destination but would remove conditions that lead to the establishment of the current permit system. The site would then be indistinguishable from dozens of other iron shipwreck sites on the NSW coast - none of which control access through a permit system like that on the *Lady Darling*. Removal of the site's artefacts, such as portholes, lanterns, ceramics, dead-eyes, etc would remove much of the justification for tightly control access conditions.

The current permit system has proven to be a highly effective way to management this site. The Heritage Office will continue to seek and consider advice on options for improving the conditions associated with these permits. The above issues need to be considered in any proposals for archaeological excavation or other removal of artefacts from the site.

Access

Permits:

Requests for access to the site have ranged from dive charter operators to dive clubs or individual divers with their own boats. Due to the vulnerability of this site to inadvertent damage from anchors and intentional damage by souvenir hunters, access has been controlled through a permits to dive charter boats operating out of Narooma and Bermagui. The permit holders have contributed financially or in-kind to the establishment of the permanent mooring system and have an interest in protecting the site as a long term local attraction.

Any alteration to this arrangement needs to consider potential impacts on the site. A permit system open to all applicants would place the site under severe risk. It would not be possible to differentiate the relative merit of the many dive clubs and individual divers with dive boats or charter boat operators from other areas. Effectively, anyone who requested a permit would be granted access. This would open the doors to unscrupulous people. Most importantly, it would remove the management role of the current charter operators from Narooma and Bermagui. Without this support the *Lady Darling* would rapidly deteriorate to a level similar to most other known iron wreck sites along the coast.

Suggestions have been made that all visitors to the site pay an access fee towards the maintenance of the mooring facility. This is already being achieved in effect through the

current access arrangements. Paying a fee to the Heritage Office would not be cost effective and would tie up Heritage Office resources required in management of other sites throughout New South Wales. In addition, there would be little control to ensure that such a fee was paid.

Number of vessels within the permit area:

A current condition of the permits is that, except where specifically approved, in writing, by the Director of the Heritage Office, no more than one vessel is to be in the Protected Zone at any one time. This condition was varied for a short time to allow a second boat, under conditions of low swell and low current, to enter the zone and attach a line to the moored boat while waiting for its departure. This arrangement did not find universal approval among the permit holders and was discontinued after a report that one of the moorings had moved a considerable distance. Such an arrangement could be reconsidered if the mooring specifications were increased to accommodate a larger strain. The current mooring could potentially be moved relatively easily by all but the smallest of the charter vessels.

An alternative proposal to limiting the number of vessels attached to the mooring has been that the number of divers be limited to about 10. This would not effect the size of the vessels mooring at the site but would cause significant problems for those charter vessels with larger carrying capacities. In addition, there is no other known shipwreck where there is a limit on the number of divers who can visit a wreck site at any one time. To maintain a full supervision of all divers on a site would require a supervision ratio of about 1 dive master to 3 divers. This is clearly not a viable option. Adequate briefing of divers prior to a dive and supervision of their exit is considered to be reasonable and effective.

MANAGEMENT RECOMMENDATIONS

As a result of the historical research, wreck site inspections, community input and subsequent assessment of significance, it is recommended that:

1. The conditions of the Protected Zone and permit system remain in force for the 1998-9 year and be reviewed annually at the time of renewal of permits.
2. Management options for the site be regularly reviewed based on input from the current permit holders and in consultation with the wider diving community, dive shops, clubs and relevant Government agencies.
3. The Heritage Office continues to monitor site usage and its effects on the integrity and long term survival of the wreck site and associated relics.
4. The Heritage Office continues periodic non-disturbance archaeological recording of the site to enable a continued picture of the remains to emerge. All results should be distributed to current permit holders and to the wider community.
5. When practicable, the site be investigated by a marine materials conservator, to assess the structural condition of the site and to identify any procedures which may prolong the retention of the structure.
6. Local historical societies, organisations and individuals be encouraged, where possible, to further research the background of the *Lady Darling* wreck site, and others thought to exist in the general region.
7. The Eurobodalla Shire Council, the National Parks and Wildlife Service, the Narooma Police Service, the Narooma Coastal Patrol and all current permit holders be provided with a copy of this report. The Heritage Office should continue to liaise with these groups and seek to promote ongoing interpretative projects suitable for the areas maritime heritage.
8. NSW State Fisheries be provided with a copy of the report and be requested to advise all members of the location of the wreck site to ensure no accidental fouling of the site by fishing operations.
9. The remains of the *Lady Darling* and its associated artefacts be retained in-situ to preserve its attraction as the most intact, easily accessible, iron shipwreck archaeological site on the NSW coast.
10. Archaeological excavation of the site only be approved where the Heritage Office receives a proposal backed by an adequate research design and funding for recovery, conservation and display to standards that ensure the long term retention of the artefacts and archaeological documentation.

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Appendix 1

List of vessels wrecked in the study area.

(Based on the *National Historic Shipwrecks Database*, 1998)

Name	Type	Built	Lost	Details
<i>Bega</i>	steamer	1883	1908	Between Tathra and Bermagui
<i>Bodalla</i>	steamer	1914	1924	Narooma, entrance to Wagonga Inlet
<i>Colleen</i>	Motor Vessel	?	1947	Narooma Bay
<i>Iron Knight</i>	Steamer	1937	1943	Torpedoed 30 km from Montague Island
<i>Kedumba</i>	steamer	1913	1932	25 miles NW of Montague Island
<i>Lady Darling</i>	steamer	1864	1880	4 miles SW Montague Island
<i>Malaita</i>	Motor Vessel	?	1948	Narooma, near