

Information Sheet on Ramsar Wetlands

Categories approved by Recommendation 4.7 of the Conference of the Contracting Parties.

1. Date this sheet was completed/updated:

31 March 1999

FOR OFFICE USE ONLY.

2. Country: AUSTRALIA

DD	MM	YY

Designation date

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Site Reference Number

3. Name of wetland: MYALL LAKES

4. Geographical coordinates:

Latitude: 32° 19' S to 32° 42' S

Longitude: 152° 2' E to 152° 31' E

5. Altitude: 0 - 495 metres above sea level

6. Area: 44 612 hectares

7. Overview:

The site occurs within the Myall Lakes National Park and includes the Corrie Island and Little Broughton Island Nature Reserves. It constitutes one of the few coastal brackish lake systems in NSW which has not been greatly modified by human activities. This extensive system provides habitat for a diverse number of native flora and fauna species, including large numbers of waterbirds, and is an important drought refuge. The lakes also have very high social value providing a broad range of recreational, educational and scientific opportunities.

8. Wetland Type (please circle the applicable codes for wetland types as listed in Annex I of the *Explanatory Note and Guidelines* document.)

marine-coastal: A B C **D** E F G H I J K
inland: L M N O P Q R Sp Ss Tp Ts
U Va Vt W Xf Xp Y Zg Zk
man-made: 1 2 3 4 5 6 7 8 9

Please now rank these wetland types by listing them from the most to the least dominant:

J, K, E, H, I, F, D

9. Ramsar Criteria: (please circle the applicable criteria; see point 12, next page.)

1a 1b **1c** 1d | **2a** 2b 2c 2d | 3a **3b** 3c | 4a 4b

Please specify the most significant criterion applicable to the site: 1a & c

10. Map of site included? Please tick *yes* -or- *no*

11. Name and address of the compiler of this form:

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Please provide additional information on each of the following categories by attaching extra pages (please limit extra pages to no more than 10):

12. Justification of the criteria selected under point 9, on previous page.

Criteria 1a & c: criteria for representative or unique wetlands

The Myall Lakes wetlands are significant because they cover an extensive area and are in a relatively near-natural condition. They also play a substantial ecological role in the functioning of one of the most important remaining coastal brackish systems in NSW and represent a particularly good example of the barrier lagoon systems which occur within the North Coast Biogeographic Region.

Criteria 2a: general criteria based on plants or animals

The area supports a diverse range of native flora and fauna species including an appreciable assemblage of threatened species (see Appendix 3). In particular, the site provides habitat for endangered and vulnerable birds such as the Masked Owl, Powerful Owl, Black-necked Stork, Wompoo Fruit-Dove, Turquoise Parrot and Little Tern. A number of vulnerable mammals, amphibians and reptiles are also found within the boundaries of the National Park including the Little Bent-wing Bat, Common Bent-wing Bat, Koala, Tiger Quoll, Eastern Chestnut Mouse, Wallum Froglet and Stephen's Banded Snake. The vegetation of Myall Lakes National Park is renowned for its floristic diversity and a number of communities are recognised as being of state significance due to their restricted distribution and pristine condition. There are a number of plant species within the Park that are listed as threatened, including *Asperula asthenes*, *Senna aclinis* and *Syzygium paniculatum*.

Criteria 3b: specific criteria based on waterfowl

This site regularly supports a substantial number of waterbirds, including migratory species covered by Australia's obligations under JAMBA and CAMBA. A number of groups are represented such as the *Pelicanidae* (pelicans), *Phalacrocoracidae* (cormorants), *Podicipedidae* (grebes), *Anatidae* (swans and ducks), *Ciconiiformes* (herons, egrets, bitterns, ibises and spoonbills) and *Charadriidae* (plovers and lapwings), which are indicative of wetland diversity and productivity. The region is also important for wetland-related raptors (*Accipitridae* and *Falconidae*) (See Appendix 1).

13. General location:

The Myall Lakes wetlands are situated approximately 75 kilometres north of Newcastle which is at the northern extremity of the Sydney Greater Metropolitan Region; between the villages of Hawks Nest and Tea Gardens (5 kilometres) to the south and Forster (35 kilometres) to the north, on the central coast of New South Wales, Australia.

14. Physical features:

Myall Lakes National Park comprises three main lakes (the Bombah Broadwater, Boolambayte and Myall Lakes), together with the lesser areas of Nerong Creek, Two Mile Lake, sections of the Upper and Lower Myall River, Boolambayte Creek, Fame Cove inlet and Broughton Island approximately 2 kilometres offshore from the mainland. The other main features of the Park are the coastal dune system and the forested areas of the Koolonock and Myers Ranges. The Park incorporates a number of distinct wetlands associated with the waterways and dune systems. Little Broughton Island and Corrie Island Nature Reserves are also included within the Ramsar site.

On the mainland, the dominant geological structure is the Myall Syncline within which the main rock types are Carboniferous sandstones, siltstones and mudstones, with some igneous intrusions varying in composition from rhyolite to basalt. A belt of limestone outcrops on the eastern side of Myall Lake. On the western side are a series of alluvial plains dissected by sandstone ridges comprising Crawford Formation Sandstone and Alum Mountain Volcanics. Further north the sandstone ridges grade into a series of low hills formed from the Wootton Beds and Nerong Volcanics. Broughton Island and Little Broughton Island have rock types associated with the Carboniferous Nerong Volcanics that are made up of toscanite, dacite, andesite, ignimbrite, agglomerate, conglomerate, sandstone and siltstone. Corrie Island constitutes a mixture of sand and mud flats. It is an excellent example of a landform produced by coastal processes. Various erosional and depositional features have resulted from reworking of the island by waves and tides.

The waters of the Myall Lake system are shallow and of roughly uniform depth (2.4 - 3.7m), with the Myall River reaching 8m in depth. Lake level fluctuations are associated with rainfall rather than tidal influences. The lakes are drowned river basins and the remnants of former hind-dune drainage systems. Their configuration is largely determined by the irregular bedrock topography of the western shoreline. The eastern shores are mainly formed by the two distinct beach ridge systems of an inner and outer barrier. The coastal dune systems were laid down between 60,000 and 2,000 years ago. The inner barrier system is composed of highly podzolised Pleistocene sands overlying a sandrock hardpan. The Holocene sands of the outer barrier are only moderately podzolised. An intervening swamp or lagoon usually separates these two larger systems. Acid peat soils occur in these areas. In general, soils are of moderate to low fertility and are subject to waterlogging or erosion depending on their location.

The main input of fresh water to the lake system is from the Myall and Crawford Rivers. Other inputs of fresh water are rainfall and groundwater drainage from the Eurunderee sand mass on the eastern shoreline. The water of the lakes has a pH of 7 - 7.5. Unlike the estuarine systems, the northern part of the Broadwater and Boolambayte Lakes are not subject to normal tidal flushing. Most of the Broadwater and Boolambayte Lakes are subject to marked and protracted fluctuations in salinity levels.

Myall Lakes has a temperate coastal climate, with an average annual rainfall of approximately 1,300 mm. The wettest months are in late summer and early autumn. Mean monthly maximum temperatures range from 27° C in summer to 17° C in winter with minimums of 15° C and 3° C respectively.

15. Hydrological values

The Myall Lakes comprise a series of fresh, saline and brackish water bodies of differing depths and associated vegetation types. The wetlands provide a permanent water source and thus serve as a key drought refuge for flora and fauna. The waters within the Myall Lakes National Park are in relatively natural condition because of the inherent stability of the small catchment, most of which has now been incorporated into the Park, and the level and type of land use that currently exists in the surrounding areas.

Since the Myall Lakes system has not been greatly modified by human activity, the area provides an important historical record of the changes in the coastline, lake deposits and seabed.

16. Ecological features:

Myall Lakes is renowned for its floristic diversity and complex variety of habitats which are largely due to differences in substrate. Over 17 separate plant communities have been identified in the Park to date ranging from rainforest pockets to forest, heath, grassland and swamp. The vegetation of the sand dunes comprises a sequence of communities from dry heath forest through to dry heath, wet heath, swamp forest and swamp. In areas of sufficient shelter from the wind, open woodland communities occur. The dominant species here are *Angophora costata* and *Banksia* species. On deep stable sands, a forest of Eucalypts develops. *Eucalyptus pilularis* is the dominant species and often occurs with *E. gummifera*. An extensive heath, 6 to 8 kilometres long and as much as 1 kilometre wide, lies between the coastal dunes and the hills south-east of Myall Lakes. The heath contains more than sixty species. In the wetter areas the heath gives way to peat swamps. These areas are dominated by *Leptospermum liversidgei*. The vegetation of the hills differs markedly from the settled dunes and sand flats, comprising a mixed *Eucalyptus* forest and sub-tropical rainforest.

The open water of the lakes is fringed by a reed swamp, except where sand reaches the water's edge. Boolambayte and Broadwater Lakes contain a number submerged and emergent aquatic plant communities. The most abundant species is Prickly Waternymph (*Najas marina*), which has been found to a depth of 3 metres. This extends towards the shore to depths of about 0.5 metres. It is associated with Floating Pondweed (*Potamogeton tricarinatus*), *Vallisneria spiralis* and *Ruppia maritima*, a seagrass.

Reeds extend from the water's edge up to a depth of 1.5 metres, the dominant species being *Scirpus locustris*. Nearer to the shore, in 0.3 to 0.6 metres of water, there is usually a continuous densely-growing zone. On the landward side of this zone *S. locustris* becomes mingled with *Phragmites communis*. A characteristic swamp forest with a dense undergrowth of sedges extends from the edge of the reed swamp to the junction with the stable sand or silt flats. This can be divided into two zones in which *Casuarina glauca* and *Melaleuca quinquenervia* respectively dominate. The former lies nearer the lake. Behind the swamp forest, on either side of the Boolambayte Creek and the Upper Myall River, are extensive silt flats caused by flooding and wash from the neighbouring hills. These flats have been largely cleared of woody vegetation.

17. Noteworthy flora:

Myall Lakes National Park is botanically diverse with over 600 species of plants having been recorded in the area.

The major vegetation communities associated with the wetlands of Myall Lakes National Park are: swamp, swamp forest, wet heath, fringe forest and *Lepironia* swamp. Swamp is differentiated from swamp forest largely by absence of trees and not by any major floristic difference in the understorey. The two species of tree in the swamp forest are *Melaleuca quinquenervia* and the *Eucalyptus robusta*. The shrubs *Leptospermum liversidgei* and *Sprengelia incarnata*, and the restiad *Lepyrodia muelleri* are included in the cluster of species comprising swamp and swamp forest. Swamp forest is particularly common amongst the inner parabolic dunes.

The *Lepironia* swamps are dominated by open stands of *Lepironia articulata*, a tall sedge often 1.5 metres or more in height; in some swamps Jointed Twig-rush (*Baumea articulata*) and *Lepidosperma longitudinale* may occur intermixed with *Lepironia*.

18. Noteworthy fauna:

Myall Lakes National Park provides habitat for a diverse range of fauna species. Over 300 animals have been recorded within the park with approximately two thirds being bird species. The wetlands regularly support large numbers of waterbirds and waders including ducks, swans, egrets and terns (see Appendix 1). Bird species covered under the JAMBA and CAMBA are also found with the Park. In addition, Myall Lakes provide habitat for vulnerable and endangered bird species such as *Tyto*

novaehollandiae (Masked Owl), *Ninox Strenua* (Powerful Owl), *Ephippiorhynchus asiaticus* (Black-necked Stork) *Ptilinopus magnificus* (Wompoo Fruit-Dove), *Neophema pulchella* (Turquoise Parrot), and *Sterna albifrons* (Little Tern).

Mammals listed as vulnerable under the *NSW Threatened Species Conversation Act* (1995) are also found with the Park and include the *Miniopterus australis* (Little Bent-wing Bat), *Miniopterus schreibersii* (Common Bent-wing Bat), *Phascolarctos cinereus* (Koala), *Dasyurus maculatus* (Tiger Quoll), and the *Pseudomys gracilicaudatus* (Eastern Chestnut Mouse). The vulnerable amphibian *Crinia tinnula* (Wallum Froglet) and the reptile *Hoplocephalus stephensii* (Stephen's Banded Snake) are also found within the Park (see Appendix 3).

19. Social and cultural values:

The Myall Lakes wetlands have a high social and cultural value. There is a diverse range of recreational activities undertaken throughout the area including: sailing, swimming, power boating, canoeing, bush walking, four-wheel driving and bird watching. The area is also popular with commercial and recreational fishers.

The University of New South Wales has established a research station in the park from which it conducts a range of ecological and other studies.

Myall Lakes National Park contains numerous middens, which are the major items of Aboriginal heritage found in the Park. Some of these middens also contain Aboriginal skeletons. No canoe trees have been identified to date, although canoes were obviously used to reach Broughton and Little Broughton Islands.

The Park contains some evidence of early European occupation. The main features are: graves and early sawmill sites; the fishing village of Tambo; old farm houses at Kataway Bay and Sunnyside; and the remains of barges used to transport timber to the sawmills.

20. Land tenure/ownership of: (a) site (b) surrounding area

(a) The Ramsar site comprises National Park and Nature Reserve dedicated under the *National Parks and Wildlife Act 1974* (NSW).

(b) Surrounding land comprises a mixture of Crown Land managed by the Department of Land and Water Conservation, State forests and freehold land.

21. Current land use: (a) site (b) surroundings/catchment

(a) The lands within the Ramsar site are permanently designated as National Park or Nature Reserve and are managed primarily for nature conservation purposes. The Park's wetlands cater for a variety of recreational activities, principally sailing, power boating, canoeing, and bird watching. Bush walking and camping occur around the coastal and lake shores. One lease concession operates permanently within the park, "Myall Shores" on Bombah Point. The concessionaire has established facilities for both campers and visitors seeking on-site accommodation. Commercial and recreational fishing occurs throughout much of the park's waterways. Commercial prawning occurs mostly at Tambo and in the Myall River, and mesh fishing in the lakes.

(b) Land surrounding the Ramsar site is primarily used for grazing domestic stock and crop cultivation. Some of the hillier areas are reserved as State forests and managed for timber production by NSW State Forests.

22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects: (a) at the site (b) around the site

(a) The Myall lakes are susceptible to pollution and damage from overuse due to their relatively small catchment, the shallowness of the water and the lack of tidal flushing. Human-induced disturbance has occurred at isolated sites and increased levels of recreation pose a moderate threat to the stability of aquatic ecosystems in some areas.

Myall Lakes is heavily utilised for recreation and fishing. While many current recreational activities appear to be compatible with the conservation of the Park's natural values, some activities such as power-boating on the lakes and river, as well as vehicular access to a number of environmentally sensitive areas, do pose a moderate threat.

Commercial prawning and fishing have been traditional uses of the area and provide a livelihood for some of the local community. At present, these activities have low impact upon the wetland resources.

Noise pollution from airforce operations in the region has a moderate but widespread impact on the Park, disturbing Park users and wildlife. Speed boats and water skiing pose a similar disturbance.

Camping around the edge of the lakes is impacting on vegetation and causing shore erosion which is considered a moderate threat. Currently, camping sites are being moved back from the lake's edge to reduce erosion and a waste disposal system has been installed to reduce pollution of the surrounding area.

Former uses, now discontinued, have had an impact upon the Park environment. These include timber harvesting, grazing, settlement and quarrying. Mineral sand mining during the 1970's and early 1980's has had the most significant impact on the Park and restoration of these areas is currently being undertaken. The main anthropogenic impact on the terrestrial ecosystems of the Park is fire, the bulk of which appear to be the result of human activities. Periods of particularly high fire incidence occurred in 1979, 1980 and 1991.

(b) Agricultural runoff from the Park's upstream catchment poses a growing threat to the integrity of Myall Lakes. The Myall River and several creeks feed into the lakes. These watercourses receive runoff from adjacent farms which, on occasion, is contaminated with agricultural chemicals.

23. Conservation measures taken:

Myall Lakes was first proclaimed a National Park in 1972, when 15,000 hectares, encompassing the entire bed of the lake system, was reserved as Myall Lakes National Park. The area of the Park has expanded considerably since then and now covers 44,172 hectares. Little Broughton Nature Reserve was proclaimed in 1961 and Corrie Island Nature Reserve in 1999. A Plan of Management for the Park was adopted by the NSW National Parks and Wildlife Service in September 1984. Within the Plan of Management are a number of initiatives to preserve and enhance the area for nature conservation. These include the control of introduced plants and animals as well as fire, recreation and water quality management.

NSW National Parks and Wildlife Service has trialled biological methods to control Bitou Bush within the Park. Three insects, the Bitou Tip Moth (released in January 1993), the Bitou Tortoise Beetle (released in January 1996) and the Painted Bone Seed Beetle, have been used to date. The area will be monitored to determine the success of these methods.

Boating on the lakes and associated rivers is regulated by the Waterways Authority (formerly known as the Maritime Services Board) in accordance with the *Maritime Services Act 1935* (NSW) and associated legislation. In addition, the NSW National Parks and Wildlife Service has concurrent powers to regulate boating in waters within the National Park. The Authority has endeavoured to restrict boat speeds and exclude water skiing from some areas as a conservation measure. Moreover, it funds and manages two sewage collection facilities to receive waste discharged from boats on the lakes. A Myall Waterways Users Group was formed in late 1995 to address issues such as speed limits, interpretative displays and ecotourism. It comprises representatives from the National Parks and Wildlife Service, recreation and community groups.

The Port Stephens Council established a Myall Lakes Estuary Management Committee in 1994 to examine long-term management issues for the estuary and the surrounding hinterland. The committee has subsequently prepared an Estuary Management Plan for this area.

Significant tracts of forest in the catchment of the Myall Lakes are managed by NSW State Forests. Preparation of management plans for these areas by NSW State Forest, in consultation with the NSW National Parks and Wildlife Service, is currently in progress.

In 1972, in an attempt to more systematically control development in the hinterland of the Park, the then State Planning Authority directed the Great Lakes Shire Council to refer all development applications to it for determination.

Myall Lakes National Park includes numerous wetlands identified under State Environmental Planning Policy 14 - Coastal Wetlands. SEPP 14 stipulates that a person shall not conduct certain activities (clearing, filling, draining and constructing levees on lands) in or near these wetlands except with the consent of the relevant council and the concurrence of the Director of the Department of Urban Affairs and Planning.

24. Conservation measures proposed but not yet implemented:

The 1984 Myall Lakes National Park Plan of Management is currently under review and a new Plan of Management is expected to be in place by 2001. In addition, the Waterways Authority has prepared a draft Waterways Management Plan for recreational and commercial boating in Myall Lakes which will be incorporated into the new Plan of Management for the Park once it has been finalised. A Fire Management Plan is also being prepared for the National Park.

25. Current scientific research and facilities:

The University of New South Wales (located in Sydney) operates a research station in the Park. The research station provides a base for various ecological and other studies being carried out in the region.

Myall Lakes has been the subject of numerous academic and government studies, particularly in relation to the effects of sand mining operations. Other areas of investigation have included the benthos of the tidal portions of the Lower Myall River (Weate 1975); floristics (Buckney and Morrison 1992); geology (Thom *et al* 1981); geomorphology (Shepherd 1970); zooplankton and aquatic invertebrates (Timms 1976); and more general studies (Atkinson *et al* 1981). There have also been various studies on the lakes themselves (for example Carolin, 1970).

26. Current conservation education:

The National Parks and Wildlife Service offers conservation education activities through a "Discovery Ranger" program. The program is run by rangers who operate interpretative tours and give talks about the Park's natural history. A number of information bays have been constructed in the Park to provide further information about its history and natural features. Several licensed commercial operators, who specialise in environmental education, also run tours in the Park.

27. Current recreation and tourism:

Myall Lakes is a popular tourist destination. The Park receives approximately 500,000 visitors per year. It caters for a variety of water-based activities such as sailing, canoeing, power boating and water skiing. Other popular activities are bird watching, bushwalking and camping. One of the most significant recreational events in the area is the Mungo Brush Regatta, an annual power boat and sailing event. Two other popular recreational activities are four-wheel driving on the ocean beaches and fishing.

There are a range of visitor facilities available in the Park including: roads, walking tracks, picnic areas, toilets, camping areas, cabins, information bays, interpretative programs and commercial outdoor recreational activities.

Because Myall Lakes is a major tourist destination, a number of towns in the region, such as Tea Gardens, Hawkes Nest and Bulahdelah, are heavily reliant on the Park for tourism-generated income.

28. Jurisdiction:

Territorial: Government of New South Wales
Functional: NSW National Parks and Wildlife Service; NSW Fisheries;
Waterways Authority; and
Department of Land and Water Conservation.

29. Management authority:

Ownership of the area is vested in the NSW National Parks and Wildlife Service. However, several other government agencies have some management powers. NSW Fisheries is responsible for the management of fisheries resources and the NSW Waterways Authority controls the use of boats.

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30. Bibliographical references:

Atkinson G., Hutchings P., Johnson M., Johnson W.D., and Melville M.D., (1981), "An Ecological Investigation of the Myall Lakes Region", *Australian Journal of Ecology*, 6: 299-327.

Buckney, R.T. and D.A. Morrison, (1992), "Temporal Trends in Plant Species Composition on Mineral Sand Dunes in Myall Lakes National Park, Australia", *Australian Journal of Ecology*, 17(3): 241-254.

Burrows, F.J., *et al.*, (1972), *Ecological Investigations of the Myall Lakes Area: Reports of Field Excursions*, Macquarie University, School of Biological Studies, Sydney.

Carolin, R.C. (1970), "Myall Lakes - An Ancient and Modern Monument", *Proceedings of the Ecological Society of Australia*, 5: 123-129.

Cropper, S. (1997), *The Vegetation of Myall Lakes National Park between Nerong and Mayers Flat: a Preliminary Survey for Use in Fire Management*. Unpublished report.

Fairlie-Cunningham, H. (1969), "The Biological Importance of the Myall Lakes, and Their Vulnerability to Destruction", *National Parks Journal*, 13: 9-10.

Garland, H.K. and J. Wheeler, (1982), *Myall Lakes - Creation to Controversy*, Palms Press, Pacific Palms, NSW.

Goodrick, G.N. (1970), *A Survey of Wetlands of Coastal New South Wales*, CSIRO Division of Wildlife Research, Technical Memorandum No.5, CSIRO, Canberra.

Hainke, L. (1984), "You Shouldn't Oughta - Drink the Water - 1984", *National Parks Journal*, 28(1): 21-22.

Linnean Society of New South Wales, (1965), "Scientific Aspects of Proposed Conservation in the Myall Lakes Area", *National Parks Journal Supplement*, February.

Marshall, A.J. (1986), "The Myall Lakes: Then and Now", *The Australian Museum Magazine*, 21 January.

McDonald, K. (1970), "The Myall Lakes as a Regional Ecosystem", *Hunter Natural History*, February: 5-13.

McNair, D.L. (1993), *Aspects of Flora Regeneration Following Mineral and Silica Sand Mining Port Stephens and Myall Lakes Region*, New South Wales, The University of Newcastle, Callaghan, NSW.

Myerscough, P.J. and R.C. Carolin, (1986), "The Vegetation of the Eurenderee Sand Mass, Headlands and Previous Islands in the Myall Lakes Area, New South Wales", *Cunninghamia*, 1(4): 399-466.

NSW National Parks and Wildlife Service (NPWS), (1984), *Myall Lakes National Park: Plan of Management*, NPWS, Sydney.

Piper, G. (1982), "Motor Vehicles at Myall Lakes", *National Parks Journal*, 26(3): 14-15.

Recher, H.F. (1971), "The Myall Lakes - Now and Tomorrow", *Australian Natural History*, 17(2): 34-29.

Recher, H.F. (1971), "The Myall Lakes - Tomorrow", *Australian Natural History*, 17(2): 72-77.

Shepherd, M. (1970), "Coastal Geomorphology of the Myall Lakes Area, New South Wales", Unpublished Ph.D. thesis, University of Sydney, Sydney.

Thom, B.G., G.M. Bowman, and P.S. Roy, (1981), "Late Quaternary Evolution of Coastal and Sand Barriers, Port Stephens - Myall Lakes Area, Central New South Wales, Australia", *Quaternary Research*, 15: 345-364.

Timms, B.V. (1976), "Salinity Regime and Zooplankton of the Myall Lakes", *Hunter Natural History*, 8: 6-11.

Timms, B.V. (1976), "New and Rare Aquatic Invertebrates, Myall Lakes", *Hunter Natural History*, 8: 204-207.

Weate, P.B. (1975), "A Study of the Wetlands of the Myall River", *Operculum*, 4(3-4): 105-113.

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